JOB NO.: TCS00694/13

AGREEMENT NO. CE 45/2008 (CE)
LIANTANG/HEUNG YUEN WAI
BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT REPORT (NO.33) – APRIL 2016

PREPARED FOR
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT (CEDD)

Date	Reference No.	Prepared By	Certified By
16 May 2016	TCS00694/13/600/R0309v2	 Winnie Chiu (Assistant Environmental Consultant)	 Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	12 May 2016	First Submission
2	16 May 2016	Amended against the IEC comment on 13 May 2016

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By Email & Post

Attention: Mr Simon LEUNG

Dear Sirs

Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary Control Point and Associated Works
Independent Environmental Checker – Investigation
Monthly EM&A Report (No. 33) – April 2016

With reference to the Monthly EM&A Report No. 33 for April 2016 (Version 2) certified by the ET Leader, please be noted that we have no adverse comments on the captioned submission. We herewith verify the captioned submission in accordance with Condition 5.4 of the Environmental Permit No. EP-404/2011/C.

Thank you for your attention and please do not hesitate to contact the undersigned on tel. 3995-8120 or by email to antony.wong@smec.com; or our Mr Man CHEUNG on tel. 3995 8132 or by email to man.cheung@smec.com.

Yours faithfully
for and on behalf of
SMEC Asia Limited

Antony WONG
Independent Environmental Checker

cc	CEDD/BCP	-	Mr Desmond LAM	by fax: 3547 1659
	ArchSD	-	Mr William WL CHENG	by fax: 2804 6805
	AECOM	-	Mr Pat LAM / Mr Perry YAM	by email
	Ronald Lu	-	Mr Peter YAM / Mr Justin CHEUNG	by email
	SRJV	-	Mr Edwin AU	by email
	CW	-	Mr Daniel HO	by email
	DHK	-	Mr Edmond WONG	by email
	CCKJV	-	Mr Vincent CHAN	by email
	KRSJV	-	Mr TY LEUNG	by email
	Leighton	-	Mr Jon KITCHING	by email
	AUES	-	Mr TW TAM	by email

EXECUTIVE SUMMARY

ES01 This is the **33rd** monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1 to 30 April 2016** (hereinafter 'the Reporting Period').

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES02 To facilitate the project management and implementation, Liantang/Heung Yuen Wai Boundary Control Point and Associated Works of the Project is divided to six CEDD contracts including Contract 2 (CV/2012/08), Contract 3 (CV/2012/09), Contract 4 (TCSS), Contract 5 (CV/2013/03), Contract 6 (CV/2013/08) and Contract 7 (NE/2014/03) and an ArshSD contract (Contract SS C505).

ES03 In the Reporting Period, the construction works under Liantang/Heung Yuen Wai Boundary Control Point and Associated Works of the Project currently included Contract 2, Contract 3, Contract 5, Contract 6, Contract 7 and Contract SS C505. Environmental monitoring activities under the EM&A programme in the Reporting Period are summarized in the following table.

Environmental Aspect	Environmental Monitoring Parameters / Inspection	Reporting Period	
		Number of Monitoring Locations to undertake	Total Occasions
Air Quality	1-hour TSP	9	150
	24-hour TSP	9	49
Construction Noise	$L_{eq(30min)}$ Daytime	10	40
Water Quality	Water in-situ measurement and/or sampling	WM1 & WM1-C,	13 Scheduled & 4 extra
		WM2A & WM2A-C	13 Scheduled & 3 extra
		WM2B & WM2B-C	13 Scheduled & 5 extra
		WM3 &WM3-C	13 Scheduled & 5 extra
		WM4, WM4-CA &WM4-CB	13 Scheduled & 0 extra
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	Contract 2	5
		Contract 3	4
		Contract 5	4
		Contract 6	4
		Contract 7	4
		Contract SS C505	4

Note: Extra monitoring day was due to measurement results exceedance

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES04 In the Reporting Period, no air quality and construction noise exceedance was registered for the Project. For water quality monitoring, a total of thirty-nine (39) Limit Level (LL) exceedances, namely nineteen (19) LL exceedances of turbidity and twenty (20) LL exceedances of Suspended Solids. The summary of exceedance in the Reporting Period is shown below.

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation Result	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--
Water Quality	DO	0	0	0	--	--

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation Result	Corrective Actions
	Turbidity	0	**19**	**19**	Total nine exceedance are due to the Project construction activities but ten exceedance are not due to the Project construction activities	The relevant Contractors including C2 and C6 shall implemented water quality mitigation measures in accordance with ISEMM of the EM&A Manual requirements
	SS	0	**20**	**20**	Total six exceedance are due to the Project construction activities but fourteen exceedance are not due to the Project construction activities	

ENVIRONMENTAL COMPLAINT

ES05 In this Reporting Period, five (5) documented environmental complaints related Contract 2 and/or Contract 6 are received by CEDD and EPD. Those complaints were issued respectively on 8th, 18th, 19th, 21st and 29th April 2016 and regarding air and water quality of environmental impact. Except a complaint received on 29th April 2016, investigation report for other four complaints had conducted by ET and submitted to relevant parties.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES06 No environmental summons or successful prosecutions were recorded in the Reporting Period.

REPORTING CHANGE

ES07 EPD has approved the revised EM&A Programme on 29th March 2016. If the measured water depth of the monitoring station is lower than 150 mm, alternative location based on the criteria will be selected to perform water monitoring in accordance with the updated EM&A Programme (Rev. 05) (Section 4.1.4)

SITE INSPECTION

ES08 In this Reporting Period, joint site inspection to evaluate the site environmental performance at ***Contract 2*** has been carried out by the RE, IEC, ET and the Contractor on **1, 8, 15, 22 and 29 April 2016**. No non-compliance was noted.

ES09 In the Reporting Period, joint site inspection to evaluate the site environmental performance at ***Contract 3*** has been carried out by the RE, IEC, ET and the Contractor on **6, 11, 20 and 25 April 2016**. No non-compliance was noted.

ES10 In the Reporting Period, joint site inspection to evaluate the site environmental performance at ***Contract 5*** has been carried out by the RE, IEC, ET and the Contractor on **5, 12, 19 and 26 April 2016.** No non-compliance was noted.

ES11 In the Reporting Period, joint site inspection to evaluate the site environmental performance at ***Contract 6*** has been carried out by the RE, IEC, ET and the Contractor on **7, 14, 21 and 28 April 2016.** No non-compliance was noted.

ES12 In the Reporting Period, joint site inspection to evaluate the site environmental performance at ***Contract SS C505*** has been carried out by the RE, IEC, ET and the Contractor on **6, 13,20 and 27 April 2016**. No non-compliance was noted.

ES13 In the Reporting Period, joint site inspection to evaluate the site environmental performance at ***Contract 7*** has been carried out by the RE, IEC, ET and the Contractor on **5, 12, 19 and 26 April 2016**. No non-compliance was noted.

FUTURE KEY ISSUES

ES14 In upcoming wet season, preventive measures for muddy water or other water pollutants from site surface flow to local stream such as Kong Yiu Channel, Ma Wat Channel, Ping Yuen River or public area would be the key issue. The Contractors should paid special attention on water quality mitigation measures and fully implement according ISEMM of the EM&A Manual, in particular for working areas near Ma Wat Channel and Ping Yuen River. Moreover, all effluent discharge shall be ensure to fulfill Technical Memorandum of Effluent Discharged into Drainage and Sewerage Systems, inland and Coastal Waters criteria or discharge permits stipulation.

ES15 Construction noise would be a key environmental issue during construction work of the Project. Noise mitigation measures such as using quiet plants should be implemented in accordance with the EM&A requirement.

ES16 Since most of construction sites under the Project are located adjacent to villages, the Contractors should fully implement air quality mitigation measures to reduce construction dust emission.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Civil Engineering and Development Department is the Project Proponent and the Permit Holder of *Agreement No. CE 45/2008 (CE) Liantang / Heung Yuen Wai Boundary Control Point and Associated Works*, which is a Designated Project to be implemented under Environmental Permit number EP-404/2011/C granted on 12 March 2015.

1.1.2 The Project consists of two main components: Construction of a Boundary Control Point (hereinafter referred as "BCP"); and Construction of a connecting road alignment. Layout plan of the Project is shown in ***Appendix A***.

1.1.3 The proposed BCP is located at the boundary with Shenzhen near the existing Chuk Yuen Village, comprising a main passenger building with passenger and cargo processing facilities and the associated customs, transport and ancillary facilities. The connecting road alignment consists of six main sections:

1) Lin Ma Hang to Frontier Closed Area (FCA) Boundary – this section comprises at-grade and viaducts and includes the improvement works at Lin Ma Hang Road;
2) Ping Yeung to Wo Keng Shan – this section stretches from the Frontier Closed Area Boundary to the tunnel portal at Cheung Shan and comprises at-grade and viaducts including an interchange at Ping Yeung;
3) North Tunnel – this section comprises the tunnel segment at Cheung Shan and includes a ventilation building at the portals on either end of the tunnel;
4) Sha Tau Kok Road – this section stretches from the tunnel portal at Wo Keng Shan to the tunnel portal south of Loi Tung and comprises at-grade and viaducts including an interchange at Sha Tau Kok and an administration building;
5) South Tunnel – this section comprises a tunnel segment that stretches from Loi Tung to Fanling and includes a ventilation building at the portals on either end of the tunnel as well as a ventilation building in the middle of the tunnel near Lau Shui Heung;
6) Fanling – this section comprises the at-grade, viaducts and interchange connection to the existing Fanling Highway.

1.1.4 Action-United Environmental Services & Consulting has been commissioned as an Independent ET to implement the relevant EM&A program in accordance with the approved EM&A Manual, as well as the associated duties. As part of the EM&A program, the baseline monitoring has carried out between **13 June 2013** and **12 July 2013** for all parameters including air quality, noise and water quality before construction work commencement. The Baseline Monitoring Report summarized the key findings and the rationale behind determining a set of Action and Limit Levels (A/L Levels) from the baseline data. Also, the Project baseline monitoring report which verified by the IEC has been submitted to EPD on **16 July 2013** for endorsement. The major construction works of the Project was commenced on **16 August 2013** in accordance with the EP Section 5.3 stipulation.

1.1.5 This is **33rd** monthly EM&A report presenting the monitoring results and inspection findings for reporting period from **1** to **30 April 2016**.

1.2 REPORT STRUCTURE

1.2.1 The Monthly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-

Section 1 *Introduction*
Section 2 *Project Organization and Construction Progress*
Section 3 *Summary of Impact Monitoring Requirements*
Section 4 *Air Quality Monitoring*
Section 5 *Construction Noise Monitoring*
Section 6 *Water Quality Monitoring*

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 CONSTRUCTION CONTRACT PACKAGING

2.1.1 To facilitate the project management and implementation, the Project would be divided by the following contracts:

- Contract 2 (CV/2012/08)
- Contract 3 (CV/2012/09)
- Contract 4 (NE/2014/02)
- Contract 5 (CV/2013/03)
- Contract 6 (CV/2013/08)
- Contract 7 (NE/2014/03)
- ArchSD Contract No. SS C505

2.1.2 The details of each contracts is summarized below and the delineation of each contracts is shown in ***Appendix A***.

Contract 2 (CV/2012/08)

2.1.3 Contract 2 has awarded in December 2013 and construction work was commenced on 19 May 2014. Major Scope of Work of the Contract 2 is listed below:

- construction of an approximately 5.2km long dual two-lane connecting road (with about 0.4km of at-grade road and 4.8km of tunnel) connecting the Fanling Interchange with the proposed Sha Tau Kok Interchange;
- construction of a ventilation adit tunnel and the mid-ventilation building;
- construction of the north and south portal buildings of the Lung Shan Tunnel and their associated slope works;
- provision and installation of ventilation system, E&M works and building services works for Lung Shan tunnel and Cheung Shan tunnel and their portal buildings;
- construction of Tunnel Administration Building adjacent to Wo Keng Shan Road and the associated E&M and building services works; and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 3 (CV/2012/09)

2.1.4 Contract 3 was awarded in July 2013 and construction work was commenced on 5 November 2013. Major Scope of Work of the Contract 3 is listed below:

- construction of four link roads connecting the existing Fanling Highway and the south portal of the Lung Shan Tunnel;
- realignment of the existing Tai Wo Service Road West and Tai Wo Service Road East;
- widening of the existing Fanling Highway (HyD's entrustment works);
- demolishing existing Kiu Tau vehicular bridge and Kiu Tau footbridge and reconstruction of the existing Kiu Tau Footbridge (HyD's entrustment works); and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 4 (NE/2014/02)

2.1.5 Contract 4 has not yet been awarded. The work of the Contract 4 includes provision and installation of Traffic Control and Surveillance System and the associated electrical and mechanical works for the Project.

Contract 5 (CV/2013/03)

2.1.6 Contract 5 has awarded in April 2013 and construction work was commenced in August 2013. Major Scope of Work of the Contract 5 is listed below:

- site formation of about 23 hectares of land for the development of the BCP;

- construction of an approximately 1.6 km long perimeter road at the BCP including a 175m long depressed road;
- associated diversion/modification works at existing local roads and junctions including Lin Ma Hang Road;
- construction of pedestrian subway linking the BCP to Lin Ma Hang Road;
- provision of resite area with supporting infrastructure for reprovisioning of the affected village houses; and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 6 (CV/2013/08)

2.1.7 Contract 6 has awarded in June 2015 and construction work was commenced on 23 October 2015. Major Scope of Work of the Contract 6 would be included below:

- construction of an approximately 4.6km long dual two-lane connecting road (with about 0.6km of at-grade road, 3.3km of viaduct and 0.7km of tunnel) connecting the BCP with the proposed Sha Tau Kok Road Interchange and the associated ventilation buildings;
- associated diversion/modification works at access roads to the resite of Chuk Yuen Village;
- provision of sewage collection, treatment and disposal facilities for the BCP and the resite of Chuk Yuen Village;
- construction of a pedestrian subway linking the BCP to Lin Ma Hang Road;
- provisioning of the affected facilities including Wo Keng Shan Road garden; and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 7 (NE/2014/03)

2.1.8 Contract 7 has awarded in December 2015 and the construction works of Contract 7 was commenced on 15 February 2016. Major Scope of Work of the Contract 7 would be included below:

- construction of the Hong Kong Special Administrative Region (HKSAR) portion of four vehicular bridge
- construction of one pedestrian bridge crossing Shenzhen (SZ) River (cross boundary bridges)

ArchSD Contract No. SS C505

2.1.9 SS C505 has awarded in July 2015 and construction work was commenced on 1 September 2015. Major Scope of Work of the SS C505 would be included below:

- passenger-related facilities including processing kiosks and examination facilities for private cars and coaches, passenger clearance building and halls, the interior fitting works for the pedestrian bridge crossing Shenzhen River, etc.;
- cargo processing facilities including kiosks for clearance of goods vehicles, customs inspection platforms, X-ray building, etc.;
- accommodation for the facilities inside of the Government departments providing services in connection with the BCP;
- transport-related facilities inside the BCP including road networks, public transport interchange, transport drop-off and pick-up areas, vehicle holding areas and associated road furniture etc;
- a public carpark; and
- other ancillary facilities such as sewerage and drainage, building services provisions and electronic systems, associated environmental mitigation measure and landscape works.

2.2 PROJECT ORGANIZATION

2.2.1 The project organization is shown in ***Appendix B***. The responsibilities of respective parties are:

Civil Engineering and Development Department (CEDD)

2.2.2 CEDD is the Project Proponent and the Permit Holder of the EP of the development of the Project and will assume overall responsibility for the project. An Independent Environmental Checker (IEC) shall be employed by CEDD to audit the results of the EM&A works carried out by the ET.

Architectural Services Department (ArchSD)

2.2.3 ArchSD acts as the works agent for Development Bureau (DEVB), for Contract SS C505 Liantang/ Heung Yuen Wai Boundary Control Point (BCP) – BCP Buildings and Associated Facilities.

