

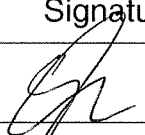
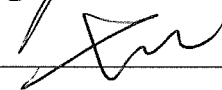
China State – Shanghai Tunnel Joint Venture

Contract No. DC/2009/05

**Harbour Area Treatment Scheme
Stage 2A,
Construction of Interconnection Tunnel and
Diaphragm Wall for
Main Pumping Station at
Stonecutters Island
Sewage Treatment Works**

**Monthly EM&A Report for
March 2010
(4th Monthly EM&A Report)**

April 2010

	Name	Signature
Prepared & Checked:	Cyrus Lau	
Reviewed & Approved:	Edith Ng	

Version: 0

Date: 14 April 2010

The information contained in this report is, to the best of our knowledge, correct at the time of printing. The interpretation and recommendations in the report are based on our experience, using reasonable professional skill and judgment, and based upon the information that was available to us. These interpretations and recommendations are not necessarily relevant to any aspect outside the restricted requirements of our brief. This report has been prepared for the sole and specific use of our client and AECOM Environment accepts no responsibility for its use by others.

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**Important Message
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CE/Harbour Area Treatment Scheme
Drainage Services Department
Sewage Services Branch
Harbour Area Treatment Scheme Division
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2A Pokfulam Road, Hong Kong

14 April 2010
By Fax (2833 9162) and Post

Attn: Mr. Danny Tang

Dear Sir,

**Agreement No. CE 8/2009(EP)
Harbour Area Treatment Scheme (HATS) Stage 2A
Independent Environmental Checker for Construction Phase – Investigation**

**Contract No. DC/2009/05
Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station
at Stonecutters Island Sewage Treatment Works
Condition 4.4 – Submission of Monthly EM&A Report for March 2010**

I refer to the revised Monthly EM&A Report for March 2010 received on 14 April 2010. Pursuant to Condition 4.4 of Environmental Permit No. EP-332/2008/B, I hereby verify the captioned Report.

Yours faithfully
for MOTT MACDONALD HONG KONG LIMITED

A handwritten signature in black ink, appearing to read 'A F Kerr', written over a horizontal line.

Dr. Anne F Kerr
Independent Environmental Checker

c.c. ARUP
AECOM
CSSTJV

Mr. Gamini Ananda
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EXECUTIVE SUMMARY

The proposed construction of interconnection tunnel and diaphragm wall for main pumping station at Stonecutters Island Sewage Treatment Works (SCISTW) (the Project) is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO) and is governed by an Environmental Permit (EP-322/2008/B). The Project comprises the construction of Interconnection Tunnel between the Inlet Chamber of the Main Pumping Station and the existing Riser Shaft and diaphragm wall for the Main Pumping Station.

China State - Shanghai Tunnel Joint Venture was commissioned as the Contractor of the Project. AECOM Asia Co. Ltd. was employed by China State - Shanghai Tunnel Joint Venture as the Environmental Team to undertake the EM&A works for the Project.

The construction phase of the Project commenced on 10 December 2009. The impact environmental monitoring and audit (EM&A) programme of the Project, which includes air quality, noise and landscape and visual monitoring and environmental site inspections, was commenced on 10 December 2009.

This report documents the findings of EM&A works conducted in the period between 1 and 31 March 2010. As informed by the Contractor, construction activities in the reporting period were:

- Drainage work;
- Steel cage fixing work;
- Welding work;
- Tree transplanting and protection;
- Predrilling for mini-piles at main pumping station;
- Construction of diaphragm wall for the main pumping station and its inlet chamber; and
- Construction of guide wall for interconnection tunnel.

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Level was recorded for both 1-hour TSP and 24-hour TSP monitoring in the reporting month.

Breaches of Action and Limit Levels for Noise

According to the information provided by the Contractor, no Action Level exceedance was recorded since no noise related complaint was received in the reporting month.

No Limit Level exceedance of noise was recorded at all monitoring station in the reporting month, except the measured noise levels recorded on 12, 18, 24 and 30 March 2010 during night-time period.

Based on on-site observations during the course of noise measurements during night-time periods, excavation and general tidy-up work by workers were the major work process undertaking within the Project site.

Other external noise sources were also noted during the monitoring periods, which may have attributed to the measured noise levels.

Referring to the information provided by the Contractor, types and number of PMEs operated within the Project site on exceedance days comply with the requirements in the CNP (Ref: GW-RW0038-10).

According to the average baseline noise level recorded during night-time period, a Limit Level exceeding noise level had been recorded.

Therefore, it is believed that the Limit Level exceedances are not project-related and not solely caused by the Contractor's construction activities.

According to the EIA report, no noise sensitive receiver was identified near the site area except the FSD Diving Rescue and Diving Training Centre. As informed by the Officer from FSD Diving Rescue and Diving Rescue Centre, there is no training course during the night-time period on normal weekdays. It is believed that the noise exceedance recorded would have unlikely caused any impact at NSRs farther away. No public complaints have been received in relation to the construction noise from the site during the restricted hours on 12, 18, 24 and 30 March 2010.

Complaint, Notification of Summons and Successful Prosecution

According to the information provided by the Contractor, no complaint, notification of summons and successful prosecution was received in the reporting month.

