**KCRC WEST RAIL CONTRACT CC-300**
**TSUEN WAN STATION AND APPROACH TUNNELS**

# ENVIRONMENTAL MONITORING AND AUDIT REPORT

**FOR**

**JUNE 2003**

MateriaLab Ref. No.: 992586EN30629

Penta-Ocean-Kier Ref. No.: CC300/MR/C/EMRP/45-03/A/EN102


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## 1. Executive Summary

The KCRC West Rail Contract CC-300 Tsuen Wan Station and Approach Tunnels has commenced. It is of main concern to ascertain whether there has been any undesirable effect of the construction activities on various environmental parameters over the site area. Impact environmental monitoring and audit on air quality and noise level condition are hence conducted accordingly to acquire data for assessing any impact associated with the construction activities.

This monthly report reviews the progress of the environmental monitoring and audit work at the site for the KCRC West Rail Contract CC-300 in June 2003 and forecasts the activities for July 2003. The environmental monitoring results along with the graphical plots are presented in Appendix 1, 2 and 3 respectively. The event contingency plan is contained in Appendix 7.

### ***Air Quality***

Impact air quality monitoring was conducted at two designated locations between 26 May 2003 and 25 June 2003 on five days in this reporting month.

In this review session, 100% compliance with the pre-established performance quality criteria regarding the 24-h TSP level was achieved at both monitoring locations, reflecting that the existing construction works within the CC-300 site area did not contribute significant dust nuisance to the surrounding environment.

### ***Noise Level***

Impact noise level monitoring was undertaken at two designated locations between 26 May 2003 and 25 June 2003 on five occasions in this reporting month. Noise level was measured during daytime sessions.

100% compliance regarding the daytime noise level was accomplished at both monitoring locations in this reporting period, indicating that the construction noise did not engender significant nuisance to the sensitive receivers. The noise emanating from vehicular road traffic was found to be the major influential factor to the monitoring.

### ***Discharge Water Quality***

From this review month onwards, the construction works have progressed such that no further water discharges from the project site are required.

Site drainage system is in operation; the seawall has been constructed along the site boundary to further minimise potential silty runoff from penetrating into the sea.

### ***Waste and Fill Management***

Waste
No uncontaminated mud was disposed of. No chemical waste was disposed of during this reporting session. Approximately 126$m^3$ of general construction waste was disposed to SENT landfill, Hang Hau, Tseung Kwan O in this reporting session. Nine chemical toilets situated on site were cleared three times per week within this reporting month.

Recyclable Fill
As reported by the Contractor, no excess excavated materials was disposed of in this reporting period (from 26 May 2003 to 25 June 2003).

## ***Public Complaints***

As far as the public complaint on the construction work in respect of the environmental protection and pollution control was concerned, there were no complaints received in this reporting month.

## ***Site Inspection***

Site inspection was conducted in this review session to identify potential impact from construction activities on the environment. CET and IEC inspection findings indicated the following recommendations to alleviate influence in terms of air quality, water quality, waste/ chemical management.

*By CET*
Generally, haulage roads and stockpiles were in wetted condition from prior rainfall.
General construction wastes lying on site areas awaiting disposal (Area S3A,S4A).
Following from last inspection, sand stockpile near seawall area S3D was removed.
Following from last inspection, slope base of Chung Hang Culvert was lined with sandbag barrier to prevent potential runoff (Area S3D).
Following from last inspection, diesel drum standing on bare soil at area S3D was not observed.

*By IEC*
Stockpiles were uncovered.
Sediment was observed in newly constructed U-channel.

The contractor has been advised of the situations with remedy recommendations to rectify the conditions to alleviate potential impact on the environment.

## ***Future Key Issues***

The construction activities for the coming months involves continuing earthworks, drainage works, concreting, station structure works, road improvement works which may generate fugitive dust and impose impact to sensitive receivers. The contractor should apply water-spraying continuously to relieve the dust impact.

Additionally, with the close proximity of the Area 6J / 'Interface' to the noise monitoring location at Waterside Plaza quietened, well serviced and maintained plant should be utilised to mtiigate noise nuisance to the noise sensitive receiver.

From June 2002, an approximately rectangular section within the existing site area sited between the new station structure and the Tsuen Wan Highway had initiated construction works by another contractor. With mainly earth excavation activities to be conducted at this area, potential contributory influential impact from dust emissions and noise nuisances may be engendered at the Clague Garden sensitive receiver monitoring station.

With the construction work for CC-302 contract substantially completed by the end of October 2000, it is the requirement as stated in the EM&A Manual that marine water quality monitoring work should then be picked up by the CC-300 contractor. However, as there would be no marine work involved in the CC-300 contract and discharge water quality monitoring was already in operation, the requirement for the marine water quality monitoring work is therefore proposed to be waived.

## 2. Background

The Contractor, Penta-Ocean – Kier Joint Venture, has been awarded a contract by the Kowloon-Canton Railway Corporation (KCRC) for the Tsuen Wan Station and Approach Tunnels, West Rail Contract CC-300. The site plan of the project is shown in Figure 2.1

The major works of the project commenced on December 20, 1999 and is anticipated to complete by the end of 2003. Major works under the contract include the followings: -

- Construction of an underground two level, three-track Tsuen Wan West Station partly in the new Tsuen Wan reclamation and partly on previously reclaimed land.
- Construction of the Northern Approach Tunnels between the DB-350 contract boundary and the north of the Tsuen Wan West Station.
- Construction of the Southern Approach Tunnels between the DB-320 contract boundary to the south of the Tsuen Wan West Station.

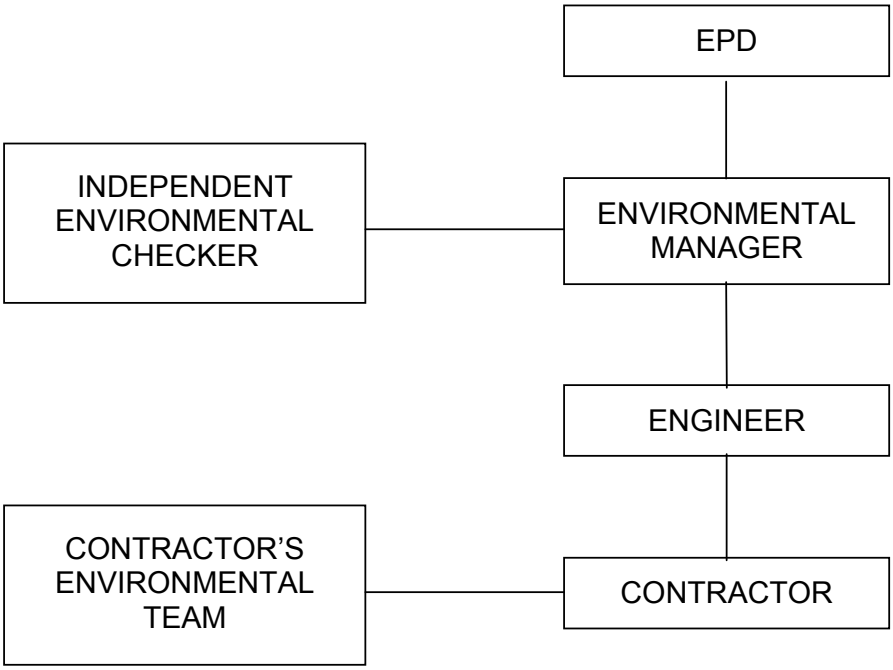
Concurrent construction works undertaken by other contractors include the Nina Tower, to the east of the West Rail alignment and the Tsuen Wan Bypass, the West Rail Contract CC-302 in close proximity and the adjoining West Rail Contracts DB-320 and DB-350 to the south and north of CC-300 respectively.

MateriaLab has been commissioned by the Joint Venture as the Contractor's Environmental Team (CET) which comprises the monitoring staff and the environmental auditor to undertake the environmental monitoring and audit work for this contract. The project organisation chart with respect to environmental protection is shown in Figure 2.2.

A baseline environmental study that involves air quality, noise level and water quality monitoring have been undertaken in the vicinity of the project site to establish the background environmental condition prior to the commencement of the reclamation work. This facilitates the establishment of the appropriate Action and Limit (AL) levels for the respective environmental parameters. Hence, environmental impact arising from the construction work can be assessed based on the AL levels.

