

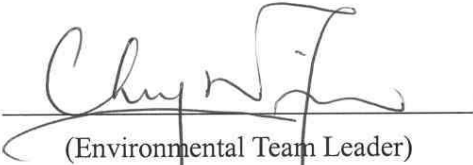
**Territory Development Department  
NT EAST Development Office**

**Tseung Kwan O Development, Phase II  
Contract No. TK57/02**

**Grade Separated Interchange T1/P1/P2**

**Environmental Monitoring and Audit  
Monthly Report (Version 1.0)**

July 2003

Certified 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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## Abbreviation and Acronym

AL Levels	Action and Limit Levels
E / ER	Engineer/Engineer's Representative
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring and Audit
EMIS	Environmental Mitigation Implementation Schedule
EP	Environmental Permit
EPD	Environmental Protection Department
ET	Environmental Team
HVS	High Volume Sampler
IEC	Independent Environmental Checker
RE	Resident Engineer
RH	Relative Humidity
TSP	Total Suspended Particulates
TDD	Territory Development Department
QA/QC	Quality Assurance / Quality Control
SLM	Sound Level Meter
WMP	Waste Management Plan

## EXECUTIVE SUMMARY

### Introduction

This is the fourteenth monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for the “Tseung Kwan O Development, Phase II – Grade Separated Interchange T1/P1/P2” (the Project). This report documents the findings of EM&A Works conducted in July 2003 (26<sup>th</sup> of each month as the cut-off day).

The construction activities undertaken in the reporting month were:

- Piles & substructure works
- Mobilization & work area set up for bored piles
- Site clearances works
- Erection of steel frame of noise barrier type B
- Pile cap construction
- Construction of superstructure of Bridge A
- Construction of superstructure of Bridge D
- Retaining Wall structure
- Pre-drilling works for noise barrier type D
- Bored piling works for Bridge C

### Environmental Monitoring Works

Environmental monitoring for the Project was performed regularly as stipulated in the EM&A Manual and the results were checked and reviewed. 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.

#### *Air Quality*

##### 1-hour TSP Monitoring

All 1-hour TSP monitoring was conducted as schedule and no Action/Limit Level exceedance was recorded in the reporting month.

##### 24-hour TSP Monitoring

All 24-hour TSP monitoring was conducted as scheduled and all monitoring results complied with the Action and Limit Levels in the reporting month.

#### *Construction Noise*

All construction noise monitoring was conducted as scheduled. One Limit Level exceedance was reported at the monitoring station N5 on 4<sup>th</sup> July 2003. The exceedance was due to the operating excavator which was located very close to the NSR.

A resident living near Po Shun Road complained about construction/piling noise and muddy

water discharge near Chung Ming Court on 10 June 2003. (Refer to Section “Complaints and Prosecutions” for details).

## **Environmental Licensing and Permitting**

License/Permits granted to the Project include the Environmental Permit (EP) for the Project, water discharge licenses, Construction Noise Permit and Waste Disposal (Chemical Waste) license. The Environmental Permit (EP) No. EP-073/2000/B issued by EPD for the construction and operation of the proposed works under the Project was amended to EP-073/2000/C.

## **Prosecutions and Complaints**

A total of 16 complaints have been received since the commencement of the Project.

Following up the complaint (log ref.: 30422-1) regarding the construction noises from the construction site at Po Shun Road after 7:00 pm and the muddy water leaking from the hoarding of the above site on both sides of the road on 17<sup>th</sup> April 2003. The complaint was received by EPD on 22<sup>nd</sup> April 2003 and was referred to the ET Leader on 24<sup>th</sup> April 2003. Complaint investigation was carried out by ET as follows:

- **Construction noises after 7:00 pm**  
According to the Works Supervisor’s Daily Report on 17<sup>th</sup> April 2003 provided by the Engineer Representative(ER), there was construction activity (i.e. Installation of steel cages, final airlifting & concreting to pile) at the concerned location after 7:00 pm till 8:00pm. With reference to the letter on 21<sup>st</sup> May 2003, the Contractor explained that the concreting works for Pile P5 at Po Shun Road was finished before 7:00 p.m. and only general cleaning and closure for TTA scheme were carried out until 8:00 p.m. They proposed that they would monitor their sub-Contractor in order that no overtime work would be allowed. The information provided by the ER on 26 June 2003 further clarified that the concreting of bored pile no. P5 at Po Shun Road King Lam Estate side was completed at about 7:42pm on 17<sup>th</sup> April 2003. The cleaning of the work area and releasing the closed lane was carried out until about 8:00pm.
- **Muddy water discharge**  
On 17 April 2003, regular site inspection was carried out by ET with the following observations on water quality at Po Shun Road:
  - (i) Sand runoff into the gullies was found at Po Shun Road near King Lam Estate.
  - (ii) Water runoff to the public road from drilling machine was found at Po Shun Road near King Lam Estate.