Environmental Protection Department (EPD)

2.2.4 EPD is the statutory enforcement body for environmental protection matters in Hong Kong.

Ronald Lu & Partners (Hong Kong) Ltd (The Architect)

2.2.5 Ronald Lu & Partners (Hong Kong) Ltd is appointed by ArchSD as an Architect for Contract SS C505 Liantang/ Heung Yuen Wai Boundary Control Point (BCP) – BCP Buildings and Associated Facilities. It responsible for overseeing the construction works of Contract SS C505 and for ensuring that the works are undertaken by the Contractor in accordance with the specification and contract requirements. The duties and responsibilities of the Architect with respect to EM&A are:

- Monitor the Contractors' compliance with contract specifications, including the implementation and operation of the environmental mitigation measures and their effectiveness
- Monitor Contractors' and ET's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual
- Facilitate ET's implementation of the EM&A programme
- Participate in joint site inspection by the ET and IEC
- Oversee the implementation of the agreed Event / Action Plan in the event of any exceedance
- Adhere to the procedures for carrying out complaint investigation
- Liaison with DSD, Engineer/Engineer's Representative, ET, IEC and the Contractor of the "Construction of the DSD's Regulation of Shenzhen River Stage 4 (RSR 4)" Project discussing regarding the cumulative impact issues.

Engineer or Engineers Representative (ER)

2.2.6 The ER is responsible for overseeing the construction works and for ensuring that the works are undertaken by the Contractor in accordance with the specification and contract requirements. The duties and responsibilities of the ER with respect to EM&A are:

- Monitor the Contractors' compliance with contract specifications, including the implementation and operation of the environmental mitigation measures and their effectiveness
- Monitor Contractors's, ET's and IEC's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual
- Facilitate ET's implementation of the EM&A programme
- Participate in joint site inspection by the ET and IEC
- Oversee the implementation of the agreed Event / Action Plan in the event of any exceedance
- Adhere to the procedures for carrying out complaint investigation
- Liaison with DSD, Engineer/Engineer's Representative, ET, IEC and the Contractor of the "Construction of the DSD's Regulaiton of Shenzhen River Stage 4 (RSR 4)" Project discussing regarding the cumulative impact issues.

The Contractor(s)

2.2.7 There will be one contractor for each individual works contract. Once the contractors are appointed, EPD, ET and IEC will be notified the details of the contractor.

2.2.8 The Contractor for Contracts under CEDD should report to the ER. For ArchSD Contract, the Contractor should report to the Architect or Architect's Representative (AR). The duties and responsibilities of the Contractor are:

- Comply with the relevant contract conditions and specifications on environmental protection
- Employ an Environmental Team (ET) to undertake monitoring, laboratory analysis and reporting of EM &A Facilitate ET's monitoring and site inspection activities
- Participate in the site inspections by the ET and IEC, and undertake any corrective actions
- Provide information / advice to the ET regarding works programme and activities which may contribute to the generation of adverse environmental impacts
- Submit proposals on mitigation measures in case of exceedances of Action and Limit levels in accordance with the Event / Action Plans
- Implement measures to reduce impact where Action and Limit levels are exceeded
- Adhere to the procedures for carrying out complaint investigation

Environmental Team (ET)

2.2.9 Once the ET is appointed, the EPD, CEDD, ER, Architect and IEC will be notified the details of the ET.

2.2.10 The ET shall not be in any way an associated body of the Contractor(s), and shall be employed by the Project Proponent/Contractor to conduct the EM&A programme. The ET should be managed by the ET Leader. The ET Leader shall be a person who has at least 7 years' experience in EM&A and has relevant professional qualifications. Suitably qualified staff should be included in the ET, and resources for the implementation of the EM&A programme should be allocated in time under the Contract(s), to enable fulfillment of the Project's EM&A requirements as specified in the EM&A Manual during construction of the Project. The ET shall report to the Project Proponent and the duties shall include:

- Monitor and audit various environmental parameters as required in this EM&A Manual
- Analyse the environmental monitoring and audit data, review the success of EM&A programme and the adequacy of mitigation measures implemented, confirm the validity of the EIA predictions and identify any adverse environmental impacts arising
- Carry out regular site inspection to investigate and audit the Contractors' site practice, equipment/plant and work methodologies with respect to pollution control and environmental mitigation, and effect proactive action to pre-empt problems
- Monitor compliance with conditions in the EP, environmental protection, pollution prevention and control regulations and contract specifications
- Audit environmental conditions on site
- Report on the environmental monitoring and audit results to EPD, the ER, the Architect, the lEC and Contractor or their delegated representatives
- Recommend suitable mitigation measures to the Contractor in the case of exceedance of Action and Limit levels in accordance with the Event and Action Plans
- Liaise with the IEC on all environmental performance matters and timely submit all relevant EM&A proforma for approval by IEC
- Advise the Contractor(s) on environmental improvement, awareness, enhancement measures etc., on site
- Adhere to the procedures for carrying out complaint investigation
- Liaison with the client departments, Engineer/Engineer's Representative, ET, lEC and the Contractor(s) of the concurrent projects as listed under Section 2.3 below regarding the cumulative impact issues.

Independent Environmental Checker (IEC)

2.2.11 One IEC will be employed for this Project. Once the IEC is appointed, EPD, ER, the Architect and ET will be notified the details of the IEC.

2.2.12 The Independent Environmental Checker (IEC) should not be in any way an associated body of the Contractor or the ET for the Project. The IEC should be employed by the Permit Holder (i.e., CEDD) prior to the commencement of the construction of the Project. The IEC should have at least 10 years' experience in EM&A and have relevant professional qualifications. The appointment of IEC should be subject to the approval of EPD. The IEC should:

- Provide proactive advice to the ER and the Project Proponent on EM&A matters related to the project, independent from the management of construction works, but empowered to audit the environmental performance of construction
- Review and audit all aspects of the EM&A programme implemented by the ET
- Review and verify the monitoring data and all submissions in connection with the EP and EM&A Manual submitted by the ET
- Arrange and conduct regular, at least monthly site inspections of the works during construction phase, and ad hoc inspections if significant environmental problems are identified
- Check compliance with the agreed Event / Action Plan in the event of any exceedance
- Check compliance with the procedures for carrying out complaint investigation
- Check the effectiveness of corrective measures
- Feedback audit results to ET by signing off relevant EM&A proforma
- Check that the mitigation measures are effectively implemented
- Verify the log-book(s) mentioned in Condition 2.2 of the EP, notify the Director by fax, within one working day of receipt of notification from the ET Leader of each and every occurrence, change of circumstances or non-compliance with the EIA Report and/or the EP, which might affect the monitoring or control of adverse environmental impacts from the Project
- Report the works conducted, the findings, recommendation and improvement of the site inspections, after reviewing ET's and Contractor's works, and advices to the ER and Project Proponent on a monthly basis
- Liaison with the client departments, Engineer/Engineer's Representative, the Architect, ET, lEC and the Contractor of the concurrent projects as listed under Section 2.3 below regarding the cumulative impact issues.

2.3 CONCURRENT PROJECTS

2.3.1 The concurrent construction works that may be carried out include, but not limited to, the following:

(a) Regulation of Shenzhen River Stage IV;

(b) Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange – Contract No. HY/2012/06;

(c) Construction of BCP facilities in Shenzhen.

2.4 CONSTRUCTION PROGRESS

2.4.1 In the Reporting Period, the major construction activity conducted under the Project is located in Contracts 2, 3, 5, 6, 7 and SS C505 and they are summarized in below. Moreover, 3-month rolling construction program for all the current contracts is enclosed in ***Appendix C***.

Contract 2 (CV/2012/08)

2.4.2 The contract commenced in May 2014. In this Reporting Period, construction activities conducted are listed below:

Mid-Vent	•	Tube excavation (NB + SB)
Portal	•	Adit invert slab
	•	Ventilation building superstructure
North Portal	•	Slope stabilization and retaining wall
	•	Northbound top heading excavation and tunnel enlargement
	•	Tunnel Boring Machine (TBM) excavation
South Portal	•	Southbound and Northbound Drill and Blast (D&B) excavation
	•	Building works superstructure
Admin Building	•	Building works foundation

Contract 3 (CV/2012/09)

2.4.3 The Contract commenced in November 2013. In this Reporting Period, construction activities conducted are listed below:

- Cable detection and trial trenches
- Filling works at Tong Hang East
- Storm drain laying
- Noise barrier construction
- Pier / pier table construction
- Pile cap works
- Portal beam construction
- Pre-drilling
- Retaining Wall construction
- Road works at Fanling Highway
- Sewer works
- Tree felling works
- Utilities duct laying
- Viaduct segment erection
- Slope works
- Waterworks
- Pre-drilling works for noise barrier

Contract 4 (Contract number to be assigned)

2.4.4 The contract has not yet been awarded.

Contract 5 (CV/2013/03)

2.4.5 The Contract awarded in April 2013 and commenced on August 2013. In this Reporting Period, construction activities conducted are listed below:

- Construction of rising main (VO61) at existing Lin Ma Hang (LMH) Road
- Bituminous laying at L15 road and existing LMH road
- Additional works (Access Works) for Village House at RS4
- Brick laying at footpath of LMH road
- Planting at proposed and existing LMH road
- Installation of Underground Utility (UU) at proposed and existing LMH road
- Irrigation at proposed LMH Road
- Water works at existing LMH Road

Contract 6 (CV/2013/08)

2.4.6 Contract 6 has awarded in June 2015 and construction work was commenced on 23 October 2015. In this Reporting Period, construction activities conducted are listed below:

- Site Clearance
- Slope Works
- Site Accesses Construction
- Ground Investigation (GI) Works
- Soil nail
- Bored piling
- H-piling
- Pile cap construction
- Road surfacing

Contract 7 (NE/2014/03)

2.4.7 Contract 7 has awarded in December 2015 and construction work was commenced on 15 February 2016. In this Reporting Period, construction activities conducted are listed below:

- Ground Investigation Works for Bridge A-E
- Piling Works for Bridge B-D

Contract SS C505

2.4.8 Contract SS C505 has awarded in July 2015 and construction work was commenced on 1 September 2015. In this Reporting Period, construction activities conducted are listed below:

- General Site Setup
- Building no. 5 and 9 construction
- Assembly of Crawler Crane
- H-pile works
- Tower crane construction
- Erection of Welfare Shelter
- Underground drainage works
- Column and conduit works
- Weighbridge works
- Prototype "A" Construction works
- Mock Up Curtain Wall works
- Pile Cap construction
- Bored Pile works and pre-drill works
- Bridge construction works

2.5 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.5.1 In according to the EP, the required documents have submitted to EPD which listed in below:

- Project Layout Plans of Contracts 2, 3, 5, 6, 7 and SS C505
- Landscape Plan
- Topsoil Management Plan
- Environmental Monitoring and Audit Programme
- Baseline Monitoring Report (*TCS00690/13/600/R0030v3*) for the Project
- Waste Management Plan of the Contracts 2, 3, 5, 6, 7 and SS C505
- Contamination Assessment Plan (CAP) and Contamination Assessment Report (CAR) for Po Kat Tsai, Loi Tung and the workshops in Fanling
- Vegetation Survey Report
- Woodland Compensation Plan
- Habitat Creation Management Plan
- Wetland Compensation Plan

2.5.2 Summary of the relevant permits, licenses, and/or notifications on environmental protection for the Project of each contracts are presented in ***Table 2-1***.

Table 2-1 Status of Environmental Licenses and Permits of the Contracts

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
Contract 2				
1	Air pollution Control (Construction Dust) Regulation	Ref No.: 368864	31 Dec 2013	Till Contract ends
2	Chemical Waste Producer Registration	***North Portal*** Waste Producers Number: No.5213-652-D2523-01	25 Mar 2014	Till Contract ends
		Mid-Vent Portal Waste Producers Number: No.5213-634-D2524-01	25 Mar 2014	Till Contract ends

Item	Description	License/Permit Status		
		Ref. no.	**Effective Date**	**Expiry Date**
		South Portal Waste Producers Number: No.5213-634-D2526-01	9 Apr 2014	Till Contract ends
3	Water Pollution Control Ordinance - Discharge License	No.WT00018374-2014	8 Oct 2014	30 Sep 2019
		No.: W5/1I389	28 Mar 2014	31 Mar 2019
		No. WT00023063-2015	18 Dec 2015	31 Mar 2019
		No.: W5/1I392	28 Mar 2014	31 Mar 2019
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7019105	8 Jan 2014	Till Contract ends
5	Construction Noise Permit	GW-RN0738-15	18 Nov 2015	8 May 2016
		GW-RN0795-15	7 Dec 2015	6 Jun 2016
		GW-RN0893-15	01-Jan-2016	27-Jun-2016
		GW-RN0057-16	28-Feb-2016	27-May-2016
		GW-RN0059-16	24-Feb-2016	23-Apr-2016
		GW-RN0067-16	28-Feb-2016	27-May-2016
		GW-RN0068-16	23-Feb-2016	22-Apr-2016
		GW-RN0071-16	02-Feb-16	31-Jul-2016
		GW-RN0077-16	07-Feb-2016	06-Aug-2016
		GW-RN0167-16	18-Mar-2016	17-May-2016
		GW-RN0199-16	24-Mar-2016	17-Sep-2016
		GW-RN0323-16	30-Apr-2016	29-Jun-2016
		GW-RN0321-16	30-Apr-2016	29-Jun-2016
6	Specified Process License **(**Mortar Plant Operation)	L-3-251(1)	12-Apr-2016	11-Apr-2021
Contract 3				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 362101	17 Jul 2013	Till Contract ends
2	Chemical Waste Producer Registration	Waste Producers Number: No.:5113-634-C3817-01	7 Oct 2013	Till Contract ends
3	Water Pollution Control Ordinance - Discharge License	No.:WT00016832 – 2013	28 Aug 13	31 Aug 2018
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7017914	2 Aug 13	Till Contract ends
5	Construction Noise Permit	GW-RN0892-15	9 Jan 2016	8 July 2016
		GW-RN0064-16	16 Feb 2016	13 Aug 2016
		GW-RN0086-16	16 Feb 2016	7 May 2016
		GW-RN0094-16	6 Mar 2016	22 May 2016
		GW-RN0096-16	6 Mar 2016	12 Jun 2016

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
		GW-RN0097-16	1 Mar 2016	17 Jun 2016
		GW-RN0098-16	1 Mar 2016	4 Sep 2016
		GW-RN0113-16	25 Feb 2016	24 Aug 2016
		GW-RN0115-16	1 Mar 2016	7 May 2016
		GW-RN0139-16	2 Mar 2016	24 Aug 2016
		GW-RN0140-16	2 Mar 2016	24 Aug 2016
		GW-RN0157-16	8 Mar 2016	7 Jun 2016
		GW-RN0158-16	8 Mar 2016	31 Aug 2016
		GW-RN0168-16	15 Mar 2016	14 Jun 2016
		GW-RN0170-16	11 Mar 2016	10 Sep 2016
		GW-RN0172-16	29 Mar 2016	8 Apr 2016
		GW-RN0218-16	6 April 2016	30 Sep 2016
		GW-RN0233-16	11 April 2016	10 Oct 2016
		GW-RN0244-16	16 April 2016	13 May 2016
		GW-RN0297-16	4 May 2016	30 June 2016
		GW-RN0303-16	30 April 2016	29 July 2016
		GW-RN0111-16	1 March 2016	30 Apr 2016
		GW-RN0169-16	15 Mar 2016	Cancelled on 28 Apr 2016
		GW-RN0309-16	30 April 2016	29 Oct 2016
Contract 5				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 359338	13 May 2013	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producers Number No.: 5213-642-S3735-01	8 Jun 2013	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: W5/1G44/1	8 Jun 13	30 Jun 2018
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7017351	29 Apr 13	Till the end of Contract
Contract 6				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 390614	29 Jun 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producers Number No.: 5213-652-C3969-01	31 Aug 2015	Till the end of Contract
3	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7022707	9 Jul 2015	Till the end of Contract
4	Water Pollution Control Ordinance - Discharge License	Application is processing by EPD		

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
5	Construction Noise Permit	GW-RN0681-15	26 Oct 2015	25 Apr 2016
6	Construction Noise Permit	GW-RN0683-15	26 Oct 2015	25 Apr 2016
Contract SS C505				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 390974	13 Jul 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producer No.: 5213-642-L1048-07	16 Sep 2015	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: WT00022774-2015	17 Nov 2015	30 Nov 2020
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7022831	23 Jul 2015	Till the end of Contract
5	Construction Noise Permit	PP-RN0013-16	14 April 2016	22 May 2016
		GW-RN0197-16	23 Mar 2016	22 May 2016
		GW-RN0209-16	23 Mar 2016	22 May 2016
		PP-RN0007-16	10 Mar 2016	9 May 2016
		PP-RN0027-15	5 Oct 2015	2 Apr 2016
Contract 7				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 397015	21 Dec 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producer No.: 5214-641-K3202-01	24 Mar 2016	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	Application is processing by EPD		
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7024129	21 Jan 2016	Till the end of Contract
5	Construction Noise Permit	GW-RN0162-16	23 Mar 2016	22 May 2016

3 SUMMARY OF IMPACT MONITORING REQUIREMENTS

3.1 GENERAL

3.1.1 The Environmental Monitoring and Audit requirements are set out in the Approved EM&A manual. Environmental issues such as air quality, construction noise and water quality were identified as the key issues during the construction phase of the Project.