Environmental Management Plan, Waste Management Plan, Environmental Mitigation Implementation Schedule and Contamination Assessment Plan have also been submitted. Contractor shall operate and strictly adhere to the guidelines of the said documents in order to facilitate the site environmental management in the best practical means.

Figure 2.2 Project Organisation Chart and Lines of Communication



# 3. General Review

## *3.1 Summary of Environmental Monitoring and Audit (EM&A) Requirements*

The EM&A requires the monitoring of air quality, noise and water quality at the pre-agreed monitoring stations prior to and during construction.
The impact water quality monitoring has already been actively in progress for the KCRC West Rail CC-302 Tsuen Wan Reclamation Contract at the same set of monitoring stations. As stipulated in the EM&A Manual, the impact water quality monitoring for the CC-300 Contract would be postponed until completion of the CC-302 project. Post-project water quality monitoring is required after the completion of construction works.

EM&A also recommends environmental auditing of monitoring results and all environmental protection and pollution mitigation measure to test the adequacy of the environmental management systems and the effectiveness of the environmental monitoring programme. A set of standards known as the Action/Limit (AL) levels is set on parameters with respect to the air quality, noise and water quality based on the baseline monitoring data. Environmental audit works are to be carried out based on the impact monitoring data with respect to the AL levels to check against any exceedance(s). When monitoring data of the air quality, noise and water quality exceed the respective AL levels, appropriate environmental mitigation measures and more frequent monitoring in accordance with the corresponding event contingency plans are to be carried out until the respective levels return to within the acceptable range.

The construction work for CC-302 contract is anticipated to be completed by the end of October 2000, it is the requirement as stated in the EM&A Manual that marine water quality monitoring work should then be picked up by the CC-300 contractor. However, as there would be no marine work involved in the CC-300 contract and discharge water quality monitoring was already in operation, the requirement for the marine water quality monitoring work is therefore proposed to be waived.
Monitoring requirements on the frequency, duration and location of measurements for the air, noise and discharge water parameters are summarised in Table 3.1.

Table 3.1 Summary of Monitoring Parameters

| | Location | Monitoring Parameters | Frequency | Requirements |
|---|---|---|---|---|
| Air | A1 , A2 | Total Suspended Particulate (TSP) | Once every six days | 1 x 24-hour sampling |
| Noise | N1 , N2 | Daytime noise level of $L_{Aeq}$(30min) as six consecutive $L_{Aeq}$ (5 min) | Once per week | 6 x $L_{Aeq}$ (5 min.) between 0700 and 1900 hours on normal weekdays |
| | | Evening noise level of $L_{Aeq}$ as three consecutive $L_{Aeq}$ (5 min) | Once per week when there is construction work undertaken between 1900 and 2300 hours | 3 x $L_{Aeq}$ (5 min) between 1900 and 2300 hours |
| | | Night-time noise level of $L_{Aeq}$ as three consecutive $L_{Aeq}$ (5 min) | Once per week when there is construction work undertaken between 2300 and 0700 hours of next day | 3 x $L_{Aeq}$ (5 min) between 2300 and 0700 hours of next day |
| Discharge Water | Discharge into communal storm drain. | • Suspended Solids | Monthly | Grab sampling at outlets of the sediment tanks. (depending upon operation use) |

### *3.2 Action and Limit Levels*

*Air Quality Limit*

The action and limit (AL) levels for 24-hour and 1-hour total suspended particulate (TSP) are formulated from the baseline data. The AL levels are shown in Table 3.2.

Table 3.2 Action and Limit Levels for Air Quality

| Location | Parameter | Action | Limit |
|---|---|---|---|
| A1 | 24-hour TSP | 174 | 260 |
| | 1-hour TSP | 326 | 500 |

| Location | Parameter | Action | Limit |
|---|---|---|---|
| A2 | 24-hour TSP | 182 | 260 |
| | 1-hour TSP | 339 | 500 |

*Noise Limit*

The AL levels are mainly dependent on the number of complaints received during the course of construction and the Area Sensitivity Rating (ASR) of the Noise Sensitivity Receivers (NSRs). For this construction project, the ASR of the NSRs is defined to be "C". The AL levels are shown in Table 3.3.

Table 3.3 Action and Limit Levels for Noise Level

| Time Period | Action | Limit |
|---|---|---|
| 07:00 to 19:00 hours on normal weekdays | When one or more documented complaint is received | 75 dB(A) |
| 07:00 to 23:00 hours on holidays; and 19:00 to 23:00 hours on all other days | | 70 dB(A) |
| 23:00 to 07:00 hours of next day | | 55 dB(A) |

Remark: ASR of the NSRs is "C".

*Water Quality Limit*

No water quality monitoring have been scheduled until the completion of the CC-302 project. The construction work for CC-302 contract is anticipated to be completed by the end of October 2000, it is the requirement as stated in the EM&A Manual that marine water quality monitoring work should then be picked up by the CC-300 contractor. However, as there would be no marine work involved in the CC-300 contract and discharge water quality monitoring was already in operation, the requirement for the marine water quality monitoring work is therefore proposed to be waived.

A variation to the water discharge license has issued and for the purposes of determining compliance with conditions as stipulated in the Water Discharge Licence, compliance levels for water discharge via licensed discharge point have been specified in the Licence. The compliance levels are tabulated as in Table 3.4.

Table 3.4 Compliance Limit for Water Discharge License

| Determinand(s) | Sample Type | Monitoring Frequency | Maximum |
|---|---|---|---|
| Suspended Solids | Grab sample at outlet of sedimentation tanks | Monthly | 30 mg/L |

## 4. Construction Phase Environmental Monitoring

### *4.1 Review of the Construction Phase Monitoring Programme*

The schedule for the monitoring programme in this reporting month (26 May 2003 to 25 June 2003) is shown in Table 4.1.

Table 4.1 Monitoring Schedule for June 2003

| SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|
| | 26 May | 27 A,N | 28 | 29 | 30 | 31 |
| 1 | 2 A,N | 3 | 4 | 5 | 6 | 7 A |
| 8 | 9 | 10 | 11 | 12 | 13 A,N | 14 |
| 15 | 16 | 17 | 18 | 19 A,N | 20 | 21 |
| 22 | 23 | 24 | 25 A,N | | | |

Legend: A – Air quality monitoring at two designated locations.
N – Noise level monitoring at two designated locations during daytime and evening-time period.

### *4.2 Monitoring Methodology*

*Air Quality*

The Total Suspended Particulate (TSP) level is measured by following the standard high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, USA, Chapter 1 (Part 50), Appendix B.

The TSP is sampled by drawing air through a piece of conditioned and pre-weighed filter paper inside the high volume sampler at controlled flowrate of about 40-60 c.f.m. After sampling, the filter paper with the retained particulate is then placed properly in a plastic bag and transported back to the laboratory for further conditioning and weighing. The TSP level is calculated from the ratio of the mass of particulate retained on the filter to the total volume of air sampled.

The equipment used and their respective calibration frequency for the TSP monitoring are as shown in Table 4.2. The locations of the monitoring stations are tabulated in Table 4.3 and shown in Figure 4.1.

Table 4.2 Air Quality Monitoring Equipment

| Item | Model | Calibration Frequency |
|---|---|---|
| High volume sampler, including :<br>• Motor/blower assembly<br>• Filter holder<br>• G901 ET1 Elapsed time indicator<br>• G310 Flow controller<br>• G105 Flow recorder with cartridge And charts<br>• G70 Seven-day mechanical timer<br>• Aluminum shelter | GMW SA2310-105 | One point calibration : every 600 hours of sampling or after replacement of motor/motor brushes |
| Variable Resistance Calibrator Orifice | Andersen G3357K | Annually |

Table 4.3 Air Quality Monitoring Locations

| Monitoring Station | Location |
|---|---|
| A1 | At rooftop of Jade River Restaurant on podium of Clague Garden Estate |
| A2 | At rooftop of lift house on podium of Water Side Plaza |

*Noise Level*

The noise level is measured in terms of the A-weighted equivalent continuous sound pressure level ($L_{Aeq}$). Measurements of $L_{Aeq}$ (30 min) as six consecutive $L_{Aeq}$ (5 min) for daytime period and $L_{Aeq}$ (15 min) as three consecutive $L_{Aeq}$ (5 min) for evening and night-time period are undertaken at each of the two designated stations if there would be construction activity during that period.