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

Key issues to be considered in the coming month included:

- Properly store and label oils and chemicals on site;
- Proper chemical, chemical waste and waste management;
- Segregation and recycling of construction wastes should be properly implemented;
- Collection of construction wastes should be carried out properly and regularly;
- Site runoff should be properly collected and treated prior to discharge;
- Regular inspection and maintenance of drainage systems and desilting facilities;
- Accumulation of stagnant water in site area should be avoided;
- Suppress dust generated from bentonite slurry treatment plant, excavation activities and haul road traffic;
- Quieter powered mechanical equipment should be used;
- Noise control measures, such as erection of movable noise barrier, should be properly maintained on site; and
- Proper tree protection works should be provided when carry out works near existing trees.

1 INTRODUCTION

1.1 Background

- 1.1.1 The proposed construction of interconnection tunnel and diaphragm wall for main pumping station at Stonecutters Island Sewage Treatment Works (SCISTW) (the Project) is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO) and is governed by an Environmental Permit (EP-322/2008/B).
- 1.1.2 The Project site is located in the Sham Shui Po District. It is located within the existing Stonecutters Island Sewage Treatment Works (SCISTW), which is bounded by Ngong Shung Road to the north and the west. The general layout plan of the Project site showing the contract area is shown in Figure 1.1.
- 1.1.3 The objective of the Project “Harbour Area Treatment Scheme (HATS) Stage 2A - Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at Stonecutters Island Sewage Treatment Works (SCISTW)” under Contract DC/2009/05 is to provide Interconnection Tunnel between the Inlet Chamber of the Main Pumping Station and the existing Riser Shaft and diaphragm wall for the Main Pumping Station.
- 1.1.4 The scope of the Project comprises mainly:
- Construction of Interconnection Tunnel with concrete lining between the Inlet Chamber of the Main Pumping Station and the existing Riser Shaft;
 - Construction of diaphragm wall, base slab and pile cap for the Main Pumping Station and its Inlet Chamber;
 - Excavation within the diaphragm walls for the Main Pumping Station and its Inlet Chamber to founding levels;
 - Piling works for the Main Pumping Stations;
 - Utilities upgrading and diversion works;
 - Temporary launching shaft to be handed over to MPS Contractor;
 - Carrying out ground monitoring and instrumentation works;
 - Carrying out pumping test;
 - Miscellaneous building, civil and electrical and mechanical works; and
 - Landscape works.
- 1.1.5 The Project is anticipated to complete in mid 2012.
- 1.1.6 According to the Environmental Permit (EP-322/2008/B) and the EM&A Manual of the Project, there is a need of an EM&A programme including air quality and noise monitoring and landscape and visual audits and environmental site inspections.
- 1.1.7 AECOM Asia Co. Ltd. was employed by the Contractor, China State - Shanghai Tunnel Joint Venture, as the Environmental Team (ET) to undertake the EM&A works for the Project. In accordance with the EM&A Manual of the Project, environmental monitoring of air quality, noise and landscape and visual impacts and environmental site inspections would be required for this Project.
- 1.1.8 The construction phase of the Project commenced on 10 December 2009. The impact environmental monitoring and audit (EM&A) programme of the Project, which includes air quality, noise and landscape and visual monitoring and environmental site inspections, was commenced on 10 December 2009.

1.2 Scope of Report

1.2.1 This is the fourth monthly Environmental Monitoring and Audit (EM&A) Report under the Contract DC/2009/05 – Harbour Area Treatment Scheme (HATS) Stage 2A - Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at Stonecutters Island Sewage Treatment Works (SCISTW). This report presents a summary of the environmental monitoring and audit works, list of activities and mitigation measures proposed by the ET for the Project in March 2010.

1.3 Project Organization

1.3.1 The project organization structure is shown in Appendix A. The key personnel contact names and numbers are summarized in Table 1.1

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
ER (Ove Arup)	The Engineer	S.Y. Chan	2528 3031	2370 4377
	The Engineer Representative	M.P. Gamini Ananda	2370 4311	2370 4377
	The Engineer Representative's Coordinator	William Yu	9705 9566	2370 4377
IEC (Mott MacDonald)	Independent Environmental Checker	Anne Kerr	2828 5793	2827 1823
Contractor (China State – Shanghai Tunnel Joint Venture)	Site Agent	Ben Siu	6432 1490	2370 2086
	Environmental Officer	Chris Leung	2704 2095	2370 2086
ET (AECOM)	ET Leader	Edith Ng	3105 8525	2891 0305

1.4 Summary of Construction Works

1.4.1 As informed by the Contractor, the Contractor has carried out the following major activities in the reporting month:

- Drainage work;
- Steel cage fixing work;
- Welding work;
- Tree transplanting and protection;
- Predrilling for mini-piles at main pumping station;
- Construction of diaphragm wall for the main pumping station and its inlet chamber; and
- Construction of guide wall for interconnection tunnel.

1.4.2 The Construction Programme is shown in Appendix B.

1.4.3 The mitigation measures implementation schedule (EMIS) are presented in Appendix C.

1.5 Summary of EM&A Programme Requirements

1.5.1 The EM&A programme required environmental monitoring for air quality, noise and landscape and visual impacts, environmental site inspections for air quality, water quality, noise and waste management. The EM&A requirements for each parameter described in the following sections include:

- All monitoring parameters;
- Monitoring schedules for the reporting month and forthcoming months;
- Action and Limit levels for all environmental parameters;
- Event / Action Plan;
- Environmental mitigation measures, as recommended in the Project EIA study final report; and
- Environmental requirement in contract documents.