3.1.2 A summary of construction phase EM&A requirements are presented in the sub-sections below.

3.2 MONITORING PARAMETERS

3.2.1 The EM&A program of construction phase monitoring shall cover the following environmental issues:

- Air quality;
- Construction noise; and
- Water quality

3.2.2 A summary of the monitoring parameters is presented in ***Table 3-1.***

Table 3-1 Summary of EM&A Requirements

Environmental Issue	Parameters
Air Quality	• 1-hour TSP by Real-Time Portable Dust Meter; and • 24-hour TSP by High Volume Air Sampler.
Noise	• $L_{eq(30min)}$ in normal working days (Monday to Saturday) 07:00-19:00 except public holiday; and • 3 sets of consecutive $L_{eq(5min)}$ on restricted hours i.e. 19:00 to 07:00 next day, and whole day of public holiday or Sunday • Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.
Water Quality	**In-situ Measurements** • Dissolved Oxygen Concentration (mg/L); • Dissolved Oxygen Saturation (%); • Turbidity (NTU); • pH unit; • Water depth (m); and • Temperature (℃).
	Laboratory Analysis • Suspended Solids (mg/L)

3.3 MONITORING LOCATIONS

3.3.1 The designated monitoring locations as recommended in the *EM&A Manual* are shown in ***Appendix D***. As the access to some of the designated monitoring locations was questionable due to safety reason or denied by the landlords, alternative locations therefore have had proposed. The proposed alternative monitoring locations has updated in the revised EM&A Programme which verified by IEC and certified by ET Leader prior submitted to EPD on 10 July 2013. ***Table 3-2***, ***Table 3-3*** and ***Table 3-4*** are respectively listed the air quality, construction noise and water quality monitoring locations for the Project and a map showing these monitoring stations is presented in ***Appendix E***.

Table 3-2 Impact Monitoring Stations - Air Quality

Station ID	Description	Works Area	Related to the Work Contract
AM1b^	Open area at Tsung Yuen Ha Village	BCP	SS C505 Contract 5 Contract 7
AM2	Village House near Lin Ma Hang Road	LMH to Frontier Closed Area	Contract 5 Contract 6

Station ID	Description	Works Area	Related to the Work Contract
AM3	Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village.	LMH to Frontier Closed Area	Contract 5 Contract 6
AM4b^	House no. 10B1 Nga Yiu Ha Village	LMH to Frontier Closed Area	Contract 6
AM5a^	Ping Yeung Village House	Ping Yeung to Wo Keng Shan	Contract 6
AM6	Wo Keng Shan Village House	Ping Yeung to Wo Keng Shan	Contract 6
AM7b@	Loi Tung Village House	Sha Tau Kok Road	Contract 2 Contract 6
AM8	Po Kat Tsai Village No. 4	Po Kat Tsai	Contract 2
AM9b#	Nam Wa Po Village House No. 80	Fanling	Contract 3

 # Proposal for the change of air quality monitoring location from AM9a to AM9b was submitted to EPD on 4 Nov 2013 after verified by the IEC and it was approved by EPD (EPD's ref.: (15) in EP 2/N7/A/52 Pt.10 dated 8 Nov 2013).
** Proposal for the change of air quality monitoring location from AM1to AM1a was submitted to EPD on 24 March 2014 after verified by the IEC. It was approved by EPD (EPD's ref.: (6) in EP 2/N7/A/52 Pt.12 dated 9 Jun 2014).*
@ Proposal for the change of air quality monitoring location from AM7a to AM7b was submitted to EPD on 4 June 2014 after verified by the IEC. It was approved by EPD (EPD's ref.: (7) in EP 2/N7/A/52 Pt.12 dated 9 Jun 2014).
^ Proposal for change of air quality monitoring locations was enclosed in the updated EM&A Programme which approval by EPD on 29 Mar 2016.

Table 3-3 Impact Monitoring Stations - Construction Noise

Station ID	Description	Works Area	Related to the Work Contract
NM1	Tsung Yuen Ha Village House No. 63	BCP	SS C505 Contract 5 Contract 7
NM2	Village House near Lin Ma Hang Road	Lin Ma Hang to Frontier Closed Area	Contract 5, Contract 6
NM3	Ping Yeung Village House (facade facing northeast)	Ping Yeung to Wo Keng Shan	Contract 6
NM4	Wo Keng Shan Village House	Ping Yeung to Wo Keng Shan	Contract 6
NM5	Village House, Loi Tung	Sha Tau Kok Road	Contract 2, Contract 6
NM6	Tai Tong Wu Village House 2	Sha Tau Kok Road	Contract 2, Contract 6
NM7	Po Kat Tsai Village	Po Kat Tsai	Contract 2
NM8	Village House, Tong Hang	Fanling	Contract 2 Contract 3
NM9	Village House, Kiu Tau Village	Fanling	Contract 3
NM10	Nam Wa Po Village House No. 80	Fanling	Contract 3

Table 3-4 Impact Monitoring Stations - Water Quality

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
WM1	Downstream of Kong Yiu Channel	833 679	845 421	Alternative location located at upstream 51m of the designated location	SS C505 Contract 5 Contract 6

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
WM1-Control	Upstream of Kong Yiu Channel	834 185	845 917	NA	SS C505 Contract 5 Contract 6
WM2A	Downstream of River Ganges	834 204	844 471	Alternative location located at downstream 81m of the designated location	Contract 6
WM2A-Controlx	Upstream of River Ganges	835 377	844 188	Alternative location located at upstream 160m of the designated location	Contract 6
WM2B	Downstream of River Ganges	835 433	843 397	NA	Contract 6
WM2B-Control	Upstream of River Ganges	835 835	843 351	Alternative location located at downstream 31m of the designated location	Contract 6
WM3x	Downstream of River Indus	836 206	842 270	Alternative location located at downstream 180m of the designated location	Contract 2 Contract 6
WM3-Control	Upstream of River Indus	836 763	842 400	Alternative location located at downstream 26m of the designated location	Contract 2 Contract 6
WM4	Downstream of Ma Wat Channel	833 850	838 338	Alternative location located at upstream 11m of the designated location	Contract 2 Contract 3
WM4–Control A	Kau Lung Hang Stream	834 028	837 695	Alternative location located at downstream 28m of the designated location	Contract 2 Contract 3
WM4–Control B	Upstream of Ma Wat Channel	833760	837395	Alternative location located at upstream 15m of the designated location	Contract 2 Contract 3

Note: EPD has approved the revised EM&A Programme on 29th March 2016. If the measured water depth of the monitoring station is lower than 150 mm, alternative location (WM3x and WM2A-Controlx) based on the criteria were selected to perform water monitoring in accordance with the updated EM&A Programme (Rev. 05) (Section 4.1.4)

3.4 MONITORING FREQUENCY AND PERIOD

The requirements of impact monitoring are stipulated in *Sections 2.1.6*, *3.1.5* and *4.1.6* of the approved *EM&A Manual* and presented as follows.

Air Quality Monitoring

3.4.1 Frequency of impact air quality monitoring is as follows:

- 1-hour TSP 3 times every six days during course of works
- 24-hour TSP Once every 6 days during course of works.

Noise Monitoring

3.4.2 One set of $L_{eq(30min)}$ as 6 consecutive $L_{eq(5min)}$ between 0700-1900 hours on normal weekdays and once every week during course of works. If construction work necessary to carry out at other time periods, i.e. restricted time period (19:00 to 07:00 the next morning and whole day on public holidays) (hereinafter referred as "the restricted hours"), 3 consecutive $L_{eq(5min)}$ measurement will depended CNP requirements to undertake. Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.

Water Quality Monitoring

3.4.3 The water quality monitoring frequency shall be 3 days per week during course of works. The interval between two sets of monitoring shall not be less than 36 hours.

3.5 MONITORING EQUIPMENT

Air Quality Monitoring

3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*. If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve.

3.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

3.5.3 All equipment to be used for air quality monitoring is listed in ***Table 3-5***.

Table 3-5 Air Quality Monitoring Equipment

Equipment	Model
24-Hr TSP	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170*
Calibration Kit	TISCH Model TE-5025A*
1-Hour TSP	
Portable Dust Meter	Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter*

** Instrument was used in the Reporting Period and the calibration certificate could be referred in Appendix F.*

Wind Data Monitoring Equipment

3.5.4 According to the approved EM&A Manual, wind data monitoring equipment shall also be provided and set up for logging wind speed and wind direction near the dust monitoring locations. The equipment installation location shall be proposed by the ET and agreed with the IEC. For installation and operation of wind data monitoring equipment, the following points shall be observed:

1) The wind sensors should be installed 10 m above ground so that they are clear of obstructions or turbulence caused by buildings.
2) The wind data should be captured by a data logger. The data shall be downloaded for analysis at least once a month.
3) The wind data monitoring equipment should be re-calibrated at least once every six months.
4) Wind direction should be divided into 16 sectors of 22.5 degrees each.

3.5.5 ET has liaised with the landlords of the successful granted HVS installation premises. However, the owners rejected to provide premises for wind data monitoring equipment installation.

3.5.6 Under this situation, the ET proposed alternative methods to obtain representative wind data. Meteorological information as extracted from "the Hong Kong Observatory Ta Kwu Ling Station" is alternative method to obtain representative wind data. For Ta Kwu Ling Station, it is located nearby the Project site. Moreover, this station is located at 15m above mean sea level while its anemometer is located at 13m above the existing ground which in compliance with the general setting up requirement. Furthermore, this station also can be to provide the humidity, rainfall, and air pressure and temperature etc. meteorological information. In Hong Kong of a lot development projects, weather information extracted from Hong Kong Observatory is common alternative method if weather station installation not allowed.

Noise Monitoring

3.5.7 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.

3.5.8 Noise monitoring equipment to be used for monitoring is listed in ***Table 3-6***.

Table 3-6 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	B&K Type 2238* or Rion NL-31 or Rion NL-52*
Calibrator	B&K Type 4231* or Cesva CB-5* or Rion NC-74*
Portable Wind Speed Indicator	Testo Anemometer

** Instrument was used in the Reporting Period and the calibration certificate could be referred in Appendix F.*

3.5.9 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 TM issued under the NCO. The acoustic calibrator and sound level meter to be used in the impact monitoring will be calibrated yearly.

Water Quality Monitoring

3.5.10 DO and water temperature should be measured in-situ by a DO/temperature meter. The instrument should be portable and weatherproof using a DC power source. It should have a membrane electrode with automatic temperature compensation complete with a cable. The equipment should be capable of measuring:

- a DO level in the range of 0-20 mg/l and 0-200% saturation; and
- a temperature of between 0 and 45 degree Celsius.

3.5.11 A portable pH meter capable of measuring a range between 0.0 and 14.0 should be provided to measure pH under the specified conditions accordingly to the APHA Standard Methods.

3.5.12 The instrument should be portable and weatherproof using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0-1000 NTU.

3.5.13 A portable, battery-operated echo sounder or tape measure will be used for the determination of water depth at each designated monitoring station as appropriate.

3.5.14 A water sampler e.g. Kahlsico Water Sampler, which is a transparent PVC cylinder with capacity not less than 2 litres, will be used for water sampling if water depth over than 0.5m. For sampling from very shallow water depths e.g. <0.5 m, water sample collection will be directly from water surface below 100mm use sampling plastic bottle to avoid inclusion of bottom sediment or humus. Moreover, Teflon/stainless steel bailer or self-made sampling buckets maybe used for water sampling. The equipment used for sampling will be depended the sampling location and depth situations.

3.5.15 Water samples for laboratory measurement of SS will be collected in high density polythene bottles, packed in ice (cooled to 4 ºC without being frozen), and delivered to the laboratory in the same day as the samples were collected.

3.5.16 Analysis of suspended solids should be carried out in a HOKLAS or other accredited laboratory. Water samples of about 1L should be collected at the monitoring stations for carrying out the laboratory suspended solids determination. The SS determination work should start within 24 hours after collection of the water samples. The SS analyses should follow the *APHA Standard Methods 2540D* with Limit of Reporting of 2 mg/L.

3.5.17 Water quality monitoring equipment used in the impact monitoring is listed in ***Table 3-7***. Suspended solids (SS) analysis is carried out by a local HOKLAS-accredited laboratory, namely *ALS Technichem (HK) Pty Ltd*.

Table 3-7 Water Quality Monitoring Equipment

Equipment	Model
Water Depth Detector	Eagle Sonar or tape measures
Water Sampler	A 2-litre transparent PVC cylinder with latex cups at both ends or teflon/stainless steel bailer or self-made sampling bucket
Thermometer & DO meter	YSI Professional Plus /YSI PRO20 Handheld Dissolved Oxygen Instrument* / YSI 550A Multifunctional Meter/ YSI Professional DSS*
pH meter	YSI Professional Plus / AZ8685 pH pen-style meter*/ YSI 6820/ 650MDS/ YSI Professional DSS*
Turbidimeter	Hach 2100Q*/ YSI 6820/ 650MDS/ YSI Professional DSS*
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-liter plastic cool box with Ice pad

** Instrument was used in the Reporting Period and the calibration certificate could be referred in Appendix F.*

3.6 MONITORING METHODOLOGY

1-hour TSP Monitoring

3.6.1 The 1-hour TSP monitor was a brand named "Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter" which is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90^{o} light scattering. The 1-hour TSP monitor consists of the following:

(a.) A pump to draw sample aerosol through the optic chamber where TSP is measured;

(b.) A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and

(c.) A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

3.6.2 The 1-hour TSP meter is used within the valid period as follow manufacturer's Operation and Service Manual.

24-hour TSP Monitoring

3.6.3 The equipment used for 24-hour TSP measurement is Tisch Environmental, Inc. Model TE-5170 TSP high volume air sampling system, which complied with *EPA Code of Federal Regulation, Appendix B to Part 50*. The High Volume Air Sampler (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 7-day mechanical timer, and

(g.) A power supply of 220v/50 Hz

3.6.4 The HVS is operated and calibrated on a regular basis in accordance with the manufacturer's instruction using Tisch Calibration Kit Model TE-5025A. Calibration would carry out in two month interval.

3.6.5 24-hour TSP is collected by the ET on filters of HVS and quantified by a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (ALS), upon receipt of the samples. The ET keep all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% RH (Relative

Humidity) and 25°C, for six months prior to disposal.

Noise Monitoring

3.6.6 Noise measurements were taken in terms of the A-weighted equivalent sound pressure level (L_{eq}) measured in decibels dB(A). Supplementary statistical results (L_{10} and L_{90}) were also obtained for reference.

3.6.7 During the monitoring, all noise measurements would be performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (L_{eq}). $Leq_{(30min)}$ in six consecutive $Leq_{(5min)}$ measurements will use as the monitoring parameter for the time period between 0700-1900 hours on weekdays; and also $Leq_{(15min)}$ in three consecutive $Leq_{(5min)}$ measurements would be used as monitoring parameter for other time periods (e.g. during restricted hours), if necessary.

3.6.8 Prior of 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. The checking is performed before and after the noise measurement.

Water Quality

3.6.9 Water quality monitoring is conducted at the designated or alternative locations. The sampling procedures with the in-situ monitoring are presented as below:

Sampling Procedure

3.6.10 A Digital Global Positioning System (GPS) is used to identify the designated monitoring stations prior to water sampling. A portable, battery-operated echo sounder or tape measurement is used for the determination of water depth at each station. At each station, water sample would be collected from 0.1m below water surface or the water surface to prevent the river bed sediment for stirring.

