



PROJECT NO.: TCS/00408/08

DSD CONTRACT NO. DC/2007/17
DRAINAGE IMPROVEMENT WORKS IN CHEUNG PO,
MA ON KONG, YUEN KONG SAN TSUEN AND TIN SAM
TSUEN OF YUEN LONG DISTRICT AND SEWERAGE AT
TSENG TAU CHUNG TSUEN, TUEN MUN

MONTHLY EM&A REPORT FOR KT14A
(AUGUST 2009)

PREPARED FOR
CHINA ROAD & BRIDGE CORPORATION

Quality Index

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10 September 2009	TCS00408/08/600/R1210v2		
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1	5 Sep 2009	Nicola Hon	Andrew Lau	First submission
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Ove Arup & Partners
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Our ref 25211/L143/CN/cl

Date 14 September 2009

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Attention: Mr. Clive Cheng

ARUP

Dear Mr. Cheng,

Contract No. DC/2007/17 Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen King San and Tin Sam Tsuen of Yuen Long District and Sewerage at Tseng Tau Chung Tsuen, Tuen Mun Monthly EM&A Report for KT14A (August 2009) – Version 2

We refer to the captioned report (ref.: TCS00408/08/600/R1210v2) and advise that we have no further comment on the captioned submission.

We hereby endorse the captioned report for your onward submission.

If you require any further information, please do not hesitate to contact the undersigned.

Yours sincerely,



Coleman Ng
Independent Environmental Checker

cc: China Road and Bridge Corporation (Mr. Raymond Mau) (Fax: 2478 9612)
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Executive Summary

ES01 This is the 11th monthly EM&A report for Channel KT14A, covering the construction period from **26 July 2009 to 25 August 2009** (the Reporting Period). Substantial completion of works had been certified by the Engineer's Representative as on 20 August 2009 and the EM&A programme was completed on 28 August 2009 upon receiving the notification.

ES02 Monitoring results from 21 August 2009 to 25 August 2009 were also included in this monthly report for completeness. Remarks will be made if an exceedance is measured during this period. Otherwise, they will be analysed in the same way as data obtained on or before 20 August 2009.

Breaches of Action and Limit Levels

ES03 Monitoring results demonstrated no exceedances of environmental quality criteria for air quality and construction noise during the Reporting Period.

ES04 For water quality, a total of thirteen (13) exceedances of the existing Action/Limit Levels were recorded where all were recorded at Location W8B downstream of the works area. The parameters of the 13 samples with exceedances are shown below:

Location	Exceedance	DO	Turbidity	pH	SS	NH ₄ ⁺ -N	Zn	Total
W8B	Action Level	7	0	0	1	0	0	8
	Limit Level	0	0	0	3	2	0	5

ES05 Investigations of the cause of exceedances are in progress. In general, the exceedances were within the values monitored during the baseline study, as a matter of fact that the construction activities during this reporting month was only landscape planting, therefore it is considered that the exceedances were due to natural variations of the stream.

ES06 Note that the Action Level exceedance in SS was measured on 21 August 2009 after substantial completion of works on 21 August 2009.

Environmental Complaint, Notification of Summons and Prosecution

ES07 No documented complaint, notification of summons and successful prosecution was received during the Reporting Period. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines, which indicated that the implemented mitigation measures for air quality, construction noise and ecology were effective. The environmental performance of the Project was, therefore, considered satisfactory.

ES08 No adverse environmental impacts were observed during the weekly site inspections and environmental audit, which indicated that the implemented mitigation measures for air quality, construction noise and ecology were effective. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines.

Reporting Changes

ES09 No reporting changes were made during the Reporting Period.

Future Key Issues

ES10 As wet season continues, water quality mitigation measures to avoid ingress of runoff into Channel KT14A should be properly installed and maintained, as appropriate. In particularly, open stockpiles, loose soil and exposed slope should be covered thoroughly with tarpaulin sheet or similar material.

ES11 The measured values of construction noise were fully in compliance with the NCO criteria after the temporary noise barrier dismantled by the Contractor. However, CREC should still keep in mind for the construction noise and other environmental issues identified in the EM&A Manual. Mitigation measures recommended in the EIA and summarized in Mitigation Measure Implementation Schedule should be fully implemented.

ES12 This is the second last report of this project following substantial completion on 20 August 2009.

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1 ENVIRONMENTAL STATUS

This is the 11th monthly EM&A report for Channel KT14A, covering the construction period from 26 July 2009 to 25 August 2009 (the Reporting Period). Substantial completion of works had been certified by the Engineer's Representative as on 20 August 2009 and the EM&A programme was completed on 28 August 2009 upon receiving the notification. This is the second last report of this project following substantial completion on 20 August 2009.

1.1 PROJECT AREA AND CONSTRUCTION PROGRAMME

Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations are enclosed in **Appendix A**, while CRBC's construction program is enclosed in **Appendix B**.

1.2 WORKS UNDERTAKEN DURING THE REPORTING PERIOD

Apart from general works of tree survey, structural survey and environmental monitoring and audit, works undertaken during the Reporting Period with fine tuning of construction activities showing the inter-relationship with environmental protection/mitigation measures for the month are summarized as follows:

- (a) Compensatory Planting and Landscaping works

1.3 ENVIRONMENTAL MANAGEMENT ORGANIZATION

Management structure and key personnel contact names and telephone numbers of the environmental management organization, where DSD is the Project Proponent; CRBC is the main Contractor of the Project; EPD and AFCD are the supervisory departments for environmental protection of the Project; BVHKL is the Engineer's Representative of DSD (the ER); ARUP is the Independent Environmental Checker (IEC) and Action-United Environmental Services and Consulting (AUES) is the environmental team (ET), are presented in **Appendix C**.

1.4 LICENSING STATUS

1.4.1 Air Pollution Control (Construction Dust) Regulation

Pursuant to the **Air Pollution Control (Construction Dust) Regulation**, CRBC has notified EPD, via submission of Form NA dated 14 February 2008, of the scope and nature of the works to be carried out under the Project, including construction activities such as stockpiling, loading and unloading, transfer of dusty material, use of vehicles and debris handling, etc. CRBC will continuously review the status of the environmental licenses and apply the required licenses/permits prior to the commencement of construction work.

1.4.2 Noise Control Ordinance

No **Construction Noise Permit** (CNP) is required for the Project pursuant to the **Noise Control Ordinance** (NCO) and the associated applicable subsidiary regulations of **Noise Control (General) Regulation**, **Noise Control (Hand-held Percussive Breaker) Regulation** and **Noise Control (Air Compressor) Regulation**, as the use of powered mechanical equipment, or conducting construction work in during Restricted Hours, i.e. 1900 to 0700 hours on normal weekdays and any time on general holidays including Sundays is not anticipated during the whole construction period. CRBC will continuously review the status of the environmental licenses under the NCO and apply the required licenses/permits prior to the commencement of construction work.

1.4.3 Waste Disposal (Charges for Disposal of Construction Waste) Regulation

CRBC has applied for a Billing Account (Construction Work Contract with Value of \$1million or above), under the **Waste Disposal (Charges for Disposal of Construction Waste) Regulation**. The account number 7006524 has been assigned on 9 Jan 2008.

1.4.4 Water Pollution Control Ordinance

CRBC has applied for a discharge license under Section 20 of the **Water Pollution Control Ordinance**, and the license No. 1U461/1 has been issued.

1.4.5 Waste Disposal (Chemical Waste) (General) Regulation

CRBC has registered as a Chemical Waste Producer with EPD under the **Waste Disposal (Chemical Waste) (General) Regulation** and the Waste Producer Number assigned is WPN: 5611-531-C3124-28 dated 2 May 08.

1.5 ENVIRONMENTAL PROTECTION AND POLLUTION CONTROL MITIGATION MEASURES

CRBC has committed to implement environmental protection and pollution control and mitigation measures as recommended in the PP, EP and the EM&A Manual. Continuous up-dating of the Mitigation Measures Implementation Schedules attached in the EM&A Manual is required under the PS. The updated Environmental Mitigation Measures Schedule will be enclosed in **Appendix I** if any amendment is made during the Reporting Period. No amendment was in June 2009 and **Appendix I** is not used. The implemented mitigation measures include:

- (a) Watering of exposed dry and dusty surface, including stock piles of dusty materials;
- (b) Covering of the loose soil to minimize water quality impacts;
- (c) Hard pavement of haul road leading to public roads;
- (d) Wheel washing facility at to avoid construction dust impacts on the public roads; and
- (e) Construction of noise barriers.
- (f) During construction works nearly the seasonal wetland, mitigation measures of Ecology will be followed in accordance with EM&A Manual Annex A ECO.1 and ECO.3;

2 MONITORING METHODOLOGY

2.1 MONITORING PARAMETERS

According to the EM&A requirements set out in the EIA, Environmental Permits No. EP231/2005A (EP) and the associated EM&A Manual, monitoring parameters are summarized as follows.

Table 2-1 Summary of Monitoring Parameters

Environmental Issue	Monitoring Parameters	
Air Quality	(a) 1-hour Total Suspended Particulate (1-hour TSP); and (b) 24-hour Total Suspended Particulate (24-hour TSP).	
Construction Noise	(a) A-weighted equivalent continuous sound pressure level (30min) (Leq(30min)) during the normal working hours; and (b) A-weighted equivalent continuous sound pressure level (5min) (Leq(5min)) for construction work during the Restricted Hours.	
Water Quality	(a) In Situ Measurement	temperature, dissolved oxygen (DO), pH & turbidity
	(b) Laboratory Analysis	suspended solids (SS), ammonia nitrogen (NH ₃ -N) and zinc (Zn)

2.2 MONITORING LOCATIONS

Details of the monitoring locations are summarized in **Table 2-2** and shown in **Appendix A**. For ease of reference, monitoring locations denoted with “(a)” are relocated locations to differentiate them from the original ‘EM&A Manual’ locations.

Table 2-2 Summary of Monitoring Locations

Issues	Monitoring Location ID	Identified Address / Co-ordinates
Air	A8(a)	Entrance of Strong Sing Garden
Noise	N8	Ground floor of Strong Sing Garden H502
Water	W8A	E825274 / N831712
	W8B	E825143 / N831786

2.3 MONITORING FREQUENCY, DURATION AND SCHEDULE

2.3.1 Monitoring Frequency and Duration

Environmental monitoring is conducted upon commencement of the construction activities and throughout the whole construction period to detect and minimize any adverse environmental impacts generated from the construction activities of the Project. The monitoring frequency and duration for air quality, construction noise, water quality, ecology and other parameters are summarized below.

Air Quality

Frequency: Once every 6 days for 24-hour TSP and three times every 6 days for 1-hour TSP, when the highest construction dust impacts are anticipated.

Duration: Throughout the construction period

Construction Noise

Frequency: Measurement of Leq(30min): Once a week during 0700-1900 hours on normal weekdays for Leq(30min).

If the construction work is undertaken at Restricted Hours, the frequency of noise monitoring will be conducted in accordance with the requirements under the related Construction Noise Permit issued by EPD as follows:

- 3 consecutive Leq(5min) during Restricted Hours from 1700 – 2300 hours;
- 3 consecutive Leq(5min) during Restricted Hours from 2300 – 0700 next day;
- 3 consecutive Leq(5min) during Sunday or public holiday from 0700 – 1900 hours;

Duration: Throughout the construction period

Water Quality

Frequency: Three times a week with at least 36 hour intervals between any two consecutive monitoring events

Depths: As the water columns in the stream water within KT14A is generally less than 3 m, measurement is performed at the mid-depths of the monitoring locations. In case the water columns are deeper than 6 m, measurement shall be carried out at three water depths, namely, 1 m below water surface, mid-depth, and 1 m above river bed. If the water depths are between 3 to 6 m, the mid-depth measurement is omitted.

Duration: Throughout the construction period.

2.3.2 Environmental Monitoring Schedule

The monitoring schedules for the Reporting Period and forthcoming month are presented in **Appendix D**.

2.4 MONITORING EQUIPMENT AND PROCEDURE

The monitoring equipment and procedures are summarized below. Calibration certificates of the equipment and the related laboratories are presented in **Appendix E**.

2.4.1 Weather Conditions during the Reporting Period

All meteorological information is sourced from the Hong Kong Observatory (Lau Fau Shan Station). The meteorological data include wind direction, wind speed, humidity, rainfall, air pressure and temperature etc., that in general are required for evaluating the environmental impact arising from the construction activities. The meteorological data are presented in **Appendix D**.

2.4.2 Air Quality

Monitoring Equipment

A list of air quality monitoring equipment is shown below.

Table 2-4-1 Air Quality Monitoring Equipment

Equipment	Model	Serial Number
<i>24-hour TSP</i>		
High Volume Air Sampler	Grasby Anderson GMWS 2310 HVS	-
Calibration Kit	TISCH Model TE-5025A	1612
<i>1-hour TSP</i>		
Portable Dust Meter	TSI DustTrak Model 8520	21060 / 23080 / 23079

Monitoring Procedure

1-hour TSP

The 1-hour TSP measurement follows manufacturer's Operation and Service Manual, using a 1-hour TSP monitor brand named TSI Dust Track Aerosol Monitor Model 8520 or Sibata LD-3 Laser Dust Meter, which is a portable, battery-operated laser photometer to record the real time 1-hour TSP based on 900 light scattering. The 1-hour TSP monitor consists of the following:

- i. A pump to draw sample aerosol through the optic chamber where TSP is measured;
- ii. A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
- iii. A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

The 1-hour TSP meter to be used will be within the valid period, calibrated by the manufacturer prior to purchasing. Zero response of the instrument will be checked before and after each monitoring event.

24-hour TSP

The equipment used for 24-hour TSP measurement is the high volume air sampling system (HVS) brand named Thermo Andersen, Model GS2310 TSP. The HVS complies with US EPA Code of Federal Regulation, Appendix B to Part 50. The HVS consists of the following:

- (a) An anodized aluminum shelter;
- (b) A 8"x10" stainless steel filter holder;
- (c) A blower motor assembly;
- (d) A continuous flow/pressure recorder;
- (e) A motor speed-voltage control/elapsed time indicator;
- (f) A 6-day mechanical timer, and
- (g) A power supply of 220v/50 Hz

The HVS is operated and calibrated on a regular basis following the manufacturer's instruction using the NIST-certified standard calibrator brand named TISCH Calibration Kit Model TE-5028A. Regular HVS operation and maintenance as well as filter paper installation and collection is performed by the ET's competent technicians, whereas laboratory analyses are conducted in a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (ALS). The 24-hour TSP filters will be kept in ALS for six months prior to disposal.

All relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper are recorded in details.

2.4.3 Construction Noise

Monitoring Equipment

A list of construction noise monitoring equipment is shown below.

Table 2-4-2 Construction Noise Monitoring Equipment

Equipment	Model	Serial Number
Integrating Sound Level Meter	Cesva SC-20c/ Bruel & Kjaer 2238	T212509 2285762 / 2285690
Calibrator	Cesva CB-5 / Bruel & Kjaer 4231	030934 2292168 / 2326408
Portable Wind Speed Indicator	Testo Anemometer	-

Monitoring Procedure

Sound level meters listed above comply with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications, as recommended in Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO).

All noise measurements will be performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). Leq(30min) in six consecutive Leq(5min) measurements will be used as the monitoring parameter for the time period between 0700-1900 hours on weekdays throughout the construction period. Leq(15min) in three consecutive Leq(5 min) measurements for other time periods (e.g. during Restricted Hours) will only be conducted for monitoring the construction noise during Restricted Hours as necessary.

The sound level meter is mounted on a tripod at a height of 1.2 m and placed at the assessment point and oriented such that the microphone is pointed to the site with the microphone facing perpendicular to the line of sight. The windshield is fitted for all measurements. Where a measurement is to be carried out at a building, the assessment point is normally at a position 1 m from the exterior of the building façade. Where a measurement is to be made for noise being received at a place other than a building, the assessment point is at a position 1.2 m above the ground in a free-field situation, i.e. at least 3.5 m away from reflective surfaces such as adjacent buildings or walls.

Immediately prior to and following each noise measurement the accuracy of the sound level meter is checked using an acoustic calibrator generating a known sound pressure level at a known

frequency. Measurements will be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0dB. No noise measurement will be made in the present of significant fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed is checked with a portable wind speed meter capable of measuring the wind speed in m/s.

2.4.4 Water Quality

Monitoring Equipment

Monitoring Equipment for water quality is listed below.