Having checked with our auditor, it was confirmed that the water runoff to the public road in observation (ii) was muddy water leaked out from the hoarding. During the audit session on 25<sup>th</sup> April 2003, it was observed that the concerned drilling machine had been removed from the site and the bottom of the hoarding at Po Shun Road near King Lam

Estate has been either sealed with concrete or provided with sandbag. No reoccurrence of leaking muddy water was observed. The information provided by the Contractor on 21<sup>st</sup> May 2003 showed that no muddy water discharged to the public area on 25<sup>th</sup> April 2003. The Contractor clarified that they would clean the muddy water immediately and patch up the leakage area under the hoarding in case of muddy water discharge from the site area. They would carry out daily inspection to the conditions of site hoarding and monitor the sub-Contractor to ensure that no wastewater would be discharged through the site hoardings. On 28<sup>th</sup> May 2003, the Contractor proposes mitigation measures for muddy water discharge around the site hoardings. The bottom of the site hoardings would be patched up by cement sand so that muddy water could not be flowed to the public area around the site hoardings. Daily inspection to the conditions of the site hoarding would be carried out and recorded on the daily environmental checklist. In case the muddy water discharge around the site hoardings was observed, it would be rectified immediately. Besides daily environmental inspection, the site foreman for each area would monitor all the sub-Contractors so that no wastewater would be allowed to discharge through the site hoardings.

One new complaint related to the Project works was reported during the month. The complaint (log ref.: 30610-1) is concerning the construction/piling noise and muddy water discharge near Chung Ming Court by a nearby resident on 10<sup>th</sup> June 2003. The complaint was received by EPD on 10<sup>th</sup> June 2003 and was referred to the ET Leader on 9<sup>th</sup> July 2003. Complaint investigation was carried out by ET. Complaint investigation was carried out by ET as follows:

#### Muddy Water Discharge

- Based on the information provided by the ER, the Contractor, our monitoring results and site inspections, the complaints muddy water discharge is valid.
- A regular site inspection was carried out by ET on 6<sup>th</sup> June 2003 with the following observations on water quality at Po Shun Road:
  - (i) Muddy water runoffs into gullies were found at Po Shun Road.
  - (ii) Damaged sand bags were still found at Po Shun Road following up previous site audit.
  - (iii) Surface runoff was still observed at Po Shun Road near Chung Ming Court on following up previous site audit.
- During the audit session on 13<sup>th</sup> June 2003, the contractor was recommended to bound the site area by sand bags to prevent sand runoff out of the site area/public road at Bridge A.

#### Construction/Piling Noise

- Based on the information provided by the ER, the Contractor, our monitoring results and site inspections, the complaint for construction/piling noise is considered to be valid.
- The Works Supervisor's Daily Report on 6<sup>th</sup> June 2003 provided by the ER and the Records of Labour Return provided by the Contractor show the major construction

activities at Po Shun Road on 6<sup>th</sup> June 2003 are summarized below:-

- Rock socket drilling for bored pile
  - Backfill around the footing of working platform with sand
  - Operate maned gate
  - General site works
  - Break up existing pavement for implementation of Stage 1 (V) TTM scheme
  - Pipe works and marking polymer
  - Cart away excavated materials to TKO Filling Area 137
  - Excavate to expose existing water main
  - General site works and implement TTA (PD. 1.2) for pilecap construction
  - Drive and splice steel casing, obstruction chiseling & check Rock Head Level
- 
- No evidence has shown that any limit level for construction noise is exceeded on 10<sup>th</sup> June 2003 since monitoring were carried out only on 5<sup>th</sup> and 17<sup>th</sup> June 2003. However, it is certified that the Action Limit for construction noise is met. Thus, the Event Action plan is triggered and the Contractor is required to submit proposals for remedial actions to ER in accordance to the Event Action.

Another new complaint (log ref.: 30714-1) is concerning the serious mosquito breeding problem in T1/P1/P2 project area, partly due to the disposal of lunch boxes by the workers. The complaint was investigated by FEHD and TDD was requested to follow-up the case on 24<sup>th</sup> July 2003 by members of the “Working Group on black spots” under the Keep Hong Kong Clean (Sai Kung) Committee after its meeting on 14 July 2003. The TDD subsequently referred the complaint to the ER and asked the ER to rectify the problem as early as possible, provide photo evidence that the problem has been rectified and actions taken to rectify the problem, investigate and give reason(s) for the problem and report back to TDD. The investigation is still undergoing by the end of the reporting month.

### **Overall Environmental Performance**

Though no non-compliance was issued during any site audits and the number of exceedances for noise and air quality remains to be low, a total of 16 complaints have been received since the commencement of the Project for 14 months. It should be noted that limited number of monitoring stations cannot always fully monitor the site. However, as view of the large numbers of complaints received mainly on construction noise and muddy water discharge, the environmental performance of the project is regarded as poor. The Contractor should monitor their work closely and carry out corresponding mitigation measures to rectify the condition.

### **Future Key Issues**

Construction of superstructure of Bridge A and Bridge D will be the major construction site activities for the coming month. The anticipated environmental impact will be mainly on dust and noise.



## 1. INTRODUCTION

### Background

- 1.1 Cinotech Consultants Limited (hereinafter called the “ET”) was appointed by Territory Development Department (TDD) (hereinafter called the "Project Proponent") via Maunsell Consultants Asia Limited (hereinafter called the “Engineer/ Engineer’s Representative) to undertake the Environmental Monitoring and Audit (EM&A) works for the Project “Tseung Kwan O Development, Phase II – Grade Separated Interchange T1/P1/P2” (the Project).
- 1.2 The scopes of works for the Project include upgrading the existing at-grade interchange at Roads T1/P1/P2 junction at Tseung Kwan O to a grade separated interchange, and to widen the section of Road P2 between Po Hong Road and Po Ning Road. Figure 1 shows the location and the site boundary of the Project. The works have been commenced under Contract No. TK 57/02 – “Grade Separated Interchange T1/P1/P2”.
- 1.3 The Project is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 449) and an environmental impact assessment report titled “Tseung Kwan O Development Contract F – Grade Separated Interchange T1/P1/P2, Environmental Impact Assessment (EIA) Study” (Register No. AEIAR – 017/1999) has been approved and deposited with Environmental Protection Department (EPD). The Environmental Permit (EP) No. EP-073/2000/B issued by EPD for the construction and operation of the proposed works under the Project was amended to EP-073/2000/C.
- 1.4 The Project “Tseung Kwan O Development, Phase II – Grade Separated Interchange T1/P1/P2” was commenced on 14<sup>th</sup> June 2002. Under the requirements of Conditions 3 of the EP, EM&A programme as set out in the EM&A Manual is required to be implemented. In accordance with the EM&A Manual, environmental monitoring of air quality and noise are required for the construction phase of the Project.
- 1.5 This is the fourteenth monthly EM&A report summarizes the EM&A works for the Project in July 2003 (26<sup>th</sup> of each month as the cut-off day).