3.6.11 The sample container will be rinsed with a portion of the water sample. The water sample then will be transferred to the high-density polythene bottles as provided by the laboratory, labeled with a unique sample number and sealed with a screw cap.

3.6.12 Before sampling, general information such as the date and time of sampling, weather condition as well as the personnel responsible for the monitoring would be recorded on the field data sheet.

3.6.13 A 'Willow' 33-liter plastic cool box packed with ice will be used to preserve the water samples prior to arrival at the laboratory for chemical determination. The water temperature of the cool box is maintained at a temperature as close to 4^0C as possible without being frozen. Samples collected are delivered to the laboratory upon collection.

In-situ Measurement

3.6.14 YSI PRO20 Handheld Dissolved Oxygen Instrument or YSI Professional DSS is used for water in-situ measures, which automates the measurements and data logging of temperature, dissolved oxygen and dissolved oxygen saturation.

3.6.15 A portable AZ Model 8685 pH pen-style meter or YSI Professional DSS is 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.

3.6.16 A portable Hach 2100Q Turbidimeter or YSI Professional DSS is used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU.

3.6.17 All in-situ measurement equipment are calibrated by HOKLAS accredited laboratory of three month interval.

Laboratory Analysis

3.6.18 All water samples analyzed Suspended Solids (SS) will be carried out by a local HOKLAS-accredited testing laboratory (ALS Technichem (HK) Pty Ltd HOKLAS registration no. 66). SS determination using *APHA Standard Methods 2540D* as specified in the *EM&A Manual* will start within 48 hours of water sample receipt.

3.7 EQUIPMENT CALIBRATION

3.7.1 Calibration of the HVS is performed upon installation and thereafter at bimonthly intervals in accordance with the manufacturer's instruction using the certified standard calibrator (TISCH Model TE-5025A). Moreover, the Calibration Kit would be calibrated annually. The calibration data are properly documented and the records are maintained by ET for future reference.

3.7.2 The 1-hour TSP meter was calibrated by the supplier prior to purchase. Zero response of the equipment would be checked before and after each monitoring event. Annually calibration with the High Volume Sampler (HVS) in same condition would be undertaken by the Laboratory.

3.7.3 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis.

3.7.4 All water quality monitoring equipment would be calibrated by HOKLAS accredited laboratory of three month intervals.

3.7.5 The calibration certificates of all monitoring equipment used for the impact monitoring program in the Reporting Period and the HOKLAS accredited certificate of laboratory are attached in ***Appendix F***.

3.8 DERIVATION OF ACTION/LIMIT (A/L) LEVELS

3.8.1 The baseline results form the basis for determining the environmental acceptance criteria for the impact monitoring. According to the approved Environmental Monitoring and Audit Manual, the air quality, construction noise and water quality criteria were set up, namely Action and Limit levels are listed in ***Tables 3-8, 3-9*** and ***3-10***.

Table 3-8 Action and Limit Levels for Air Quality Monitoring

Monitoring Station	Action Level (μg /m^3)		Limit Level (μg/m^3)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AM1b	265	143	500	260
AM2	268	149		
AM3	269	145		
AM4b	267	148		
AM5a	268	143		
AM6	269	148		
AM7b	275	156		
AM8	269	144		
AM9b	271	151		

Table 3-9 Action and Limit Levels for Construction Noise

Monitoring Location	Action Level	Limit Level in dB(A)
	Time Period: 0700-1900 hours on normal weekdays	
NM1, NM2, NM3, NM4, NM5, NM6, NM7, NM8, NM9, NM10	When one or more documented complaints are received	75 dB(A)[Note 1 & Note 2]

Note 1: Acceptable Noise Levels for school should be reduced to 70 dB(A) and65 dB(A) during examination period

Note 2: If works are to be carried out during restricted hours, the conditions stipulated in the construction

noise permit issued by the NCA have to be followed.

Table 3-10 Action and Limit Levels for Water Quality

Parameter	Performance criteria	Monitoring Location				
		WM1	**WM2A**	**WM2B**	**WM3**	**WM4**
DO (mg/L)	Action Level	(*)4.23	(**)4.00	(*)4.74	(**)4.00	(*)4.14
	Limit Level	(#)4.19	(**)4.00	(#)4.60	(**)4.00	(#)4.08
Turbidity (NTU)	Action Level	51.3	24.9	11.4	13.4	35.2
		AND	120% of upstream control station of the same day			
	Limit Level	67.6	33.8	12.3	14.0	38.4
		AND	130% of upstream control station of the same day			
SS (mg/L)	Action Level	54.5	14.6	11.8	12.6	39.4
		AND	120% of upstream control station of the same day			
	Limit Level	64.9	17.3	12.4	12.9	45.5
		AND	130% of upstream control station of the same day			

Remarks:
(*) *The Proposed **Action Level** of Dissolved Oxygen is adopted to be used 5%-ile of baseline data*
(**) *The Proposed **Action & Limit Level** of Dissolved Oxygen is used 4mg/L*
(#) *The Proposed **Limit Level** of Dissolved Oxygen is adopted to be used 1%-ile of baseline data*

3.8.2 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan which presented in ***Appendix G.***

3.9 DATA MANAGEMENT AND DATA QA/QC CONTROL

3.9.1 All monitoring data will be handled by the ET's in-house data recording and management system. The monitoring data recorded in the equipment will be downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data will input into a computerized database maintained by the ET. The laboratory results will be input directly into the computerized database and checked by personnel other than those who input the data.

3.9.2 For monitoring parameters that require laboratory analysis, the local laboratory shall follow the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.

4 AIR QUALITY MONITORING

4.1 GENERAL

4.1.1 In the Reporting Period, construction works under the project have been commenced in Contracts 2, 3, 5, 6, 7 and Contract SS C505. Hence, air quality monitoring was performed at all designated locations.

4.1.2 The air quality monitoring schedule is presented in ***Appendix H*** and the monitoring results are summarized in the following sub-sections.

4.2 AIR QUALITY MONITORING RESULTS IN REPORTING MONTH

4.2.1 In the Reporting Period, a total of ***150*** events of 1-hour TSP and ***49*** events 24-hours TSP monitoring were carried out and the monitoring results are summarized in ***Tables 4-1 to 4-9***. The detailed 24-hour TSP monitoring data are presented in ***Appendix I*** and the relevant graphical plots are shown in ***Appendix J***.

Table 4-1 Summary of 24-hour and 1-hour TSP Monitoring Results – AM1b

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
2-Apr-16	72	5-Apr-16	10:35	75	78	114
8-Apr-16	39	11-Apr-16	9:18	56	65	62
14-Apr-16	37	16-Apr-16	9:27	203	181	186
22-Apr-16	51	22-Apr-16	9:14	94	76	76
26-Apr-16	28	28-Apr-16	9:33	96	68	78
30-Apr-16	97					
Average (Range)	**54 (28 – 97)**	Average (Range)		**101 (56 – 203)**		

Table 4-2 Summary of 24-hour and 1-hour TSP Monitoring Results – AM2

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
2-Apr-16	138	5-Apr-16	10:13	106	108	118
8-Apr-16	106	11-Apr-16	9:38	69	64	73
14-Apr-16	38	16-Apr-16	9:35	187	212	193
20-Apr-16	104	22-Apr-16	9:26	83	74	76
26-Apr-16	44	28-Apr-16	9:31	98	89	91
30-Apr-16	132					
Average (Range)	**94 (38 – 138)**	Average (Range)		**109 (64 – 212)**		

Table 4-3 Summary of 24-hour and 1-hour TSP Monitoring Results – AM3

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
2-Apr-16	65	5-Apr-16	10:24	80	85	124
8-Apr-16	93	11-Apr-16	9:53	54	61	69
14-Apr-16	36	16-Apr-16	13:06	185	181	133
20-Apr-16	53	22-Apr-16	13:01	80	59	60
26-Apr-16	63	28-Apr-16	9:37	113	112	120
30-Apr-16	86					
Average (Range)	**66 (36 – 93)**	Average (Range)		**101 (54 – 185)**		

Table 4-4 Summary of 24-hour and 1-hour TSP Monitoring Results – AM4b

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
5-Apr-16	48	2-Apr-16	9:24	91	93	103
11-Apr-16	42	8-Apr-16	10:11	94	78	57
16-Apr-16	74	14-Apr-16	9:27	38	34	38
22-Apr-16	48	20-Apr-16	10:00	89	90	102
28-Apr-16	61	26-Apr-16	10:25	107	108	118
		30-Apr-16	8:49	82	71	82
Average (Range)	**55 (42 – 74)**	Average (Range)		**82 (34 – 118)**		

Table 4-5 Summary of 24-hour and 1-hour TSP Monitoring Results – AM5a

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
5-Apr-16	28	2-Apr-16	9:37	93	97	107
11-Apr-16	31	8-Apr-16	10:09	80	64	44
16-Apr-16	47	14-Apr-16	9:31	43	41	49
22-Apr-16	26	20-Apr-16	10:34	91	92	109
28-Apr-16	54	26-Apr-16	10:21	100	77	98
		30-Apr-16	8:51	91	69	80
Average (Range)	**37 (26 – 54)**	Average (Range)		**79 (41 – 109)**		

Table 4-6 Summary of 24-hour and 1-hour TSP Monitoring Results – AM6

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
5-Apr-16	94	2-Apr-16	9:45	67	67	87
11-Apr-16	65	8-Apr-16	9:51	112	98	97
16-Apr-16	55	14-Apr-16	9:39	38	34	41
22-Apr-16	46	20-Apr-16	10:35	87	86	93
28-Apr-16	108	26-Apr-16	9:51	98	91	93
		30-Apr-16	8:58	80	72	85
Average (Range)	**74 (46 – 108)**	Average (Range)		**79 (34 – 112)**		

Table 4-7 Summary of 24-hour and 1-hour TSP Monitoring Results – AM7b

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
5-Apr-16	88	2-Apr-16	13:09	104	126	119
11-Apr-16	51	8-Apr-16	9:22	99	77	97
16-Apr-16	126	14-Apr-16	9:26	53	78	58
22-Apr-16	60	20-Apr-16	9:24	51	45	29
28-Apr-16	83	26-Apr-16	9:14	101	88	73
		30-Apr-16	13:05	87	71	80
Average (Range)	**82 (51 –126)**	Average (Range)		**80 (29 – 126)**		

Table 4-8 Summary of 24-hour and 1-hour TSP Monitoring Results – AM8

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
5-Apr-16	43	2-Apr-16	13:38	107	93	102
11-Apr-16	25	8-Apr-16	13:03	97	78	98
16-Apr-16	66	14-Apr-16	13:03	57	70	56
22-Apr-16	39	20-Apr-16	13:09	52	44	30
28-Apr-16	43	26-Apr-16	13:10	108	96	80
		30-Apr-16	13:17	87	65	78
Average (Range)	**43 (25 – 66)**	Average (Range)		**78 (30 -108)**		

Table 4-9 Summary of 24-hour and 1-hour TSP Monitoring Results – AM9b

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
2-Apr-16	50	5-Apr-16	13:01	116	110	94
8-Apr-16	49	11-Apr-16	9:18	29	83	67
14-Apr-16	36	16-Apr-16	9:48	181	119	81
20-Apr-16	38	22-Apr-16	9:22	63	54	64
26-Apr-16	19	28-Apr-16	13:08	101	95	82
30-Apr-16	116					
Average (Range)	**51 (19 – 116)**	Average (Range)		**89 (29 – 181)**		

4.2.2 As shown in ***Tables 4-1 to 4-9***, all the 1-hour TSP and 24-hour TSP monitoring results were below the Action/Limit Levels. No Notification of Exceedance (NOE) was issued in this Reporting Period.

4.2.3 The meteorological data during the impact monitoring days are summarized in ***Appendix K***.

5 CONSTRUCTION NOISE MONITORING

5.1 GENERAL

5.1.1 In the Reporting Period, construction works under the project have been commenced in Contracts 2, 3, 5, 6, 7 and Contract SS C505 and noise monitoring was performed at all designated locations.

5.1.2 The noise monitoring schedule is presented in ***Appendix H*** and the monitoring results are summarized in the following sub-sections.

5.2 NOISE MONITORING RESULTS IN REPORTING MONTH

5.2.1 In the Reporting Period, a total of **40** event noise measurements were carried out at the designated locations. The sound level meter was set in 1m from the exterior of the building façade including noise monitoring locations NM1, NM2, NM3, NM4, NM5, NM6, NM7, NM8 and NM9. Therefore, no façade correction (+3 dB(A)) is added according to acoustical principles and EPD guidelines. However, free-field status was performed at NM10 and façade correction (+3 dB(A)) has added according to the requirement in this month. The noise monitoring results at the designated locations are summarized in ***Tables 5-1 and 5-2.*** The detailed noise monitoring data are presented in ***Appendix I*** and the relevant graphical plots are shown in ***Appendix J***.

Table 5-1 Summary of Construction Noise Monitoring Results

Construction Noise Level ($L_{eq30min}$), dB(A)					
Date	**NM1**	**NM2**	**NM8**	**NM9**	**NM10(*)**
5-Apr-16	64	64	58	58	66
11-Apr-16	57	59	65	67	68
22-Apr-16	55	67	59	60	73
28-Apr-16	62	60	59	61	64
Limit Level	**75 dB(A)**				

Remarks

(*) *façade correction (+3 dB(A) is added according to acoustical principles and EPD guidelines*

Table 5-2 Summary of Construction Noise Monitoring Results

Construction Noise Level ($L_{eq30min}$), dB(A)					
Date	**NM3**	**NM4**	**NM5**	**NM6**	**NM7**
8-Apr-16	59	66	55	59	60
14-Apr-16	62	64	56	51	64
20-Apr-16	59	64	63	59	63
26-Apr-16	63	64	54	63	64
Limit Level	**75 dB(A)**				

5.2.2 As shown in ***Tables 5-1 and 5-2***, the noise level measured at all designated monitoring locations were below 75dB(A). Furthermore, there was no noise complaints (Action Level exceedance) received by the RE, CEDD, Architect/AR/ and the Contractors in the Reporting Period. Therefore, no Action or Limit Level exceedance was triggered and no corrective action was required.

6 WATER QUALITY MONITORING

6.1 GENERAL

6.1.1 In the Reporting Period, construction works under the project has been commenced in Contracts 2, 3, 5, 6, 7 and Contract SS C505 and water quality monitoring was performed at all designated locations. The water quality monitoring schedule is presented in ***Appendix H***. The monitoring results are summarized in the following sub-sections.

6.2 RESULTS OF WATER QUALITY MONITORING

6.2.1 In the Reporting Period, a total of thirteen (13) sampling days was scheduled to carry out for all designated locations with their control stations. Except monitoring station WM4, total thirty-nine (39) Limit Level (LL) of water quality exceedances were respectively recorded at the monitoring stations WM1, WM2A, WM2B and WM3. According to "*Event and Action Plan*" stipulation, additional water quality monitoring days respectively were conducted four days for WM1 and its control station, three days for WM2A and its control station, five days for WM2B & WM3 and their control stations.

6.2.2 The key monitoring parameters including Dissolved Oxygen, Turbidity and Suspended Solids are summarized in ***Tables 6-1 to 6-5***. Breaches of water quality monitoring criteria are shown in ***Table 6-6***. Detailed monitoring database including in-situ measurements and laboratory analysis data are shown in ***Appendix I*** and the relevant graphical plot are shown in ***Appendix J***.