With reference to the Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO), sound level meters in compliance with the International Electrotechnical Commission Publications 651 : 1979 (Type 1) and 804 : 1985 (Type 1) specifications are used for carrying out the noise monitoring.

Where a measurement is to be carried out at a building, the assessment point shall normally be at a position one meter from the exterior of the building façade. The assessment point shall be at a position 1.2 meter above the ground at a place other than a building.

Immediately prior to and following each noise measurement, the accuracy of the sound levels meter are checked using an acoustic calibrator generating a known

sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurements agree to within 1.0 dB.

Noise measurements will not be made in the presence of fog, rain, wind with a steady speed exceeding $5ms^{-1}$, or wind with gusts exceeding $10ms^{-1}$. The wind speed is checked with a portable wind speed meter capable of measuring the wind speed in m/s.

The equipment used and their respective calibration frequency for the noise monitoring are as shown in Table 4.4. The locations of the monitoring stations are tabulated in Table 4.5 and shown in Figure 4.2.

Table 4.4 Noise Level Monitoring Equipment

| Item | Model | Calibration Frequency |
|---|---|---|
| Precision integrating sound level meter | B&K 2236<br>B&K 2238<br>RION NL-14 | Bi-annually |
| Sound level calibrator | B&K 4230<br>B&K 4231<br>RION NC-73 | Bi-annually |
| Microphone extension cable (3m) | B&K A00027<br>B&K A00185<br>B&K A00408 | - |

Table 4.5 Noise Level Monitoring Locations

| Monitoring Station | Location |
|---|---|
| N1 | At rooftop of Jade River Restaurant on podium of Clague Garden Estate |
| N2 | At rooftop of lift house on podium of Water Side Plaza |

Remark: The measurement is to be undertaken from the exterior of the building façade.

*Discharge Water Quality*

A variation in the water discharge license has delineated the monitoring of a single parameter- suspended solids level (mg/l), to be conducted monthly at the outlets of the sedimentation tanks and determined in a laboratory.
The method statements and equipment used with their respective calibration frequency are shown in Table 4.6 and Table 4.7 respectively.

From this review month onwards, the construction works have progressed such that no further water discharges from the project site are required.

Table 4.6 Method Statements of Laboratory Analysis of Discharge Water Quality

| Parameters | Method |
|---|---|
| Suspended solids | APHA, 17th edition, 2540D |

Table 4.7 Discharge Water Quality Monitoring Equipment

| Equipment | Model | Parameters Measured | Calibration Frequency |
|---|---|---|---|
| Water sampler | Plastic pitcher | Water sampling | - |
| Analytical balance | Mettler Toledo | Suspended solids | 6 months |
| Oven | WTB-Binder | Suspended solids | 12 months |
| Vacuum pump | GAST DOA-P104-BN | Suspended solids | - |

### *4.3 Summary of Monitoring Results*

*Air Quality*

Air quality monitoring was conducted between 26 May 2003 and 25 June 2003 on five days in this reporting month. The summary of the monitoring results is shown in Table 4.8.

Table 4.8 Summary of Air Quality Monitoring Results

| | A1 | A2 |
|---|---|---|
| Average 24-h TSP ($\mu g/m^3$) | 80 | 62 |
| Range ($\mu g/m^3$) | 57-102 | 43-86 |

*Noise Level*

Noise level monitoring during daytime sessions were conducted between 26 May 2003 and 25 June 2003 on five days in this reporting month. The summary of the monitoring results is shown in Table 4.9.

Table 4.9 Summary Noise Monitoring Results

| | Day time | | Evening | | Night-time | |
|---|---|---|---|---|---|---|
| | N1 | N2 | N1 | N2 | N1 | N2 |
| Average noise level (dB(A)) | 70.9 | 71.6 | - | - | - | - |
| Range (dB(A)) | 69.3-74.6 | 70.9-72.4 | - | - | - | - |

*Discharge Water Quality*

From this review month onwards, the construction works have progressed such that no further water discharges from the project site are required.

### *4.4 Summary of Non-Compliances*

*Air Quality*

100% compliance of AL levels regarding the 24-hour TSP monitoring was accomplished in this reporting month.

*Noise Level*

No documented complaint was received in this reporting month and as compared against the Limit level, no event of non-compliance was recorded for the noise monitoring conducted between 0700 and 1900 on normal weekdays.

*Discharge Water Quality*

From this review month onwards, the construction works have progressed such that no further water discharges from the project site are required.

### *4.5 Review of events of non-compliance*

*Air Quality*

Full compliance of air quality was attained in this reporting session.

*Noise Level*

Full compliance of noise levels was attained in this reporting session.

*Discharge Water Quality*

From this review month onwards, the construction works have progressed such that no further water discharges from the project site are required.

### *4.6 Actions taken in event(s) of non-compliance*

*Air Quality*

The contractor is advised to continue and maintain the deployment of dust mitigation measures, namely more frequent water spraying and covering of exposed stockpiles and slopes to alleviate potential impact incurred from ongoing constructional activities.

*Noise Level*

The contractor is advised to employ quiet working method practices to minimise impact on the environment.

*Discharge Water Quality*
From this review month onwards, the construction works have progressed such that no further water discharges from the project site are required.

## 5. Construction Site Environmental Audit

Site inspection was conducted in this reporting period to identify any potential impact associated with the construction activities and to examine the implementation status of necessary mitigation measures. The updated environmental mitigation implementation schedule is contained in Appendix 6. The site inspection records are contained in Appendix 4.

### *Air Quality*

*By CET*
Generally, haulage roads and stockpiles were in wetted condition from prior rainfall.
Stockpiles throughout site area were uncovered.

*By IEC*
Stockpiles were uncovered.

The Contractor has been advised to maintain the frequency of water spraying at potential dust inducing activities and cover exposed stockpiles, construction materials as appropriate so to alleviate potential dust impacts.

### *Noise Level*

*By CET/ IEC*
The noise level condition around the site area was generally satisfactory. The noise environment around the construction site stemmed mainly from vehicular traffic within the site area and from the adjacent Tsuen Wan Highway.

### *Water Quality*

*By CET*
Following from last inspection, sand stockpile near seawall area S3D was removed.
Following from last inspection, slope base of Chung Hang Culvert was lined with sandbag barrier to prevent potential runoff (Area S3D).

*By IEC*
Sediment was observed in newly constructed U-channel.

Stockpiles were recommended to be covered to avoid runoff and dust impacts.
Covering, bunds/ barriers should be provided along the shoreline to avoid silty surface runoff into the marine waters. The Contractor has endeavoured to re-use the water as far as possible for water-spraying at dry areas on-site. Additionally, site drainage system is in use.

***Waste and Fill Management***

*By CET*
General construction wastes lying on site areas awaiting disposal (Area S3A,S4A).
Following from last inspection, diesel drum standing on bare soil at area S3D was not observed.

By *IEC*
No significant comments.

Waste
No uncontaminated mud was disposed of. No chemical waste was disposed of during this reporting session. Approximately 126$m^3$ of general construction waste was disposed to SENT landfill, Hang Hau, Tseung Kwan O in this reporting session.
Nine chemical toilets situated on site were cleared three times per week within this reporting month.

A fabricated steel chemical storage area has been designated on-site and in service since mid-August 2000. All the relevant sub-contractors have been informed to temporarily store any chemical waste in the chemical area for proper disposal by licensed waste haulier in the future.

Recyclable Fill
As reported by the Contractor, no excess excavated materials were disposed of in this reporting period (from 26 May 2003 to 25 June 2003).

## 6. Summary of Public Complaints

No public complaint in association of environmental performance and pollution control was registered in this reporting month.