### Project Organizations

- 1.6 Different parties with different levels of involvement in the project organization include:
  - Project Proponent – TDD, NT East Development Office
  - Engineer or Engineer’s Representative (E/ER) – Maunsell Consultants Asia Limited (MCAL)
  - Environmental Team (ET) – Cinotech Consultants Limited
  - Independent Environmental Checker (IEC) – Ove Arup & Partners Hong Kong Limited
  - Contractor - China Civil Engineering Construction Corporation

- 1.7 The responsibilities of respective parties are detailed in Section 1.4 of the EM&A Manual and the project organization chart is presented in Figure 2.
- 1.8 The key contacts of the Project are shown in Table 1.1.

**Table 1.1 Key Project Contacts**

Party	Name	Role	Phone No.	Fax No.
TDD	Ms. Joanna Kwok	Permit Holder	23011384	27218630
	Mr. Clement Poon	Project Coordinator	23011374	27218630
MCAL	Mr. Ivan Tsang	The Engineer	26856514	26912649
	Mr. Peter Yue / Mr. Stephen Lai	The Engineer's Representative	27010811	27013155
ET	Dr. Priscilla Choy	The ET Leader	21512083	31071388
	Mr. Elizabeth Lam	Audit Team Leader	21512076	31071388
	Mr. Henry Leung	Monitoring Team Leader	21512083	31071388
IEC	Mr. Sam Tsoi	Independent Environmental Checker	22683208	22683950
Contractor	Mr. Tommy Leung	Project Manager	22718899	28274313

### Construction Programme

- 1.9 The construction activities undertaken in the reporting month were:
- Piles & substructure works
  - Mobilization & work area set up for bored piles
  - Site clearances works
  - Erection of steel frame of noise barrier type B
  - Pile cap construction
  - Construction of superstructure of Bridge A
  - Construction of superstructure of Bridge D
  - Retaining Wall structure
  - Pre-drilling works for noise barrier type D
  - Bored piling works for Bridge C

### Summary of EM&A Requirements

- 1.10 The EM&A programme requires construction phase monitoring for air quality and construction noise and environmental site audit. The EM&A requirements for each parameter are described in following sections, including:
- All monitoring parameters;
  - Action and Limit levels for all environmental parameters;
  - Event / Action Plans;
  - Environmental mitigation measures, as recommended in the project EIA study final report;
  - Environmental requirements in contract documents.

- 1.11 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 4 of this report.
- 1.12 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely dust, noise levels and audit works for the Project in the reporting month.

## 2. AIR QUALITY

### Monitoring Requirements

- 2.1 1-hour and 24-hour TSP monitoring was conducted to monitor the air quality. Appendix A shows the established Action/Limit Levels for the environmental monitoring works.

### Monitoring Locations

- 2.2 Two designated monitoring stations, A1 and A2 were selected for impact dust monitoring. Table 2.1 describes the air quality monitoring locations, which are also depicted in Figure 1.

**Table 2.1 Locations for Air Quality Monitoring**

Monitoring Stations	Location
A1	Wan Lung Road Refuse Collection Station
A2	On Ning Garden

### Monitoring Equipment

- 2.3 Table 2.2 summarizes the equipment used in the impact air monitoring programme. Copies of calibration certificates are attached in Appendix B.

**Table 2.2 Air Quality Monitoring Equipment**

Equipment	Model and Make	Quantity
Calibrator	GMW 25	1
1-hour TSP Dust Meter	Laser Dust Monitor – Model LD3	2
HVS Sampler	GMWS 2310 c/w of TSP sampling inlet	2

### Monitoring Parameters, Frequency and Duration

- 2.4 Table 2.3 summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period. The air quality monitoring schedule for the reporting period is shown in Appendix C.

**Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration**

Parameters	Frequency
1-hr TSP	Three times / 6 days
24-hr TSP	Once / 6 days

## **Monitoring Methodology and QA/QC Procedure**

### *1-hour TSP Monitoring*

#### Measuring Procedures

2.5 The measuring procedures of the 1-hour dust meter were in accordance with the Manufacturer's Instruction Manual as follow:

- Pull up the air sampling inlet cover
- Change the Mode 0 to BG with once
- Push Start/Stop switch once
- Turn the knob to SENSI.ADJ and press it
- Push Start/Stop switch once
- Return the knob to the position MEASURE slowly
- Push the timer set switch to set measuring time
- Remove the cap and make a measurement

#### Maintenance/Calibration

2.6 The following maintenance/calibration was required for the direct dust meter:

- Check the meter at 3-month intervals and calibrate the meter at 1-year intervals throughout all stages of the air quality monitoring.