Table 6-1 Water Quality Monitoring Results Associated of Contracts 2 and 3

Date	Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
	WM4	WM4-CA	WM4-CB	WM4	WM4-CA	WM4-CB	WM4	WM4-CA	WM4-CB
2-Apr-16	8.4	8.6	6.8	11.1	208.0	11.0	15.0	100.0	21.5
5-Apr-16	7.4	8.2	5.9	11.0	60.2	10.0	18.5	75.0	12.5
7-Apr-16	7.3	8.2	6.0	10.5	8.1	6.2	15.5	7.5	10.5
9-Apr-16	6.9	8.0	5.3	20.0	32.2	16.1	36.0	44.5	26.0
11-Apr-16	7.5	8.1	5.8	18.8	5.5	10.4	21.0	4.5	14.0
14-Apr-16	7.5	8.3	6.5	25.6	6.9	14.9	28.0	7.0	17.0
16-Apr-16	7.3	8.1	5.9	13.3	9.3	15.2	14.0	6.0	19.5
18-Apr-16	7.4	8.2	7.0	28.5	13.6	17.9	16.5	9.0	13.0
20-Apr-16	7.6	8.3	6.6	14.9	8.2	14.1	13.5	8.0	15.5
22-Apr-16	7.4	8.1	7.0	45.1	22.8	39.3	43.0	23.0	37.0
26-Apr-16	7.3	8.0	6.7	15.1	10.8	10.4	11.0	3.5	10.0
28-Apr-16	7.4	8.0	6.5	14.6	12.8	14.9	23.5	9.5	24.0
30-Apr-16	8.3	8.7	7.8	11.2	8.6	5.6	5.5	13.5	19.5

Table 6-2 Water Quality Monitoring Results Associated of Contracts 5, 6 and SS C505

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
2-Apr-16	7.5	8.1	26.2	9.9	40.5	9.0
5-Apr-16	7.3	7.3	**124.5**	19.3	**220.0**	39.5
6-Apr-16#	--	--	**108.0**	9.3	**269.0**	16.0
7-Apr-16	7.6	8.2	**94.1**	7.7	**150.5**	5.5
8-Apr-16#	--	--	**101.8**	9.6	**298.0**	10.0
9-Apr-16	7.8	8.3	49.9	6.8	54.0	11.0
11-Apr-16	8.1	7.6	**82.2**	18.6	**125.0**	18.5
12-Apr-16#	--	--	24.9	13.1	33.0	17.0
13-Apr-16#	--	--	71.0	106.0	74.0	114.0
14-Apr-16	7.5	8.0	19.9	9.3	42.0	11.0
16-Apr-16	7.9	7.8	15.1	9.9	19.5	11.0
18-Apr-16	7.3	7.5	164.5	607.5	147.5	470.0
20-Apr-16	7.6	7.9	23.2	9.3	22.5	8.0

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
22-Apr-16	8.2	8.0	578.0	556.5	530.0	495.0
26-Apr-16	6.3	7.0	24.4	14.6	26.0	13.0
28-Apr-16	7.6	7.9	35.4	10.5	50.5	9.0
30-Apr-16	7.9	7.6	16.2	10.6	21.5	11.5

Remarks: *bold with underline indicated Limit Level exceedance*

 # Additional water quality monitoring at the exceeded location(s) due to two consecutive *monitoring days indicated Limit Level exceedance.*

Table 6-3 Water Quality Monitoring Results Associated only Contract 6

Date	Dissolved Oxygen (mg/L)				Turbidity (NTU)				Suspended Solids (mg/L)			
	WM2A	WM2A-C	WM2B	WM2B-C	WM2A	WM2A-C	WM2B	WM2B-C	WM2A	WM2A-C	WM2B	WM2B-C
2-Apr-16	8.4	8.4	8.5	8.3	19.9	4.1	6.4	2.8	13.0	<2	10.5	<2
5-Apr-16	8.1	8.1	8.4	7.8	17.5	5.8	10.8	4.2	12.0	3.5	11.0	5.5
7-Apr-16	8.2	8.0	8.3	7.9	18.3	4.3	**790.0**	4.9	11.5	<2	**806.0**	<2
8-Apr-16#	--	--	--	--	--	--	8.4	3.2	--	--	9.5	<2
9-Apr-16	8.4	7.9	8.1	7.8	10.9	3.8	3.6	3.7	14.5	2.0	3.0	<2
11-Apr-16	8.4	8.5	8.2	7.9	**68.6**	6.5	10.8	3.2	**93.5**	<2	**17.0**	<2
12-Apr-16#	--	--	--	--	23.8	4.7	--	--	14.0	<2	--	--
13-Apr-16#	--	--	--	--	**103.0**	23.3	--	--	**104.0**	22.0	--	--
14-Apr-16	8.4	8.2	8.7	7.4	17.6	4.4	**73.1**	7.4	**20.5**	3.0	**120.0**	3.5
16-Apr-16	8.1	8.3	8.4	7.4	8.8	4.7	10.0	4.5	5.5	<2	4.0	4.0
18-Apr-16	8.1	7.9	8.6	7.4	**83.6**	19.9	7.2	5.4	**84.0**	9.5	10.0	2.0
19-Apr-16#	--	--	--	--	22.6	6.0	--	--	**26.0**	2.0	--	--
20-Apr-16	8.2	8.3	8.9	7.4	20.3	4.3	**12.5**	2.1	14.0	2.5	**13.0**	<2
21-Apr-16#	--	--	--	--	--	--	10.8	4.0	--	--	11.0	4.0
22-Apr-16	8.2	8.5	8.5	7.3	56.0	48.9	**136.5**	7.9	**92.5**	27.5	**135.0**	8.0
23-Apr-16#	--	--	--	--	--	--	**<1000**	3.2	--	--	**934.0**	<2
25-Apr-16#	--	--	--	--	--	--	**77.1**	3.1	--	--	**75.0**	5.0
26-Apr-16	7.6	8.3	8.4	7.4	15.5	4.7	**175.0**	3.9	14.0	3.0	**138.5**	4.5
27-Apr-16#	--	--	--	--	--	--	10.9	3.3	--	--	10.0	<2
28-Apr-16	7.8	7.9	8.0	7.3	17.9	5.8	9.5	3.8	12.0	2.5	10.5	3.0
30-Apr-16	8.1	8.3	8.7	7.5	21.7	5.3	9.3	3.2	13.5	<2	7	<2

Remarks: *bold with underline indicated Limit Level exceedance*

 # Additional water quality monitoring at the exceeded location(s) due to two consecutive *monitoring days indicated Limit Level exceedance.*

Table 6-4 Water Quality Monitoring Results Associated Contracts 2 and 6

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM3	WM3-Control	WM3	WM3-Control	WM3	WM3-Control
1-Apr-16#	--	--	7.1	6.0	16.0	14.0
2-Apr-16	8.6	8.4	**44.6**	4.9	**87.5**	6.5
5-Apr-16	8.0	7.4	13.1	3.9	14.0	51.0
6-Apr-16#	--	--	7.2	4.0	9.0	7.0
7-Apr-16	7.8	7.0	4.8	3.9	5.5	5.0
9-Apr-16	7.8	7.2	5.8	3.5	4.0	2.5
11-Apr-16	8.1	7.7	8.2	3.4	9.5	5.5
14-Apr-16	7.6	7.4	6.4	7.5	7.5	16.0
16-Apr-16	7.1	7.5	18.9	<1000	30.5	4485.0
18-Apr-16	7.1	7.6	31.4	30.1	26.5	221.5
20-Apr-16	7.3	6.9	**20.1**	5.8	22.0	25.5

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM3	WM3-Control	WM3	WM3-Control	WM3	WM3-Control
21-Apr-16#	--	--	**28.0**	9.8	13.0	58.0
22-Apr-16	7.3	7.7	**86.8**	50.4	78.0	197.0
23-Apr-16#	--	--	34.6	149.5	56.0	408.0
25-Apr-16#	--	--	12.2	7.4	22.0	53.0
26-Apr-16	7.2	6.9	8.9	9.8	9.5	149.5
28-Apr-16	7.4	7.4	8.0	32.2	8.0	173.0
30-Apr-16	8.3	8.1	22.4	488.0	61.0	898.5

Remarks: *bold with underline indicated Limit Level exceedance*

 # Additional water quality monitoring at the exceeded location(s) due to two consecutive *monitoring days indicated Limit Level exceedance.*

Table 6-5 Breaches of Water Quality Monitoring Criteria in Reporting Period

Location	Dissolved Oxygen		Turbidity		Suspended Solids		Total Exceedance	
	Action	Limit	Action	Limit	Action	Limit	Action	Limit
WM1	0	0	0	**5**	0	**5**	0	**10**
WM2A	0	0	0	**3**	0	**6**	0	**9**
WM2B	0	0	0	**7**	0	**8**	0	**15**
WM3	0	0	0	**4**	0	**1**	0	**5**
WM4	0	0	0	0	0	0	0	0
No of Exceedance	**0**	**0**	**0**	**19**	**0**	**20**	**0**	**39**

6.2.3 In this Reporting Period, a total of thirty-nine (39) Limit Level (LL) exceedances, namely nineteen (19) LL exceedances of turbidity and twenty (20) LL exceedances of Suspended Solids were recorded for the Project and they are summarized in ***Table 6-5***.

6.2.4 NOE was issued to relevant parties upon confirmation of the monitoring result. The cause of exceedance is summarized in ***Table 6-6*** accordance to investigation findings and the detailed investigation reports for the exceedances are attached in ***Appendix N***.

Table 6-6 Summary of Water Quality Exceedance in the Reporting Period

Date of Exceedance	Location	Exceeded Parameter	Cause of Water Quality Exceedance
5th, 6th, 7th, 8th and 11th April 2016	WM1 (C5, C6 and SS C505)	NTU & SS	According to field photo records as provided by ET, accumulation of rubbish were observed at the screening steel bar of box culvert near WM1 on 4 April 2016 after heavy rainstorm. Water flow near WM1 was therefore retarded and turbid water would be cumulated at WM1. Considered that the exceedances were unlikely related or due to the works of Contracts 5, 6 and SS C505.
11th, 13th, 14th, 18th, 19th and 22nd April 2016	WM2A (C6)	NTU and/or SS	According to the site information provided from the CCKJV, construction activities carried out on 11th, 13th and 18th April 2016 at Bridge D (upstream of WM2A) were mainly piling works. Wastewater treatment facilities including one AquaSed and three series of sedimentation tank have been installed for piling work. • As reported by CCKJV, since too much silt accumulated inside the sedimentation tank, the quality of effluent was not desirable and some turbid effluent was discharged into Ping Yuen River on ***11th April 2016***. So, the exceedance should relate Contract 6 since turbid effluent flowed into Ping Yuen

Date of Exceedance	Location	Exceeded Parameter	Cause of Water Quality Exceedance
			River from working area. • According to the daily meteorological information as extracted from the Hong Kong Observatory, a total rainfall 76.4 mm was recorded on 13 April 2016 and 23.7 mm on 18 April 2016. Due to the heavy rainfall, the soil slope at the river side was eroded and ran into the Ping Yuen River and muddy water was observed after passing the suspected soil erosion point. Hence, exceedances as recorded on ***13th, 14th, 18th, 19th and 22nd April 2016*** are unlikely related the C6 construction activities.
7th, 11th, 14th, 20th, 22nd, 23rd, 25th and 26th April 2016	WM2B (C6)	NTU and/or SS	According to the site information as provided by C6, construction activities carried out at North Portal (upstream of WM2B) in the reporting period was included the piling and slope works. Daily self-monitoring has conducted by the Contractor to ensure effluent is fully compliance with the TM criteria. • Water monitoring on 7 April 2016 at WM2B, ET observed that water flowing in channel and the samples collected at WM2B was turbid. Daily effluent self-monitoring was recorded visually clear. However, the silt cumulated at the channel bed or the screen gate was stirred-up by the flow of discharge from the AquaSed. Then the mixture of silt and treated water was overflow to the downstream. So the exceedance was not due to C6 construction activities. • On 11th and 20th April 2016, around 20mm shallow water deep encountered during water sampling. Moreover, the water flowing in the channel and the water samples collected at WM2B was observed visually clear. Consider that the water sample could not avoid inclusion of the loose sediment and debris and concluded the exceedance not due to C6 construction activities. • According to the site record from the monitoring team on 14 April 2016, very shallow water was measured at WM2B and the water depth was around 0.02m and water sampling during rainfall and it was observed that the water flowing in the open channel was slightly turbid due to stir up of sediment and cumulated silt at the river bed during rain. So, the exceedance was not due to C6 construction activities. • According to the site photos taken on 22, 23, 25 and 26 April 2016 by the ET, it was observed that the water samples collected at WM2B were turbid while water samples collected at WM2B-C were clear. As extracted from the Hong Kong Observatory, heavy rainfall was recorded 22nd and 25th April 2016. Hence, runoff was generated from the excavating areas during the rainfall and the turbid water was flowed into river channel. Thus, it is considered that the exceedances recorded on 22, 23, 25 and 26 April 2016 were related to runoff from the excavation work of site access construction.
2nd, 20th, 21st and 22nd April 2016	WM3 (C2 and C6)	NTU and/or SS	• The exceedance recorded on 2 April 2016 caused by turbid water discharge from the unknown outfall. Hence, the exceedance triggered unlikely due to the works under Contracts 2 and 6. • According to the site information respectively came from the Contractors of C2 and C6, major construction activities carried out on 20, 21, 22 April 2016 at upstream of WM3 was bored pile works for C6 and rebar fixing and concreting at admin building for C2. Site observation recorded by ET during monitoring, the water quality at WM3 was slightly turbid on 20 and 21 April 2016 but turbid water on 22 April 2016. For investigation, the Contractor of C2 said that no discharge was made from the construction admin building. However, site

Date of Exceedance	Location	Exceeded Parameter	Cause of Water Quality Exceedance
			inspection by RE, ET, IEC and the Contractor of C6 on 21 April 2016, the AquaSed (SH-8) which located upstream of W3, was found to have turbid treated effluent. As reported by the Contractor of C6, the AquaSed(SH-8) was running out of flocculent thus effectiveness of the water treatment was reduced. Hence, the exceedance triggered likely due to the works of Contract 6 for effluent discharge.

6.2.5 There are five investigation reports for the exceedances are under review by IEC.

7 WASTE MANAGEMENT

7.1 GENERAL WASTE MANAGEMENT

7.1.1 Waste management was carried out in accordance with the Waste Management Plan (WMP) for each contract.

7.2 RECORDS OF WASTE QUANTITIES

7.2.1 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.

7.2.2 The quantities of waste for disposal in this Reporting Period are summarized in ***Tables 7-1*** and ***7-2*** and the Monthly Summary Waste Flow Table is shown in ***Appendix L***. Whenever possible, materials were reused on-site as far as practicable.

Table 7-1 Summary of Quantities of Inert C&D Materials for the Project

Type of Waste	Contract 2		Contract 3		Contract 5		Contract 6		Contract 7		Contract SS C505		Total Quantity
	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	
C&D Materials (Inert) (in '000m^3)	**86.9048**	--	**0.472**	--	0	--	**33.767**	--	**0.313**	--	**0.1105**	--	**121.5673**
Reused in this Contract (Inert) (in '000 m^3)	**0.7045**	--	0.018	--	0	--	**1.933**	--	0	--	0	--	**2.6555**
Reused in other Contracts/ Projects (Inert) (in '000 m^3)	**32.8811**	C6/ NENT# & other projects approved by the ER	0	--	0	--	**5.759**	C5 & other projects approved by the ER	0	--	0	--	**38.6401**
Disposal as Public Fill (Inert) (in '000 m^3)	**53.3191**	Tuen Mun 38	**0.408**	Tuen Mun 38	0	--	**26.075**	Tuen Mun 38	**0.313**	Tuen Mun 38	**0.1105**	TKO 137	**80.2256**

Remark #: The C&D materials were delivered to NENT for reuse by laying cover of the landfilling area.

Table 7-2 Summary of Quantities of C&D Wastes for the Project

Type of Waste	Contract 2		Contract 3		Contract 5		Contract 6		Contract 7		Contract SS C505		Total Quantity
	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	
Recycled Metal ('000kg) #	0.002	-	0	-	0	--	0	--	0	--	**1465.59**	Licensed collector	**1465.59**
Recycled Paper / Cardboard Packing ('000kg) #	0.4	-	0	-	0	--	0.221	Licensed collector	0	--	**0.09**	Licensed collector	**0.311**
Recycled Plastic ('000kg) #	0	--	0	-	0	--	0	--	0	--	0	--	**0**
Chemical Wastes ('000kg) #	**0.704**	Licensed collector	0	-	0	--	0	--	0	--	0	--	**0.704**
General Refuses ('000m^3)	**0.1306**	NENT	**0.135**	NENT	**0.03**	NENT	**0.07**	NENT	**0.005**	--	**0.091**	NENT	**0.4616**

Remark #: Unit of recycled metal, recycled paper/ cardboard packing, recycled plastic and chemical waste for Contract 3 was in ('000m^3).