2 AIR QUALITY MONITORING

2.1 Monitoring Requirements

- 2.1.1 In accordance with the EM&A Manual, 1-hour and 24-hour TSP levels at 4 air quality monitoring stations should be established. As accesses to some of the proposed monitoring stations as stipulated in the EM&A manual have been rejected by other parties or found to be not suitable, a Monitoring Proposal, presenting the alternative monitoring stations, requirements and methodologies for the monitoring, had been submitted.
- 2.1.2 Moreover, monitoring station at Block A of Government Dockyard mentioned in the Monitoring Proposal will be established by the other contract (Contract DE/2009/02: Provision of Covers and Deodourisation Facilities to the Existing Sedimentation Tanks at SCISTW), so impact monitoring details at this station are not mentioned in this report.
- 2.1.3 Impact monitoring of air quality at 1 monitoring station, West Kowloon No. 2 Sewage Pumping Station (AM7), as described in the Monitoring Proposal, was established.
- 2.1.4 Impact 1-hour TSP monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was carried out for at least once every 6 days. The Action and Limit level of the air quality monitoring is provided in Appendix D.

2.2 Monitoring Equipment

- 2.2.1 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at the designated monitoring station. The HVS meets all the requirements of the EM&A Manual. Portable direct reading dust meters were used to carry out the 1-hour TSP monitoring. Brand and model of the equipment is given in Table 2.1.

Table 2.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
Portable direct reading dust meter (1-hour TSP)	Sibata Digital Dust Monitor (Model No. LD-3 and LD-3B)
High Volume Sampler (24-hour TSP)	Graseby Andersen Total Suspended Particulate Mass Flow Controlled Sampling System (Model No. GMWS2310)

2.3 Monitoring Location

- 2.3.1 Monitoring station (AM7), was set up at the proposed location in accordance with the Monitoring Proposal submitted, as agreed by the ER and IEC. Figure 2.1 shows the location of air quality monitoring station during impact phase. Table 2.2 describes the details of the monitoring stations.

Table 2.2 Locations of Air Quality Monitoring Station

ID	Location	Monitoring Station
AM7	West Kowloon No. 2 Sewage Pumping Station	Roof top of the premise

2.4 Monitoring Parameters, Frequency and Duration

2.4.1 Table 2.3 summarizes the monitoring parameters, frequency and duration of impact TSP monitoring.

Table 2.3 Air Quality Monitoring Parameters, Frequency and Duration

Monitoring Station	Parameter	Frequency and Duration
AM7	1-hour TSP	At least 3 times every 6 days
	24-hour TSP	At least once every 6 days

2.5 Monitoring Methodology

2.5.1 24-hour TSP Monitoring

(a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS.

- (i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
- (ii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
- (iii) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
- (iv) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
- (v) No furnace or incinerator flues nearby.
- (vi) Airflow around the sampler was unrestricted.
- (vii) Permission was obtained to set up the samplers and access to the monitoring stations.
- (viii) A secured supply of electricity was obtained to operate the samplers.
- (ix) The sampler was located more than 20 meters from any dripline.
- (x) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
- (xi) Flow control accuracy was kept within $\pm 2.5\%$ deviation over 24-hour sampling period.

(b) Preparation of Filter Papers

- (i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
- (ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ± 3 °C; the relative humidity (RH) was < 50% and not variable by more than $\pm 5\%$. A convenient working RH was 40%.
- (iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.

(c) Field Monitoring

- (i) The power supply was checked to ensure the HVS works properly.
- (ii) The filter holder and the area surrounding the filter were cleaned.

- (iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
 - (iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
 - (v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
 - (vi) Then the shelter lid was closed and was secured with the aluminium strip.
 - (vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
 - (viii) A new flow rate record sheet was set into the flow recorder.
 - (ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.1 m³/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m³/min).
 - (x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
 - (xi) The initial elapsed time was recorded.
 - (xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
 - (xiii) The final elapsed time was recorded.
 - (xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
 - (xv) It was then placed in a clean plastic envelope and sealed.
 - (xvi) All monitoring information was recorded on a standard data sheet.
 - (xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.
- (d) Maintenance and Calibration
- (i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
 - (ii) HVSS were calibrated using TE-5025A Calibration Kit upon installation and thereafter at bi-monthly intervals.
 - (iii) Calibration certificate of the TE-5025A Calibration Kit and the HVSS are provided in Appendix E.

2.5.2 1-hour TSP Monitoring

(a) Measuring Procedures

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

- (i) Turn the power on.
- (ii) Close the air collecting opening cover.
- (iii) Push the "TIME SETTING" switch to [BG]
- (iv) Push "START/STOP" switch to perform background measurement for 6 seconds.
- (v) Turn the knob at SENSI ADJ position to insert the light scattering plate.
- (vi) Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
- (vii) Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
- (viii) Pull out the knob and return it to MEASURE position.
- (ix) Push the "TIME SETTING" switch the time set in the display to 3 hours.
- (x) Lower down the air collection opening cover.
- (xi) Push "START/STOP" switch to start measurement.

(b) Maintenance and Calibration

- (i) The 1-hour TSP meter was calibrated at 1-year intervals against a continuous particulate TEOM Monitor, Series 1400ab. Calibration certificates of the Laser Dust Monitors are provided in Appendix E.

2.6 Monitoring Schedule for the Reporting Month

2.6.1 The schedule for environmental monitoring in March 2010 is provided in Appendix F.

2.7 Monitoring Results

2.7.1 The monitoring results for 1-hour TSP and 24-hour TSP are summarized in Table 2.4 and 2.5 respectively. Detailed air quality monitoring results are presented in Appendix G.