Table 2-4-3 Water Quality Monitoring Equipment

Equipment	Model / Description	Serial Number
Water Depth Detector	Eagle Sonar	-
Water Sampler	Teflon bailer / bucket	-
Thermometer & DO meter	YSI 550A	05F2063AZ
pH meter	Extech pH EC500	133298
Turbidimeter	Hach 2100p	950900008735
Hand Refractometer	ATAGO	289468
Sample Container	High density polythene bottles (provided by	-
Storage Container	'Willow' 33-litter plastic cool box	-

Monitoring Procedure

Water Depth

As the water columns in the stream water within KT14A is generally less than 3 m, measurement is performed at the mid-depths of the monitoring locations. In case the water columns are deeper than 6 m, measurement shall be carried out at three water depths, namely, 1 m below water surface, mid-depth, and 1 m above river bed. If the water depths are between 3 to 6 m, the mid-depth measurement is omitted.

Water depths are determined prior to measurement and sampling, using a portable battery operated depth detector, brand named 'Eagle Sonar', if the depths exceed 1.5 meter. For the depths well below 1 meter, the depths of water columns are measured with a steel ruler with appropriate weight.

Dissolved Oxygen (DO)

A portable YSI 550A Meter will be used for in-situ DO measurement. The DO meter is capable of measuring DO in the range of 0 - 20 mg/L and 0 - 200 % saturation and checked against water saturated ambient air on each monitoring day prior to monitoring. Although the DO Meter automatically compensates ambient water temperature to a standard temperature of 20°C for ease of comparison of the data under the changing reality, the temperature readings of the DO Meter will be recorded in the field data sheets. Calibration of the equipment will be performed by ALS on quarterly basis.

pH

A portable Extech pH Meter will be used for in-situ pH measurement. The pH meter is capable of measuring pH in the range of 0 – 14 and readable to 0.1. Standard buffer solutions of pH 7 and pH 10 are used for calibration of the instrument before and after measurement. Quarterly calibration of the equipment will be performed by ALS.

Turbidity

A portable Hach 2100p turbidity Meter will be used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU. Calibration of the equipment will be performed by ALS on quarterly basis.

Salinity

A portable hand Refractometer AGATO will be used for in-situ salinity measurement. The refractometer is capable of measuring salinity in the range of 0-70ppt with accuracy $\pm 1\%$ reading. Calibration of the equipment will be performed by ALS on quarterly basis.

Suspended Solids (SS)

SS will be determined by ALS upon receipt of the water samples using the HOKLAS accredited analytical method - ALS Method EA-025.

Ammonia Nitrogen(NH₃-N)

NH₃-N will be examined by ALS upon receipt of the water samples using the HOKLAS accredited analytical methods - ALS Method EK-055A.

Zinc(Zn)

Zn will be analyzed by ALS upon receipt of the water samples using the HOKLAS accredited analytical methods - ALS Method EG-020.

Water Sampler

Water samples will be collected using a plastic sampler to prevent metal contamination. As the water depths in the stream water within KT14A are generally less than 0.5 m, a plastic bucket with a rope of appropriate length is used for water sampling. The sampler is rinsed before collection with the sample to be taken. For water depths deeper than 0.5 meter, a cleaned plastic bailer bucket will be used for sample collection. 1000 mL water sample is collected from each depth for SS determination. The samples collected are stored in a cool box maintained at 4⁰C and delivered to ALS upon completion of the sampling by end of each sampling day.

Sample Container

Water samples are contained in screw-cap PE (Poly-Ethylene) bottles, which are provided and pretreated according to corresponding HOKLAS and ALS analytical requirements. Where appropriate, the sampling bottles are rinsed with the water to be contained. Water samples are then transferred from the water sampler to the sampling bottles to 95% bottle capacity to allow possible volume expansion during delivery and storage.

Sample Storage

A 'Willow' 33-litter plastic cool box packed with ice will be used to preserve the collected water samples prior to arrival at ALS. The water temperature of the cool box will be maintained at a temperature as close to 4⁰C as possible without being frozen. Samples collected will be delivered to the laboratory upon collection within the maximum storage time required under the HOKLAS and ALS analytical requirements

2.4.6 Waste Management

Waste management requirements for KT14A are stipulated in the EM&A Manual [382047/E/EMA/Issue 5]. During the monthly audit, waste management issued will be checked to see if the relevant contract specifications and relevant statutory provisions have been followed..

2.5 QUALITY ASSURANCE PROCEDURES AND DATA MANAGEMENT

2.5.1 Documentation of the Environmental Monitoring

Field data including in-situ monitoring results, weather conditions and water sampling information and observation will be recorded in corresponding Field Data Sheets.

2.5.2 Data Management and Analysis

All impact monitoring data will be processed by the AUES data recording and management system, which complies with in-house Quality (**ISO 9001:2000**) Management System. Monitoring results recorded in the monitoring equipment e.g. 1-hour TSP Meters and Noise Meters will be downloaded directly from the equipment at the end of the monitoring period and input into a computerized database maintained by the ET. Laboratory results will be input directly into the computerized database and checked by personnel other than those who input the data.

2.5.3 Quality Assurance Procedures

Appropriate and standard QA/QC measures will be adopted for the environmental monitoring to ensure the scientific integrity of the data produced. Sources of error in the impact monitoring will be properly controlled with the following QA/QC procedures:

- (a) Appropriate field monitoring and sampling techniques, including monitoring equipment, storage and delivery of samples;
- (b) Well organized systematic field-data system e.g. all baseline monitoring information, field observation, results, weather conditions and water sampling information, etc. will be recorded in the field monitoring record sheets. The laboratory analysis records will be maintained by the HOKLAS following HOKLAS requirements;
- (c) HOKLAS requirements for QA/QC of all laboratory testing to ensure acceptable accuracy and reproducibility of the laboratory analysis indicated by consistent agreement between duplicate samples, validity of the analytical results by compliance with the required blanks and recovery of standard addition.

2.5.4 Records

All impact monitoring data will be clearly and systematically documented in both hardware and software format and the software copy will be available for inspection upon request. All the document and data will be kept for at least one year after completion of the Project. Field Data Sheets used to record the impact monitoring information, field observation, results, weather conditions and water sampling information, etc., will be properly maintained and kept by the ET. The copies of laboratory analysis records from ALS will be kept by the ET throughout the at least one year after completion of the EM&A program of the Project.

2.6 REPORTING

2.6.1 General Requirements for Report Submission

General requirements for Monthly EM&A report submission as stipulated in the EIA, EP and EM&A Manual are summarized below.

Table 2-6 Requirements for Report Submission

Report	Submission
Monthly EM&A Report	<ul style="list-style-type: none">• Within 10 working days of the end of each reporting month.
Quarterly EM&A Summary Report	<ul style="list-style-type: none">• Within 10 working days of the end of each reporting quarter.
Final EM&A Summary Report	<ul style="list-style-type: none">• One month after completion of post project monitoring

2.6.2 Cut-Off Day of the Reporting Month

It is also agreed among the ER, IEC, CRBC, ET and EPD that, in order to streamline the EM&A report submission and to cater for the occasional delay in receiving laboratory analysis results, the cutoff day is 25th of each month i.e. the first day in each report is the 26th of the previous month and the last day is the 25th of that month.

3 MONITORING RESULTS

The environmental monitoring results will be compared against the Action and Limit Levels established based on the baseline monitoring results. Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan enclosed in **Appendix F**. The environmental monitoring results are presented in tabulation below and graphical plots in **Appendix G**.

3.1 AIR QUALITY

3.1.1 Action and Limit Levels

According to the Baseline Monitoring Report for KT14A, the Action and Limit Levels for 24-hour and 1-hour TSP are summarized in **Table 3-1-1**.

Table 3-1-1 Summary of Air Quality Monitoring Results at KT14A-A8(a)

Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)		Limit Level ($\mu\text{g}/\text{m}^3$)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
KT14A - A8(a)	310	144	500	260

3.1.2 Results

Results of air quality monitoring at KT14A-A8(a) during the Reporting Period are summarized in **Tables 3-1-2**. Details of 24-hour TSP data and graphical plots of trends of monitored parameters at KT14A-A8(a) over the past four reporting periods are presented in **Appendix G**.

Table 3-1-2 Summary of Air Quality Monitoring Results at KT14A-A8(a)

1-hour TSP ($\mu\text{g}/\text{m}^3$)						24-hour TSP ($\mu\text{g}/\text{m}^3$)		
Date	Start Time	1st hour	2nd hour	3rd hour	Average	Date	Results	
29-Jul-09	09:08	87	96	93	92	28-Jul-09	27	
4-Aug-09	13:10	39	46	43	43	3-Aug-09	40	
10-Aug-09	09:08	90	98	95	94	8-Aug-09	62	
15-Aug-09	09:00	64	69	67	67	14-Aug-09	23	
21-Aug-09	09:06	44	49	46	46	20-Aug-09	23	
Average (Range)		68 (39-98)				Average (Range)		35 (23-62)

3.1.4 Discussion

As shown in **Tables 3-1-2**, the 1-hour and 24-hour TSP results fluctuated well below the Action Level during the Reporting Period. Neither Notification of Exceedance (NOE) of air quality criteria nor corrective action was required.

3.2 CONSTRUCTION NOISE

3.2.1 Action and Limit Levels

The Action and Limit Levels for construction noise at KT14A-N8 are summarized in **Table 3-2-1**.

Table 3-2-1 Action and Limit Levels of Construction Noise Monitoring

Time Period	Action Level in dB(A)	Limit Level in dB(A)
0700-1900 hours on normal weekdays	When one documented complaint is received	75* dB(A)

Note: * Reduces to 70dB(A) for schools and 65dB(A) during the school examination periods.

3.2.2 Results

Construction noise monitoring results during the Reporting Period are summarized in **Table 3-2-2**. The noise monitoring data of L10 and L90 have been recorded and are available for reference or inspection upon request. Graphical plots of trends of monitored parameters at KT14A-N8 over the past four months are presented in **Appendix G**.

Although the baseline monitoring was performed in a free-field situation, impact monitoring, is performed in a non-free-field situation at the same sensitive receiver as stipulated in the EM&A Manual due to denial of access by the owner. After the change, it no longer requires a 3dB(A) façade correction and it will not introduce any significant change in detection of construction noise impact; nor would that alter the existing construction noise A/L Levels. Nonetheless, the ET has written to inform and get formal approval from EPD upon agreement with the ER and IEC.

Table 3-2-2 Summary of Construction Noise Monitoring Results at KT14A-N8

Date	Start Time	1 st Leq5	2 nd Leq5	3 rd Leq5	4 th Leq5	5 th Leq5	6 th Leq5	Leq30
29-Jul-09	11:20	57.2	58.2	59.2	52.3	57.3	53.2	56.9
4-Aug-09	13:12	52.0	49.9	55.1	52.0	47.1	51.0	51.8
10-Aug-09	09:10	53.9	50.8	50.3	51.3	51.6	50.0	51.5
15-Aug-09	09:00	64.4	58.8	59.6	58.6	60.5	62.7	61.3
21-Aug-09	09:10	52.8	57.5	46.7	49.6	50.3	49.1	52.5
Limit Level								75 dB(A)

3.2.3 Discussion

To facilitate the completion of works, the temporary noise barrier located at KT14A was dismantled by the Contractor on 27 July 2009 after obtained an approval from EPD. According to the monitoring results on 29 Jul 2009 and afterwards as shown in **Tables 3-2-2**, all the construction noise results fluctuated below the Limit Level. No exceedances of Limit Levels or documented construction complaints were recorded during the Reporting Period. It indicated that measured values were fully in compliance with the NCO criteria after the removal of the noise barriers. Neither NOE of construction noise nor corrective action was, therefore, required for the parameter.

3.3 WATER QUALITY

3.3.1 Action and Limit Levels

The existing water quality Action and Limit Levels were established using one of the approaches stipulated in the EM&A Manual - up-stream control station approach. They are summarized in **Table 3-3-1**.

Table 3-3-1 Existing Water Quality Action/Limit Levels Using Up-stream Control Station Approach

Parameter	Monitoring Location	Type of Station	Action Level	Limit Level
DO (mg/L)	W8A	Control	NA	NA
	W8B	Impact	6.378	4.00
Turbidity (NTU)	W8A	Control	NA	NA
	W8B	Impact	120% of the results of upstream control station's of the same day	130% of the results of upstream control station's of the same day
pH+	W8A	Control	NA	NA
	W8B	Impact	9.2 (95%-ile of baseline results)	9.3 (99%-ile of baseline results)
SS (mg/L)	W8A	Control	NA	NA
	W8B	Impact	120% of the results of upstream control station's of the same day	130% of the results of upstream control station's of the same day
Ammonia (µg/L)	W8A	Control	NA	NA
	W8B	Impact	120% of the results of upstream control station's of the same day	130% of the results of upstream control station's of the same day
Zinc (µg/L)	W8A	Control	NA	NA
	W8B	Impact	120% of the results of upstream control station's of the same day	130% of the results of upstream control station's of the same day

+ A/L Levels of pH are respectively set at out side the ranges of 6.5 - 8.5 and 6 - 9 as generally used for environmental water quality standards.

3.3.2 Results and Discussion

Results

Water quality monitoring results at KT14A-W8A and KT14A-W8B during the Reporting Period are tabulated in **Appendix G**, where graphical plots of trends of the monitored parameters over the past four months are also presented.

According to the existing A/L Levels, a total of thirteen (13) exceedances of environmental quality criteria, namely seven (7) Action Level exceedances of DO, four (4) Action/ Limit Level exceedances of SS and two (2) Limit Level exceedances of NH₄⁺-N, were recorded during the Reporting Period. They are summarized in **Table 3-3-2**.

Table 3-3-2 Summary of Exceedances of Existing Action and Limit Levels

Location	Exceedance	DO	Turbidity	pH	SS	NH ₄ ⁺ -N	Zn	Total
W8A	Action Level	N.A	N.A	N.A	N.A	N.A	N.A	N.A
	Limit Level	N.A	N.A	N.A	N.A	N.A	N.A	N.A
W8B	Action Level	7	0	0	1	0	0	8
	Limit Level	0	0	0	3	2	0	5

Discussion

DO

A total of seven (7) exceedances of DO Action Level were recorded during the Reporting Period. Notices of Exceedance of environmental quality criteria (NOE) were issued upon confirmation of the monitoring results, and investigations of the NOE were conducted upon receipt of the information of construction activities and the implemented mitigation measures provided by CRBC. The exceedances were concluded not to be related to the works under the Project. As a matter of fact, the DO levels during the Reporting Period fluctuated within a range of 5.02 to 6.50 with an average of 5.94 mg/L, which is considered not too bad.

pH

pH fluctuated within a range of 6.8 to 7.0 with an average of 6.9, which significantly within from the existing Action Level of 9.2 and Limit Level of 9.3. All the pH results are considered acceptable. No NOE or remedial actions were needed for the parameter.

Turbidity and Zinc

No exceedances of Action and Limit Levels of turbidity and Zinc were recorded during the Reporting Period. No Notifications of Environmental Quality Limit Exceedances (NOE) or corrective actions were therefore required for these parameters.

SS and NH₄⁺-N

According to the existing A/L Levels, a total of four (4) Action/ Limit Level of SS and two (2) Limit Level exceedances of NH₄⁺-N were registered during the Reporting Period respectively. NOE were issued upon confirmation of the monitoring results, and investigations of the NOE were conducted upon receipt of the information of construction activities and the implemented mitigation measures provided by CRBC. During the exceedance period, the construction activity in progress was only some landscaping works which did not cause any adverse impact to water quality. Preliminary investigations concluded that the exceedances were unlikely due to the works under the project. Note that the Action Level exceedance in SS was measured on 21 August 2009 after substantial completion of works on 21 August 2009.

3.4 WASTE MANAGEMENT

In order to comply with the waste management requirements, CRBC has

- Been assigned, since 9 Jan 2008, a Billing Account (account number 7006524) under the **Waste Disposal (Charges for Disposal of Construction Waste) Regulation**;
- Been issued Discharge License No. 1U461/1 under Section 20 of the **Water Pollution Control Ordinance** has been issued; and
- Been registered as a Chemical Waste Producer under the **Waste Disposal (Chemical Waste) (General) Regulation** (the Waste Producer Number assigned is WPN: 5611-531-C3124-28 dated 2 May 08).