A running summary of EPD warnings, complaints and prosecutions is shown in the following table:

| Date | Summary | Follow-up Action |
|---|---|---|
| 25-03-2000 | A site inspection held on 06-03-2000 was conducted by the EPD. A yellow form was issued concerning the muddy water discharge at sea. | The wheel washing facilities at the northern exit has been modified and the problem rectified. |
| 24-12-1999 | A warning letter (pink form) from EPD was received regarding the absence of hoarding adjoining public access along Wing Shun Street and the dry surface of main haul road within Area S4B of the project area. | Hoarding along Wing Shun Street was erected immediately and water spraying at dry surface was deployed more frequently. |
| 19-09-2000 | An enforcement check by EPD regarding piling noise was carried out on 28/07/00. Percussive piling was carried out at the site without a valid CNP. | Apply and carry out percussive piling works only with a valid CNP and conditions as stated within. |
| 28-07-2001 | A site inspection held on 13-05-2001 (general holiday) was conducted by the EPD. Construction works involving powered mechanical equipment undertaken without a valid CNP. | Apply and carry out construction works other than percussive piling only with a valid CNP and conditions as stated within. |

## 7. Construction Works in June 2003

The construction works undertaken in June 2003 comprise station earthworks, concreting, station structure works, station electrical works, road reconstruction, underground drainage works for Approach Tunnels and roadworks.

The Works Program is contained in Appendix 5 for reference.

## 8. Construction Works in July, August and September 2003

### *Forthcoming Construction Activities*

The construction works scheduled for July, August and September 2003 mainly comprises the following works:

- Station earthworks
- Drainage works
- Road construction works
- Associated electrical and mechanical works
- Landscaping earthworks.

The Works Program is contained in Appendix 5 for reference.

### *Impact Prediction Review*

The continuation of station earthworks and roadworks may generate fugitive dust and impose impact to sensitive receivers. The contractor should apply water-spraying continuously so as to relieve potential dust impacts to a minimum.

The close proximity of the Waterside Plaza to the 'Interface' construction works area may generate short term noise nuisance to the nearby receiver. In this respect, the Contractor has been advised to use quietened and well maintained plants to alleviate impact to a minimum.

### *Future Key Issue*

With the construction work for CC-302 contract substantially completed by the end of October 2000, it is the requirement as stated in the EM&A Manual that marine water quality monitoring work should then be picked up by the CC-300 contractor. However, as there would be no marine work involved in the CC-300 contract and discharge water quality monitoring was already in operation, the requirement for the marine water quality monitoring work is therefore proposed to be waived.

## 9. Permits

The status of various permits applied are as follows:-

***EIA***

| Permit No. | Description | Valid period | | Time | Section | Status | Remark |
|---|---|---|---|---|---|---|---|
| | | From | To | | | | |
| FEP-13/004/1999 | Further Environmental Permit | 20-10-1999 | - | - | Whole work site | Valid | - |
| VEP-020/2000/A/EP-004 | Amended Environmental Permit | 18-08-2000 | - | - | Whole work site | Valid | - |
| EP-004/1998/B | Amended Environmental Permit | 27-06-2001 | - | - | Whole work site | Valid | - |
| EP-004/1998/C | Amended Environmental Permit | 09/04/2002 | - | - | Whole work site | Valid | - |
| EP-004/1998/D | Amended Environmental Permit | 08/07/2002 | - | - | Whole work site | Valid | - |
| EP-004/1998/E | Amended Environmental Permit | 24/10/2002 | - | - | Whole work site | Valid | - |
| EP-004/1998/F | Amended Environmental Permit | 20/02/2003 | - | - | Whole work site | Valid | - |

***Water***

| Permit No. | Description | Valid period | | Time | Section | Status | Remark |
|---|---|---|---|---|---|---|---|
| | | From | To | | | | |
| ~~EP742/324/1517 I~~ | ~~Water Discharge License~~ | ~~01-02-2000~~ | ~~28-02-2005~~ | - | ~~Inshore Water~~ | Superseded by license below | ~~Bimonthly monitoring of pH, COD, SS~~ |
| EP742/324/1517 I | Water Discharge License | 20-11-2000 | 28-02-2005 | - | All sedimentation tanks discharging to communal drains | Valid | Monthly monitoring of SS |

***Waste***

| Waste Producer No. | Description | Valid period | | Time | Section | Status | Remark |
|---|---|---|---|---|---|---|---|
| | | From | To | | | | |
| 5211-324-P2793-01 | Chemical Waste Producer Registration | 01-02-2000 | - | - | Whole work site | Valid | - |

| Admission Ticket No. | Description | Valid period | | Time | Section | Status | Remark |
|---|---|---|---|---|---|---|---|
| | | From | To | | | | |
| 812/841/3884 | Disposal of Special Waste at Landfills Admission Ticket | 15-11-2002 | 14-01-03 | 8a.m. – 8p.m. | CC300 Stockpiled mud at Area S4B to SENT landfill | Expired | Contaminated Mud from Old Ma Tau Pa Culvert |

***Marine Dumping***

| Permit No. | Description | Valid period | | Time | Section | Status | Remark |
|---|---|---|---|---|---|---|---|
| | | From | To | | | | |
| EP/MD/01-078 | Marine Dumping (Uncontaminated excavated marine mud) | 16-10-2000 | 15-04-2001 | - | CC300 Tsuen Wan to South Cheung Chau Spoil Disposal Area | Invalid | Allocation full |
| ~~EP/MD/01-079~~ | ~~Marine Dumping (Contaminated excavated marine mud)~~ | ~~10-10-2000~~ | ~~19-11-2000~~ | - | ~~CC300 Tsuen Wan to East Sha Chau Spoil Disposal Area~~ | ~~Expired~~ | Bulk volume allocation 9250$m^3$ Superseded |
| EP/MD/01-107 | Marine Dumping (Contaminated excavated marine mud) | 28-11-2000 | 27-12-2000 | - | CC300 Tsuen Wan to East Sha Chau Spoil Disposal Area | Expired | - |
| EP/MD/01-139 | Marine Dumping (Contaminated excavated marine mud) | 28-02-2001 | 27-03-2001 | - | CC300 Tsuen Wan to East Sha Chau Spoil Disposal Area | Expired | Bulk volume allocation 9750$m^3$ Renewal of EP/MD/01-107 |
| EP/MD/01-142 | Marine Dumping (Uncontaminated excavated marine mud) | 19-01-2001 | 18-07-2001 | - | CC300 Tsuen Wan to South Cheung Chau Spoil Disposal Area | Invalid | Bulk volume allocation 12775$m^3$ Allocation full |
| EP/MD/01-156 | Marine Dumping (Uncontaminated excavated marine mud) | 16-02-2001 | 15-08-2001 | - | CC300 Tsuen Wan to South Cheung Chau Spoil Disposal Area | Expired | Bulk volume allocation 6500$m^3$ |
| EP/MD/01-155 | Marine Dumping (Contaminated excavated marine mud) | 16-02-2001 | 15-03-2001 | - | CC300 Tsuen Wan to South Cheung Chau Spoil Disposal Area | Expired | Bulk volume allocation 4000$m^3$ |
| EP/MD/01-154 | Marine Dumping (Uncontaminated excavated marine mud) | 16-02-2001 | 15-08-2001 | - | CC300 Tsuen Wan to South Cheung Chau Spoil Disposal Area | Expired | Bulk volume allocation 31500$m^3$ |

***Marine Dumping (continued)***

| Permit No. | Description | Valid period | | Time | Section | Status | Remark |
|---|---|---|---|---|---|---|---|
| | | From | To | | | | |
| EP/MD/01-181 | Marine Dumping (Contaminated excavated marine mud) | 31-03-2001 | 30-04-2001 | - | CC300 Tsuen Wan to East Sha Chau Spoil Disposal Area | Expired | Bulk volume allocation 13750$m^3$ |
| EP/MD/02-006 | Marine Dumping (Contaminated excavated marine mud) | 01-05-2001 | 30-05-2001 | - | CC300 Tsuen Wan to East Sha Chau Spoil Disposal Area | Expired | Renewal of EP/MD/01-181 |
| EP/MD/02-019 | Marine Dumping (Contaminated excavated marine mud) | 01-06-2001 | 30-06-2001 | - | CC300 Tsuen Wan to East Sha Chau Spoil Disposal Area | Expired | Bulk allocation 10615$m^3$. |
| EPMD/02-030 | Marine Dumping (Contaminated excavated marine mud) | 01-07-2001 | 31-07-2001 | - | CC300 Tsuen Wan to East Sha Chau Spoil Disposal Area | Expired | Bulk allocation 10615$m^3$ |
| EP/MD/02-055 | Marine Dumping (Uncontaminated excavated marine mud) | 16-08-2001 | 15-12-2001 | - | CC300 Tsuen Wan to South Cheung Chau Spoil Disposal Area | Expired | Bulk allocation 1425$m^3$ |
| EP/MD/02-058 | Marine Dumping (Contaminated excavated marine mud) | 02-09-2001 | 01-10-2001 | - | CC300 Tsuen Wan to East Sha Chau Spoil Disposal Area | Expired | Bulk allocation 9540$m^3$ |
| EP/MD/02-080 | Marine Dumping (Contaminated excavated marine mud) | 02-10-2001 | 01-11-2001 | - | CC300 Tsuen Wan to East Sha Chau Spoil Disposal Area | Expired | Bulk allocation 7000$m^3$ |
| EP/MD/02-103 | Marine Dumping (Contaminated excavated marine mud) | 02-11-2001 | 01-12-2001 | - | CC300 Tsuen Wan to East Sha Chau Spoil Disposal Area | Expired | Bulk allocation 5980 $m^3$ |