### *24-hour TSP Monitoring*

#### Instrumentation

2.7 High volume (HVS) samplers (Model GMWS-2310 Accu-Vol) completed with appropriate sampling inlets were employed for 24-hour TSP monitoring. The sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complied with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50). Moreover, the HVS also met all the requirements in section 2.3 of the EM&A Manual.

#### Operating/Analytical Procedures

2.8 Operating/analytical procedures for the operation of HVS were as follows:

- A horizontal platform was provided with appropriate support to secure the samplers against gusty wind.
- No two samplers were placed less than 2 meters apart.
- The distance between the sampler and an obstacle, such as buildings, was at least twice the height that the obstacle protrudes above the sampler.
- A minimum of 2 meters of separation from walls, parapets and penthouses was required for rooftop samples.
- A minimum of 2 meters separation from any supporting structure, measured

- horizontally was required.
- No furnaces or incineration flues were nearby.
  - Airflow around the sampler was unrestricted.
  - The sampler was more than 20 meters from the drip line.
  - Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.
- 2.9 Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 1.1 m<sup>3</sup>/min. and 1.4 m<sup>3</sup>/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.
- 2.10 For TSP sampling, fiberglass filters (G810) were used [Note: these filters have a collection efficiency of > 99% for particles of 0.3 mm diameter].
- 2.11 The power supply was checked to ensure the sampler worked properly.
- 2.12 On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air monitoring station.
- 2.13 The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.
- 2.14 The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.
- 2.15 The shelter lid was closed and secured with the aluminum strip.
- 2.16 The timer was then programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).
- 2.17 After sampling, the filter was removed and sent to the laboratory for weighing. The elapsed time was also recorded.
- 2.18 Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment temperature should be between 25°C and 30°C and not vary by more than ±3°C; the relative humidity (RH) should be < 50% and not vary by more than ±5%. A convenient working RH is 40%.

#### Maintenance/Calibration

- 2.19 The following maintenance/calibration was required for the HVS.
- The high volume motors and their accessories were properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking were made to ensure that the equipment and necessary

power supply are in good working condition.

- High volume samplers were calibrated at 3-month intervals using GMW-25 Calibration Kit throughout all stages of the air quality monitoring.

### **Results and Observations**

- 2.20 Dust monitoring was conducted as scheduled in the reporting month.
- 2.21 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in Appendices D and E respectively. In accordance with Condition 4.2 of the EP, all environmental monitoring data was made available to the public via internet access at the website <http://www.cinotech.com.hk/TKO>.
- 2.22 Wind data monitoring equipment has been installed near the RE Office for logging wind speed and wind direction.
- 2.23 Key dust monitoring findings and observations are provided as below.
- 2.24 The weather during the monitoring session was mainly sunny. Weather conditions are provided in Appendix D.

#### *1-hour TSP Monitoring*

- 2.25 All monitoring data complied with the Action and Limit Levels. No exceedance was reported.

#### *24-hour TSP Monitoring*

- 2.26 All monitoring data complied with the Action and Limit Levels. No exceedance was reported.
- 2.27 According to our field observations, the identified dust sources were mainly from road traffic.

### 3. NOISE

#### Monitoring Requirements

- 3.1 Noise monitoring was conducted in accordance with the EM&A Manual. Appendix A shows the established Action Limit Levels for the environmental monitoring works. 1 Limit Level exceedance was reported at the monitoring station N5 on 4<sup>th</sup> July 2003. The exceedance was due to the operating excavator which was located very close to the NSR.

#### Monitoring Locations

- 3.2 In accordance with the EM&A Manual, noise monitoring was conducted at four monitoring stations, namely N1, N2, N5 and N7. Figure 1 shows the locations of these stations.

**Table 3.1 Noise Monitoring Stations**

Monitoring Stations	Location
N1	Tseung Kwan O Public Library
N2	On Ning Garden
N5	Nam Fung Plaza
N7	Chung Ming Court

#### Monitoring Equipment

- 3.3 Integrating Sound Level Meters were used for noise monitoring. They were Type 1 sound level meters capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level ( $L_{eq}$ ) and percentile sound pressure level ( $L_x$ ). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1).
- 3.4 Table 3.2 summarizes the noise monitoring equipment model being used. Copies of calibration certificates are attached in Appendix B.

**Table 3.2 Noise Monitoring Equipment**

Equipment	Model	Quantity
Integrating Sound Level Meter	B&K 2238	5
Calibrator	B&K 4231	2
Wind Speed Anemometer	Vane Anemometer, Model 451104	1

#### Monitoring Parameters, Frequency and Duration



- 3.5 Table 3.3 summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule is shown in Appendix C.

**Table 3.3 Noise Monitoring Parameters, Frequency and Duration**

Monitoring Station	Parameter	Period	Frequency	Measurement
N1	L <sub>10</sub> (30 min.)dB(A) L <sub>90</sub> (30 min.)dB(A) L <sub>eq</sub> (30 min.)dB(A)	0700-1900 hrs. on weekdays	Once per week	Free Field
N2				Facade
N5				Facade
N7				Facade

### Monitoring Methodology and QA/QC Procedures

- 3.6 The Sound Level Meter was set on a tripod at a height of 1.2 m above the ground.
- 3.7 For free field measurement, the meter was positioned away from any nearby reflective surfaces. All records for free field noise levels were adjusted with a correction of +3 dB(A).
- 3.8 The battery condition was checked to ensure the correct functioning of the meter.
- 3.9 Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
- frequency weighting : A
  - time weighting : Fast
  - time measurement : 30 minutes / 5 minutes
- 3.10 Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- 3.11 The wind speed was frequently checked with the portable wind meter.
- 3.12 At the end of the monitoring period, the L<sub>eq</sub>, L<sub>90</sub> and L<sub>10</sub> were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- 3.13 Noise measurement was paused during periods of high intrusive noise if possible and observation was recorded when intrusive noise was not avoided.
- 3.14 Noise monitoring was cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.