Table 2.4 Summary of 1-hour TSP Monitoring Results in the Reporting Period

	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM7	82	73 – 90	322	500

Table 2.5 Summary of 24-hour TSP Monitoring Results in the Reporting Period

	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM7	59	27 – 96	207	260

2.7.2 All 1-hour TSP and 24-hour TSP results were below the Action and Limit Level at all monitoring location in the reporting month.

2.7.3 The event action plan is annexed in Appendix J.

2.7.4 Weather information including wind speed and wind direction is annexed in Appendix I. The information was obtained from Hong Kong Observatory Cheung Sha Wan Anemometer Station.

3 NOISE MONITORING

3.1 Monitoring Requirements

- 3.1.1 In accordance with the EM&A Manual, impact noise levels should be obtained at 2 noise monitoring stations. As accesses to some of the proposed monitoring stations as stipulated in the EM&A manual have been rejected by other parties or found to be not suitable, a Monitoring Proposal, presenting the alternative monitoring stations, requirements and methodologies for the monitoring, had been submitted.
- 3.1.2 Impact monitoring of construction noise at 1 monitoring station, Customs' Marine Base (NM6), as described in the Monitoring Proposal, was established.
- 3.1.3 Impact noise monitoring was conducted for at least once per week during the construction phase of the Project. The Action and Limit level of the noise monitoring is provided in Appendix D.

3.2 Monitoring Equipment

- 3.2.1 Noise monitoring was performed using sound level meter at the designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in Table 3.1.

Table 3.1 Noise Monitoring Equipment

Equipment	Brand and Model
Integrated Sound Level Meter	B&K (Model No. 2238)
Acoustic Calibrator	B&K (Model no. 4231)

3.3 Monitoring Location

- 3.3.1 Monitoring station (NM6), was set up at the proposed location in accordance with the Monitoring Proposal submitted, as agreed by the ER and IEC. Figure 3.1 shows the location of noise monitoring station during impact phase. Table 3.2 describes the details of the monitoring stations.

Table 3.2 Locations of Impact Noise Monitoring Station

ID	Location	Monitoring Station
NM6	Customs' Marine Base	1m from the exterior of the roof top façade of Block H of Government Dockyard

3.4 Monitoring Parameters, Frequency and Duration

3.4.1 Table 3.3 summarizes the monitoring parameters, frequency and duration of impact noise monitoring.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Station	Parameters and Duration	Frequency
NM6	<p>30-min measurement at monitoring station between 0700 and 1900 on normal weekdays.</p> <p>3 times of 5-min measurement at monitoring station during restricted hours if construction works were carried out.</p> <p>L_{eq}, L_{10} and L_{90} would be recorded.</p>	At least once per week

3.5 Monitoring Methodology

3.5.1 Monitoring Procedure

- (a) The sound level meter was set on a tripod at a height of 1.2 m above the ground.
- (b) Façade measurements were made at all monitoring locations.
- (c) The battery condition was checked to ensure the correct functioning of the meter.
- (d) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
 - (i) frequency weighting: A
 - (ii) time weighting: Fast
 - (iii) time measurement: $L_{eq(30\text{-minutes})}$ during non-restricted hours i.e. 07:00 – 1900 on normal weekdays; $L_{eq(5\text{-minutes})} \times 3$ during restricted hours i.e. 19:00 – 23:00 and 23:00 – 07:00 of normal weekdays, whole day of Sundays and Public Holidays
- (e) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94dB(A) 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.
- (f) During the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- (g) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.
- (h) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s.

3.5.2 Maintenance and Calibration

- (a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.
- (b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- (c) Calibration certificates of the sound level meters and acoustic calibrators are provided in Appendix E.

3.6 Monitoring Schedule for the Reporting Month

3.6.1 The schedule for environmental monitoring in March 2010 is provided in Appendix F.

3.7 Monitoring Results

3.7.1 As informed by the Contractor, the construction works had extended to include works during the evening time period (1900 to 2300) on all weekdays and during daytime and evening time period (0700 to 2300) on Sundays and Public Holidays in the reporting month. Moreover, construction works had been further extended to the night-time period (2300 to 0700 of next day) on all days. The construction works were conducted in accordance with the granted Construction Noise Permit (CNP) under NCO.

3.7.2 According to the requirement stipulated in Clause 3.16 of EM&A Manual, additional weekly noise impact monitoring was carried out during restricted hours on the scheduled day as stated in Appendix F.

3.7.3 The monitoring results for noise are summarized in Table 3.4 to 3.6 and the monitoring data is provided in Appendix H.

Table 3.4 Summary of Impact Noise Monitoring Results During Daytime on Normal Weekdays in the reporting period

	Average, dB(A), L_{eq} (30 mins)	Range, dB(A), L_{eq} (30 mins)	Limit Level, dB(A), L_{eq} (30 mins)
NM6	72.3	71.4 – 73.4	75

Table 3.5 Summary of Impact Noise Monitoring Results During Evening time on Normal Weekdays in the reporting period

	Average, dB(A), L_{eq} (5 mins)	Range, dB(A), L_{eq} (5 mins)	Limit Level, dB(A), L_{eq} (5 mins)
NM6	64.0	58.9 – 67.1	70

Table 3.6 Summary of Impact Noise Monitoring Results During Night-time on Normal Weekdays in the reporting period

	Average, dB(A), L_{eq} (5 mins)	Range, dB(A), L_{eq} (5 mins)	Limit Level, dB(A), L_{eq} (5 mins)
NM6	<u>64.2</u>	<u>57.6 – 67.2</u>	55
Background Corrected Noise Levels (from 12 to 30 March 2010 only)	<u>63.5</u>	<u>55.8 – 66.4</u>	

Remarks: The bolded and underlined measured noise levels indicated the exceedance of Limit Level.