***Noise***

| Permit No. | Description | Valid period | | Time | Section | Status | Remark |
|---|---|---|---|---|---|---|---|
| | | From | To | | | | |
| GW-UW0205-00 | Construction Noise Permit for evening works at Area S3E | 25-05-2000 | 14-11-2000 | General Holidays (including Sundays): 0700-1900 hours. Any day not being a general holiday: 1900-2300 hours. | Area S3E | Expired | - |
| GW-UW0278-00 | Construction Noise Permit for evening works at Area S5A and S5B | 01-08-2000 | 01-01-2001 | | Area S5A and S5B | Expired | - |
| GW-UW0279-00 | Construction Noise Permit for evening works at Area S4A and S4B | 25-07-2000 | 24-12-2000 | | Area S4A and S4B | Expired | Renewal of GW-UW0058-00 |
| GW-UW0280-00 | Construction Noise Permit for evening works at Chung Hang Culvert | 25-07-2000 | 24-12-2000 | | Chung Hang Culvert | Expired | Renewal of GW-UW0057-00 |
| GW-UW0287-00 | Construction Noise Permit for evening works at Area S3A | 25-07-2000 | 24-12-2000 | | Area S3A | Expired | Renewal of GW-UW0056-00 |
| GW-UW0354-00 | Construction Noise Permit for evening works at Area S3E (N8-N10) | 04-09-2000 | 28-02-2001 | | Area S3E (N8 – N10) | Expired | - |
| GW-UW0481-00 | Construction Noise Permit for evening works at Area S4A and S4B (Excavation & Concreting) | 25-12-2000 | 24-05-2001 | | Area S4A and S4B | Expired | - |
| GW-UW0482-00 | Construction Noise Permit for evening works at Chung Hang Culvert (Concreting) | 25-12-2000 | 24-05-2001 | | Chung Hang Culvert | Expired | - |
| GW-UW0484-00 | Construction Noise Permit (Excavation & Concreting) | 17-11-2000 | 14-04-2001 | | SE3 | Expired | - |

***Noise (continued)***

| Permit No. | Description | Valid period | | Time | Section | Status | Remark |
|---|---|---|---|---|---|---|---|
| | | From | To | | | | |
| GW-UW0493-00 | Construction Noise Permit (Excavation & Concreting) | 25-12-2000 | 24-05-2001 | General Holidays (including Sundays): 0700-1900 hours. Any day not being a general holiday: 1900-2300 hours. | S3A | Expired | - |
| GW-UW0017-01 | Construction Noise Permit (Areas S5A and S5B) | 23-01-2001 | 01-06-2001 | | S5A and S5B | Expired | - |
| GW-UW0076-01 | Construction Noise Permit (Area S3E-extended) | 01-03-2001 | 31-08-2001 | | S3E | Expired | - |
| GW-UW0184-01 | Construction Noise Permit (Area S3E) | 08-05-2001 | 28-10-2001 | | S3E | Expired | - |
| GW-UW0202-01 | Construction Noise Permit (Areas S3A and S6B) | 02-06-2001 | 01-11-2001 | | S6A and S6B | Expired | - |
| GW-UW0203-01 | Construction Noise Permit (Areas S4A and S4B) | 25-05-2001 | 24-10-2001 | | S4A and S4B | Expired | - |
| GW-UW0209-01 | Construction Noise Permit (Area S3E) | 29-05-2001 | 15-10-2001 | | S3E | Expired | - |
| GW-UW0226-01 | Construction Noise Permit (Area S3A) | 08-06-2001 | 25-10-2001 | | S3A | Expired | - |

***Noise (continued)***

| Permit No. | Description | Valid period | | Time | Section | Status | Remark |
|---|---|---|---|---|---|---|---|
| | | From | To | | | | |
| GW-UW0421-00 | Construction Noise Permit (demolition work in Ferry Bus Terminal) | 16-10-2000 | 12-12-2000 | Any day not being a general holiday : 1900-0700 | Ferry Bus Terminal | Expired | - |
| GW-UW030-01 | Construction Noise Permit (Areas S3A) | 26-08-2001 | 26-10-2001 | | S3A | Expired | - |
| GW-UW0236-01 | Construction Noise Permit (Areas S4A and S5A) | 19-06-2001 | 01-11-2001 | General Holidays (including Sundays): 0700-1900 hours. Any day not being a general holiday: 1900-2300 hours. | S4A and S5A | Expired | - |
| GW-UW0238-01 | Construction Noise Permit (Area S4A and S4B) | 21-06-2001 | 15-11-2001 | | S4A and S4B | Expired | - |
| GW-UW-0280-01 | Construction Noise Permit (Chung Hang Culvert) | 27-07-2001 | 20-12-2001 | | Chung Hang Culvert | Expired | - |
| GW-UW0370-01 | Construction Noise Permit (Area S4A) | 04-11-2001 | 20-12-2001 | | S4A | Expired | - |
| GW-UW0371-01 | Construction Noise Permit (Area S4A) | 04-11-2001 | 13-11-2001 | | S4A | Expired | - |
| GW-UW0410-01 | Construction Noise Permit (Area S4D) | 26-11-2001 | 25-03-2002 | | S4D | Expired | - |

***Noise (continued)***

| Permit No. | Description | Valid period | | Time | Section | Status | Remark |
|---|---|---|---|---|---|---|---|
| | | From | To | | | | |
| GW-UW0284-01 | Construction Noise Permit (Areas S4A and S4B) | 18-07-2001 | 31-08-2001 | General Holidays (including Sundays): 1900 to 2300 hours AND any day not being a general holiday: 2300 to 0800 hours on next day. | S4A and S4B | Expired | - |
| GW-UW0303-01 | Construction Noise Permit (Areas S3A) | 26-08-2001 | 26-01-2002 | Any day not being a general holiday : 2300-0700 | S3A | Expired | - |
| GW-UW0437-01 | Construction Noise Permit (Area PTI) | 02-11-2001 | 30-03-2002 | General Holidays (including Sundays): 0700 to 1900 hours AND any day not being a general holiday: 1900 to 2300 hours | PTI | Expired | - |
| GW-UW0425-01 | Construction Noise Permit (Areas S3A and S4B) | 07-11-2001 | 25-03-2002 | | S3A and S4B | Expired | - |
| GW-UW0443-01 | Construction Noise Permit (Area PT1) | 15-11-2001 | 15-04-2002 | | PT1 | Expired | - |
| GW-UW0477-01 | Construction Noise Permit (Chung Hang Culvert) | 21-12-2001 | 20-05-2002 | | Chung Hang Culvert | Expired | - |
| GW-UW0517-01 | Construction Noise Permit (Tower 9 and Tower 10) | 01-01-2002 | 20-04-2002 | | Tower 9 and tower 10 | Expired | - |