**Maintenance and Calibration**

- 3.15 The microphone head of the sound level meter and calibrator was cleaned with soft cloth regularly.
- 3.16 The meter was sent to the supplier to check and calibrate on yearly intervals.

**Results and Observations**

- 3.17 Noise monitoring was performed at four designated locations during the daytime period (0700 to 1900) as scheduled. Results and graphical presentations are shown in Appendix F. In accordance with Condition 4.2 of the EP, all environmental monitoring data was made available to the public via internet access at the website <http://www.cinotech.com.hk/TKO>.
- 3.18 The weather during the monitoring sessions was mainly sunny. Weather conditions are provided in Appendix F.
- 3.19 1 Limit Level exceedance was reported at the monitoring station N5 on 4<sup>th</sup> July 2003. The exceedance was due to the operating excavator which was located very close to the NSR.

#### **4. ENVIRONMENTAL AUDIT**

##### **Site Audits**

- 4.1 Site audits were carried out on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audits are attached in Appendix H.
- 4.2 Site audits were conducted on 27<sup>th</sup> June, 4<sup>th</sup>, 11<sup>th</sup>, 18<sup>th</sup> and 25<sup>th</sup> July 2003.

##### **Review of Environmental Monitoring Procedures**

- 4.3 The monitoring works conducted by the monitoring team were inspected regularly. The following observations have been recorded for the monitoring works:

##### *Air Quality Monitoring*

- 4.4 The monitoring team recorded all observations around the monitoring stations within and outside of the construction site.
- 4.5 The monitoring team recorded the temperature, air pressure and weather conditions on the monitoring day.

##### *Noise Monitoring*

- 4.6 The monitoring team recorded all observations around the monitoring stations, which might affect the monitoring result.
- 4.7 Major noise sources were identified and recorded. Other intrusive noise attributing to the result was trimmed off by pausing the monitoring temporarily.

##### **Status of Environmental Licensing and Permitting**

- 4.8 All permits/licenses obtained are summarized in Table 4.1. The Environmental Permit (EP) No. EP-073/2000/B issued by EPD for the construction and operation of the proposed works under the Project was amended to EP-073/2000/C.

##### **Implementation Status of Environmental Mitigation Measures**

- 4.9 During site inspections in the month, the following observations and recommendations were made:

**Table 4.1 Summary of Environmental Licensing and Permit Status**

Permit No.	Valid Period		Section	Status
	From	To		
<b>Environmental Permit</b>				
EP-073/2000/B * a copy was attached in the monthly report of June 2002	08/02/02	N/A	Construction of widened Road P2 between Road D1 and D2, modified TKO Tunnel Road and Road P1 near Road P2 and Slip Road A to G, together with associated footpath, cycle tracks or amenity strips and retaining wall. Construction of 3 nos. vehicular bridges, a pedestrian subway and 2 extended pedestrian/cyclist subways. Erection of noise barriers and enclosure. Construction of drainage and utilities work.	Valid
EP-073/2000/C *a copy was attached in Appendix N	24/06/03	N/A	A full enclosure of about 120m long along Po Shun Road in front of King Lam Estate and Chung Ming Court shall be completed within 16 months after commencement of construction of the Project to help screen construction noise. 5 other mitigation measures are to be completed before commencement of operation of the Project. During the utility diversion works at the Po Shun Road section, the main construction activities for the Project at the Po Shun Road section shall be pre-drilling and bored piling only and no excessive noisy work including percussive piling and sheet piling shall be carried out. Acoustic sheds shall be provided to enclose the noise generating part of oscillators and drill-rigs to achieve at least 15dB(A) noise reduction. One additional noise monitoring station shall be provided throughout the whole construction period of full enclosure.	Valid
<b>Wastewater Discharge License</b>				
TE/C1247/837/1 * a copy was attached in the monthly report of July 2002	12/7/02	31/7/07	Effluent arising from construction site.	Valid
TE/F1045/838/1 * a copy was attached in the monthly report of September 2002	6/8/02	N/A	Effluent arising from RE office at TKO Area 56.	Valid
<b>Waste Disposal (Chemical Waste)</b>				
WPN: 5213-837-C3070-07 * a copy was attached in the monthly report of July 2002	N/A	N/A	Disposal of chemical waste such as waste lubricating oil and diesel oil arising from construction work.	Valid
<b>Construction Noise Permit</b>				
PP-TE0006-03 * a copy was attached in the monthly report of March 2003	20/3/03	16/9/03	Permission was granted for carrying out percussive piling at specific time of designated days.	Valid

*Air Quality*

- 4.10 On 4<sup>th</sup> July 2003, the exit at Po Shun Road near King Lam Estate was found to be untidy.
- 4.11 On 11<sup>th</sup> July 2003, materials transported on truck was not covered with tarpaulin sheet at Bridge D. Unpaved road was observed to be dry. The Contractor was reminded to spray water more frequently.
- 4.12 On 18<sup>th</sup> July 2003, materials transported on truck were not covered with tarpaulin sheet at Bridge D. Following up site audit carried out last week, the Contractor has sprayed water on dry sand.

*Noise*

- 4.13 On 9<sup>th</sup> July 2003, the ER confirmed that the Noise Mitigation Measure (d) being an absorptive, 5.5m inverted L-shape barrier of about 175m along the central divider of Road P1 was completed on 30 June 2003.