4 NON-COMPLIANCE, COMPLAINT, NOTIFICATIONS OF SUMMONS, SUCCESSFUL PROSECUTION AND OTHERS

4.1 NON-COMPLIANCE

In this reporting period, a total of thirteen (13) exceedances of water quality Action/ Limit Levels were recorded and summarized in **Table 3-3-3**. No non-compliance or deficiency was identified during regular site inspections and environmental audits. Exceedances of environmental quality criteria have been discussed in **Sections 3.1 to 3.4**. No other non-compliance or deficiency was identified during regular the site inspections and environmental audits. No remedial actions were required.

4.2 ENVIRONMENTAL COMPLAINTS

No written or verbal complaints were received for each environmental issue during the Reporting Period. No associated remedial actions were recommended.

4.3 NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

No notifications of summons and successful prosecutions were recorded during the Reporting Period. No associated remedial actions were recommended.

4.4 OTHERS

4.4.1 Waste Management Status

All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil and sediment

Waste generated, re-used, recycled and disposed of during the Reporting Period is shown in **Appendix I: Monthly Summary Waste Flow Table**.

4.4.2 Site Inspection and Environmental Audit

In this month, **five** occasions of weekly environmental site inspection and audit were conducted jointly by the ER, EO and ET. No adverse environmental impacts were registered which indicated that the mitigation measures implemented were effective for the construction activities or preparation work and site clearance undertaken. Minor deficiencies found in the site inspection and audit were in general rectified within the specified deadlines. Findings are summarized below.

Table 4-4 Summary of Findings of Site Inspection and Environmental Audit

Date	Findings / Deficiencies	Follow-Up Status
28 July 2009	No adverse environmental impacts were observed during the site inspection	N/A
4 August 2009	The Contractor was reminded to maintain good site tidiness at KT-14A.	Recommendations based on the observation on 7 August 2009 were followed.
11 August 2009	The Contractor is reminded to clear the obstacles that were washed out from the site due to heavy rainfall	Recommendations based on the observation on 21 August 2009 were followed.
21 August 2009	General refuse was observed, house keeping shall be improved to maintain site tidiness.	Recommendations based on the observation on 25 August 2009 were followed.
25 August 2009	No adverse environmental impacts were observed during the site inspection	N/A

4.4.3 Works to be Undertaken in the Forth-Coming Month

Works to be undertaken next month are shown in the construction program in **Appendix B**. Apart from general works of tree survey, structural survey and environmental monitoring and audit, works to be undertaken during the forth-coming month are summarized as follows:

- (a) Compensatory Planting and Landscaping works

4.4.4 Future Key Issues and Mitigation Measures for Next Month

The temporary noise barrier located at KT14A was dismantled by the Contractor in July due to site constraint for completion of works prior to EPD's approval. To ensure such event does not conflict with the environmental permit requirement, a noise assessment in related to the dismantling of noise barriers was conducted which reviewed by IEC and EPD. In addition to control the plant usage for compliance with condition set out in the noise assessment, moveable noise barriers will be available on site to screen out any noisy operations.

As wet season continues, water quality mitigation measures to avoid ingression of turbid water and other water quality pollutants via site surface runoff into the river should be properly maintained or improved. In particular open stockpiles and exposed slope should be covered thoroughly with tarpaulin sheet and hydroseeding on the filled slope surface should be applied as appropriate.

In addition, special attention should also be paid to construction noise, water quality, ecology and other environmental issues identified in the EM&A Manual. Mitigation measures recommended in the EIA and summarized in Mitigation Measure Implementation Schedule (EMIS) should also be fully implemented.

5 CONCLUSIONS AND RECOMMENDATIONS

This is the 11th monthly EM&A report for Channel KT14A, covering the construction period from **26 July 2009 to 25 August 2009** (the Reporting Period).

Monitoring results of the Reporting Period demonstrated no exceedance of environmental quality criteria for air quality and construction noise.

For water quality however, a total of thirteen (13) exceedances of environmental quality criteria were recorded during the Reporting Period. Investigations of the cause of exceedances are in progress. In general, the exceedances were within the values monitored during the baseline study and the only construction activity during the reporting month was landscape planting, therefore the exceedances were likely due to natural variations of the stream. Note that the Action Level exceedance in SS was measured on 21 August 2009 after substantial completion of works on 21 August 2009.

No documented complaint, notification of summons and successful prosecution were received during the Reporting Period.

As wet season continues, water quality mitigation measures to avoid ingress of runoff into Channel KT14A should be properly installed and maintained, as appropriate. In particular, open stockpiles and exposed slope should be covered thoroughly with tarpaulin sheet or treated with hydroseeding, as appropriate.

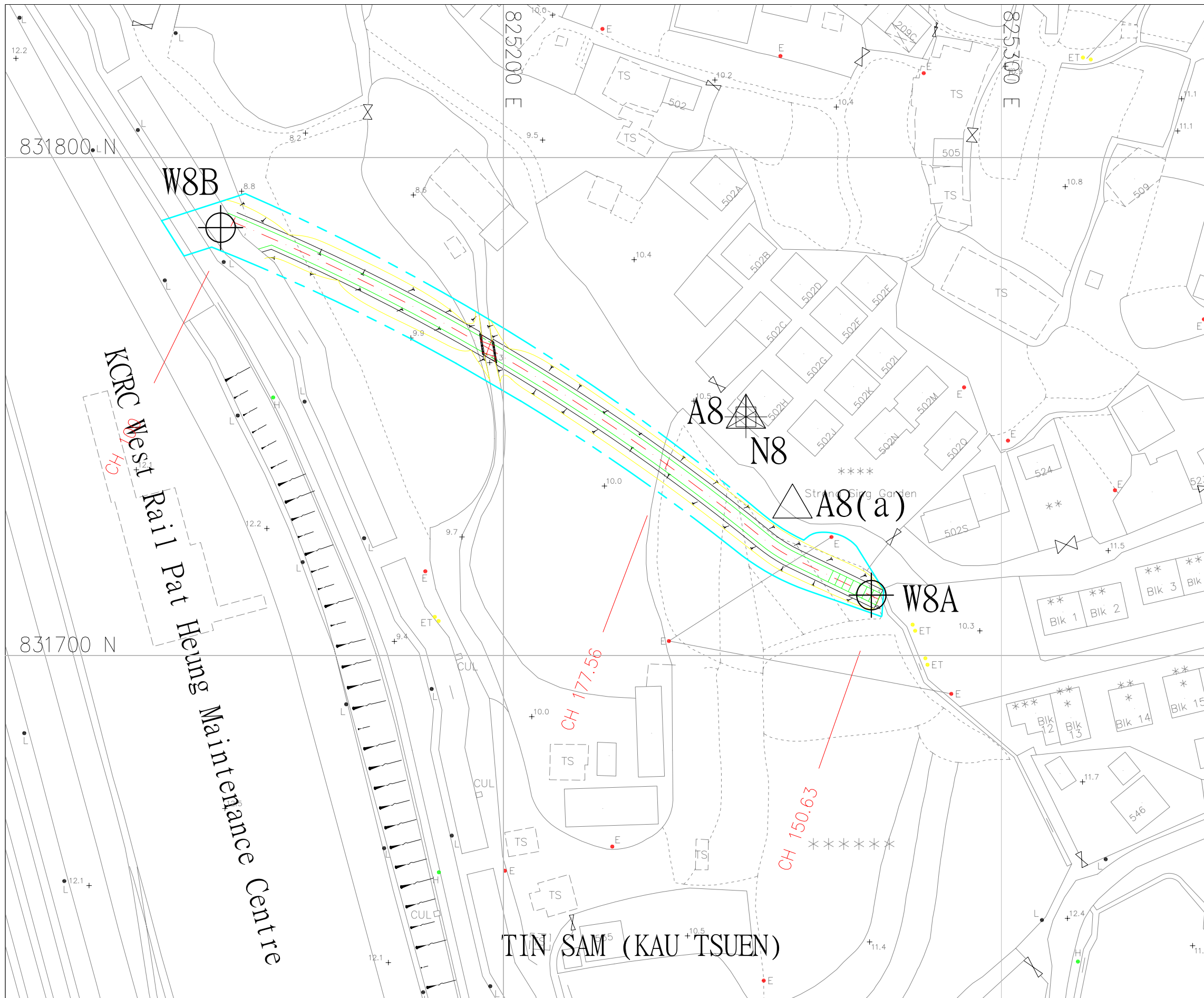
No adverse environmental impacts were observed during the weekly site inspections. In general it is reminded that good house keeping practice shall be maintained. Minor deficiencies found in the weekly site inspections were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

The measured values of construction noise were fully in compliance with the NCO criteria after the temporary noise barrier dismantled by the Contractor. However, CREC should still keep in mind for the construction noise and other environmental issues identified in the EM&A Manual. Mitigation measures recommended in the EIA and summarized in Mitigation Measure Implementation Schedule should be fully implemented.





END OF TEXT

Appendix A

**Location Plan and
Environmental Monitoring Locations**



Legends

-  Construction Noise Monitoring Location
-  Air Quality Monitoring Location
-  Water Quality Monitoring Location
-  Monitoring Location access is not allow (Air or Noise or Water) for measurement

Table

Monitoring Parameter	Location ID	Address	Remarks
Water	W8A	E825274 / N831712	
Water	W8B	E825143 / N831786	
Air	A8		Replaced by A8(a)
Air	A8(a)	Entrance of Strong Sing Garden	Recommended Location
Noise	N8	No. 205H of Strong Sing Garden	

Note:

Air Monitoring Location A8 are proposed to relocate at the entrance of Strong Sing Garden A8(a) due to request of the property management. The relocated monitoring point is considered suitable as representative sensitive receiver for Strong Sing Garden.

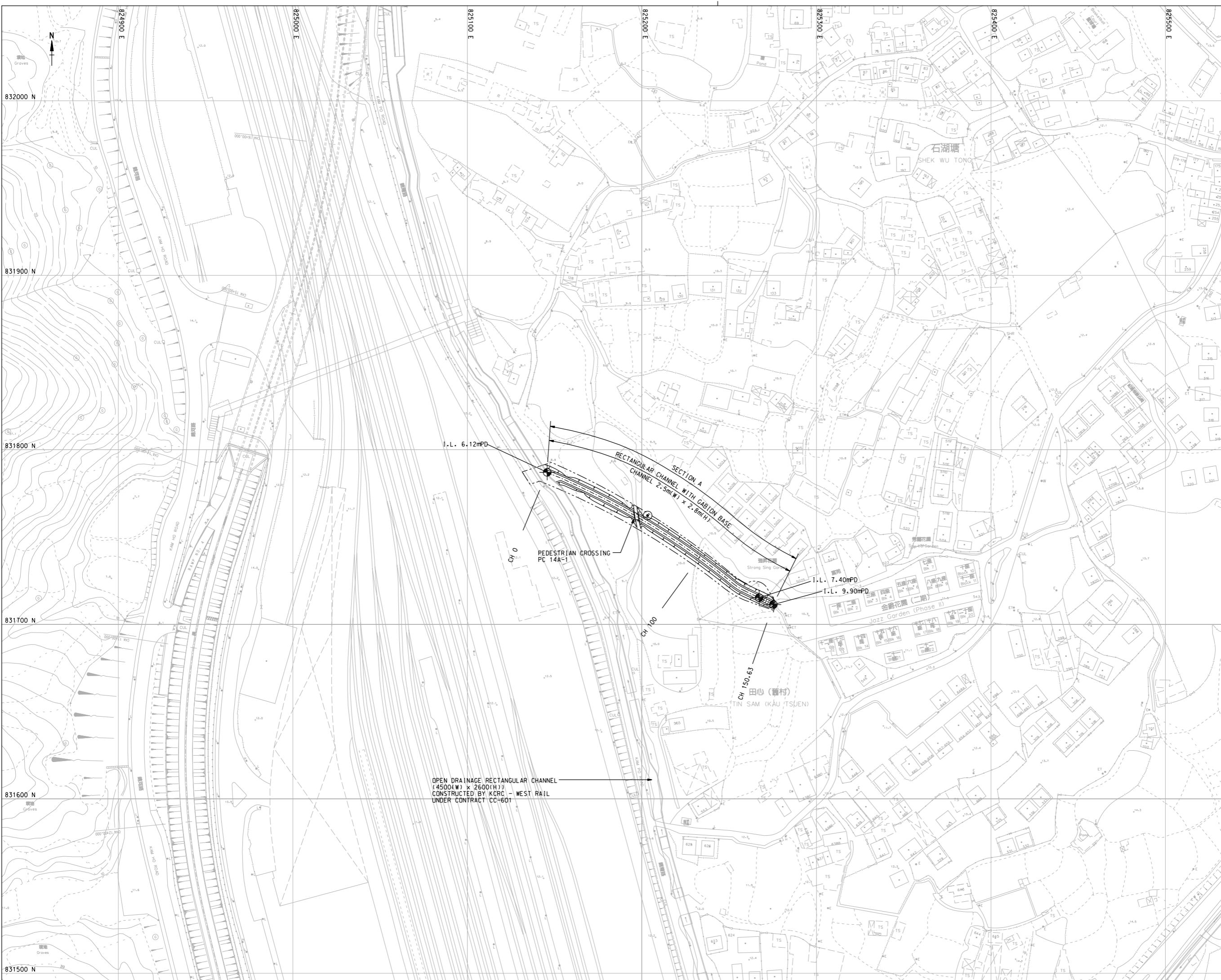
Drawing:

Air, Noise and Stream Water Monitoring Location at KT-14A

Contract No. DC/2007/17-
Drainage Improvement Works in Cheung Po,
Ma On Kong, Yuen Kong San Tsuen and Tin
Sam Tsuen of Yuen Long District and Sewerage
at Tseng Tau Chung Tsuen, Tuen Mun

AUES

NOTES :
1. FOR NOTES AND LEGEND REFER TO DRAWING NO. 021.



Revision	Date	Description	Initial
	Designed	Checked	Drawn
	Verified		
Initial	BW	WLC	LWL
Date	09/07	09/07	09/07
Approved			

CONTRACT NO. DC /2007 /17

Contract title
DRAINAGE IMPROVEMENT WORKS
IN CHEUNG PO, MA ON KONG,
YUEN KONG SAN TSUEN AND TIN SAM
TSUEN OF YUEN LONG DISTRICT AND
SEWERAGE AT TSENG TAU CHUNG TSUEN,
TUEN MUN

Drawing title
CHANNEL KT14
GENERAL LAYOUT PLAN
(SHEET 1 OF 2)