***Noise (continued)***

| Permit No. | Description | Valid period | | Time | Section | Status | Remark |
|---|---|---|---|---|---|---|---|
| | | From | To | | | | |
| GW-UW0502-01 | Construction Noise Permit (Areas S3A) | 21-12-2001 | 18-05-2002 | General Holidays (including Sundays): 0700-1900 hours AND any day not being a general holiday: Immediately following a general holiday: 1900-2400 hours. Not immediately following a general holiday :0000-0700 hours & 1900-2400 hours | S3A | Expired | - |
| GW-UW0063-02 | Construction Noise Permit (Area S4D) | 26-03-2002 | 25-09-2002 | General Holidays (including Sundays): 0700 to 1900 hours AND any day not being a general holiday: 1900 to 2300 hours | S4D | Expired | - |
| GW-UW0064-02 | Construction Noise Permit (Area S3A & Area S4B) | 02-04-2002 | 25-09-2002 | | S3A & S4B | Expired | - |
| GW-UW0080-01 | Construction Noise Permit (PTI -Tower 7 & Tower 8) | 10-04-2002 | 31-10-2002 | | Tower 7 & tower 8 | Expired | - |
| GW-UW0086-02 | Construction Noise Permit (Area S3A) | 16-04-2002 | 15-10-2002 | | S3A | Expired | - |
| GW-UW0151-02 | Construction Noise Permit (Area S3A) | 12-06-2002 | 30-11-2002 | | S3A | Expired | - |
| GW-UW0152-02 | Construction Noise Permit (Chung Hang Area) | 12-06-2002 | 30-11-2002 | | Chung Hang Area | Expired | - |
| GW-UW0153-02 | Construction Noise Permit (Area S4D) | 12-06-2002 | 30-11-2002 | | S4D | Expired | - |
| GW-UW0154-02 | Construction Noise Permit (Hoi Hing Road) | 12-06-2002 | 30-11-2002 | | Hoi Hing Road | Expired | - |

**Noise (continued)**

| Permit No. | Description | Valid period | | Time | Section | Status | Remark |
|---|---|---|---|---|---|---|---|
| | | From | To | | | | |
| GW-UW0270-02 | Construction Noise Permit (Area S3A (Station, S26-N28)) | 26-09-2002 | 25-03-2003 | General Holidays (including Sundays): 0700 to 1900 hours AND any day not being a general holiday: 1900 to 2300 hours | S3A (Station, S26-N28) | Expired | - |
| PP-UW0028-00 | Construction Noise Permit for percussive piling at Tai Ho Culvert | 14-08-2000 | 26-08-2000 | Weekday: 0700 - 1900 | Tai Ho Culvert | Expired | - |
| PP-UW0031-00 | Construction Noise Permit for percussive piling at Chung Hang Culvert | 17-08-2000 | 30-08-2000 | Weekday: 0900 – 1130 1630 - 1900 | Chung Hang Culvert | Expired | - |
| PP-UW0032-00 | Construction Noise Permit for percussive piling at Chung Hang Culvert vicinity | 05-09-2000 | 11-09-2000 | | Near pumping Station (Chung Hang Culvert's vicinity) | Expired | - |
| PP-UW0033-00 | Construction Noise Permit for percussive piling at Ma Tau Pa Culvert | 07-09-2000 | 30-09-2000 | Weekday: 0700 - 1900 | Ma Tau Pa Culvert | Expired | - |
| PP-UW0041-00 | Construction Noise Permit for percussive piling at Ma Tau Pa Culvert | 03-10-2000 | 24-10-2000 | | Ma Tau Pa Culvert | Expired | Renewal of PP-UW0033-00 |
| PP-UW0040-00 | Construction Noise Permit for percussive piling at Tai Ho Culvert 2 | 03-10-2000 | 21-10-2000 | | Tai Ho Culvert | Expired | - |
| PP-UW0011-01 | Construction Noise Permit for percussive piling – vicinity of Chung Hang Culvert | 28-03-2001 | 10-04-2001 | Weekday: 0800 – 0900 1600 - 1900 | Chung Hang Culvert | Expired | - |

## 10. Monitoring Schedule for June, July and August 2003

Air quality and noise level impact monitoring are scheduled for the forthcoming three reporting months as shown in Table 10.1.

Table 10.1 Impact Monitoring Schedule for July, August and September 2003

July 2003

| SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|
| | | 1 | 2 A,N | 3 | 4 | 5 |
| 6 | 7 | 8 A,N | 9 | 10 | 11 | 12 |
| 13 | 14 A,N | 15 | 16 | 17 | 18 | 19 A |
| 20 | 21 | 22 | 23 | 24 | 25 A,N | 26 |
| 27 | 28 | 29 | 30 | 31 A,N | | |

August 2003

| SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|
| | | | | | 1 | 2 |
| 3 | 4 | 5 | 6 A,N | 7 | 8 | 9 |
| 10 | 11 | 12 A,N | 13 | 14 | 15 | 16 |
| 17 | 18 A,N | 19 | 20 | 21 | 22 | 23 A |
| 24 | 25 | 26 | 27 | 28 | 29 A,N | 30 |
| 31 | | | | | | |

September 2003

| SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 A,N | 5 | 6 |
| 7 | 8 | 9 | 10 A,N | 11 | 12 | 13 |
| 14 | 15 | 16 A,N | 17 | 18 | 19 | 20 |
| 21 | 22 A,N | 23 | 24 | 25 | 26 | 27 A |
| 28 | 29 | 30 | | | | |

Legend: The monitoring date is shaded
A – Air quality monitoring at two designated locations
N – Noise level monitoring at two designated locations.

## 11. Comments and Conclusion for June 2003

Regular impact air quality and noise level monitoring was conducted in this reporting period in accordance with the EM&A requirements. The monitoring results indicated that the environmental condition around the project area generally complied with the pre-established environmental quality performance.

Construction site environmental audits were conducted in this reporting month. The site environmental management practices were generally sufficient. The Contractor has been instigated to rectify the deficiencies as identified during regular site environmental audit.

All in all, the environmental performance of the construction site was generally satisfactory with respect to air quality, noise level, water quality and waste management in concern.

Summary of Recommendations:

- Cover large stockpiles of fine materials.
- Maintain frequent water spraying at haul road areas to suppress dust emissions.
- Site drainage should be maintained to prevent potential runoff into the water body.
- Earth materials should be removed prevent run-off into the sea area.
- Construction wastes should be regularly disposed and general housekeeping upheld.

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# Appendix 1

# Air Quality Monitoring Data

# Appendix 2

# Noise Level Monitoring Data

# Appendix 3

# Graphical Presentation of Monitoring Data

# Appendix 4

# Site Inspection Records

# Appendix 5

# Works Program

# Appendix 6

# Environmental Mitigation Implementation Schedule

**Air Quality**

| Air Quality | Environmental Mitigation Measures | Location | Timing | Implementation Status |
|---|---|---|---|---|
| Material Handling | The heights from which excavated materials are dropped shall be controlled to a minimum practical height to limit fugitive dust generation from loading/unloading. | Whole work site | During material handling | Done |
| | Any stockpile of dusty material shall be either –<br>(a) covered entirely by impervious sheeting;<br>(b) placed in an area sheltered on the top and the 3 sides; or<br>(c) sprayed with water or a dust suppression chemical so as to maintain the entire surface wet. | Stockpiling area | At all times | Done |
| | The loading, unloading, transfer, handling or storage of bulk cement or any cement during or after the de-bagging process shall be carried out in a totally enclosed system or facility, and any vent or exhaust shall be fitted with an effective fabric filter or equivalent air pollution control system or equipment. | Cement handling area | During cement handling | Done |

| Air Quality | Environmental Mitigation Measures | Location | Timing | Implementation Status |
|---|---|---|---|---|
| Excavation or Earth Moving | The working area of any excavation or earth moving operation shall be sprayed with water or a dust suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet. | Excavation area | Before, during and after excavation | Done |
| | Exposed earth shall be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, viny1, bitumen, shotcrete or other suitable surface stabiliser within 6 months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. | Excavation area | Within 6 months after last activity on site | Done |
| Power Driving Operation | Water or a dust suppression chemical shall be continuously sprayed on the surface where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation that causes dust emission is carried out, unless the process is accompanied by the operation of an effective dust extraction and filtering device. | Whole work site | During power driven operation | Done |
| Vehicle Dust | Immediately before leaving a construction site, every vehicle shall be washed to remove any dusty materials from its body and wheels. | Exit of site | During vehicle leaving | Done |
| | Where a vehicle leaving a construction site is carrying a load of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle. | Exit of site | During vehicle leaving | Done |