*Water Quality*

- 4.14 On 27<sup>th</sup> June 2003, damaged sand bags were found near the gullies at Bridge D. The Contractor was rectified immediately. Insufficient measure was applied to prevent sand runoff into the gullies at Po Shun Road near King Lam Estate. The Contractor was recommended to cover the gullies by wood plate or other alternative method. Stand water was found at A10 area. The Contractor was recommended to clean up more frequently after rainy season.
- 4.15 On 4<sup>th</sup> July 2003, damaged sand bags were found at Bridge D. The Contractor was recommended to bound the site area to prevent any sand / dusty materials spreading out of the site at Po Shun Road near Chung Ming Court.
- 4.16 On 11<sup>th</sup> July 2003, damaged sand bags were found at Po Shun Road near King Lam Estate. No sand bag was provided to bound the area along the Wan Po Road site area to prevent muddy water discharge. Damaged cement which patched up the bottom of hoarding was observed and not enough sand bags provided to bound the gullies at Po Shun Road near Chung Ming Court.
- 4.17 On 18<sup>th</sup> July 2003, damaged sand bags were found at Bridge A and Bridge D. The Contractor was reminded to replace the sand bags more frequently. Following up the site audit conducted in the previous week, sand bags were provided at Po Shun Road near King Lam Estate, Wan Po Road and Po Shun Road near Chung Ming Court.

*Chemical and Waste Management*

- 4.18 On 26<sup>th</sup> June 2003, oil stains were found at Po Shun Road near King Lam Estate. Following up the site audit conducted in the previous week, the air compressor that drip oil was not turned on at Po Shun Road near King Lam Estate.

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*Environmental Mitigation Implementation Schedule (EMIS)*

- 4.19 According to the Environmental Permit and the EM&A Manual, the mitigation measures detailed in the documents are required to be implemented. An updated summary of the EMIS is presented in Appendix J.

**Summary of Non-compliance of the Environmental Quality Performance Limit**

- 4.20 No non-compliance was recorded during the site audits in the reporting month.

**Implementation Status of Event Action Plans**

- 4.21 The Event Action Plans for air quality and noise are presented in Appendix I.

Air Quality

- 4.22 No exceedance of Action and Limit Levels was recorded for 1-hour and 24-hour TSP concentrations in the reporting month.

Noise

- 4.23 One Limit Level exceedance was reported at the monitoring station N5 on 4<sup>th</sup> July 2003. The exceedance was due to the operating excavator which was located very close to the NSR. The Contractor was reminded to take mitigation measures to lower the noise level in accordance to the EM & A manual.

**Summary of Complaints and Prosecution**

- 4.24 A total of 16 complaints have been received since the commencement of the Project. The details of each of the complaint are summarized in Appendix L.
- 4.25 Following up the complaint (log ref.: 30422-1) regarding the construction noises from the construction site at Po Shun Road after 7:00 pm and the muddy water leaking from the hoarding of the above site on both sides of the road on 17<sup>th</sup> April 2003. The complaint was received by EPD on 22<sup>nd</sup> April 2003 and was referred to the ET Leader on 24<sup>th</sup> April 2003. Complaint investigation was carried out by ET as follows:

Construction noises after 7:00 pm

According to the Works Supervisor's Daily Report on 17<sup>th</sup> April 2003 provided by the Engineer Representative(ER), there was construction activity (i.e. Installation of steel cages, final airlifting & concreting to pile) at the concerned location after 7:00 pm till 8:00pm. With reference to the letter on 21<sup>st</sup> May 2003, the Contractor explained that the concreting works for Pile P5 at Po Shun Road was finished before 7:00 p.m. and

only general cleaning and closure for TTA scheme were carried out until 8:00 p.m. They proposed that they would monitor their sub-Contractor in order that no overtime work would be allowed. The information provided by the ER on 26 June 2003 further clarified that the concreting of bored pile no. P5 at Po Shun Road King Lam Estate side was completed at about 7:42pm on 17<sup>th</sup> April 2003. The cleaning of the work area and releasing the closed lane was carried out until about 8:00pm.

#### Muddy water discharge

On 17 April 2003, regular site inspection was carried out by ET with the following observations on water quality at Po Shun Road:

- (i) Sand runoff into the gullies was found at Po Shun Road near King Lam Estate.
- (ii) Water runoff to the public road from drilling machine was found at Po Shun Road near King Lam Estate.

Having checked with our auditor, it was confirmed that the water runoff to the public road in observation (ii) was muddy water leaked out from the hoarding. During the audit session on 25<sup>th</sup> April 2003, it was observed that the concerned drilling machine had been removed from the site and the bottom of the hoarding at Po Shun Road near King Lam Estate has been either sealed with concrete or provided with sandbag. No reoccurrence of leaking muddy water was observed. The information provided by the Contractor on 21<sup>st</sup> May 2003 showed that no muddy water discharged to the public area on 25<sup>th</sup> April 2003. The Contractor clarified that they would clean the muddy water immediately and patch up the leakage area under the hoarding in case of muddy water discharge from the site area. They would carry out daily inspection to the conditions of site hoarding and monitor the sub-Contractor to ensure that no wastewater would be discharged through the site hoardings. On 28<sup>th</sup> May 2003, the Contractor proposes mitigation measures for muddy water discharge around the site hoardings. The bottom of the site hoardings would be patched up by cement sand so that muddy water could not be flowed to the public area around the site hoardings. Daily inspection to the conditions of the site hoarding would be carried out and recorded on the daily environmental checklist. In case the muddy water discharge around the site hoardings was observed, it would be rectified immediately. Besides daily environmental inspection, the site foreman for each area would monitor all the sub-Contractors so that no wastewater would be allowed to discharge through the site hoardings.