- 3.7.4 According to the information provided by the Contractor, no noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.
- 3.7.5 No Limit Level exceedance of noise was recorded at all monitoring station in the reporting month, except the measured noise levels recorded on 12, 18, 24 and 30 March 2010 during night-time period.
- 3.7.6 Based on on-site observations during the course of noise measurements during night-time periods, general tidy-up work by workers and excavation by hydraulic extractor/hydromill were the major work process undertaking within the Project site.
- 3.7.7 Other external noise sources, including engine noise from barge anchored at nearby piers, noise from chiller located at rooftop of Customs' Marine Base (which was not operating during the past measurements and is close to the monitoring point) and traffic noise from occasional aircrafts passing by and from nearby piers, were also noted during the monitoring periods, which may have attributed to the measured noise levels.
- 3.7.8 According to the information provided by the Contractor, the following plants were operating within the Project site on exceedance days:
- A generator and two water pumps (electric) on 12 March 2010.
 - A hydraulic extractor, a generator and three water pumps (electric) on 18 March 2010.
 - A hydromill, two generators and three water pumps (electric) on 24 March 2010.
 - A hydraulic extractor, a dump truck, a generator and three water pumps (electric) on 30 March 2010.
- 3.7.9 Types and number of PMEs operated on exceedance days comply with the requirements in the CNP (Ref: GW-RW0038-10).
- 3.7.10 Referring to the baseline monitoring results, an average baseline noise level of $L_{eq}(5\text{-min})$ 59.6 dB(A) was recorded at NM6 during night-time period, which already exceeded the Limit Level.
- 3.7.11 Therefore, it is believed that the Limit Level exceedances are not project-related and not solely caused by the Contractor's construction activities.

- 3.7.12 Meanwhile, the Contractor is reminded to strictly implement all noise mitigation measures as stated in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid any further noise Limit Level exceedance and any public complaints.
- 3.7.13 Moreover, the Contractor was reminded to ensure that the types and number of PME deployed on site during the restricted hours should strictly comply with the granted CNPs.
- 3.7.14 According to the EIA report, no noise sensitive receiver was identified near the site area except the FSD Diving Rescue and Diving Training Centre. As informed by the Officer from FSD Diving Rescue and Diving Rescue Centre, there is no training course during the night-time period on normal weekdays. It is believed that the noise exceedance recorded would have unlikely caused any impact at NSRs farther away. No public complaints have been received in relation to the construction noise from the site during the restricted hours on 12, 18, 24 and 30 March 2010.
- 3.7.15 The event action plan is annexed in Appendix J.
- 3.7.16 Major noise sources during the noise monitoring included nearby traffic noise, engine noise from ships anchored at nearby piers, other construction sites and community noises.

4 LANDSCAPE AND VISUAL

4.1 Monitoring Requirements

4.1.1 In accordance with the EM&A Manual, during the construction phase of the Project, landscape and visual monitoring should be carried out monthly with supervision by a Registered Landscape Architect (RLA). The landscape and visual monitoring is to check if the design, implementation and maintenance of the landscape and visual mitigation measures are fully effectuated.

4.1.2 A detailed report is annexed in Appendix K.

4.2 Background

4.2.1 A Baseline Review was conducted prior to the commencement of the construction contracts. The Baseline Review is to review the landscape and visual baseline conditions associated with the Project. Based on the findings given in the Baseline Review Report, the baseline landscape resources, landscape character areas and visually sensitive receivers originally identified within the EIA study area are generally unchanged and remain valid. Changes to the landscape and visual baseline are thus judged to be Insignificant.

4.3 Summary of Inspection – 17 March 2010

Matters Arising from Previous Inspections:

4.3.1 It was observed that the tree protection works in the Portion 2 area was still not yet commenced. As advised by the Contractor that the works in that area would be started soon, therefore, the Contractor was requested to carry out tree protection works for the existing trees as soon as possible prior to the works being commenced.

4.3.2 It was observed and as advised by the ER, the existing trees T500 to T509 were transplanted on 27th February 2010.

Protection of Existing Trees and Tree Works:

4.3.3 It was observed that the existing tree T171 (*Casuarina equisetifolia*) had die-back branches from the top. The Contractor was requested to seek their landscape sub-contractor to have a detailed inspection and assessment at the top of the tree as to the cause of the tree die-back and to carry out remedial actions to nurse the tree back to health. The Contractor was recommended to remove the dead branches, and to aerate the area at the base of the tree, apply mulch and slow released fertilizer.

Recommendations:

4.3.4 The Contractor was recommended to carry out proper tree protection works to existing trees within Portion 2 area as soon as possible.

4.3.5 The Contractor was recommended to carry out detailed assessment of the condition of tree T171 and to remedy the tree back to health.

4.3.6 The event action plan is annexed in Appendix J.

4.4 Next Landscape and Visual Audit Schedule

- 4.4.1 The landscape and visual audits in the next reporting month was tentatively scheduled to 21 April 2010.

5 ENVIRONMENTAL SITE INSPECTION AND AUDIT

5.1 Site Inspection

5.1.1 Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. In the reporting month, 5 site inspections were carried out on 3, 10, 17, 24 and 31 March 2010. Particular observations are described below. All observations were rectified by the Contractor within the agreed time frame.