Drawing no.	Scale
024	1:1000 A1 1:2000 A3



Appendix B

Construction Program

Monthly Rolling Programme - September 2009

ID	Task Name	Duration	Start	Complete	9/2009				
					30/8	6/9	13/9	20/9	27/9
1	Section II (Channel KT13)	26 days	2009/9/1	0	[Summary bar from 30/8 to 27/9]				
2	Regular Environmental Impact Monitoring	26 days	2009/9/1	0	[Task bar from 30/8 to 27/9]				
3	Regular Tree Survey & Protection	26 days	2009/9/1	0	[Task bar from 30/8 to 27/9]				
4	Regular Structural Condition Survey	26 days	2009/9/1	0	[Task bar from 30/8 to 27/9]				
5	Tree Transplanting	10 days	2009/9/10	0	[Task bar from 13/9 to 20/9]				
6	Section A	26 days	2009/9/1	0	[Summary bar from 30/8 to 27/9]				
7	Excavation to channel formation & laying of rock fill material (A CH0.00 - A CH402.00)	26 days	2009/9/1	0	[Summary bar from 30/8 to 27/9]				
8	Bay A24 (A CH245.00 - A CH258.00) - TG2 (W.B.)	4 days	2009/9/1	0	[Task bar from 30/8 to 6/9]				
9	Bay A25 (A CH258.00 - A CH271.00) - TG2 (W.B.)	4 days	2009/9/5	0	[Task bar from 6/9 to 13/9]				
10	Bay A18 (A CH170.00 - A CH180.00) - TG2 (W.B.)	4 days	2009/9/10	0	[Task bar from 13/9 to 20/9]				
11	Bay A19 (A CH180.00 - A CH191.00) - TG2 (W.B.)	4 days	2009/9/15	0	[Task bar from 20/9 to 27/9]				
12	Bay A26 (A CH271.00 - A CH283.00) - TG6 (W.B.)	4 days	2009/9/19	0	[Task bar from 27/9 to 4/10]				
13	Bay A27 (A CH283.00 - A CH295.00) - TG6 (W.B.)	4 days	2009/9/24	0	[Task bar from 4/10 to 11/10]				
14	Bay A28 (A CH295.00 - A CH308.00) - TG6 (W.B.)	2 days	2009/9/29	0	[Task bar from 11/10 to 13/10]				
15	Construction of channel structure (RC2, Transition, and TG2)	26 days	2009/9/1	0	[Summary bar from 30/8 to 27/9]				
16	Bay A2 (A CH09.00 - A CH18.00) - RC2	4 days	2009/9/1	0	[Task bar from 30/8 to 6/9]				
17	Bay A20 (A CH191.00 - A CH201.00) - TG2 (W.B.)	4 days	2009/9/5	0	[Task bar from 6/9 to 13/9]				
18	Bay A22 (A CH214.00 - A CH226.00) - TG2 (W.B.)	4 days	2009/9/10	0	[Task bar from 13/9 to 20/9]				
19	Bay A24 (A CH245.00 - A CH258.00) - TG2 (W.B.)	4 days	2009/9/15	0	[Task bar from 20/9 to 27/9]				
20	Bay A25 (A CH258.00 - A CH271.00) - TG2 (W.B.)	4 days	2009/9/19	0	[Task bar from 27/9 to 4/10]				
21	Bay A18 (A CH170.00 - A CH180.00) - TG2 (W.B.)	4 days	2009/9/24	0	[Task bar from 4/10 to 11/10]				
22	Bay A19 (A CH180.00 - A CH191.00) - TG2 (W.B.)	2 days	2009/9/29	0	[Task bar from 11/10 to 13/10]				
23	Backfilling along the channel sides / laying underground drain pipe	23 days	2009/9/4	0	[Summary bar from 30/8 to 27/9]				
24	Bay A21 (A CH201.00 - A CH214.00) - TG2 (W.B.)	3 days	2009/9/4	0	[Task bar from 30/8 to 6/9]				
25	Bay A23 (A CH226.00 - A CH245.00) - TG2 (W.B.)	3 days	2009/9/8	0	[Task bar from 6/9 to 13/9]				
26	Bay A2 (A CH09.00 - A CH18.00) - RC2	3 days	2009/9/11	0	[Task bar from 13/9 to 20/9]				
27	Bay A20 (A CH191.00 - A CH201.00) - TG2 (W.B.)	3 days	2009/9/15	0	[Task bar from 20/9 to 27/9]				
28	Bay A22 (A CH214.00 - A CH226.00) - TG2 (W.B.)	3 days	2009/9/18	0	[Task bar from 27/9 to 4/10]				
29	Bay A24 (A CH245.00 - A CH258.00) - TG2 (W.B.)	3 days	2009/9/22	0	[Task bar from 4/10 to 11/10]				
30	Bay A25 (A CH258.00 - A CH271.00) - TG2 (W.B.)	3 days	2009/9/25	0	[Task bar from 11/10 to 13/10]				
31	Bay A18 (A CH170.00 - A CH180.00) - TG2 (W.B.)	2 days	2009/9/29	0	[Task bar from 13/10 to 15/10]				

Task [Task bar icon] Split [Split bar icon] Progress [Progress bar icon] Milestone [Milestone icon] Summary [Summary bar icon]

Monthly Rolling Programme - September 2009

ID	Task Name	Duration	Start	Complete	9/2009				
					30/8	6/9	13/9	20/9	27/9
32	Section of Box Culvert BC13-1	14 days	2009/9/15	0					
33	Construct box culvert BC13-1 (BC CH0.00 - BC CH386.00)	14 days	2009/9/15	0					
34	Excavation for box culvert formation & laying of rock fill material (BC CH0.00 - BC CH386.00)	14 days	2009/9/15	0					
35	Bay BC17 (BC CH202.00 - BC CH217.00)	4 days	2009/9/15	0					
36	Bay BC18 (BC CH217.00 - BC CH232.00)	4 days	2009/9/19	0					
37	Bay BC19 (BC CH232.00 - BC CH247.00)	4 days	2009/9/24	0					
38	Bay BC20 (BC CH247.00 - BC CH262.00)	2 days	2009/9/29	0					
39	Section B	26 days	2009/9/1	0					
40	Construction of channel structure (Transition, TG3, TG4, TG5, and TG8)	10 days	2009/9/1	0					
41	Bay B6 (B CH46.00 - B CH57.00) - TG3 (S.B.)	5 days	2009/9/1	0					
42	Bay B5 (B CH34.00 - B CH46.00) - TG3 (S.B.)	5 days	2009/9/7	0					
43	Backfilling along the sides of channel & laying of underground drain	8 days	2009/9/12	0					
44	Bay B6 (B CH46.00 - B CH57.00) - TG3 (S.B.)	4 days	2009/9/12	0					
45	Bay B5 (B CH34.00 - B CH46.00) - TG3 (S.B.)	4 days	2009/9/17	0					
46	Installation of Type 2 railing on top of channel wall	8 days	2009/9/22	0					
47	Bay B6 (B CH46.00 - B CH57.00) - TG3 (S.B.)	2 days	2009/9/22	0					
48	Bay B5 (B CH34.00 - B CH46.00) - TG3 (S.B.)	2 days	2009/9/24	0					
49	Bay B4 (B CH24.00 - B CH34.00) - TG3 (S.B.)	2 days	2009/9/26	0					
50	Bay B3 (B CH14.00 - B CH24.00) - TG3 (S.B.)	2 days	2009/9/29	0					
51									
52	Section III (Channel KT14A - Tin Sam Tsuen)	26 days	2009/9/1	0					
53	Regular Tree Survey	26 days	2009/9/1	0					
54	Regular Structural Condition Survey	26 days	2009/9/1	0					
55	Compensatory Planting	2 days	2009/9/2	0					
56									
57	Section IV (Channel KT14B & 14C and Portion 8A & 8B)	26 days	2009/9/1	0					
58	Regular Environmental Impact Monitoring	26 days	2009/9/1	0					
59	Regular Tree Survey & Protection	26 days	2009/9/1	0					
60	Regular Structural Condition Survey	26 days	2009/9/1	0					
61	Portion 8B (CP1 to CP9) - Kam Sheung Road (1050 Dia. Pipe)	26 days	2009/9/1	0					
62	Manhole MH1 - Catchpit CP1	26 days	2009/9/1	0					

Task  Split Progress  Milestone  Summary 

Monthly Rolling Programme - September 2009

ID	Task Name	Duration	Start	Complete	9/2009				
					30/8	6/9	13/9	20/9	27/9
63	Manhole MH7 - Manhole MH6 (Pipe Jacking)	26 days	2009/9/1	0	[Summary bar from 30/8 to 27/9]				
64	Pipe Jacking of Steel Ring	20 days	2009/9/1	0	[Task bar from 30/8 to 20/9]				
65	Installation of Drain Pipe	5 days	2009/9/24	0	[Task bar from 20/9 to 27/9]				
66	Grouting Works	1 day	2009/9/30	0	[Task bar from 27/9 to 30/8]				
67	Planting of Shrubs at planters	14 days	2009/9/15	0	[Task bar from 13/9 to 27/9]				
68	Channel 14B	26 days	2009/9/1	0	[Summary bar from 30/8 to 27/9]				
69	Compensatory Planting	14 days	2009/9/15	0	[Task bar from 13/9 to 27/9]				
70	Construction of catchpit / manhole / drain pipe along the sides of the channel	26 days	2009/9/1	0	[Summary bar from 30/8 to 27/9]				
71	Bay 14 (CH135.00 - CH147.00)	4 days	2009/9/1	0	[Task bar from 30/8 to 3/9]				
72	Bay 15 (CH147.00 - CH159.00)	4 days	2009/9/5	0	[Task bar from 3/9 to 7/9]				
73	Bay 16 (CH159.00 - CH171.00)	4 days	2009/9/10	0	[Task bar from 7/9 to 11/9]				
74	Bay 17 (CH171.00 - CH183.00)	4 days	2009/9/15	0	[Task bar from 11/9 to 15/9]				
75	Bay 18 (CH183.00 - CH195.00)	4 days	2009/9/19	0	[Task bar from 15/9 to 19/9]				
76	Bay 19 (CH195.00 - CH207.00)	4 days	2009/9/24	0	[Task bar from 19/9 to 23/9]				
77	Bay 20 (CH207.00 - CH216.00)	2 days	2009/9/29	0	[Task bar from 23/9 to 25/9]				
78	Laying of gabion block inside the channel structure	18 days	2009/9/10	0	[Task bar from 13/9 to 27/9]				
79	Bay 28 (CH285.00 - CH297.00)	5 days	2009/9/10	0	[Task bar from 13/9 to 18/9]				
80	Bay 29 (CH297.00 - CH299.00)	5 days	2009/9/16	0	[Task bar from 18/9 to 23/9]				
81	Bay 31 (CH303.00 - CH317.00)	5 days	2009/9/22	0	[Task bar from 23/9 to 28/9]				
82	Bay 32 (CH317.00 - CH326.00)	3 days	2009/9/28	0	[Task bar from 28/9 to 30/8]				
83	Construction of 3.5m maintenance access (CH225.00 - CH335.00) - East bank	14 days	2009/9/15	0	[Task bar from 13/9 to 27/9]				
84	Channel KT14C	26 days	2009/9/1	0	[Summary bar from 30/8 to 27/9]				
85	Rectangular channel 2.5m(W) x 2.0m(H) Type RC-1 (CH0.00 -CH475.00)	18 days	2009/9/10	0	[Task bar from 13/9 to 27/9]				
86	Excavation to channel formation (CH180.00 - CH475.00) & Laying rock fill material	18 days	2009/9/10	0	[Task bar from 13/9 to 27/9]				
87	Bay 1E (CH475.00 - CH466.00) & Vehicular Crossing VC14C-1	4 days	2009/9/10	0	[Task bar from 13/9 to 17/9]				
88	Bay 2E (CH466.00 - CH460.00)	4 days	2009/9/15	0	[Task bar from 17/9 to 21/9]				
89	Bay 3E (CH460.00 - CH448.00)	4 days	2009/9/19	0	[Task bar from 21/9 to 25/9]				
90	Bay 4E (CH448.00 - CH435.00)	4 days	2009/9/24	0	[Task bar from 25/9 to 29/9]				
91	Bay 5E (CH435.00 - CH425.00)	2 days	2009/9/29	0	[Task bar from 29/9 to 30/8]				
92	Construction of channel structure (CH180.00 - CH475.00)	10 days	2009/9/19	0	[Task bar from 19/9 to 29/9]				
93	Bay 1E (CH475.00 - CH466.00) & Vehicular Crossing VC14C-1	8 days	2009/9/19	0	[Task bar from 19/9 to 27/9]				

Task [Pattern] Split [Pattern] Progress [Pattern] Milestone [Pattern] Summary [Pattern]

Monthly Rolling Programme - September 2009

ID	Task Name	Duration	Start	Complete	9/2009				
					30/8	6/9	13/9	20/9	27/9
94	Bay 2E (CH466.00 - CH460.00)	2 days	2009/9/29	0					
95	Laying gabion blocks	9 days	2009/9/21	0					
96	Bay 8E (CH401.00 - CH390.00)	3 days	2009/9/21	0					
97	Bay 9E (CH390.00 - CH384.00)	3 days	2009/9/24	0					
98	Bay 10E (CH384.00 - CH371.00)	3 days	2009/9/28	0					
99	Construction of catchpit / manhole / drain pipe	26 days	2009/9/1	0					
100	Bay 16E (CH311.00 - CH299.00) - 2.5m(W) x 2.0m(H) Box Culvert (Type BC2)	4 days	2009/9/1	0					
101	Bay 17E-1 (CH299.00 - CH292.00) - 2.5m(W) x 2.0m(H) Box Culvert (Type BC2)	4 days	2009/9/5	0					
102	Bay 17E-2 (CH292.00 - CH285.00) - 2.5m(W) x 2.0m(H) Box Culvert (Type BC2)	4 days	2009/9/10	0					
103	Bay 16E (CH311.00 - CH299.00) - 2.5m(W) x 2.0m(H) Box Culvert (Type BC2)	4 days	2009/9/15	0					
104	Bay 17E-1 (CH299.00 - CH292.00) - 2.5m(W) x 2.0m(H) Box Culvert (Type BC2)	4 days	2009/9/19	0					
105	Bay 17E-2 (CH292.00 - CH285.00) - 2.5m(W) x 2.0m(H) Box Culvert (Type BC2)	4 days	2009/9/24	0					
106	Bay 20E (CH267.00 - CH255.00)	2 days	2009/9/29	0					
107	Installation of Type 2 railing on top of channel walls	14 days	2009/9/15	0					
108	Bay 16E (CH311.00 - CH299.00) - 2.5m(W) x 2.0m(H) Box Culvert (Type BC2)	3 days	2009/9/15	0					
109	Bay 17E-1 (CH299.00 - CH292.00) - 2.5m(W) x 2.0m(H) Box Culvert (Type BC2)	3 days	2009/9/18	0					
110	Bay 17E-2 (CH292.00 - CH285.00) - 2.5m(W) x 2.0m(H) Box Culvert (Type BC2)	3 days	2009/9/22	0					
111	Bay 18E (CH285.00 - CH279.00) - 2.5m(W) x 2.0m(H) Box Culvert (Type BC2)	3 days	2009/9/25	0					
112	Bay 19E (CH279.00 - CH267.00)	2 days	2009/9/29	0					
113									
114	Section V	26 days	2009/9/1	0					
115	Preservation and protection of tree for Section I, II, III and IV	26 days	2009/9/1	0					
116									
117	Section VI - Portion 9A & 9B (Tuen Mun Sewerage Work)	26 days	2009/9/1	0					
118	Structural Survey and Monitoring	26 days	2009/9/1	0					
119	Construction of Manhole, Timber Box and Trench Excavation	26 days	2009/9/1	0					
120									
121	Section VII - Portion 10A, 10B & 10C (Tuen Mun Sewerage Work)	26 days	2009/9/1	0					
122	Structural Survey and Monitoring	26 days	2009/9/1	0					
123	Construction of Manhole, Timber Box and Trench Excavation	26 days	2009/9/1	0					

Task Split Progress Milestone Summary

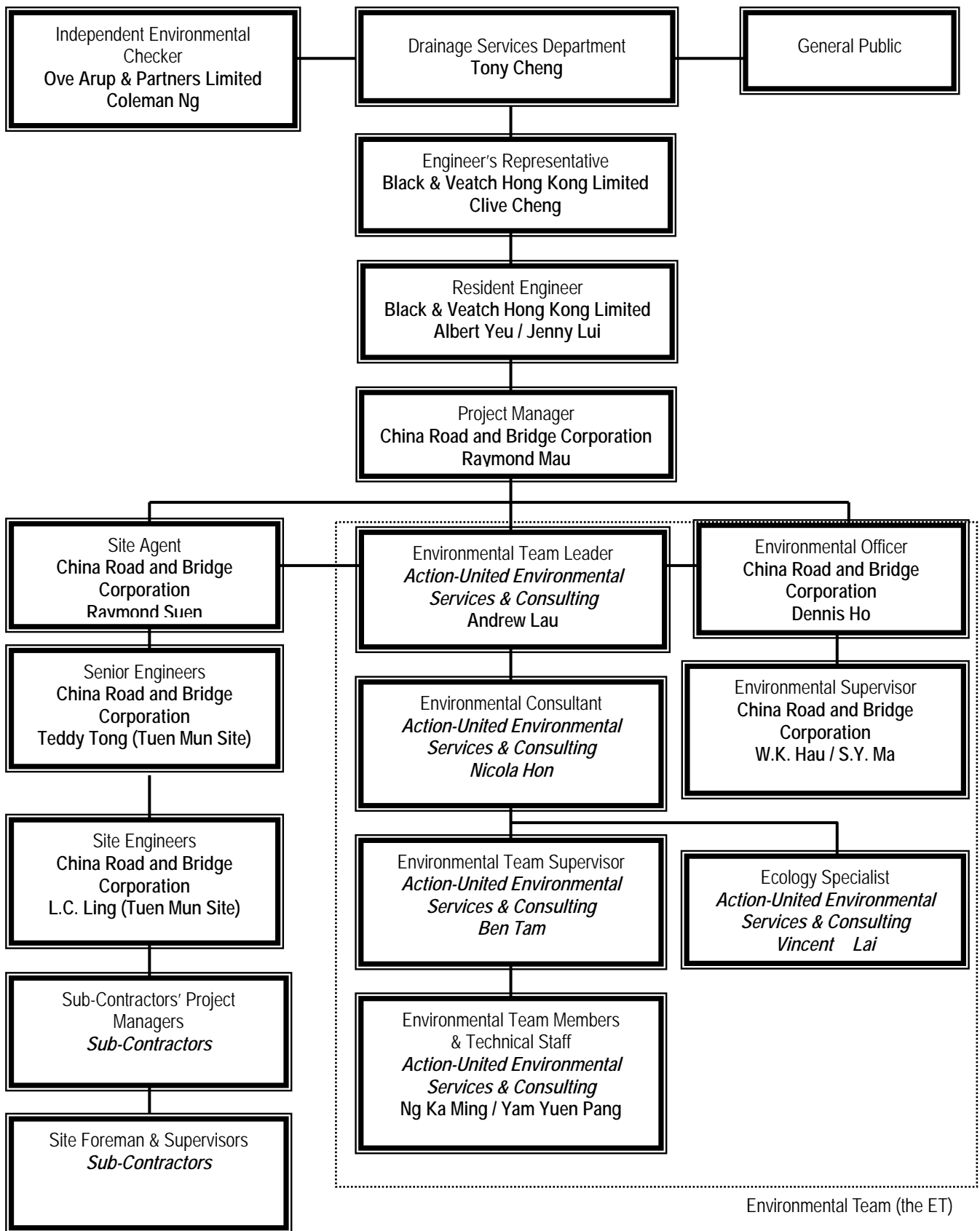
Three Months Rolling Programme - October 2009 to December 2009