- 4.26 One new complaint related to the Project works was reported during the month. The complaint (log ref.: 30610-1) is concerning the construction/piling noise and muddy water discharge near Chung Ming Court by a nearby resident on 10<sup>th</sup> June 2003. The complaint was received by EPD on 10<sup>th</sup> June 2003 and was referred to the ET Leader on 9<sup>th</sup> July 2003. Complaint investigation was carried out by ET. Complaint investigation was carried out by ET as follows:

#### Muddy Water Discharge

- Based on the information provided by the ER, the Contractor, our monitoring results and site inspections, the complaints muddy water discharge is valid.
- A regular site inspection was carried out by ET on 6<sup>th</sup> June 2003 with the following observations on water quality at Po Shun Road:
  - (i) Muddy water runoffs into gullies were found at Po Shun Road.
  - (ii) Damaged sand bags were still found at Po Shun Road following up previous site audit.
  - (iii) Surface runoff was still observed at Po Shun Road near Chung Ming Court on following up previous site audit.
- During the audit session on 13<sup>th</sup> June 2003, the contractor was recommended to bound the site area by sand bags to prevent sand runoff out of the site area/public road at Bridge A.

#### Construction/Piling Noise

- Based on the information provided by the ER, the Contractor, our monitoring results and site inspections, the complaint for construction/piling noise is considered to be valid.
  - The Works Supervisor's Daily Report on 6<sup>th</sup> June 2003 provided by the ER and the Records of Labour Return provided by the Contractor show the major construction activities at Po Shun Road on 6<sup>th</sup> June 2003 are summarized below:-
    - Rock socket drilling for bored pill
    - Backfill around the footing of working platform with sand
    - Operate maned gate
    - General site works
    - Break up existing pavement for implementation of Stage 1 (V) TTM scheme
    - Pipe works and marking polymer
    - Cart away excavated materials to TKO Filling Area 137
    - Excavate to expose existing water main
    - General site works and implement TTA (PD. 1.2) for pilecap construction
    - Drive and splice steel casing, obstruction chiseling & check Rock Head Level
  - No evidence has shown that any limit level for construction noise is exceeded on 10<sup>th</sup> June 2003 since monitoring were carried out only on 5<sup>th</sup> and 17<sup>th</sup> June 2003. However, it is certified that the Action Limit for construction noise is met. Thus, the Event Action plan is triggered and the Contractor is recommended to submit proposals for remedial actions to ER in accordance to the Event Action.
- 4.27 Another new complaint (log ref.: 30714-1) is concerning the serious mosquito breeding problem in T1/P1/P2 project area, partly due to the disposal of lunch boxes by the workers. The complaint was investigated by FEHD and TDD was requested to follow-up the case on 24<sup>th</sup> July 2003 by members of the "Working Group on black spots" under the Keep Hong Kong Clean (Sai Kung) Committee after its meeting on 14 July 2003. The TDD subsequently referred the complaint to the ER and asked the ER to rectify the problem as early as possible, provide photo evidence that the



problem has been rectified and actions taken to rectify the problem, investigate and give reason(s) for the problem and report back to TDD. The investigation is still undergoing by the end of the reporting month.

### **Overall Environmental Performance**

- 4.28 Though no non-compliance was issued during any site audits and the number of exceedances for noise and air quality remains to be low, a total of 16 complaints have been received since the commencement of the Project for 14 months. It should be noted that limited number of monitoring stations cannot always fully monitor the site. However, as view of the large numbers of complaints received mainly on construction noise and muddy water discharge, the environmental performance of the project is regarded as poor. The Contractor should monitor their work closely and carry out corresponding mitigation measures to rectify the condition.

## **5. FUTURE KEY ISSUES**

### **Key Issues for the Coming Month**

5.1 Key issues to be considered in the coming month include:

- Generation of dust from stockpiles, haul road and vehicles movement on-site.
- Noise from operation equipment and machinery on-site.
- Ineffective use of sand traps and/or baffles.
- Regular removal of mud, sand and silt along u-channel.
- Wastewater discharge from site.
- Storage of chemicals/fuel and chemical waste/waste oil on site.
- Surface runoff generated in rainy season.

### **Monitoring Schedule for the Next Month**

5.2 The tentative environmental monitoring schedule for the next month is shown in Appendix C.

### **Construction Program for the Next Month**

5.3 The construction program for the Project is shown in Appendix K.

## 6. CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

- 6.1 Environmental monitoring for the Project was performed in the reporting month and all monitoring results were checked and reviewed.
- 6.2 No exceedance of Action and Limit Levels for 1-hour TSP and 24-hour TSP concentrations was recorded during the reporting month.
- 6.3 All construction noise monitoring was conducted. One Limit Level exceedance was reported at the monitoring station N5 on 4<sup>th</sup> July 2003. The exceedance was due to the operating excavator which was located very close to the NSR.
- 6.4 No environmental prosecution or complaint was received during the reporting month.

### Recommendations

- 6.5 According to the environmental audit performed in the reporting month, the following recommendations were made:

#### *Dust Impact*

- To prohibit any open burning on site.
- To regularly maintain the machinery and vehicles on site.
- To follow up any exceedance caused by the construction works.
- To implement dust suppression measures on all haul roads, stockpiles and dry surfaces.