5.1.2 Air Quality

- Nil.

5.1.3 Noise

- Nil.

5.1.4 Water Quality

- Proper drainage channels and pumping systems should be provided at site boundaries and site area near wheel washing facilities in order to cope with run-off generated from the works area and wheel washing facilities and direct them to the sedimentation facilities.
- Chemical containers/oil drums/batteries placed within site area should be properly stored with provision of drip tray in order to avoid any chemical/oil leakage. Chemical containers/oil drums should be clearly and properly labelled. Chemical containers should be securely closed in order to avoid any chemical leakage.
- Oily liquid mixture accumulation was observed inside the drip trays placed on site and abandoned channels on site. The Contractor should clear the liquid mixture and dispose of as chemical wastes. The Contractor should conduct regular inspections on the site conditions, especially after rainstorm.
- Stagnant water accumulation was observed at inactive wheel washing bay at Portion 2. The Contractor should clear the accumulated stagnant water and apply larvicidal oil in order to avoid mosquito breeding.

5.1.5 Chemical and Waste Management

- Stockpiles of steel scraps were found accumulated at temporary steel wastes storage area on site. The Contractor was reminded to remove the steel wastes off site properly and regularly by licensed recycler in order to improve the site tidiness.
- C&D wastes (paper cardboards and plastic packaging) scattered at site area near the gate should be properly sorted and disposed of off-site in order to maintain the site tidiness.
- Setting of the chemical waste storage area on site and chemical waste containers placed on site should comply with Code of Practice on the Packing, Labelling and Storage of Chemical Wastes. Adequate ventilation should be allowed for the chemical waste storage area in order to prevent formation of any dangerous or harmful concentration of vapour in case of spillage or leakage. Chemical waste containers placed inside the chemical waste storage area should be properly labelled. The chemical waste storage area should be locked at all times.
- Chemical containers/oil drums/batteries placed within site area should be properly stored with provision of drip tray in order to avoid any chemical/oil leakage. Chemical containers/oil drums should be clearly and properly labeled. Chemical containers should be securely closed in order to avoid any chemical leakage.
- Oily liquid mixture accumulation was observed inside the drip trays placed on site and abandoned channels on site. The Contractor should clear the liquid mixture and dispose of as chemical wastes. The Contractor should conduct regular inspections on the site conditions, especially after rainstorm.

5.1.6 Others

- Nil.

5.2 Advice on the Solid and Liquid Waste Management Status

- 5.2.1 The Contractor is registered as a chemical waste producer for this Project. C & D material and waste sorting was carried out on site. Receptacles were available for general refuse and C&D wastes collection.
- 5.2.2 As advised by the Contractor, a total of 7285.24 tones of inert C&D materials were generated on site in the reporting month. 5936.46 tones were slurry generated on site and disposed of at Public Fill (Tuen Mun Area 38 Fill Bank). 1348.78 tones were used bentonite slurry and disposed of at Public Fill (Tseung Kwan O Area 137 Fill Bank). 10,640 kg of metals was generated and collected by registered recycling collector. No paper cardboard packing and plastic were generated on site and collected by registered recycling collector. No chemical waste was collected by licensed chemical waste collectors. 6.85 tons of other types of wastes (e.g. general refuse) were generated on site and disposed of at North East New Territories (NENT) Landfill.
- 5.2.3 The Contractor is advised to properly maintain on site C&D material and waste sorting, collection and recording system and maximize reuse / recycle of C&D material and waste. The Contractor is reminded to properly maintain housekeeping in the site area and dispose of the wastes accumulated on site regularly and properly.
- 5.2.4 The Contractor should ensure that the setting of the chemical waste storage area on site and chemical waste containers placed on site should comply with Code of Practice on the Packing, Labelling and Storage of Chemical Wastes. Chemical wastes should be properly stored in designated chemical waste storage area, collected by licensed collectors and disposed of at designated treatment facilities in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

5.3 Environmental Licenses and Permits

5.3.1 The environmental licenses and permits for this Project and valid in the reporting month is summarized in Table 5.1.

Table 5.1 Summary of Environmental Licensing and Permit Status

Statutory Reference	Description	Permit No.	Valid Period		Remarks
			From	To	
EIAO	Environmental Permit	EP-322/2008/B	02/11/09	--	- Harbour Area Treatment Scheme (HATS) Stage 2A
APCO	NA notification	--	09/11/09	19/12/11	- Whole Construction Site for Contract DC/2009/05
WPCO	Discharge License	WT00005755-2010	22/01/10	31/01/15	- Discharge of Construction Runoff from Contract DC/2009/05
WDO	Chemical Waste Producer Registration	WPN5213-269-C35 72-01	23/10/2009	--	- Whole Construction Site for Contract DC/2009/05
WDO	Waste Charges Account	7009440	--	--	- Whole Construction Site for Contract DC/2009/05
NCO	Construction Noise Permit	GW-RW0500-09	13/11/09	01/05/10	- Whole Construction Site for Contract DC/2009/05
NCO	Construction Noise Permit	GW-RW0038-10	23/01/10	22/07/10	- Whole Construction Site for Contract DC/2009/05

5.4 Implementation Status of Environmental Mitigation Measures

- 5.4.1 In response to the site audit findings, the Contractor carried out corrective actions.
- 5.4.2 A summary of the Implementation Schedule of Mitigation Measures (EMIS) is presented in Appendix C. Most of the necessary mitigation measures were implemented properly.