8 SITE INSPECTION

8.1 REQUIREMENTS

8.1.1 According to the approved EM&A Manual, the environmental site inspection shall be formulation by ET Leader. Weekly environmental site inspections should carry out to confirm the environmental performance.

8.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

Contract 2

8.2.1 In the Reporting Period, joint site inspection for Contract 2 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **1, 8, 15, 22, 29 April 2016**. No non-compliance was noted.

8.2.2 The findings / deficiencies of ***Contract 2*** that observed during the weekly site inspection are listed in ***Table 8-1***.

Table 8-1 Site Observations for Contract 2

Date	Findings / Deficiencies	Follow-Up Status
1 April 2016	• Dust mitigation measures should be provided when loading, breaking or unloading materials to reduce dust impact. (South Portal)	• Watering provided to all breaking activities and dusty operations.
8 April 2016	• No adverse environmental issue was observed.	NA
15 April 2016	• Oil drums without drip tray was observed. Drip tray should be provided for all chemical containers storage on site. (Administrative building)	• The captioned oil drums were removed from the site
22 April 2016	• No adverse environmental issue was observed.	NA
29 April 2016	• No adverse environmental issue was observed.	NA

Contract 3

8.2.3 In the Reporting Period, joint site inspection for Contract 3 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **6, 11, 20 and 25 April 2016**. No non-compliance was noted.

8.2.4 The findings / deficiencies of ***Contract 3*** that observed during the weekly site inspection are listed in ***Table 8-2***.

Table 8-2 Site Observations for Contract 3

Date	Findings / Deficiencies	Follow-Up Status
6 April 2016	• Stagnant water was observed at Pier AC5. The Contractor should remove the stagnant water or add larvicidal oil as temporary measure to prevent mosquito breeding.	• Larvicide was applied to prevent mosquito breeding.
11 April 2016	• No adverse environmental issue was observed.	• NA
20 April 2016	• Stagnant water cumulated inside the lifting eyes of the concrete block was observed. The contractor should fill sand inside the lifting eye to prevent stagnant water	• Sand was filled into the lifting eye of concrete block to avoid stagnant water accumulation.

Date	Findings / Deficiencies	Follow-Up Status
	accumulation. (Pier AD9) • Drip tray for a generator missing a plug was observed. The contractor should plug the drip tray to prevent chemical waste inside spillage on ground. (SA14)	• Plug was provided for the drip tray to prevent chemical waste spillage.
25 April 2016	• No adverse environmental issue was observed. • The Contractor was reminded to carry out regular maintenance work for the generator at PC5 to avoid continuous smoke emission.	• NA • Not required for reminder.

Contract 5

8.2.5 In the Reporting Period, joint site inspection for Contract 5 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **5, 12, 19, 26 April 2016**. No non-compliance was noted.

8.2.6 The findings / deficiencies of ***Contract 5*** that observed during the weekly site inspection are listed in ***Table 8-3***.

Table 8-3 Site Observations for Contract 5

Date	Findings / Deficiencies	Follow-Up Status
5 April 2016	• No adverse environmental issue was observed.	• NA
12 April 2016	• No adverse environmental issue was observed.	• NA
19 April 2016	• Stagnant water cumulated inside the constructing u-channel was observed. The Contractor should drain away to prevent mosquito breeding.	• Larvicidal oil has been sprayed into the stagnant water.
26 April 2016	• No adverse environmental were observed.	• NA

Contract 6

8.2.7 In the Reporting Period, joint site inspection for Contract 6 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **7, 14, 21, 28 April 2016**. No non-compliance was noted.

8.2.8 The findings / deficiencies of ***Contract 6*** that observed during the weekly site inspection are listed in ***Table 8-4***.

Table 8-4 Site Observations for Contract 6

Date	Findings / Deficiencies	Follow-Up Status
7 April 2016	• Smoke emission from a power generator at BCP was observed, the Contractor should provide maintenance or replace it. • Stagnant water at a pit in BCP was observed, the Contractor should remove the stagnant water to prevent mosquito breeding.	• Exhaust filter of the air compressor has been replaced. • Stagnant water has been removed.

Date	Findings / Deficiencies	Follow-Up Status
14 April 2016	• Tree without fencing was observed at STKC2P2, the Contractor should provide tree protection zone. • The Contractor was reminded to display NEL and NRMM for new air compressor at BCP.	• Tree protection zone has been set up. • Not required for reminder
21 April 2016	• The AquaSeds (SH-8) at Bridge A should be maintained regularly and make sure the quality of the effluent is complied with the requirements of the draft application license. • The Contractor was reminded to remove stagnant water in drip tray as raining season has arrived. •	• Maintenance of the AquaSed (SH-8) has been carried out and effluent quality has been improved. • Not required for reminder.
28 April 2016	• Smoke emitted from an air compressor at Bridge D was observed, the Contractor should provide maintenance to prevent smoke emission.	• Air compressor at Bridge D was maintained. No smoke emission was observed.
	• At site area Bridge D, turbid water discharged from an AquaSed (SH-15) was observed, JV has therefore immediately stopped the operation of the AquaSed and agreed to modify and review the performance of the wastewater treatment before resume the operation.	• Maintenance work was carried out and the quality of effluent was improved.
	• A tree without proper fencing at Bridge B was found, the Contractor should fence off the tree and provide a tree protection zone.	• Proper fencing for tree at Bridge B was provided.

Contract SS C505

8.2.9 In the Reporting Period, joint site inspection for Contract SS C505 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **6, 13, 20, 27 April 2016.** No non-compliance was noted.

8.2.10 The findings / deficiencies of ***Contract SS C505*** that observed during the weekly site inspection are listed in ***Table 8-5***.

Table 8-5 Site Observations for Contract SS C505

Date	Findings / Deficiencies	Follow-Up Status
6 April 2016	• Stagnant water was observed at Portion 1. The Contractor should remove the stagnant water to prevent mosquito breeding.	• Stagnant water was pumped away and the uneven ground was filled with soil to avoid stagnant water being stored.
13 April 2016	• Overflow of wastewater from AquaSed at Portion 1 was observed. The Contractor should review the wastewater treatment system and ensure no overflow	• No overflow of wastewater from the AquaSed was observed.

Date	Findings / Deficiencies	Follow-Up Status
	of wastewater.	
20 April 2016	• Stagnant water was observed near PTB at Portion 1. The Contractor should remove the stagnant water to prevent mosquito breeding.	• Stagnant water accumulated in the storage area in PTB at Portion 1 was cleared by water pump.
27 April 2016	• No adverse environmental issue was observed.	NA

Contract 7

8.2.11 In the Reporting Period, joint site inspection for Contract 7 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **5, 12, 19, 26 April 2016**. No non-compliance was noted.

8.2.12 The findings / deficiencies of ***Contract 7*** that observed during the weekly site inspection are listed in ***Table 8-6***.

Table 8-6 Site Observations for Contract 7

Date	Findings / Deficiencies	Follow-Up Status
5 April 2016	• No adverse environmental issue was observed.	NA
12 April 2016	• No adverse environmental issue was observed.	NA
19 April 2016	• The Contractor was reminded that the chemical containers should be avoided to be placed nearby the river.	• Not required for reminder.
26 April 2016	• No adverse environmental issue was observed.	NA

8.2.13 Overall, general housekeeping such as daily site tidiness and cleanliness should be maintained for all Contracts. Furthermore, the Contractors were reminded to implement Waste Management Plan of the Project.

Other Contracts

8.2.14 Since Contract 4 has not yet commenced, no site inspection were performed.

9 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

9.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

9.1.1 In the Reporting Period, no summons and prosecution under the EM&A Programme was lodged for Contracts 2, 3, 5, 6, 7 and Contract SS C505. However, a total of five (5) documented environmental complaint was received in the reporting month on between 22nd and 29th by EPD or CEDD or RE regarding water pollution and construction dust issues at Sha Tau Kok Road and Wo Keng Shan Road.

9.1.2 Upon receipt of the complaints, RE, IEC and ET with the relevant Contractors has immediately undertaken investigation. In the Reporting Period, all complaints of investigation are not yet completed and ongoing. The detail of complaints is presented below.

Investigation Result for the Documented Complaints received by CEDD on 22 April 2016

9.1.3 On 22 April 2016, CEDD received a complaint regarding to the direct discharge of wastewater into the manhole. This complaint is under investigation and the result will be presented in the coming monthly EM&A report.

Investigation Result for the Documented Complaints received by CEDD on 20 April 2016

9.1.4 On 20 April 2016, CEDD received a complaint from the Sha Tau Kok District Rural Committee expressing their concerns with respect to discharge of suspected untreated muddy water from the construction sites at Wo Keng Shan Road and Sha Tau Kok Road into the existing river channel. The discharge of muddy water causing water pollution and accumulation of silt and sediment in the river channel which affecting the livelihood of the nearby resident. This complaint is under investigation and the result will be presented in the coming monthly EM&A report.

Investigation Result for the Documented Complaints received by CEDD on 22 April 2016

9.1.5 On 22 April 2016, CEDD received a complaint from Sha Tau Kok District Rural Committee expressing their concerns with respect to pumping water from the exiting river channel near Ping Yuen Road for construction purpose without prior notice to villager and discharging suspected untreated muddy water into the river channel. It seriously affects the villagers especially for those making life on agriculture. Moreover, the construction causing loss of groundwater source which highly affecting the livelihood of the villagers who making life on farming. This complaint is under investigation and the result will be presented in the coming monthly EM&A report.

Investigation Result for the Documented Complaints received by 1823 on 21 April 2016

9.1.6 A complaint was received from 1823 on 21 April 2016 and passed to CEDD and EPD. The complaint location is the construction site of junction of Sha Tau Kok Road and Wo Keng Shan Road (Loi Tung Village). There are two concerns. Firstly, dust generated from the site affected the nearby farmlands. It is suspected that the dump trucks getting out of the site had not been washed in wheel washing facilities. And the site had not carried out water spraying on the excavated materials. Besides, it is suspected that the Contractor discharged wastewater directly into the storm drain, affecting the residents and farmers of Tai Tong Wu. This complaint is under investigation and the result will be presented in the coming monthly EM&A report.

Investigation Result for the Documented Complaints received by 1823 on 28 April 2016

9.1.7 A complaint was received on 28 April 2016 from 1823 regarding to the muddy water discharged from the construction sites under Contract 6 affected the growth of crops. This complaint is under investigation and the result will be presented in the coming monthly EM&A report.

9.1.8 The statistical summary table of environmental complaint is presented in ***Tables 9-1, 9-2*** and ***9-3***.

Table 9-1 Statistical Summary of Environmental Complaints

Reporting Period	Contract No	Environmental Complaint Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 – 31 Mar 2016	Contract 2	0	**14**	• **(6) Water Quality** • **(6) Dust** • **(2) Noise**
06 Nov 2013 – 31 Mar 2016	Contract 3	0	**4**	• **(1) Dust** • **(2) Water quality** • **(1) Noise**
16 Aug 2013 – 31 Mar 2016	Contract 5	0	**2**	• **(2) Dust**
16 Aug 2013 – 31 Mar 2016	Contract 6	0	**7**	• **(6) Water Quality** • **(1) Dust**
15 Feb 2016 – 31 Mar 2016	Contract 7	0	**0**	**N/A**
16 Aug 2013 – 31 Mar 2016	SS C505	0	**0**	**N/A**
1 – 30 Apr 2016	Contract 2	**1**	**16**	• **(7) Water Quality** • **(7) Dust** • **(2) Noise**
	Contract 3	0	**4**	• **(1) Dust** • **(2) Water quality** • **(1) Noise**
	Contract 5	0	**2**	• **(2) Dust**
	Contract 6	**5**	**12**	• **(11) Water Quality** • **(1) Dust**
	Contract 7	0	**0**	**N/A**
	SS C505	0	**0**	**N/A**

Table 9-2 Statistical Summary of Environmental Summons

Reporting Period	Contract No	Environmental Summons Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 – 31 Mar 2016	Contract 2	0	0	NA
06 Nov 2013 – 31 Mar 2016	Contract 3	0	0	NA
16 Aug 2013 – 31 Mar 2016	Contract 5	0	0	NA
16 Aug 2013 – 31 Mar 2016	Contract 6	0	0	NA
15 Feb 2016 – 31 Mar 2016	Contract 7	0	0	NA
16 Aug 2013 – 31 Mar 2016	SS C505	0	0	NA
1 – 30 Apr 2016	Contract 2	0	0	NA
	Contract 3	0	0	NA
	Contract 5	0	0	NA
	Contract 6	0	0	NA
	Contract 7	0	0	NA
	SS C505	0	0	NA

Table 9-3 Statistical Summary of Environmental Prosecution

Reporting Period	Contract No	Environmental Prosecution Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 – 31 Mar 2016	Contract 2	0	0	NA
06 Nov 2013 – 31 Mar 2016	Contract 3	0	0	NA
16 Aug 2013 – 31 Mar 2016	Contract 5	0	0	NA
16 Aug 2013 – 31 Mar 2016	Contract 6	0	0	NA
15 Feb 2016 – 31 Mar 2016	Contract 7	0	0	NA
16 Aug 2013 – 31 Mar 2016	SS C505	0	0	NA
1 – 30 Apr 2016	Contract 2	0	0	NA
	Contract 3	0	0	NA
	Contract 5	0	0	NA
	Contract 6	0	0	NA
	Contract 7	0	0	NA
	SS C505	0	0	NA

The Other Contracts

9.1.9 Since the construction works at the Contract 4 has not yet commenced, no environmental complaint, summons and prosecution under the EM&A Programme are registered in the Reporting Period.

10 IMPLEMENTATION STATUS OF MITIGATION MEASURES

10.1 GENERAL REQUIREMENTS

10.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the approved EM&A Manual covered the issues of dust, noise, water and waste and they are summarized presented in ***Appendix M.***

10.1.2 All contracts under the Project shall be implementing the required environmental mitigation measures according to the approved EM&A Manual as subject to the site condition. Environmental mitigation measures generally implemented by Contracts 2, 3, 5, 6, 7 and Contract SS C505 in this Reporting Period are summarized in ***Table 10-1***.

Table 10-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	• Wastewater to be treated by the wastewater treatment facilities i.e. sedimentation tank or similar facility before discharge.
Air Quality	• Maintain damp / wet surface on access road • Low vehicular speed within the works areas. • All vehicles must use wheel washing facility before off site • Sprayed water during breaking works • A cleaning truck was regularly performed on the public road to prevent fugitive dust emission
Noise	• Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. • Keep good maintenance of plants • Place noisy plants away from residence or school • Provide noise barriers or hoarding to enclose the noisy plants or works • Shut down the plants when not in used.
Waste and Chemical Management	• On-site sorting prior to disposal • Follow requirements and procedures of the "Trip-ticket System" • Predict required quantity of concrete accurately • Collect the unused fresh concrete at designated locations in the sites for subsequent disposal
General	• The site was generally kept tidy and clean.