| Air Quality | Environmental Mitigation Measures | Location | Timing | Implementation Status |
|---|---|---|---|---|
| Vehicle Dust | Vehicle washing facilities including a high pressure water jet shall be provided at every discernible or designated vehicle exit point. | Exit of site | During vehicle leaving | Done |
| | The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point shall be paved with concrete, bituminous materials or hardcores. | Exit of site | During construction | Done |
| | In site vehicle speed shall be controlled at 15 km/h. | Site area | At all time | Done |
| Access Road | Every main haul road shall be:-<br>a) paved with concrete, bituminous materials, hardcores or metal plates, and kept clear of dusty materials; or<br>b) sprayed with water or a dust suppression chemical so as to maintain the entire road surface wet. | Main haul roads | During construction | Done |
| | The portion of any road leading only to a construction site that is within 30 m of a discernible or designated vehicle entrance or exit shall be kept clear of dusty materials. | Access road | During construction | Done |
| Hoarding | Where a site boundary adjoins a road, street, service lane or other are accessible to the public, hoarding of not less than 2.4 m high from ground level shall be provided along the entire length of that portion of the site boundary except for a site entrance or exit. | Site boundary | During construction | Done |

| **Air Quality** | Environmental Mitigation Measures | **Location** | **Timing** | **Implementation Status** |
|---|---|---|---|---|
| Demolition Works | The area at which demolition work takes place shall be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the demolition activities so as to maintain the entire surface wet. | Demolition area | During demolition | Done |
| | For any wall of the building to be demolished that abuts or fronts upon a street, service lane or other open are accessible to the public, impervious dust screens or sheeting shall be used to enclose the whole wall to a height of at least 1 m higher than the highest level of the structure being demolished. | Demolition area | During demolition | Not applicable |
| | Any dusty materials remaining after a stockpile is removed shall be wetted with water and cleared from the surface of roads or streets. | Demolition area | After removing stockpiles | Done |
| | Registered asbestos consultant shall be commissioned to investigate the presence of asbestos in structure to be demolished. Procedures in accordance with Air Pollution Control Ordinance (Cap. 311) Sections 69, 73, 74 and 75 shall be followed. | Demolition area | Before demolition | Not applicable |
| Open Burning | Open burning activities for the following purposes shall be prohibited:<br>a) the disposal of construction wastes;<br>b) the clearance of a site in preparation for construction work;<br>c) the disposal of tyres; and<br>d) the salvage of metal. | Whole work site | At all times | Done |

**Noise**

| Noise | Environmental Mitigation Measures | Location | Timing | Implementation Status |
|---|---|---|---|---|
| Maintenance of equipment | Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction programme.<br>Silencers or mufflers on construction equipment shall be properly fitted and maintained if appropriate. | Whole work site | At all times | Done |
| Scheduling of Work | Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum. | Whole work site | At all times | Done |
| | Whenever possible, the removal of a stockpile of earth or a topographical noise barrier shall commence at the side far from any noise-sensitive receiver, so that the earth itself can perform as a natural sound barrier which reduces the noise level and minimises the length of disturbance to the receiver. Similar practice shall be adopted for excavation works. | Whole work site | During earth moving | Done |
| Siting of equipment | Noisy equipment shall always be sited as far away as possible from any noise-sensitive receiver such as residential buildings, schools or hospitals, etc. Advantage shall be taken of the screening effect of any object nearby, such as water cooling tanks or temporary site offices. | Whole work site | At all times | Done |

| Noise | Environmental Mitigation Measures | Location | Timing | Implementation Status |
|---|---|---|---|---|
| Site Supervision | Unnecessary noise disturbance created from, for example, colliding of materials or striking of steel bars especially in noise sensitive periods shall be avoided by close supervision of work on site. The site supervisor shall take necessary precaution and ensure that the operations of all plant and work will not causing nuisance to any nearby noise sensitive receiver. | Whole work site | At all times | Done |
| Permit | Noise permit shall be obtained when there is construction activities in restricted time period. | Whole work site | Before activities in restricted time | CNP obtained |

**Water Quality**

| Water Quality | Environmental Mitigation Measures | Location | Timing | Implementation Status |
|---|---|---|---|---|
| Construction Runoff | Exposed soil areas shall be minimised to reduce the potential for increased siltation, contamination of runoff and erosion. | Whole work site | At all times | Done |
| | Sediment trap in accordance with the guidelines in Appendix A1 of ProPECC PN 1/94 shall be installed. | Sediment trap | During construction | Done |
| | The boundaries of critical areas of earthworks shall be marked and surrounded by dykes or embankments for flood protection. Temporary ditches shall be provided to facilitate runoff discharge into the appropriate watercourses, via a silt retention pond. Permanent drainage channels shall incorporate sediment basins or traps and baffles to enhance deposition rates. | Whole work site | During earth work | Drainage system constructed |
| | Measures shall be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. | Stockpiling area | At all times | Done |
| | Manholes (including newly constructed ones) shall always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers. | Manholes | At all times | Done |

| Water Quality | Environmental Mitigation Measures | Location | Timing | Implementation Status |
|---|---|---|---|---|
| Construction Runoff | Oil interceptors shall be provided in the drainage system and regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor shall have a bypass to prevent flushing during periods of heavy rain. | Oil interceptor | At all times | No oily waste was expected |
| Drainage | Culvert extension outfall shall be constructed to facilitate runoff discharge. | Culvert outfall | During construction | Not applicable |
| | All sediment control measures and drainage system shall be inspected weekly to ensure proper operation. | Drainage system | At all times | Done |
| General Construction Activities | Debris and rubbish on site shall be collected, handled and disposed of properly to avoid entering the water column to cause water quality impact. | Whole work site | At all times | Done |

**Waste Management**

| Waste Management | Environmental Mitigation Measures | Location | Timing | Implementation Status |
|---|---|---|---|---|
| General | The hierarchy of the various waste management options shall be as follows:<br>a) Avoidance and minimisation (not generating waste through changing or improving practices and design);<br>b) Reuse of materials, thus avoiding disposal (generally with only limited reprocessing);<br>c) Recovery and recycling, thus avoiding disposal (although reprocessing may be required); and<br>d) Treatment and disposal, according to relevant regulations, guidelines and good practice. | Whole work site | During waste handling | Done |
| Excess Excavated Material | The priority for off-site disposal of excess excavated material shall be as follows:<br>a) Transport to other Sections of West Rail for reuse;<br>b) Transport to other land formation site for reuse;<br>c) Transport to public filling areas.<br>The Contractor shall liaise with other contractors who will require fill material during that period. | Excavation area | During excavation | Part of excess excavated materials reused on site while the remaining transported to Public Filling Area |

| Waste Management | Environmental Mitigation Measures | Location | Timing | Implementation Status |
|---|---|---|---|---|
| Construction and Demolition Waste | Careful design, planning and good site management shall be adopted to minimise over-ordering and waste of materials. The design of formwork shall maximise the use of standard wooden panels so that high reuse levels can be achieved. Alternatives such as steel formwork of plastic facing shall be considered to increase the potential for reuse. | Whole work area | At all times | Done |
| | The Contractor shall recycle as much as possible of the construction waste on-site. Different areas shall be designated for such segregation and storage wherever site conditions permit. | Whole work site | During waste handling | Done |
| | Construction waste shall be stockpiled and disposed of at public dumping areas regularly. | Waste stockpiling areas | Once per week | Not applicable |
| | During demolition, inert construction waste shall be sorted out of household refuse, plastic, metal and industrial waste. Construction waste shall be disposed of at public filling areas. For waste other than construction waste, the segregated waste shall be either recycled and reused or disposed of at landfills. | Demolition areas | Immediately after demolition | Steel bars and reinforcement to be sold as scrap metals. |

| Waste Management | Environmental Mitigation Measures | Location | Timing | Implementation Status |
|---|---|---|---|---|
| General Refuse | General refuse generated on-site shall be stored in enclosed bins or compaction units separate from construction and chemical wastes. A waste collector shall be employed to remove general refuse from the site, on a daily or every other day basis to minimise odour, pest and litter impacts. The burning of refuse on construction sites is prohibited by law. | Whole work site | Daily and when necessary | Done |
| | General refuse will be generated largely by food service activities on site, so reusable rather than disposable dishware shall be used if feasible. Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated or easily accessible, so separate labelled bins for their deposit shall be provided wherever feasible. | Whole work site | At all times | Done |
| | Office wastes can be reduced through recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme shall be considered if one is available. | Whole work site | At all times | Not applicable |