ID	Task Name	Duration	Start	Complete	2009/10					2009/11				2009/12					
					27/9	4/10	11/10	18/10	25/10	1/11	8/11	15/11	22/11	29/11	6/12	13/12	20/12	27/12	
1	Section II (Channel KT13)	74 days	2009/10/2	0															
150																			
151	Section III (Channel KT14A - Tin Sam Tsuen)	74 days	2009/10/2	0															
152	Regular Tree Survey	74 days	2009/10/2	0															
153	Regular Structural Condition Survey	74 days	2009/10/2	0															
154																			
155	Section IV (Channel KT14B & 14C and Portion 8A & 8B)	74 days	2009/10/2	0															
263																			
264	Section V	74 days	2009/10/2	0															
266																			
267	Section VI - Portion 9A & 9B (Tuen Mun Sewerage Work)	74 days	2009/10/2	0															
270																			
271	Section VII - Portion 10A, 10B & 10C (Tuen Mun Sewerage Work)	74 days	2009/10/2	0															

Task Split Progress Milestone Summary

Appendix C

**Environmental Management Organization and
Contacts of Key Personnel**



Environmental Management Organization

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Employer	Mr. Tony Cheng	2594-7264	2827-8526
B&V	Engineer's Representative	Mr. Clive Cheng	2478-9161	2478-9369
B&V	Resident Engineer	Mr. Albert Yeu	2478-9161	2478-9369
B&V	Resident Engineer	Mr. Jenny Lui	2478-9161	2478-9369
OAP	Independent Environmental Checker	Mr. Coleman Ng	2268-3097	2268 3950
CRBC	Project Director	Mr. Wang Yanhua	2283-1688	2283-1689
CRBC	Project Manager	Mr. Raymond Mau	9048-3669	2283-1689
CRBC	Site Agent	Mr. Raymond Suen	9779-8871	2283-1689
CRBC	Senior Engineer (Tuen Mun Site)	Mr. Teddy Tong	6283-9684	2283-1689
CRBC	Site Engineer (Tuen Mun Site)	Mr. L.C. Ling	6770-4010	2283-1689
CRBC	Environmental Officer	Mr. Dennis Ho	6474-6975	2283-1689
CRBC	Environmental / Construction Supervisor (Tuen Mun and Yuen Long site)	Mr. W.K. Hau	6283--9696	2283-1689
CRBC	Environmental / Construction Supervisor (Yuen Long site)	Mr. S.Y. Ma	9401-6296-	2283-1689
CRBC	Safety Officer	Kenny Sze	9374-8954	2283-1689
AUES	Environmental Team Leader	Mr. Andrew Lau	2959-6059	2959-6079
AUES	Environmental Consultant	Miss Nicola Hon	2959-6059	2959-6079
AUES	Environmental Site Inspector	Mr. Ben Tam	2959-6059	2959-6079
AUES	Ecologist	Mr. Vincent Lai	2959-6059	2959-6079

Legend:

DSD (Employer) – Drainage Services Department

B&V (Engineer) – Black & Veatch Hong Kong Limited

CRBC (Main Contractor) – China Road and Bridge Corporation

OAP (IEC) – Ove Arup & Partners Ltd

AUES (ET) – Action-United Environmental Services & Consulting

Appendix D

- (a) Monitoring Schedules**
- (b) Meteorological Data**

A(1) Monitoring Schedule for the Reporting Period

Date		Air Quality		Noise Leq 30min	Water Quality
		1-hour TSP	24-hour TSP		
Sun	26-July-09				
Mon	27-July-09				W8A & W8B
Tue	28-July-09		A8(a)		
Wed	29-July-09	A8(a)		N8	W8A & W8B
Thu	30-July-09				
Fri	31-July-09				W8A & W8B
Sat	1-Aug-09				
Sun	2-Aug-09				
Mon	3-Aug-09		A8(a)		W8A & W8B
Tue	4-Aug-09	A8(a)		N8	
Wed	5-Aug-09				W8A & W8B
Thu	6-Aug-09				
Fri	7-Aug-09				W8A & W8B
Sat	8-Aug-09		A8(a)		
Sun	9-Aug-09				
Mon	10-Aug-09	A8(a)		N8	W8A & W8B
Tue	11-Aug-09				
Wed	12-Aug-09				W8A & W8B
Thu	13-Aug-09				
Fri	14-Aug-09		A8(a)		W8A & W8B
Sat	15-Aug-09	A8(a)		N8	
Sun	16-Aug-09				
Mon	17-Aug-09				W8A & W8B
Tue	18-Aug-09				
Wed	19-Aug-09				W8A & W8B
Thu	20-Aug-09		A8(a)		
Fri	21-Aug-09	A8(a)		N8	W8A & W8B
Sat	22-Aug-09				
Sun	23-Aug-09				
Mon	24-Aug-09				W8A & W8B
Tue	25-Aug-09				

	Monitoring Day
	Sunday or Public Holiday

A(2) Monitoring Schedule for the Next Reporting Month

Date		Air Quality		Noise Leq 30min	Water Quality
		1-hour TSP	24-hour TSP		
Wed	26-Aug-09		A8(a)		W8A & W8B
Thu	27-Aug-09	A8(a)		N8	
Fri	28-Aug-09				W8A & W8B
Sat	29-Aug-09				
Sun	30-Aug-09				
Mon	31-Aug-09				W8A & W8B
Tue	1-Sep-09		A8(a)		
Wed	2-Sep-09	A8(a)		N8	W8A & W8B
Thu	3-Sep-09				
Fri	4-Sep-09				W8A & W8B
Sat	5-Sep-09				
Sun	6-Sep-09				
Mon	7-Sep-09		A8(a)		W8A & W8B
Tue	8-Sep-09	A8(a)		N8	
Wed	9-Sep-09				W8A & W8B
Thu	10-Sep-09				
Fri	11-Sep-09				W8A & W8B
Sat	12-Sep-09		A8(a)		
Sun	13-Sep-09				
Mon	14-Sep-09	A8(a)		N8	W8A & W8B
Tue	15-Sep-09				
Wed	16-Sep-09				W8A & W8B
Thu	17-Sep-09				
Fri	18-Sep-09		A8(a)		W8A & W8B
Sat	19-Sep-09	A8(a)		N8	
Sun	20-Sep-09				
Mon	21-Sep-09				W8A & W8B
Tue	22-Sep-09				
Wed	23-Sep-09				W8A & W8B
Thu	24-Sep-09		A8(a)		
Fri	25-Sep-09	A8(a)		N8	W8A & W8B

	Monitoring Day
	Sunday or Public Holiday

(B) Meteorological Data Extracted from HKO in the Reporting Period

Date	Weather	Lau Fau Shan Weather Station					
		Total Rainfall (mm)	Mean Air Temperature (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction	
Sun	26-Jul-09	cloudy/a few showers/moderate	24.1	30.6	15.7	75.2	S/SE
Mon	27-Jul-09	cloudy/a few showers/sunny	33.6	28.3	12.5	90	S/SE
Tue	28-Jul-09	cloudy/showers/squally	10.2	29.2	13.5	85.5	S/SE
Wed	29-Jul-09	cloudy/a few showers/sunny	2.4	29	13.2	84	S/SE
Thu	30-Jul-09	cloudy/showers/squally	14	29.3	13.5	81	S/SE
Fri	31-Jul-09	fine/showers/moderate/fresh	8.7	29.8	18.5	77.5	E/SE
Sat	1-Aug-09	fine/very hot/showers/light winds	0	29.8	14	76	E
Sun	2-Aug-09	sunny periods/showers/very	0	31.4	10.5	72.5	S/SE
Mon	3-Aug-09	sunny periods/very hot/a few	21.4	31.7	9.5	77	E/NE
Tue	4-Aug-09	strong/cloudy/rain/squalls	21.3	28.1	17.5	75.5	E/NE
Wed	5-Aug-09	cloudy/rain/squalls/moderate/fresh/strong	92.5	27	21	89.7	E/SE
Thu	6-Aug-09	cloudy/a few showers/squally	8.3	28.1	18.5	88.5	SE
Fri	7-Aug-09	fine/moderate	0	29.4	11	84.2	S/SE
Sat	8-Aug-09	very hot/fresh/moderate	0	30.2	14.5	82.3	S/SE
Sun	9-Aug-09	sunny periods/very hot/a few	0	30	12	79	W/SW
Mon	10-Aug-09	cloudy/showers/thunderstorms/light	21.8	29.5	9.5	82.5	W/SW
Tue	11-Aug-09	cloudy/rain/squally thunderstorm/light	32.2	27.7	17	84.5	S/SE
Wed	12-Aug-09	cloudy/rain/squally thunderstorm/light	3.1	26.7	16.2	88.5	E/SE
Thu	13-Aug-09	cloudy/rain/squally	70.7	26.2	8.2	93.5	S/SE
Fri	14-Aug-09	cloudy/a few showers/sunny	44.9	28.2	10.5	86.5	S/SE
Sat	15-Aug-09	hot/sunny periods/a few	0	28.7	11	85.5	S/SE
Sun	16-Aug-09	sunny periods/a few	0	30.2	15.7	78	W/NW
Mon	17-Aug-09	cloudy/showers/squally	2	29.4	8	76.5	S/SE
Tue	18-Aug-09	fine/hot/isolated	12.7	28.6	11.5	77	E/NE
Wed	19-Aug-09	fine/isolated showers/very hot/light winds	0.3	29	16	83	E/SE
Thu	20-Aug-09	fine/isolated showers/very hot/light	0	29.3	9.5	79	S/SE
Fri	21-Aug-09	fine/very hot/light winds	0	29.9	13.5	71.7	E/SE
Sat	22-Aug-09	fine/isolated showers/very hot/moderate	0	30.3	14	67	W
Sun	23-Aug-09	very hot/fine/isolated showers/moderate	Trace	30.1	15.7	Maintenance	W/SW
Mon	24-Aug-09	sunny intervals/haze/showers/moderate	0	29.4	8	Maintenance	N/NE
Tue	25-Aug-09	sunny periods/a few	Trace	30.9	12	72	E/NE

Appendix E

**Calibration Certificates and
HOKLAS-Accreditation Certificate**

Equipment Calibration List for Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen of Yuen Long District and Sewerage at Tseng Tau Chung Tsuen, Tuen Mun

Items	Aspect	Description of Equipment	Date of Calibration	Date of Next Calibration
1	Air	Tisch Calibration Kit Model TE-5025A (Serial No. 1612)	2 Jun 09	2 Jun 10
2*		TSP Sampler Calibration Spreadsheet for KT14A -A8(a)	15 Jun 09 18 Aug 09	15 Aug 09 18 Aug 09
3		TSI DustTrak Model 8520 (Serial No. 21060)	30 Aug 08	30 Aug 09
4		TSI DustTrak Model 8520 (Serial No. 23080)	30 Aug 08	30 Aug 09
5		TSI DustTrak Model 8520 (Serial No. 23079)	30 Aug 08	30 Aug 09
6	Noise	Cesva SC-20c Sound Level Meter (Serial No. T212509)	28 Apr 09	28 Apr 10
7		Cesva CB-5 Acoustical Calibrator (Serial No. 030934)	28 Apr 09	28 Apr 10
8		Bruel & Kjaer Integrating Sound Level Meter 2238 (Serial No. 2285762)	30 Apr 09	30 Apr 10
9		Bruel & Kjaer Integrating Sound Level Meter 2238 (Serial No. 2285690)	30 Apr 09	30 Apr 10
10		Bruel & Kjaer Acoustical Calibrator 4231 (Serial No. 2292168)	28 Apr 09	28 Apr 10
11		Bruel & Kjaer Acoustical Calibrator 4231 (Serial No. 2326408)	28 Apr 09	28 Apr 10
12	Water	YSI 550A (Serial No. 05F2063AZ)	17 July 09	17 Oct 09
13*		Extect pH EC500 (Serial No. 133298)	17 July 09	17 Oct 09
14*		Turbidimeter HACH 2100p (Serial No. 950900008735)	3 Aug 09	3 Nov 09
15		Hand Refractometer ATAGO (Serial No. 289468)	21 Jul 09	21 Oct 09

Note: *Calibration certificates will only provide when monitoring equipment is re-calibrate or new.
 The rest of calibration certificates could be referred to the previous EM&A monthly report (July 2009)

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Strong Sing Garden	Date of Calibration: 18-Aug-09
Location ID : KT14-1 (A8(a))	Next Calibration Date: 18-Oct-09
	Technician: Mr. Ben Tam

CONDITIONS

Sea Level Pressure (hPa)	1010.9	Corrected Pressure (mm Hg)	758.175
Temperature (°C)	28.7	Temperature (K)	302

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.01546
Model->	TE-5025A	Qstd Intercept ->	-0.02851

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	5.3	5.3	10.6	1.618	52	51.30	Slope = 40.6571 Intercept = -14.1150 Corr. coeff. = 0.9992		
13	4.4	4.4	8.8	1.475	47	46.37			
10	3.2	3.2	6.4	1.260	38	37.49			
7	2.3	2.3	4.6	1.070	29	28.61			
5	1.2	1.2	2.4	0.777	18	17.76			

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H20(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

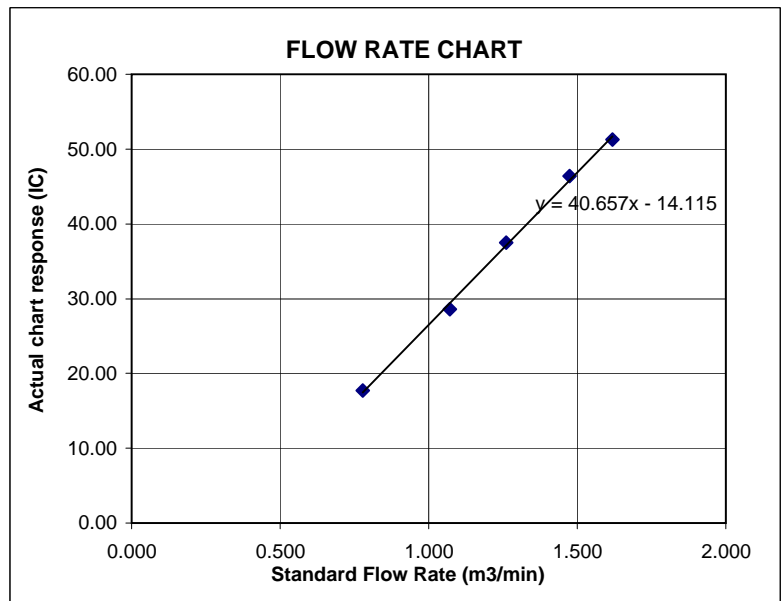
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



CERTIFICATE OF ANALYSIS



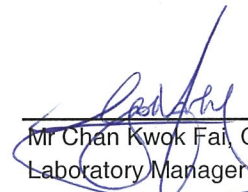
Batch: HK0915278
Date of Issue: 03/08/2009
Client: ACTION UNITED ENVIRO SERVICES
Client Reference:

Calibration of Turbidity System

Item : HACH Turbidimeter
Model No. : HACH 2100P
Serial No. : 950900008735
Equipment No. : EQ091
Calibration Method : This meter was calibrated in accordance with standard method APHA (19th Ed.) 2130B
Date of Calibration : 03 August, 2009

Testing Results :

Expected Reading	Recording Reading
0.00 NTU	0.10 NTU
4.00 NTU	3.86 NTU
16.0 NTU	15.0 NTU
80.0 NTU	76.4 NTU
160 NTU	149 NTU
Allowing Deviation	±10%


Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

CERTIFICATE OF ANALYSIS



Batch: HK0914216
Date of Issue: 21/07/2009
Client: ACTION UNITED ENVIRO SERVICES
Client Reference:

Calibration of DO System

Item : Exttech pH / Conductivity / TDS meter
Model No. : EC 500
Serial No. : 133298
Equipment No. : --
Calibration Method : This meter was calibrated in accordance with standard method APHA (19th Ed.) 4500-H⁺B
Date of Calibration : 17 July, 2009

Testing Results :

Expected Reading	Recording Reading
4.00	3.97
7.00	6.97
10.0	9.86
Allowing Deviation	± 0.2


Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

Appendix F

Event Action Plan

Event/Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	Engineer	Contractor
ACTION LEVEL				
1. Exceedance for one sample	<ol style="list-style-type: none"> Identify source Inform IEC and Engineer Repeat measurement to confirm finding Increase monitoring frequency to daily 	<ol style="list-style-type: none"> Check monitoring data submitted by ET Check Contractor's working method 	Notify Contractor	<ol style="list-style-type: none"> Rectify any unacceptable practice Amend working methods if appropriate
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> Identify source Inform IEC and Engineer Repeat measurements to confirm findings Increase monitoring frequency to daily Discuss with IEC and Contractor on remedial actions required If exceedance continues, arrange meeting with IEC and Engineer If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> Check monitoring data submitted by ET Check Contractor's working method Discuss with ET and Contractor on possible remedial measures Advice Engineer on the effectiveness of the proposed remedial measures Supervise implementation of remedial measures 	<ol style="list-style-type: none"> Confirm receipt of notification of failure in writing Notify Contractor Ensure remedial measures properly implemented 	<ol style="list-style-type: none"> Submit proposals for remedial actions to IEC within 3 working days of notification Implement the agreed proposals Amend proposal if appropriate
LIMIT LEVEL				
1. Exceedance for one sample	<ol style="list-style-type: none"> Identify source Inform Engineer and EPD Repeat measurement to confirm finding Increase monitoring frequency to daily Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and Engineer informed of the results 	<ol style="list-style-type: none"> Check monitoring data submitted by ET Check Contractor's working method Discuss with ET and Contractor on possible remedial measures Advice Engineer on the effectiveness of the proposed remedial measures Supervise implementation of remedial measures 	<ol style="list-style-type: none"> Confirm receipt of notification of failure in writing Notify Contractor Ensure remedial measures properly implemented 	<ol style="list-style-type: none"> Take immediate action to avoid further exceedance Submit proposals for remedial actions to IEC within 3 working days of notification Implement the agreed proposals Amend proposal if appropriate
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> Notify IEC, Engineer and EPD Identify source Repeat measurement to confirm findings Increase monitoring frequency to daily Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. Arrange meeting with IEC and Engineer to discuss the remedial actions to be taken Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and Engineer informed of the results If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> Discuss amongst Engineer, ET and Contractor on potential remedial actions Review Contractor's remedial actions whether necessary to assure their effectiveness and advice the Engineer accordingly Supervise implementation of remedial measures 	<ol style="list-style-type: none"> Confirm receipt of notification of failure in writing Notify Contractor In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented Discuss amongst Environmental Team Leader and the Contractor potential remedial actions Ensure remedial measures properly implemented If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated 	<ol style="list-style-type: none"> Take immediate action to avoid further exceedance Submit proposals for remedial actions to IEC within 3 working days of notification Implement the agreed proposals Resubmit proposals if problem still not under control Stop the relevant portion of works as determined by the Engineer until the exceedance is abated

Event/Action Plan for Construction Noise

EVENT	ACTION			
	ET Leader	IEC	Engineer	Contractor
ACTION LEVEL	<ol style="list-style-type: none"> 1. Notify Contractor and Engineer 2. Carry out investigation 3. Report the results of investigation to the IEC and Contractor 4. Discuss with the Contractor and formulate remedial measures 5. Increase monitoring frequency to check mitigation effectiveness 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by ET 2. Review the proposed remedial measures by the Contractor and advice the Engineer accordingly 3. Supervise implementation of remedial measures 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures properly implemented 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals for remedial actions to IEC 2. Implement the agreed proposals
LIMIT LEVEL	<ol style="list-style-type: none"> 1. Notify IEC, Engineer, EPD and Contractor 2. Identify source 3. Repeat measurement to confirm findings 4. Increase monitoring frequency 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented 6. Inform IEC, Engineer and EPD the causes & actions taken for the exceedances 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and Engineer informed of the results 8. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Discuss amongst Engineer, ET and Contractor on potential remedial actions 2. Review Contractor's remedial actions whether necessary to assure their effectiveness and advice the Engineer accordingly 3. Supervise implementation of remedial measures 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures properly implemented 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IEC within 3 working days of notification 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the Engineer until the exceedance is abated

Event and Action Plan for Stream Water Quality

Event	ET Leader	IEC	Engineer	Contractor
ACTION LEVEL (being exceeded by one sampling day)	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings 2. Identify source(s) of impact 3. Inform IEC and Contractor 4. Check monitoring data, all plant, equipment and Contractor's working methods 5. Discuss mitigation measures IEC and Contractor 6. Repeat measurement on next day of exceedance 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures 2. Review proposals on mitigation measures submitted by Contractor and advice Engineer accordingly 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Discuss with IEC on the proposed mitigation measures 2. Make agreement on the mitigation measures to be implemented 	<ol style="list-style-type: none"> 1. Inform Engineer and confirm notification of the non-compliance in writing 2. Rectify unacceptable practice 3. Check all plant and equipment 4. Consider changes of working methods 5. Discuss with ET and Contractor and propose mitigation measures to IEC and Engineer 6. Implement the agreed mitigation measures
ACTION LEVEL (being exceeded by more than one sampling day)	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings 2. Identify source(s) of impact 3. Inform IEC, Contractor and EPD 4. Check monitoring data, all plant, equipment and Contractor's working methods 5. Discuss mitigation measures IEC, Engineer and Contractor 6. Repeat measurement on next day of exceedance 7. Ensure mitigation measures are implemented 8. Prepare to increase the monitoring frequency to daily 9. Repeat measurement on next day of exceedance 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures 2. Review proposals on mitigation measures submitted by Contractor and advice Engineer accordingly 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Discuss with IEC on the proposed mitigation measures 2. Make agreement on the mitigation measures to be implemented 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Inform Engineer and confirm notification of the non-compliance in writing 2. Rectify unacceptable practice 3. Check all plant and equipment 4. Consider changes of working methods 5. Discuss with ET and IEC and propose mitigation measures to IEC and Engineer within 3 working days 6. Implement the agreed mitigation measures
LIMIT LEVEL (being exceeded by one sampling days)	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings 2. Identify source(s) of impact 3. Inform IEC, Contractor and EPD 4. Check monitoring data, all plant, equipment and Contractor's working methods 5. Discuss mitigation measures IEC, Engineer and Contractor 6. Ensure mitigation measures are implemented 7. Increase the monitoring frequency to daily until no exceedance of Limit Level 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures 2. Review proposals on mitigation measures submitted by Contractor and advice Engineer accordingly 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Discuss with IEC, ET and Contractor on the proposed mitigation measures 2. Request Contractor to critically review the working methods 3. Make agreement on the mitigation measures to be implemented 4. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Inform Engineer and confirm notification of the non-compliance in writing 2. Rectify unacceptable practice 3. Check all plant and equipment 4. Consider changes of working methods 5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within 3 working days 6. Implement the agreed mitigation measures
LIMIT LEVEL (being exceeded by more than one sampling days)	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform Contractor, Engineer, IEC and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, Engineer and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures 2. Review proposals on mitigation measures submitted by Contractor and advice Engineer accordingly 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Discuss with IEC, ET and Contractor on the proposed mitigation measures 2. Request Contractor to critically review the working methods 3. Make agreement on the mitigation measures to be implemented 4. Assess the effectiveness of the implemented mitigation measures 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until daily until no exceedance of Limit Level 	<ol style="list-style-type: none"> 1. Inform Engineer and confirm notification of the non-compliance in writing 2. Rectify unacceptable practice 3. Check all plant and equipment 4. Consider changes of working methods 5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within 3 working days Propose mitigation measures to Engineer within 3 working days 6. Implement the agreed mitigation measures; 7. As directed by Engineer, to slow down or to stop all or part of the construction activities

Appendix G

(A) Environmental Monitoring Data

(B) Graphic Plot of Monitoring

- 1. Construction Noise**
- 2. Air Quality**
- 3. Water Quality**

Summary of Water Quality Monitoring Results - KT14A

Date 27-Jul-09																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	14:40	0.10	29.9	29.9	2.93	2.92	39.0	38.7	5.5	5.4	0	0.0	7.6	7.6	13	13.0	9.89	9.89	31	31.0
			29.9		2.9		38.4		5.3		7.6		13		9.89		31			
W8B	14:30	0.10	30.6	30.6	6.51	6.48	86.9	86.5	6.1	6.0	0	0.0	8	8.0	35	35.0	0.07	0.07	23	23.0
			30.6		6.44		86.1		5.8		8		35		0.07		23			

Date 29-Jul-09																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	16:05	0.10	31.0	31.0	2.24	2.22	31.1	30.9	6.7	6.7	0	0.0	7.6	7.6	11	11.0	0.12	0.12	15	15.0
			31.0		2.2		30.6		6.6		7.6		11		0.12		15			
W8B	15:55	0.10	30.3	30.3	6.49	6.48	85.9	85.7	7.0	7.0	0	0.0	8	8.0	11	11.0	0.11	0.11	15	15.0
			30.3		6.47		85.4		6.9		8		11		0.11		15			

Date 31-Jul-09																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	15:30	0.10	30.2	30.2	3.66	3.63	47.2	47.0	9.8	9.8	0	0.0	7.4	7.4	13	13.0	0.06	0.06	26	26.0
			30.2		3.59		46.7		9.7		7.4		13		0.06		26			
W8B	15:45	0.10	31.0	31.0	6.1	6.10	82.6	82.4	11.4	11.3	0	0.0	8.1	8.1	21	21.0	0.05	0.05	15	15.0
			31.0		6.09		82.1		11.1		8.1		21		0.05		15			

Date 3-Aug-09																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	15:50	0.10	30.2	30.2	3.77	3.75	48.2	48.0	8.9	8.8	0	0.0	7.4	7.4	18	18.0	0.03	0.03	16	16.0
			30.2		3.73		47.8		8.7		7.4		18		0.03		16			
W8B	15:55	0.10	30.6	30.6	5.97	5.96	80.9	80.4	10.0	9.9	0	0.0	7.8	7.8	16	16.0	0.04	0.04	15	15.0
			30.6		5.94		79.9		9.9		7.8		16		0.04		15			

Date 5-Aug-09																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	16:15	0.10	28.0	28.0	3.21	3.19	42.3	42.1	10.4	10.4	0	0.0	6.9	6.9	6	6.0	0.06	0.06	12	12.0
			28.0		3.16		41.8		10.3		6.9		6		0.06		12			
W8B	16:25	0.10	27.6	27.6	6.44	6.42	86.1	85.8	12.3	12.3	0	0.0	7.3	7.3	7	7.0	0.08	0.08	15	FALSE
			27.6		6.4		85.4		12.2		7.3		7		0.08		15			

Date 7-Aug-09																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	10:30	0.10	28.8	28.8	3.13	3.11	37.4	37.1	9.9	9.8	0	0.0	7.8	7.8	40	40.0	<0.01	0.01	19	19.0
			28.8		3.09		36.7		9.7		7.8		40		<0.01		19			
W8B	20:40	0.10	29.2	29.2	5.43	5.40	74.8	74.5	10.4	10.3	0	0.0	7.3	7.3	10	10.0	<0.01	0.01	18	18.0
			29.2		5.37		74.2		10.2		7.3		10		<0.01		18			

Date 10-Aug-09																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	15:20	0.10	27.9	27.9	3.42	3.40	40.2	40.0	11.3	11.2	0	0.0	7.6	7.6	5	5.0	0.02	0.02	13	13.0
			27.9		3.37		39.7		11.0		7.6		5		0.02		13			
W8B	15:25	0.08	27.6	27.6	5.49	5.46	75.6	75.3	13.2	13.1	0	0.0	7.2	7.2	6	6.0	0.02	0.02	<10	10.0
			27.6		5.43		74.9		13.0		7.2		6		0.02		<10			

Summary of Water Quality Monitoring Results - KT14A

Date 12-Aug-09																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	15:40	0.10	27.6	27.6	2.3	2.29	31.4	31.1	10.4	10.3	0	0.0	7.4	7.4	3	3.0	6.32	6.32	52	52.0
			27.6		2.27		30.7		10.2		0		7.4		3		6.32		52	
W8B	16:00	0.10	27.4	27.4	5.42	5.38	74.6	74.3	11.4	11.3	0	0.0	7.5	7.5	11	11.0	1.96	1.96	32	32.0
			27.4		5.34		74.0		11.2		0		7.5		11		1.96		32	

Date 14-Aug-09																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	16:00	0.10	26.6	26.6	2.45	2.44	32.6	32.3	9.7	9.9	0	0.0	7.2	7.2	39	39.0	0.33	0.33	54	54.0
			26.6		2.43		32.0		10.0		0		7.2		39		0.33		54	
W8B	16:15	0.10	27.0	27.0	5.21	5.19	71.2	70.7	11.6	11.3	0	0.0	7.3	7.3	20	20.0	0.29	0.29	55	55.0
			27.0		5.16		70.2		11.0		0		7.3		20		0.29		55	

Date 17-Aug-09																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	16:15	0.10	30.3	30.3	2.56	2.53	36.4	36.2	10.3	10.0	0	0.0	7.7	7.7	6	6.0	0.03	0.03	<10	10.0
			30.3		2.5		36.0		9.7		0		7.7		6		0.03		<10	
W8B	16:25	0.10	30.0	30.0	5.03	5.02	68.9	68.6	10.8	10.6	0	0.0	7.4	7.4	6	6.0	0.02	0.02	<10	10.0
			30.0		5		68.2		10.4		0		7.4		6		0.02		<10	

Date 19-Aug-09																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	15:50	0.10	30.2	30.2	5.23	5.21	65.6	65.3	11.2	11.0	0	0.0	7.8	7.8	9	9.0	0.04	0.04	<10	10.0
			30.2		5.19		65.0		10.7		0		7.8		9		0.04		<10	
W8B	16:00	0.10	30.6	30.6	6.43	6.40	84.6	84.3	10.9	10.7	0	0.0	7.4	7.4	8	8.0	0.04	0.04	<10	10.0
			30.6		6.37		84.0		10.5		0		7.4		8		0.04		<10	

Date 21-Aug-09																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	14:35	0.10	31.4	31.4	5.33	5.30	66.9	66.4	12.4	12.2	0	0.0	7.8	7.8	8	8.0	0.02	0.02	<10	10.0
			31.4		5.26		65.9		12.0		0		7.8		8		0.02		<10	
W8B	14:45	0.10	31.2	31.2	6.51	6.50	88.4	88.3	11.6	11.5	0	0.0	7.6	7.6	10	10.0	0.01	0.01	<10	10.0
			31.2		6.49		88.1		11.3		0		7.6		10		0.01		<10	