10.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

10.2.1 Construction activities as undertaken in the coming month for the Project lists below:

Contract 2

Mid-Vent Portal	• Tube excavation (NB+SB) • Adit invert slab • Ventilation building superstructure
North Portal	• Retaining walls and slope stabilization • Northbound top heading excavation and tunnel enlargement • TBM excavation
South Portal	• Southbound and Northbound D&B excavation • Building works superstructure
Admin Building	• Building works foundation & superstructure

Contract 3

- Cable detection and trial trenches
- Decking construction for Bridge E
- Filling works at Tong Hang East
- Storm Drains Laying

- Noise barrier construction
- Pier / Pier Table construction
- Pile cap works
- Portal beam construction
- Pre-drilling works and piling works for viaduct
- Retaining Wall construction
- Road works at Fanling Highway
- Sewer works
- Slope works
- Socket H-pile installation
- Tree felling works
- Utilities duct laying
- Viaduct segment erection
- Water works
- Per-drilling works for noise barrier

Contract 5

- Laying of rising main (VO61) at LMH road
- Bituminous laying at existing LMH road.
- Brick laying at footpath of LMH road
- Road works (kerb and bituminous laying) at existing LMH road
- Irrigation system at existing LMH Road
- Installation of underground utilities at existing LMH road
- Planting works at proposed & existing LMH road

Contract 6

- Site Clearance
- Slope Works
- Site Accesses Construction
- Ground Investigation Works
- Soil Nail
- Bored Piling
- Pile Cap Construction
- Tunnel Excavation
- Sewage Treatment Plant Construction

Contract 7

- Ground Investigation Works for Bridge A and E
- Piling Works for Bridge A to E
- Pile cap construction for Bridge B, C, D

Contract SS C505

- General Site Setup
- CLP temporally sub-station works
- Building no. 5 and 9 construction
- Tower Crane TC10 Construction
- H-pile works and load test
- Disassembly of crawler crane
- Grouting and full core to completed bored piles
- Underground drainage works
- Erection of Welfare Shelter
- Prototype “A” Construction works
- Prototype “B” footing construction
- Formwork and falsework for PTB’s slap construction

- Pile cap construction for PTB
- Tower Crane Construction
- Pile Cap construction for building number 4, 6 and 7
- Bridge construction works including construction of bridge column, retaining wall, pile cap

10.3 KEY ISSUES FOR THE COMING MONTH

10.3.1 Key issues to be considered in the coming month for Contracts 2, 3, 5, 6, 7 and SS C505 include:

- Implementation of control measures for rainstorm;
- Regular clearance of stagnant water during wet season;
- Implementation of dust suppression measures at all times;
- Potential wastewater quality impact due to surface runoff;
- Potential fugitive dust quality impact due from the dry/loose/exposure soil surface/dusty material;
- Disposal of empty engine oil containers within site area;
- Ensure dust suppression measures are implemented properly;
- Sediment catch-pits and silt removal facilities should be regularly maintained;
- Management of chemical wastes;
- Discharge of site effluent to the nearby wetland, stockpiling or disposal of materials, and any dredging or construction area at this area are prohibited;
- Follow-up of improvement on general waste management issues; and
- Implementation of construction noise preventative control measures

10.3.2 Contract 4 has not yet commenced and no environmental issue is presented.

11 CONCLUSIONS AND RECOMMENDATIONS

11.1 CONCLUSIONS

11.1.1 This is the **33th** monthly EM&A report presenting the monitoring results and inspection findings for the Reporting Period from **1** to **30 April 2016**.

11.1.2 For air quality monitoring, no 1-hour and 24-hour TSP monitoring results triggered the Action or Limit Levels were recorded. No NOEs or the associated corrective actions were therefore issued.

11.1.3 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in the Reporting Period. No NOEs or the associated corrective actions were therefore issued.

11.1.4 For water quality monitoring, a total of thirty-nine (39) Action/ Limit Levels (AL/LL) exceedances, namely nineteen (19) LL exceedances of turbidity and twenty (20) AL/LL exceedances of Suspended Solids. The investigations for the cause of exceedances have been conducted by the ET and the associated investigation reports were submitted to relevant parties

11.1.5 No environmental summons or successful prosecutions were recorded in the Reporting Period.

11.1.6 In this Reporting Period, a total five (5) documented environmental complaint was received in the reporting month between 22nd and 29th by EPD or CEDD or RE regarding water pollution and construction dust issues at Sha Tau Kok Road and Wo Keng Shan Road. Upon receipt of the complaints, RE, IEC and ET with the relevant Contractors has immediately undertaken investigation. In the Reporting Period, all complaints of investigation are not yet completed and ongoing.

11.1.7

11.1.8 During the Reporting Period, weekly joint site inspection by the RE, IEC, ET with the relevant Main-contractor were carried out for Contracts 2, 3, 5, 6, 7 and SS C505 in accordance with the EM&A Manual stipulation. No non-compliance observed during the site inspection.

11.2 RECOMMENDATIONS

11.2.1 In upcoming wet season, preventive measures for muddy water or other water pollutants from site surface flow to local stream such as Kong Yiu Channel, Ma Wat Channel, Ping Yuen River or public area would be the key issue. The Contractors should paid special attention on water quality mitigation measures and fully implement according ISEMM of the EM&A Manual, in particular for working areas near Ma Wat Channel and Ping Yuen River. Moreover, all effluent discharge shall be ensure to fulfill Technical Memorandum of Effluent Discharged into Drainage and Sewerage Systems, inland and Coastal Waters criteria or discharge permits stipulation.

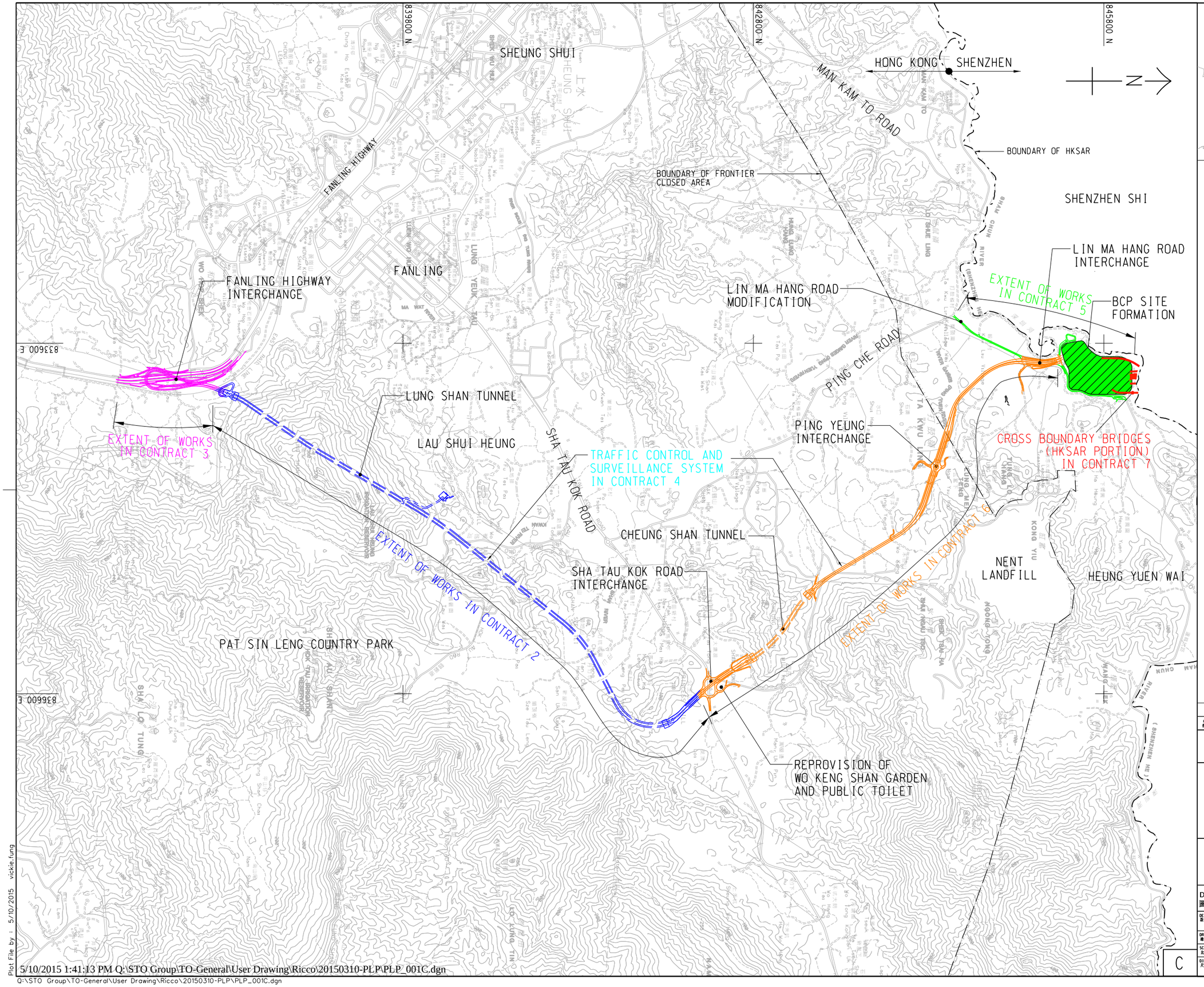
11.2.2 Construction noise would be a key environmental issue during construction work of the Project. Noise mitigation measures such as using quiet plants should be implemented in accordance with the EM&A requirement.

11.2.3 Since most of construction sites under the Project are located adjacent to villages, the Contractors should fully implement air quality mitigation measures to reduce construction dust emission.

11.2.4 Furthermore, daily cleaning and weekly tidiness shall be properly performed and maintained. In addition, mosquito control should be kept to prevent mosquito breeding on site.

Appendix A

Layout plan of the Project



LOCATION PLAN
SCALE 1 : 30000

LEGEND:

UNDERGROUND WORKS

REV. 修訂	DESCRIPTION 內容摘要	D.E. CHECKED 查核	P.E.	DATE 日期

土木工程拓展署
Civil Engineering and Development Department

LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS (SITE FORMATION AND INFRASTRUCTURES) - DESIGN AND CONSTRUCTION

PROJECT LAYOUT PLAN

AECOM

DRG.NO. 圖紙編號 60212563/PLP/001

DESIGNED BY 設計	CONTRACT NO. 合約編號	P. Dir. APPROVED 批准人
–	–	–
DRAWN BY 繪圖 ZJ	STATUS 階段	
SCALE 比例 A1 1 : 15000 A3 1 : 30000		
DIMENSIONS ARE IN 尺寸單位 METRES	© COPYRIGHT RESERVED 版權所有	

C

Plot File by : 5/10/2015 vickie.fung

5/10/2015 1:41:13 PM Q:\STO Group\TO-General\User Drawing\Ricco\20150310-PLP\PLP_001C.dgn

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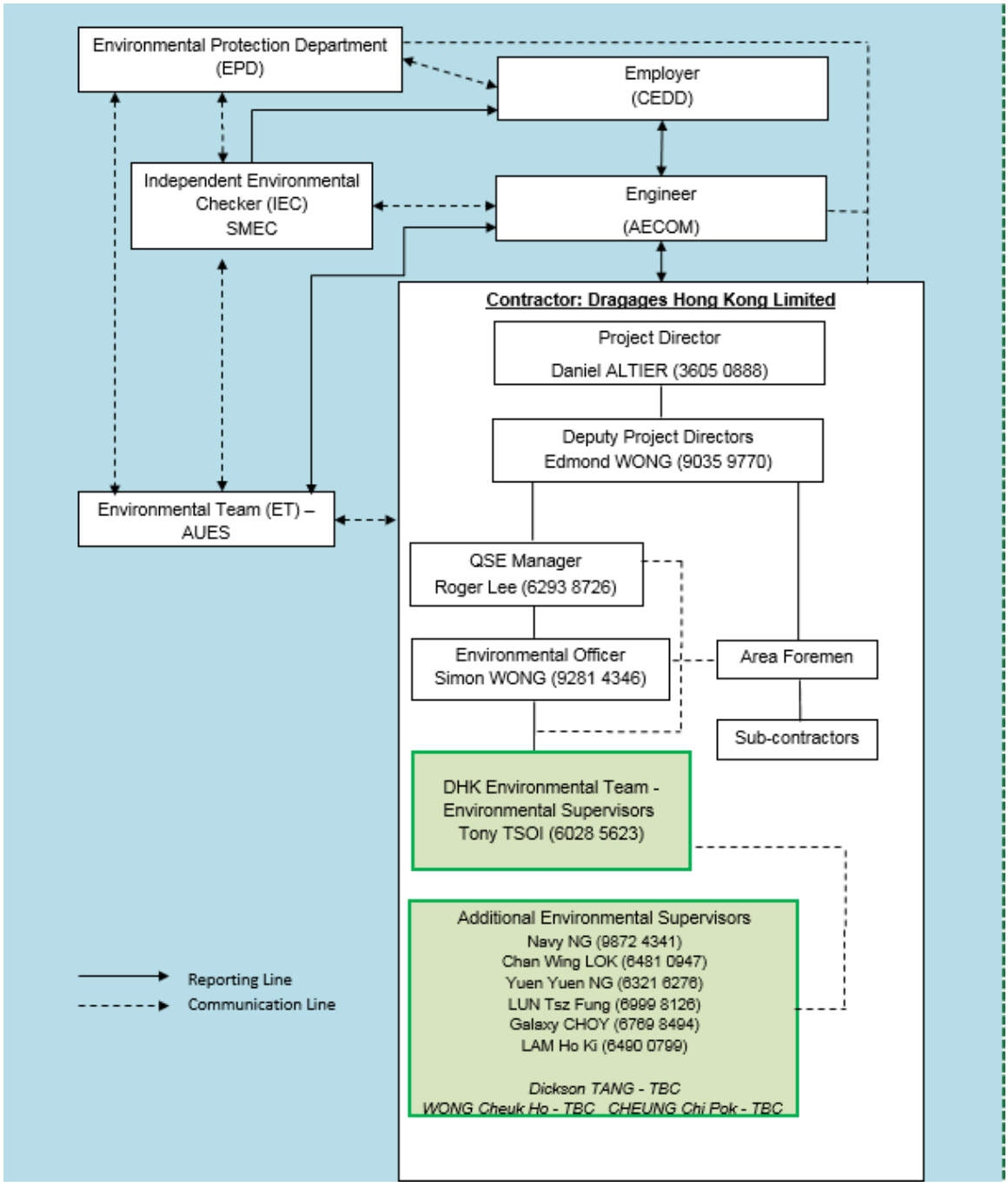
Appendix B

Organization Chart



Environmental Management Organization for Contract 2 - (CV/2012/08)

Contact Details of Key Personnel for Contract 2 - CV/2012/08

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Gregory Lo	2171 3300	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
DHK	Project Director	Daniel Altier	2171 3004	2171 3299
DHK	Deputy Project Manager	Edmond Wong	2171 3004	2171 3299
DHK	QSE Manager	Roger Lee	6293 8726	2171 3299
DHK	Environmental Officer	Simon Wong	2171 3004	2171 3299
DHK	Environmental Supervisor	Sophie Baycheuer	6321 5001	2171 3299
DHK	Environmental Supervisor	Tony Tsoi	6028 5623	2171 3299
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

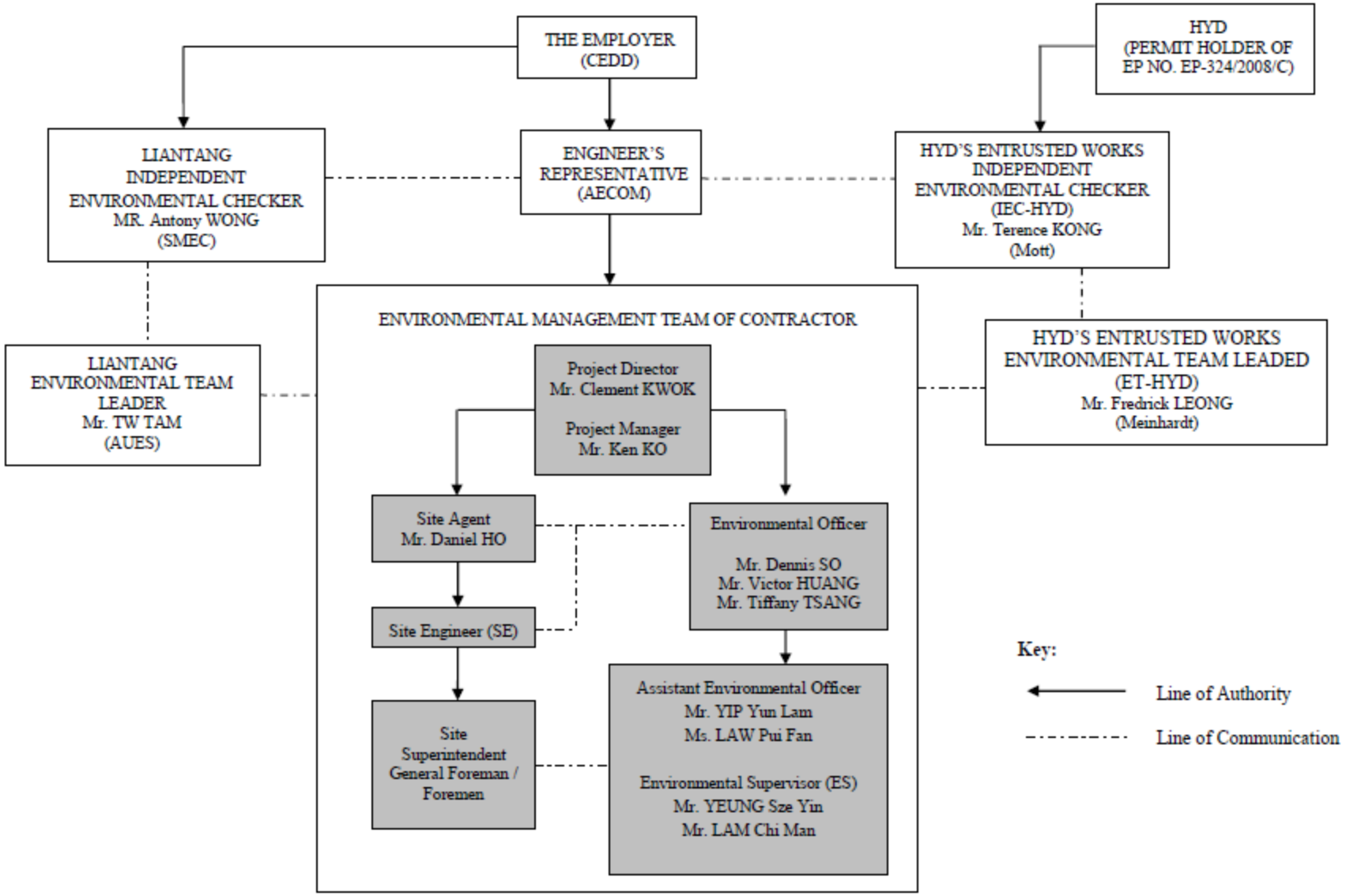
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

DHK(Main Contractor) –Dragages Hong Kong Ltd.