#### *Noise Impact*

- To inspect the noise sources from inside and outside of the site.
- To follow up any exceedance caused by the construction works.
- To space out noisy equipment and position as far away as possible from sensitive receivers.
- To provide temporary noise barriers for operations of noisy equipment near the noise sensitive receivers.
- To obtain a valid Construction Noise Permit for prescribed works and construction works using powered mechanical equipment (PME) during restricted hours as stipulated in the relevant Technical Memorandum under Noise Control Ordinance.

#### *Water Impact*

- To identify any wastewater discharges from site.
- To regularly maintain the condition of u-channel, catch pits and wheel washing facilities on site.
- To regularly maintain the sediment control measures after rainstorms.

*Waste/Chemical Management*

- To check for any accumulation of waste materials or rubbish on site.
- To avoid any discharge of chemical waste or oil directly from the site.

**Table 1.1 Key Project Contacts**

<b>Party</b>	<b>Name</b>	<b>Role</b>	<b>Phone No.</b>	<b>Fax No.</b>
TDD	Ms. Joanna Kwok	Permit Holder	23011384	27218630
	Mr. Clement Poon	Project Coordinator	23011374	27218630
MCAL	Mr. Ivan Tsang	The Engineer	26856514	26912649
	Mr. Peter Yue / Mr. Stephen Lai	The Engineer's Representative	27010811	27013155
ET	Dr. Priscilla Choy	The ET Leader	21512083	31071388
	Mr. Elizabeth Lam	Audit Team Leader	21512076	31071388
	Mr. Henry Leung	Monitoring Team Leader	21512083	31071388
IEC	Mr. Sam Tsoi	Independent Environmental Checker	22683208	22683950
Contractor	Mr. Tommy Leung	Project Manager	22718899	28274313

**Table 2.1 Locations for Air Quality Monitoring**

Monitoring Stations	Location
A1	Wan Lung Road Refuse Collection Station
A2	On Ning Garden

**Table 2.2 Air Quality Monitoring Equipment**

Equipment	Model and Make	Quantity
Calibrator	GMW 25	1
1-hour TSP Dust Meter	Laser Dust Monitor – Model LD3	2
HVS Sampler	GMWS 2310 c/w of TSP sampling inlet	2

**Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration**

Parameters	Frequency
1-hr TSP	Three times / 6 days
24-hr TSP	Once / 6 days



**Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration**

Parameters	Frequency
1-hr TSP	Three times / 6 days
24-hr TSP	Once / 6 days

**Table 3.1 Noise Monitoring Stations**

Monitoring Stations	Location
N1	Tseung Kwan O Public Library
N2	On Ning Garden
N5	Nam Fung Plaza
N7	Chung Ming Court

**Table 3.2 Noise Monitoring Equipment**

Equipment	Model	Quantity
Integrating Sound Level Meter	B&K 2238	5
Calibrator	B&K 4231	2
Wind Speed Anemometer	Vane Anemometer, Model 451104	1

**Table 3.3 Noise Monitoring Parameters, Frequency and Duration**

Monitoring Station	Parameter	Period	Frequency	Measurement
N1	L <sub>10</sub> (30 min.)dB(A) L <sub>90</sub> (30 min.)dB(A) L <sub>eq</sub> (30 min.)dB(A)	0700-1900 hrs. on weekdays	Once per week	Free Field
N2				Facade
N5				Facade
N7				Facade

**Table 4.1 Summary of Environmental Licensing and Permit Status**

Permit No.	Valid Period		Section	Status
	From	To		
<b>Environmental Permit</b>				
EP-073/2000/B * a copy was attached in the monthly report of June 2002	08/02/02	N/A	Construction of widened Road P2 between Road D1 and D2, modified TKO Tunnel Road and Road P1 near Road P2 and Slip Road A to G, together with associated footpath, cycle tracks or amenity strips and retaining wall. Construction of 3 nos. vehicular bridges, a pedestrian subway and 2 extended pedestrian/cyclist subways. Erection of noise barriers and enclosure. Construction of drainage and utilities work.	Valid
EP-073/2000/C *a copy was attached in Appendix N	24/06/03	N/A	A full enclosure of about 120m long along Po Shun Road in front of King Lam Estate and Chung Ming Court shall be completed within 16 months after commencement of construction of the Project to help screen construction noise. 5 other mitigation measures are to be completed before commencement of operation of the Project. During the utility diversion works at the Po Shun Road section, the main construction activities for the Project at the Po Shun Road section shall be pre-drilling and bored piling only and no excessive noisy work including percussive piling and sheet piling shall be carried out. Acoustic sheds shall be provided to enclose the noise generating part of oscillators and drill-rigs to achieve at least 15dB(A) noise reduction. One additional noise monitoring station shall be provided throughout the whole construction period of full enclosure.	Valid
<b>Wastewater Discharge License</b>				
TE/C1247/837/1 * a copy was attached in the monthly report of July 2002	12/7/02	31/7/07	Effluent arising from construction site.	Valid

TE/F1045/838/1 * a copy was attached in the monthly report of September 2002	6/8/02	N/A	Effluent arising from RE office at TKO Area 56.	Valid
<b>Waste Disposal (Chemical Waste)</b>				
WPN: 5213-837-C3070-07 * a copy was attached in the monthly report of July 2002	N/A	N/A	Disposal of chemical waste such as waste lubricating oil and diesel oil arising from construction work.	Valid
<b>Construction Noise Permit</b>				
PP-TE0006-03 * a copy was attached in the monthly report of March 2003	20/3/03	16/9/03	Permission was granted for carrying out percussive piling at specific time of designated days.	Valid