5.5 Summary of Exceedances of the Environmental Quality Performance Limit

- 5.5.1 All 1-hour TSP and 24-hour TSP results were below the Action and Limit level at all monitoring location in the reporting month.
- 5.5.2 Referring to the information provided by the Contractor, there was no noise related complaint received in the reporting month; hence, no Action Level exceedance was recorded.
- 5.5.3 No Limit Level exceedance of noise was recorded at all monitoring station in the reporting month, except the measured noise levels recorded on 12, 18, 24 and 30 March 2010 during night-time period.
- 5.5.4 Based on on-site observations during the course of noise measurements during night-time periods, general tidy-up work by workers and excavation by hydraulic extractor/hydromill were the major work process undertaking within the Project site.
- 5.5.5 Other external noise sources, including engine noise from barge anchored at nearby piers, noise from chiller located at rooftop of Customs' Marine Base (which was not operating during the past measurements and is close to the monitoring point) and traffic noise from occasional aircrafts passing by and from nearby piers, were also noted during the monitoring periods, which may have attributed to the measured noise levels.
- 5.5.6 According to the information provided by the Contractor, the following plants were operating within the Project site on exceedance days:
- A generator and two water pumps (electric) on 12 March 2010.
 - A hydraulic extractor, a generator and three water pumps (electric) on 18 March 2010.
 - A hydromill, two generators and three water pumps (electric) on 24 March 2010.
 - A hydraulic extractor, a dump truck, a generator and three water pumps (electric) on 30 March 2010.
- 5.5.7 Types and number of PMEs operated on exceedance days comply with the requirements in the CNP (Ref: GW-RW0038-10).
- 5.5.8 Referring to the baseline monitoring results, an average baseline noise level of Leq(5-min) 59.6 dB(A) was recorded at NM6 during night-time period, which already exceeded the Limit Level.
- 5.5.9 Therefore, it is believed that the Limit Level exceedances are not project-related and not solely caused by the Contractor's construction activities.
- 5.5.10 Meanwhile, the Contractor is reminded to strictly implement all noise mitigation measures as stated in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid any further noise Limit Level exceedance and any public complaints.

- 5.5.11 Moreover, the Contractor was reminded to ensure that the types and number of PME deployed on site during the restricted hours should strictly comply with the granted CNPs.
- 5.5.12 According to the EIA report, no noise sensitive receiver was identified near the site area except the FSD Diving Rescue and Diving Training Centre. As informed by the Officer from FSD Diving Rescue and Diving Rescue Centre, there is no training course during the night-time period on normal weekdays. It is believed that the noise exceedance recorded would have unlikely caused any impact at NSRs farther away. No public complaints have been received in relation to the construction noise from the site during the restricted hours on 12, 18, 24 and 30 March 2010.
- 5.5.13 Cumulative statistics of exceedances is provided in Appendix L.

5.6 Summary of Complaints, Notification of Summons and Successful Prosecutions

- 5.6.1 Complaints shall be referred to the ET Leader for action. The ET Leader shall undertake the following procedures upon receipt of any complaint:
- Log complaint and date of receipt onto the complaint database and inform the IC(E) immediately;
 - Investigate the complaint to determine its validity, and assess whether the source of the problem is due to works activities;
 - Identify mitigation measures in consultation with the IC(E) if a complaint is valid and due to works;
 - Advise the Contractor and the ER if additional mitigation measures are required;
 - Review the Contractor's response to identified mitigation measures, and the updated situation;
 - If the complaint is transferred from EPD, submit interim report to EPD on status of the complaint investigation and follow-up action within the time frame assigned by EPD;
 - Undertake additional monitoring and audit to verify the situation if necessary, and review that circumstances leading to the complaint to not recur;
 - Report investigation results and subsequent actions to complainant (if the source of complaint is EPD, the results should be reported within the time frame assigned by EPD); and
 - Record the complaint, investigation, the subsequent actions and the results in the monthly EM&A reports.
- 5.6.2 During any complaint investigation work, the Contractor and the ER shall cooperate with the ET Leader in providing all necessary information and assistance for completion of the investigation. If mitigation measures are identified in the investigation, the Contractor shall promptly carry out the mitigation. The ER shall ensure that all necessary measures have been carried out by the Contractor.
- 5.6.3 Referring to the information provided by the Contractor, no environmental complaint, notification of summons and successful prosecution was received in the reporting month.
- 5.6.4 Cumulative statistics of complaints, notification of summons and successful prosecutions is provided in Appendix L.

6 FUTURE KEY ISSUES

6.1 Construction Programme for the Coming Months

6.1.1 The major construction works in April and May 2010 will be:

- Drainage work;
- Steel cage fixing work;
- Welding work;
- Tree transplanting and protection;
- Predrilling for mini-piles at main pumping station;
- Construction of diaphragm wall for the main pumping station and its inlet chamber;
- Construction of guide wall for interconnection tunnel; and
- Diaphragm wall installation at launching shaft region of interconnection tunnel.

6.2 Key Issues for the Coming Month

6.2.1 Key issues to be considered in the coming month included:

- Properly store and label oils and chemicals on site;
- Proper chemical, chemical waste and waste management;
- Segregation and recycling of construction wastes should be properly implemented;
- Collection of construction wastes should be carried out properly and regularly;
- Site runoff should be properly collected and treated prior to discharge;
- Regular inspection and maintenance of drainage systems and desilting facilities;
- Accumulation of stagnant water in site area should be avoided;
- Suppress dust generated from bentonite slurry treatment plant, excavation activities and haul road traffic;
- Quieter powered mechanical equipment should be used;
- Noise control measures, such as erection of movable noise barrier, should be properly maintained on site; and
- Proper tree protection works should be provided when carry out works near existing trees.