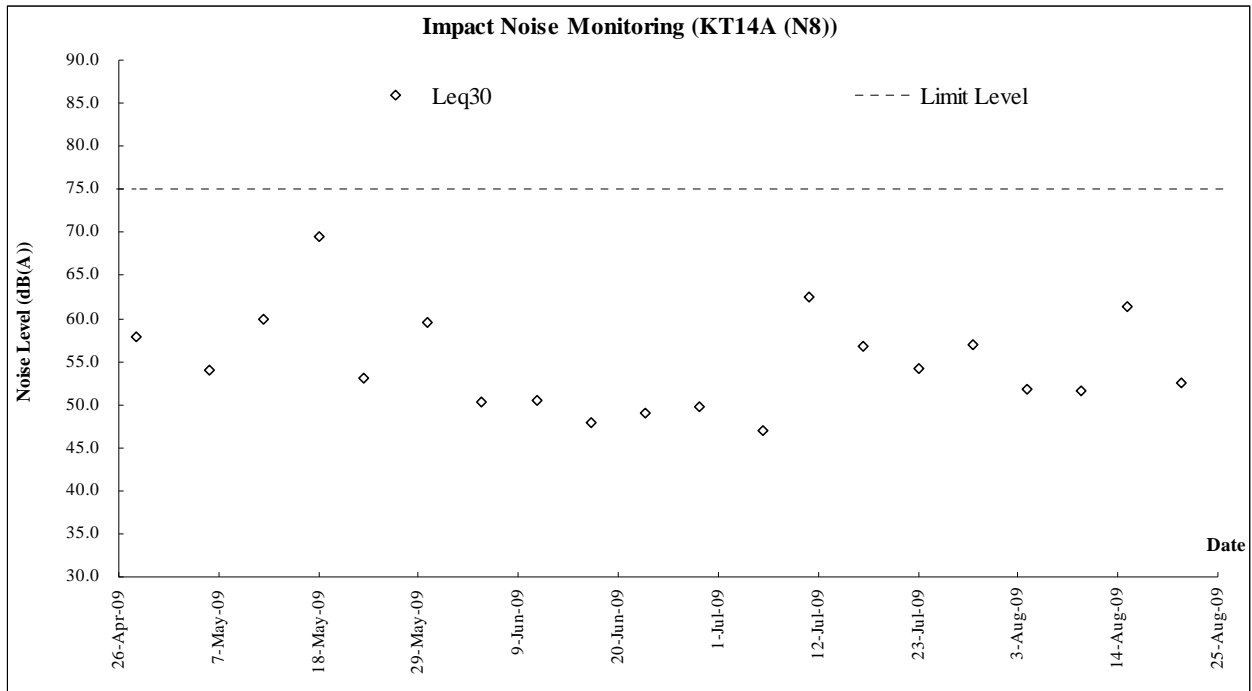
Date 24-Aug-09																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	15:20	0.10	30.2	30.2	4.97	4.97	62.4	62.2	9.8	9.8	0	0.0	6.9	6.9	58	58.0	0.29	0.29	28	28.0
			30.2		4.96		62.0		9.7		0		6.9		58		0.29		28	
W8B	15:25	0.10	30.6	30.6	6.44	6.40	87.6	87.3	11.3	11.3	0	0.0	7.2	7.2	54	54.0	0.31	0.31	25	25.0
			30.6		6.35		86.9		11.2		0		7.2		54		0.31		25	

DSD CONTRACT NO. DC/2007/17
 Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen of
 Yuen Long District and Sewerage at Tseng Tau Chung Tsuen, Tuen Mun

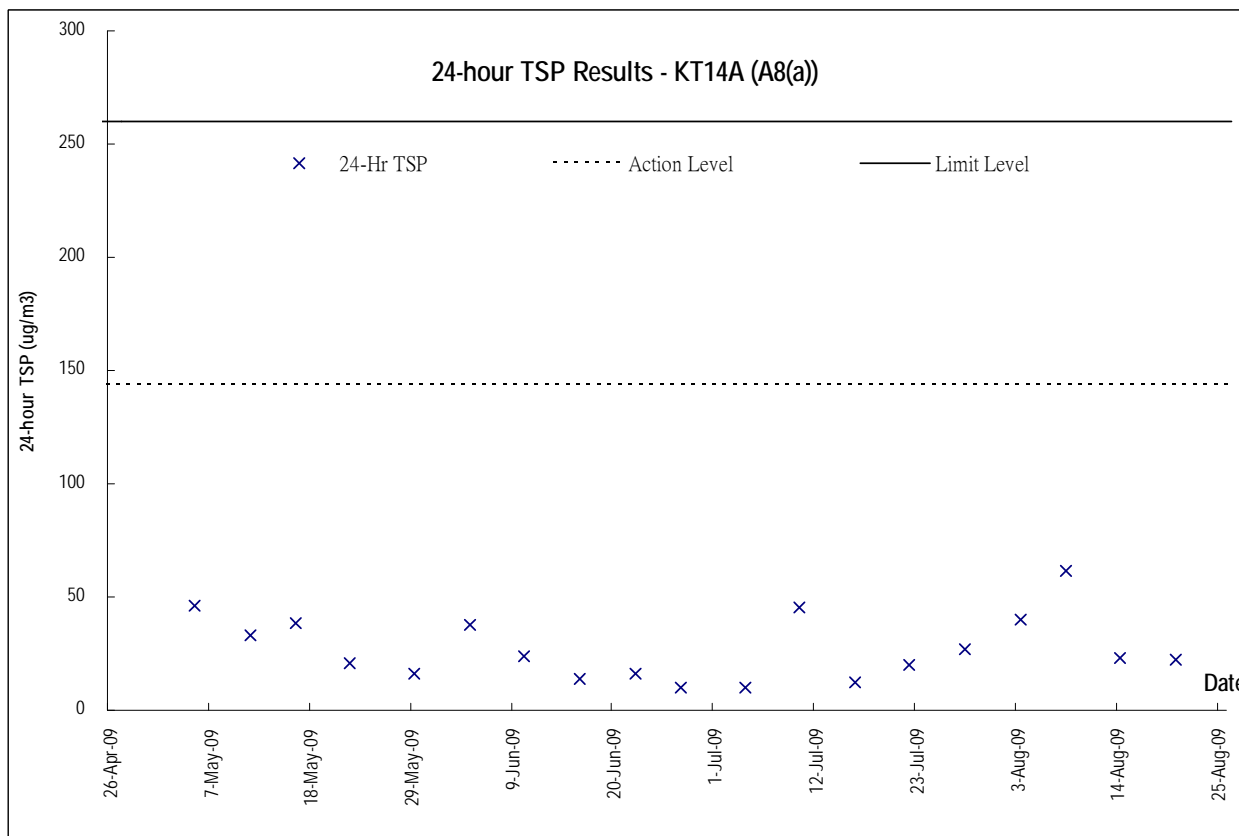
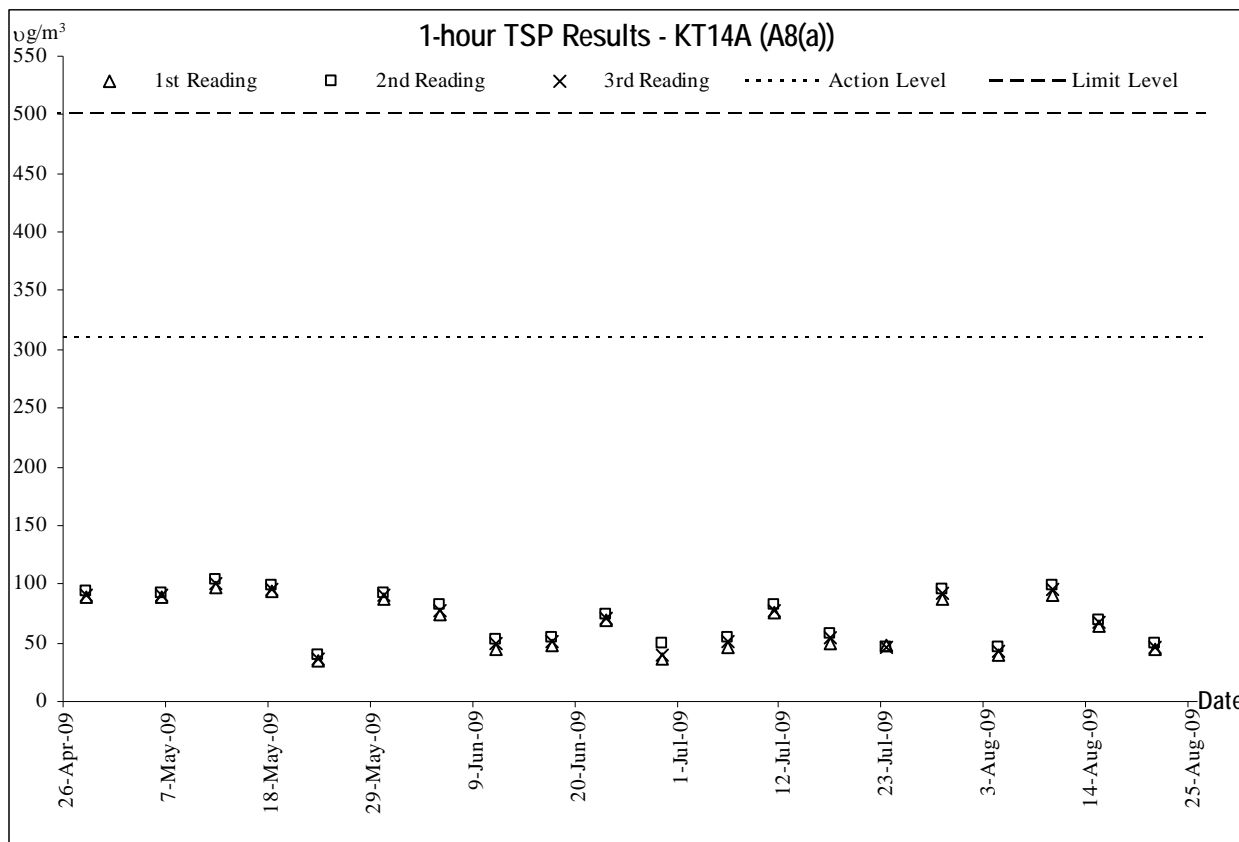
24-Hour TSP Monitoring Results

DATE	SAMPLE NUMBER	STANDARD										BLANK			SAMPLE OF FILTER PAPER			Dust 24-Hr TSP in Air ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)	
		ELAPSED TIME			CHART READING		AVERAGE			FLOW	AIR	SAMPLE NUMBER	WEIGHT (g)		WEIGHT (g)						
		INITIAL	FINAL	(min)	MIN	MAX	CHART READING	TEMP ($^{\circ}\text{C}$)	PRESS (hPa)	RATE (m^3/min)	VOLUME (std m^3)		INITIAL	FINAL	DIFF	INITIAL	FINAL				DUST COLLECTION
KT14 A8(a) Date of Calibration: 15-June-2009 Next Calibration Date: 15-Aug-2009 Cal Graph Slope = 39.2131 Intercept = -11.2436																					
KT14 A8(a) Date of Calibration: 18-Aug-2009 Next Calibration Date: 18-Oct-2009 Cal Graph Slope = 40.6571 Intercept = -14.1150																					
28-Jul-09	20301	1777.58	1801.82	1454.40	36	38	37.0	29.3	1002.4	1.22	1772	NA	3.6459	3.6419	-0.0040	2.8275	2.8708	0.0433	27	144	260
3-Aug-09	20299	1801.82	1826.11	1457.40	37	38	37.5	29.9	997.5	1.23	1789	NA	3.6459	3.6419	-0.0040	2.8691	2.9365	0.0674	40	144	260
8-Aug-09	20341	1826.11	1850.31	1452.00	36	38	37.0	30.4	993.1	1.21	1761	NA	3.6459	3.6419	-0.0040	2.8452	2.9495	0.1043	62	144	260
14-Aug-09	20373	1850.31	1874.46	1449.00	36	38	37.0	27.8	1009.7	1.22	1774	NA	3.6459	3.6419	-0.0040	2.8081	2.8454	0.0373	23	144	260
20-Aug-09	20451	1874.46	1898.58	1447.20	36	38	37.0	29.8	1008.8	1.25	1806	NA	3.6459	3.6419	-0.0040	2.8172	2.8539	0.0367	23	144	260

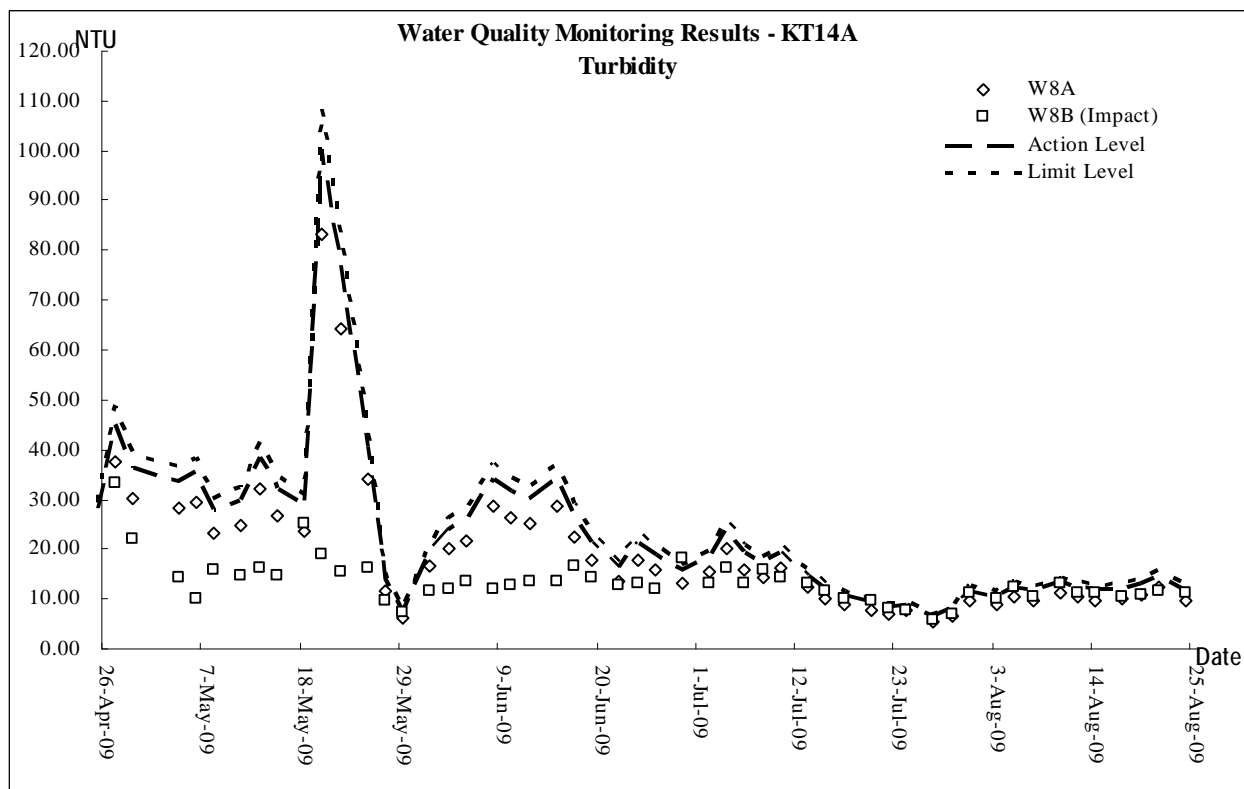
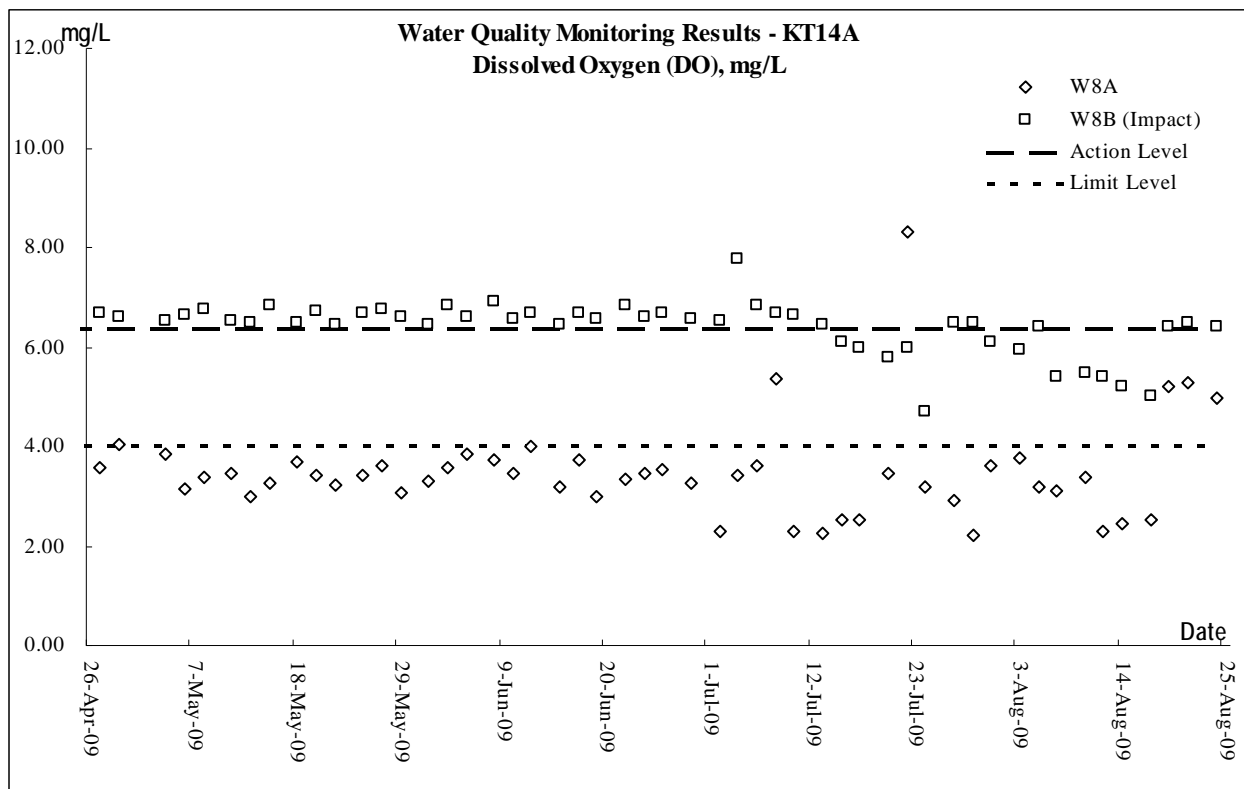
Graphic Plot of Monitoring - Construction Noise