# Appendix 7

# Event Contingency Plan

Event Contingency Plan for Action Level Exceedance (Air, Water)*

| Step | Day | Action | Contractor/ CET | RSS | IEC |
|---|---|---|---|---|---|
| 1 | 1 | Identify exceedance from monitoring data and initiate corrective action. Submit data to RSS with observed source(s) of pollution. | ■ | | |
| 2 | 1 | Input monitoring data and observed pollution source(s) into WREMS on same day when data is submitted from CET. WREMS will automatically generate a Notice of Exceedance (NOE) and send it to the IEC via email. | | ■ | |
| 3 | 1 | On same day of receipt of the NOE, check monitoring data trend and Contractor's work method. Decide if a formal NOE should be issued. If so, forward the NOE via email to KCRC and RSS. If not, close the Exceedance record in the WREMS. | | | ■<br>□ |
| 4 | 1 | Confirm receipt of NOE to IEC. | | ■ | |
| 5 | 1 | Issue NOE to Contractors and remind their contractual obligations. | | ■ | |
| 6 | 2 | Propose remedial measures to RSS within 1 working day of receipt of NOE. | ■ | □ | |
| 7 | 2 | Review and agree the proposed remedial measures and make recommendations where necessary. | | ■<br>□ | ■<br>□ |
| 8 | 2 | Implement the proposed remedial measures once they have been agreed. | ■ | | |
| 9 | - | Arrange site visit to ensure implementation of the agreed remedial measures. | | ■ | ■ |
| 10 | - | Increase monitoring frequency to assess effectiveness of remedial measures. (Be specific about the frequency for the different parameters. e.g. once every 3 days for 24-hr dust, daily for 1-hr dust) Submit monitoring data to RSS for entering into the WREMS once they are available. | ■ | | |
| 11 | - | If exceedance continues, arrange meeting with Contractor and RSS to review the implemented remedial measures and identify further remedial measures. Go to step 8.<br>If exceedance stops for 3 consecutive monitoring, resume normal monitoring frequency. | ■ | ■<br>□ | ■ |
| 12 | - | Inform IEC the closure of exceedance. | | ■ | |
| 13 | - | Close the exceedance record in the WREMS. | | | ■ |

■ Action party

□ Enter comments/proposals into the appropriate exceedance record in WREMS where applicable.

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* Action level exceedance for noise is defined as the receipt of one documented complaint. Follow the Event Contingency Plan for Complaint to handle this exceedance.

Event Contingency Plan for Limit Level Exceedance (Air, Water and Noise)

| Step | Day | Action | Contractor/ CET | RSS | IEC |
|---|---|---|---|---|---|
| 1 | 1 | Identify exceedance from monitoring data and initiate corrective action. Submit data to RSS with observed source(s) of pollution. | ■ | | |
| 2 | 1 | Input monitoring data and observed pollution source(s) into WREMS on same day when data is submitted from CET. WREMS will automatically generate a Notice of Exceedance (NOE) and send it to the IEC via email. | | ■ | |
| 3 | 1 | On same day of receipt of the NOE, check monitoring data trend and Contractor's work method. Decide if a formal NOE should be issued. If so, forward the NOE via email to KCRC and RSS. If not, close the Exceedance record in the WREMS. | | | ■<br>□ |
| 4 | 1 | Confirm receipt of NOE to IEC on receipt of NOE. | | ■ | |
| 5 | 1 | Issue NOE to Contractors and remind their contractual obligations. | | ■ | |
| 6 | 2 | Take immediate action to avoid further exceedance. | ■ | | |
| 7 | 2 | Propose remedial measures to RSS within 1 working day of receipt of NOE. | ■ | □ | |
| 8 | 2 | Review and agree with the proposed remedial measures and make recommendations where necessary. | | ■<br>□ | ■<br>□ |
| 9 | - | Implement the proposed remedial measures once they have been agreed. | ■ | | |
| 10 | - | Arrange site visit to ensure implementation of agreed remedial measures. | | ■ | ■ |
| 11 | - | Increase monitoring frequency to assess effectiveness of remedial measures. (Be specific about the frequency for the different parameters. e.g. daily for all parameters) Submit monitoring data to RSS for entering into the WREMS once they are available. | ■ | | |
| 12 | - | If exceedance continues, arrange meeting with Contractor and RSS to review the implemented remedial measures and identify further remedial measures. Go to step 9.<br>If exceedance stops for 3 consecutive monitoring, resume normal monitoring frequency. | ■ | ■<br>□ | ■ |
| 13 | - | Inform IEC the closure of exceedance. | | ■ | |
| 14 | - | Close the exceedance record in the WREMS. | | | ■ |

■ Action party

□ Enter comments/proposals into the appropriate exceedance record in WREMS where applicable.

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Event Contingency Plan for Complaint

| Step | Day | Action | Contractor/ CET | KCRC | RSS | IEC |
|---|---|---|---|---|---|---|
| 1 | 1 | Party receiving complaint shall create a new complaint record in the WREMS. If the Contractor receives a complaint, the Contractor shall pass the information to the RSS for entering into the WREMS. WREMS then automatically sends a Notification of Complaint to KCRC, RSS and IEC via email. | ■ | ■ | ■ | |
| 2 | 1 | RSS forward the complaint to Contractor/CET if that is not already received by the Contractor. | | ■ | | |
| 3 | 2 | Within 1 working day after the receipt of the Notification of Complaint, provide RSS relevant works site information, e.g. types and locations of construction works. | ■ | | □ | |
| 4 | 2 | Investigate the complaint to determine its validity, and to assess whether the source of the problem is due to the works activities. Report the validity of the complaint to KCRC and RSS. | | | | ■<br>□ |
| 5 | 2 | If complaint is valid and due to works, RSS shall notify the Contractor.<br>If complaint is invalid or not due to works, Go to Step 11. | | | ■ | |
| 6 | 2 | Propose mitigation measures to RSS within 1 working day of the receipt of the Notification. | ■ | | □ | |
| 7 | 2 | Review and agree with the proposed mitigation measures and make recommendations where necessary. | | | ■<br>□ | ■<br>□ |
| 8 | 2 | Implement the mitigation measures once they have been agreed. | ■ | | | |
| 9 | 4 | Audit the implementation of the proposed mitigation measures on site within 2 working days after the measures have been agreed. | | | ■<br>□ | ■<br>□ |
| 10 | - | Undertake additional monitoring to verify the situation where necessary. | ■ | | | |
| 11 | 4 | Report the investigation results and subsequent actions taken to RSS within 2 working days after the implementation of mitigation measures. | ■ | | □ | |
| 12 | 5 | Respond to the complainant within 2 working day after receiving the investigation report. | | ■ | | |
| 13 | 25 | If no further comments or complaints are received from the complainant within 20 working days after responding to the complainant, close the complaint record in the WREMS.<br>If the complainant has further comments or complaints on the same issue, notify other parties on the same day and go to step 2. | | ■ | ■<br>□ | |

■ Action party

□ Enter comments/proposals into the appropriate exceedance record in WREMS where applicable.

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Event Contingency Plan for Non Compliance

| Step | Day | Action | Contractor/ CET | RSS | IEC |
|---|---|---|---|---|---|
| 1 | 1 | Create a new non-compliance record in the WREMS within 1 working day after making an observation during a site audit accompanied by RSS. The WREMS automatically sends a Notice of Non-Compliance (NNC) to the RSS and KCRC via email. The NNC will include the observations and the reasons for non-compliance. | | | ■ |
| 2 | 1 | Confirm receipt of NNC to IEC and forward NNC to Contractor. | | ■ | |
| 3 | 2 | Propose corrective actions within 1 working day after the receipt of the NNC. | ■ | □ | |
| 4 | 2 | Review and agree with the proposed corrective actions and make additional recommendations as required. | | ■<br>□ | ■<br>□ |
| 5 | 2 | Implement the proposed corrective action once they have been agreed. | ■ | | |
| 6 | 3 | Audit the implementation of the corrective actions on site within 1 working day after the actions have been implemented. | | ■<br>□ | |
| 7 | - | Check the implementation of the corrective actions at the next site audit. Close the non-compliance record in the WREMS if the implementation of the corrective actions is satisfactory. | | | ■<br>□ |
| 8 | - | Propose preventive actions within 3 working days after the closure of the non-compliance record. | ■ | □ | |

■ Action party

□ Enter comments/proposals into the appropriate exceedance record in WREMS where applicable.

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# Appendix 8

# Equipment Calibration Details