6.3 Monitoring Schedule for the Coming Month

6.3.1 The tentative schedule for environmental monitoring in April 2010 is provided in Appendix F.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

- 7.1.1 The construction phase of the project commenced in December 2009.
- 7.1.2 1-hour TSP, 24-hour TSP and noise monitoring were carried out in the reporting month.
- 7.1.3 All 1-hour TSP and 24-hour TSP monitoring results complied with the Action / Limit Level.
- 7.1.4 According to the Contractor's information, no noise complaint was received in the reporting month. Hence, no Action Level exceedance was recorded.
- 7.1.5 No Limit Level exceedance of noise was recorded at all monitoring station in the reporting month, except the measured noise levels recorded on 12, 18, 24 and 30 March 2010 during night-time period.
- 7.1.6 Based on on-site observations during the course of noise measurements during night-time periods, excavation and general tidy-up work by workers were the major work process undertaking within the Project site.
- 7.1.7 Other external noise sources were also noted during the monitoring periods, which may have attributed to the measured noise levels.
- 7.1.8 Referring to the information provided by the Contractor, types and number of PMEs operated within the Project site on exceedance days comply with the requirements in the CNP (Ref: GW-RW0038-10).
- 7.1.9 According to the average baseline noise level recorded during night-time period, a Limit Level exceeding noise level had been recorded.
- 7.1.10 Therefore, it is believed that the Limit Level exceedances are not project-related and not solely caused by the Contractor's construction activities.
- 7.1.11 According to the EIA report, no noise sensitive receiver was identified near the site area except the FSD Diving Rescue and Diving Training Centre. As informed by the Officer from FSD Diving Rescue and Diving Rescue Centre, there is no training course during the night-time period on normal weekdays. It is believed that the noise exceedance recorded would have unlikely caused any impact at NSRs farther away. No public complaints have been received in relation to the construction noise from the site during the restricted hours on 12, 18, 24 and 30 March 2010.
- 7.1.12 One landscape and visual audit was carried out in the reporting month. The Contractor was recommended to carry out proper tree protection works to existing trees within Portion 2 prior to commencement of construction works. Detailed assessment on the condition of tree T171 should be carried out and proper measures should be provided to remedy it back to health. Also, the Contractor was remaindered to ensure all mitigation measures listed in the EM&A Manual were properly implemented on site.
- 7.1.13 Environmental site inspections were carried out 5 times in March 2010. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 7.1.14 Referring to the Contractor's information, no environmental complaint, and no notification of summons and prosecution was received in the reporting month.

7.2 Recommendations

7.2.1 According to the environmental site inspections performed in the reporting month, the following recommendations were provided:

Air Quality Impact

- Nil.

Construction Noise Impact

- Nil.

Water Quality Impact

- Proper drainage channels and pumping systems should be provided at site boundaries and site area near wheel washing facilities in order to cope with run-off generated from the works area and wheel washing facilities and direct them to the sedimentation facilities.
- Chemical containers/oil drums/batteries placed within site area should be properly stored with provision of drip tray in order to avoid any chemical/oil leakage. Chemical containers/oil drums should be clearly and properly labelled. Chemical containers should be securely closed in order to avoid any chemical leakage.
- Any oil mixed material, like oily liquid mixture in drip trays, found within the works area shall be cleared and disposed of properly as chemical wastes. Regular inspection on the site condition should be conducted to avoid any accumulation of chemical wastes within works area, especially after rainstorm.
- The Contractor should provide proper mitigation measures in order to avoid stagnant water accumulation and mosquito breeding within works area and conduct regular site inspection of site conditions, especially after rainfall.

Chemical and Waste Management

- Housekeeping on site should be improved. C&D wastes scattered within site area should be properly sorted and disposed of off site regularly. Stockpiles of steel scraps accumulated at temporary steel wastes storage area should be removed off-site properly and regularly by licensed recycler.
- Setting of the chemical waste storage area on site and chemical waste containers placed on site should comply with Code of Practice on the Packing, Labelling and Storage of Chemical Wastes. Adequate ventilation should be allowed for the chemical waste storage area in order to prevent formation of any dangerous or harmful concentration of vapour in case of spillage or leakage. Chemical waste containers placed inside the chemical waste storage area should be properly labelled. The chemical waste storage area should be locked at all times.

- Chemical containers/oil drums/batteries placed within site area should be properly stored with provision of drip tray in order to avoid any chemical/oil leakage. Chemical containers/oil drums should be clearly and properly labelled. Chemical containers should be securely closed in order to avoid any chemical leakage.
- Any oil mixed material, like oily liquid mixture in drip trays, found within the works area shall be cleared and disposed of properly as chemical wastes. Regular inspection on the site condition should be conducted to avoid any accumulation of chemical wastes within works area, especially after rainstorm.

Landscape and Visual Impact

- The Contractor was recommended to carry out proper tree protection works to existing trees within Portion 2 area as soon as possible.
- The Contractor was recommended to carry out detailed assessment of the condition of tree T171 and to remedy the tree back to health.

Others

- Nil.

7.2.2 The Contractor has rectified all the observations as identified during environmental site inspection in the reporting month within agreed time frame.