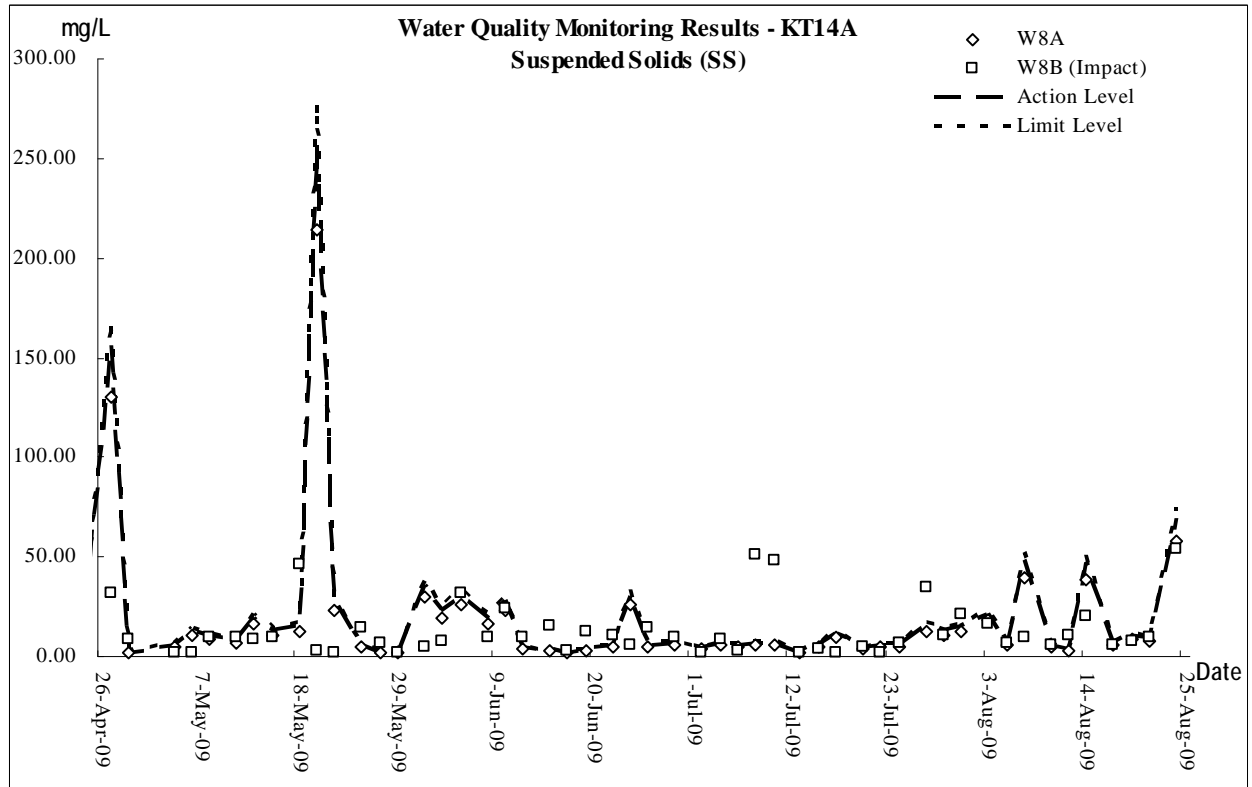
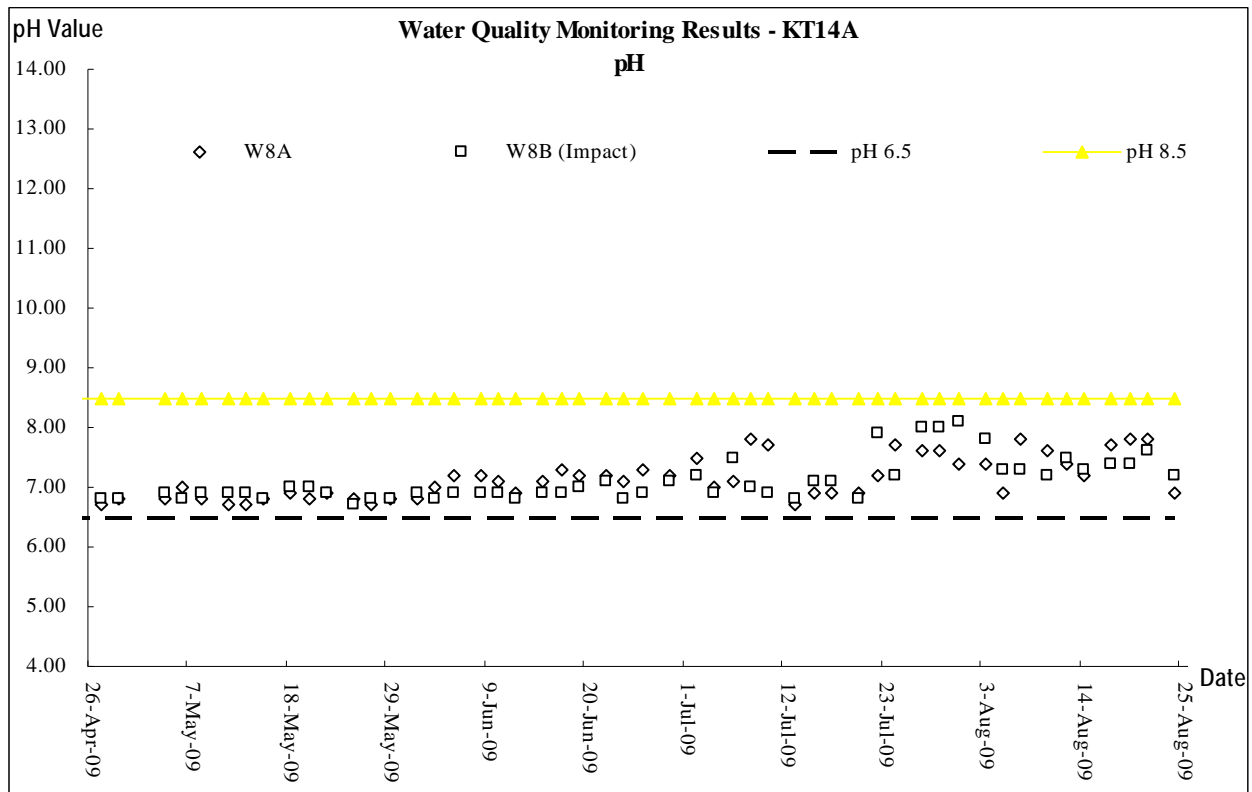


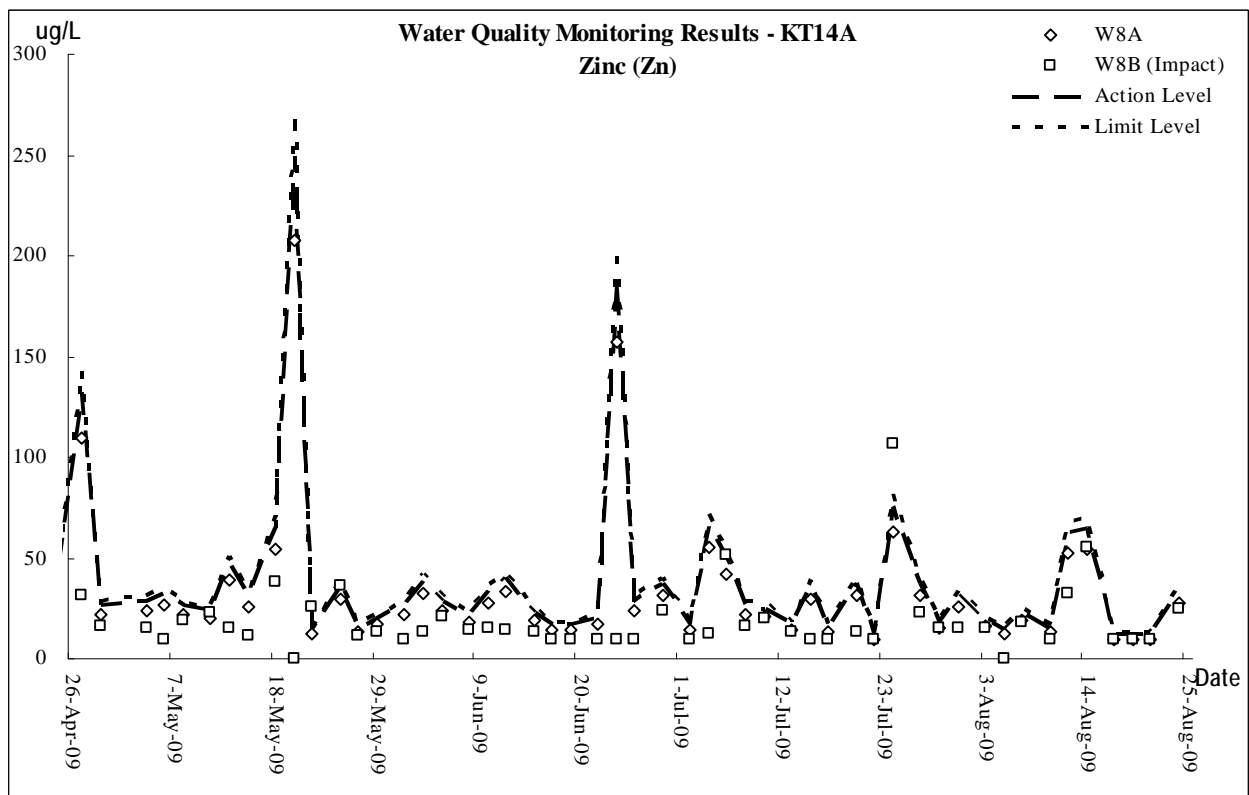
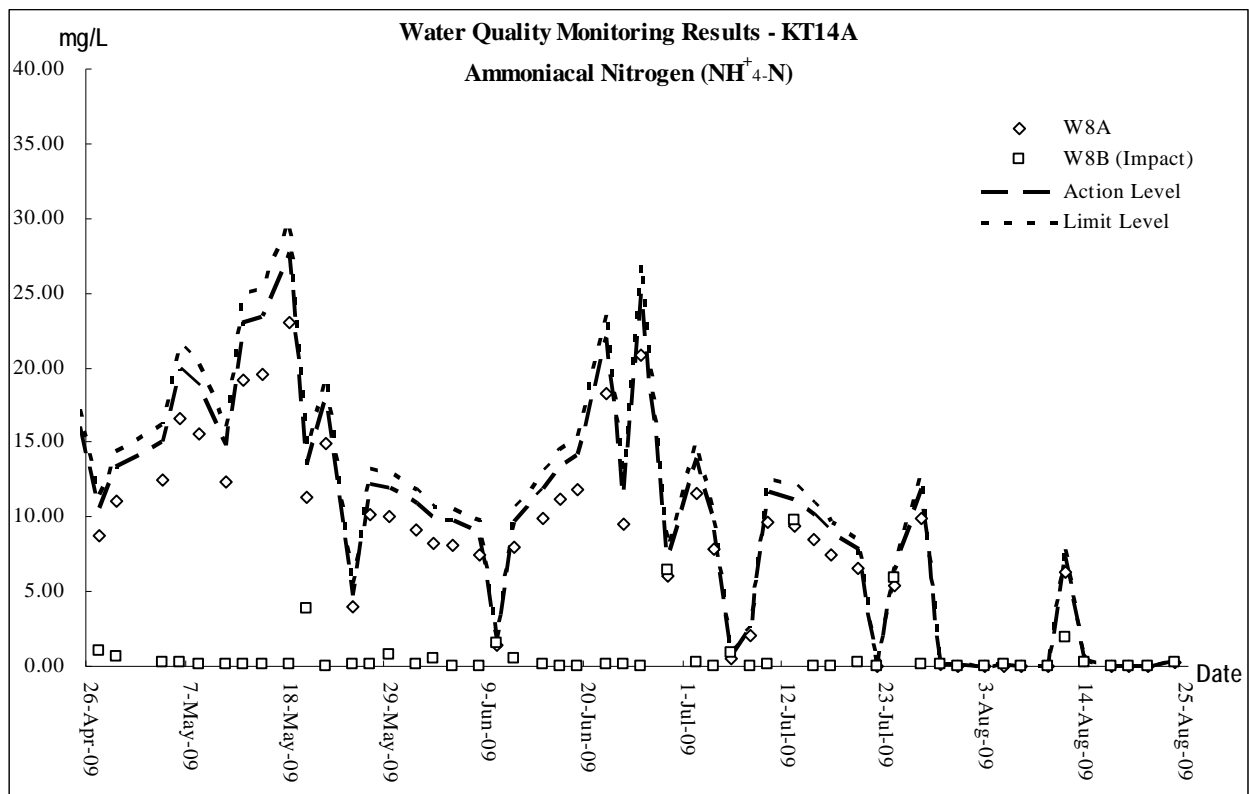
Graphic Plot of Monitoring – Air Quality



Graphic Plot of Monitoring – Water Quality







Appendix H

Monthly Summary Waste Flow Table

Monthly Summary Waste Flow Table

Date: 31-Aug-09
Year/Month: Aug-09

Monthly Summary Waste Flow Table for Aug 2009										
Year	Actual Quantities of Inert C & D Materials Generated Monthly					Estimated Annual Quantities of C & D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete (see note 4)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Metals	Paper/ Cardboard packaging	Plastics (see note 3)	Chemical Waste	Others, e.g. General refuse
	(in '000M ³)	(in '000M ³)	(in '000M ³)	(in '000M ³)	(in '000M ³)	(in '000KG)	(in '000KG)	(in '000KG)	(in '000KG)	(in '000M ³)
Jan	6.716	0.008	6.708	0	0	0	0	0	0	0
Feb	8.001	0.009	7.632	0.360	0	0	0	0	0	0
Mar	5.792	0.014	5.778	0	0	0	0	0	0	0
Apr	6.622	0.004	6.864	-0.246	0	0	0	0	0	0
May	7.632	0.006	7.674	-0.048	0	0	0	0	0	0
Jun	6.002	0.008	5.676	-0.498	0.816	0	0	0	0	0
Sub-Total	40.76	0.049	40.332	-0.432	0.816	0	0	0	0	0
Jul	4.163	0.005	5.016	-0.858	0	0	0	0	0	0
Aug	5.666	0.007	6.354	-0.828	0.132	0	0	0	0	0
Sep										
Oct										
Nov										
Dec										
Total	50.593	0.061	51.702	-2.118	0.948	0.000	0.000	0.000	0.000	0.000

- Notes:
- (1) The performance targets are given in PS Clause 28.10(14)
 - (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/ containers, plastic sheets/ foam form packaging material
 - (4) Broken concrete for recycling into aggregates