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization for Contract 3 - CV/2012/09

Contact Details of Key Personnel for Contract 3 - CV/2012/09

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Alan Lee	2171 3300	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
Chun Wo	Project Director	Clement Kwok	3758 8735	2638 7077
Chun Wo	Project Manager	Ken Ko	2638 6136	2638 7077
Chun Wo	Site Agent	Daniel Ho	2638 6144	2638 7077
Chun Wo	Environmental Officer	Victor Huang Tiffany Tsang Dennis So	2638 6115	2638 7077
Chun Wo	Assistant Environmental Officer	Yip Yun Lam Law Pui Fan	2638 6125	2638 7077
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

CEDD (Employer) – Civil Engineering and Development Department

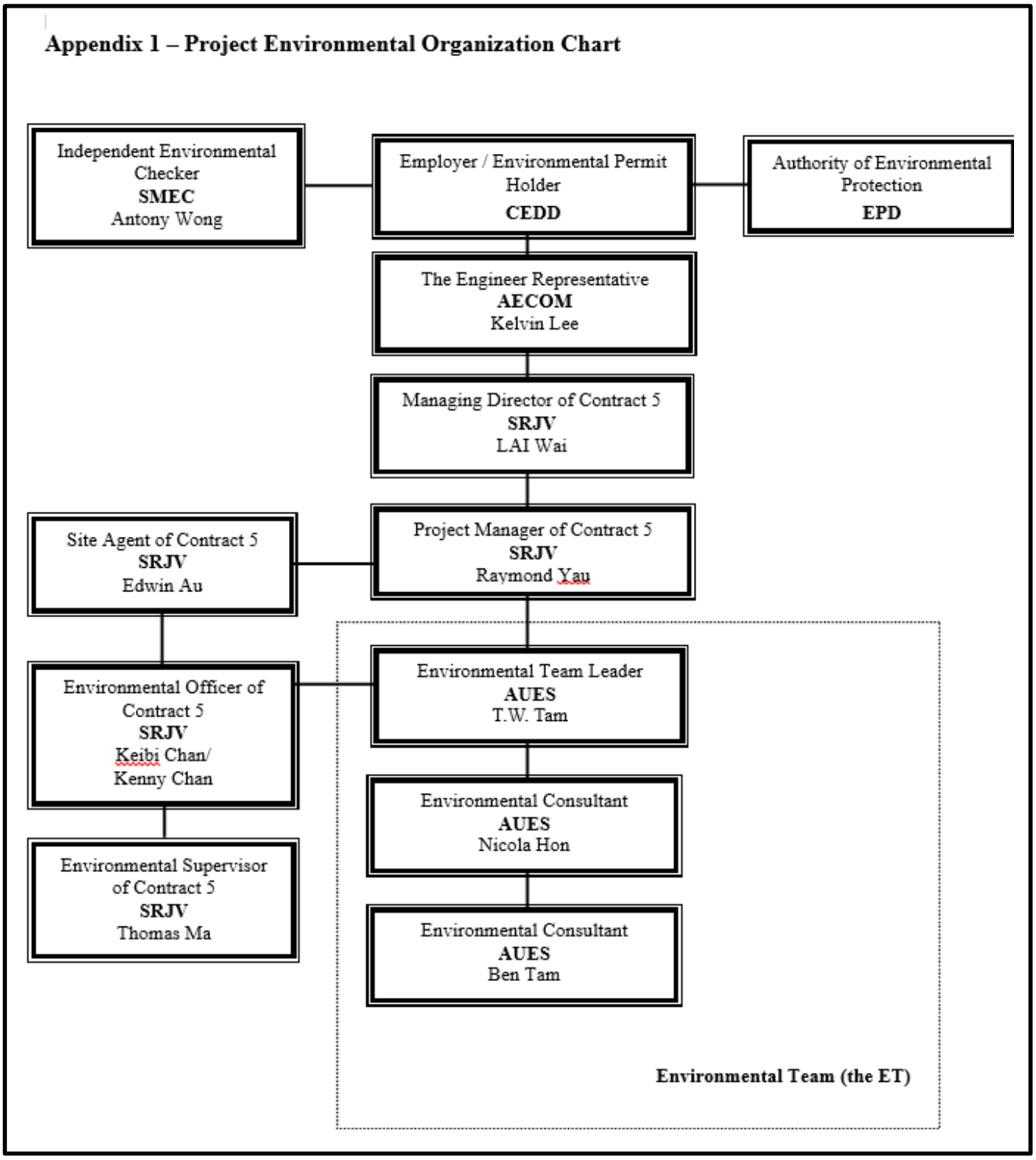
AECOM (Engineer) – AECOM Asia Co. Ltd.

Chun Wo (Main Contractor) – Chun Wo Construction Ltd.

SMEC (IEC) – SMEC Asia Limited

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

Appendix 1 – Project Environmental Organization Chart



Environmental Management Organization – CV/2013/03

Contact Details of Key Personnel for Contract 5 - CV/2013/03

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
AECOM	Engineer's Representative	Kelvin Lee	2674 2273	2674 7732
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
SRJV	Project Director	LAI Wai	--	2403 1162
SRJV	Contract Manager	Raymond Yu	9041 1620	2403 1162
SRJV	Project Manager	Aaron Mak	9464 7095	2403 1162
SRJV	Site Agent	Edwin Au	9208 7329	2403 1162
SRJV	Environmental Officer	Chan Ng jhon-keibi / Kenny Chan	6090 0183	2403 1162
SRJV	Environmental Supervisor	Thomas Ma	-	2403 1162
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

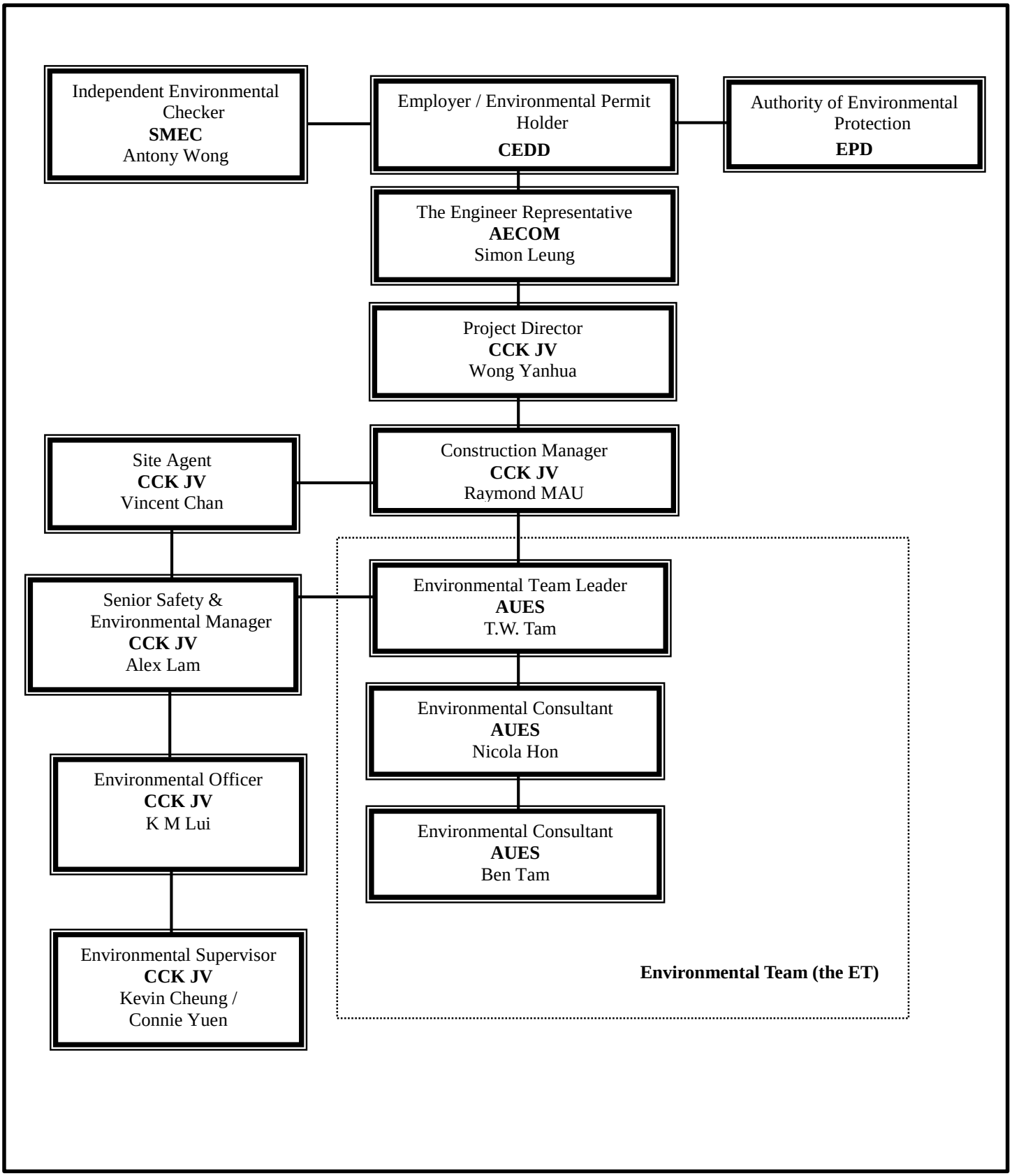
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

SRJV (Main Contractor) – Sang Hing Civil – Richwell Machinery JV

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization – CV/2013/08

Contact Details of Key Personnel for Contract 6 - CV/2013/03

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
AECOM	Engineer's Representative	Simon Leung	2674 2273	2674 7732
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
CCK JV	Project Director	Wang Yanhua	6190 4212	--
CCK JV	Construction Manager	Raymond Mau Sai-Wai	9011 5340	--
CCK JV	Site Agent	Vincent Chan	9655 9404	--
CCK JV	Senior Safety & Environmental Manager	Alex Lam	5547 0181	--
CCK JV	Environmental Officer	K M Lui	51138223	--
CCK JV	Environmental Supervisor	Kevin Cheung/ Connie Yeun	6316 6931 6117 1344	--
AUES	Environmental Team Leader	TW Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079

Legend:

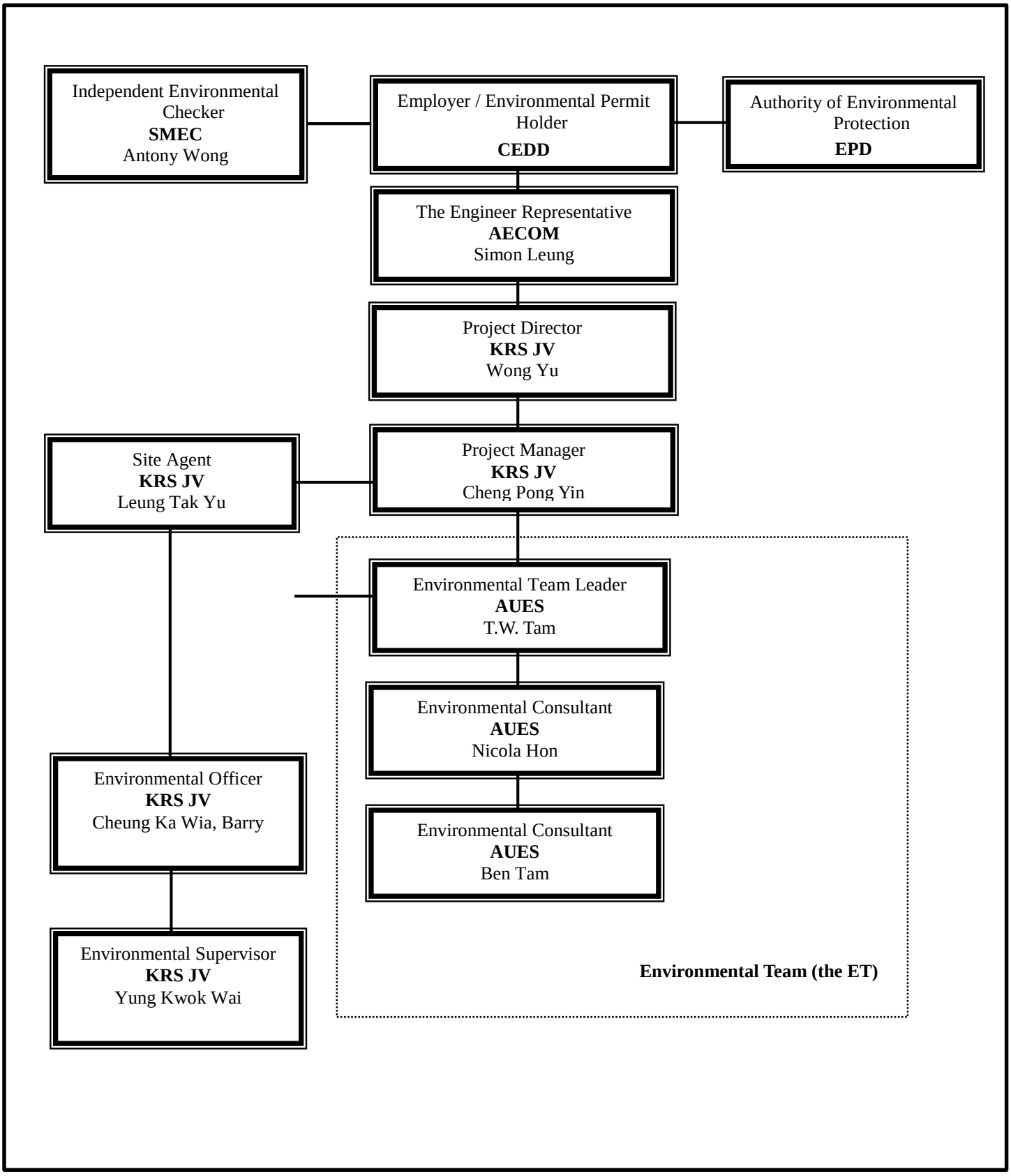
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

CCK JV (Main Contractor) – CRBE-CEC-Kaden Joint Venture

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization –NE/2014/03

Contact Details of Key Personnel for Contract 7 – NE/2014/03

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
AECOM	Engineer's Representative	Simon Leung	2674 2273	2674 7732
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
CCK JV	Project Director	Wong Yu	2682 6691	2682 2783
CCK JV	Project Manager	Cheng Pong Yin	9023 4821	2682 2783
CCK JV	Site Agent	Leung Tak Yu	9705 7536	2682 2783
CCK JV	Environmental Officer	Cheung Ka Wia, Barry	6117 2339	2682 2783
CCK JV	Environmental Supervisor	Yung Kwok Wai	6592 3084	2682 2783
AUES	Environmental Team Leader	TW Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079

Legend:

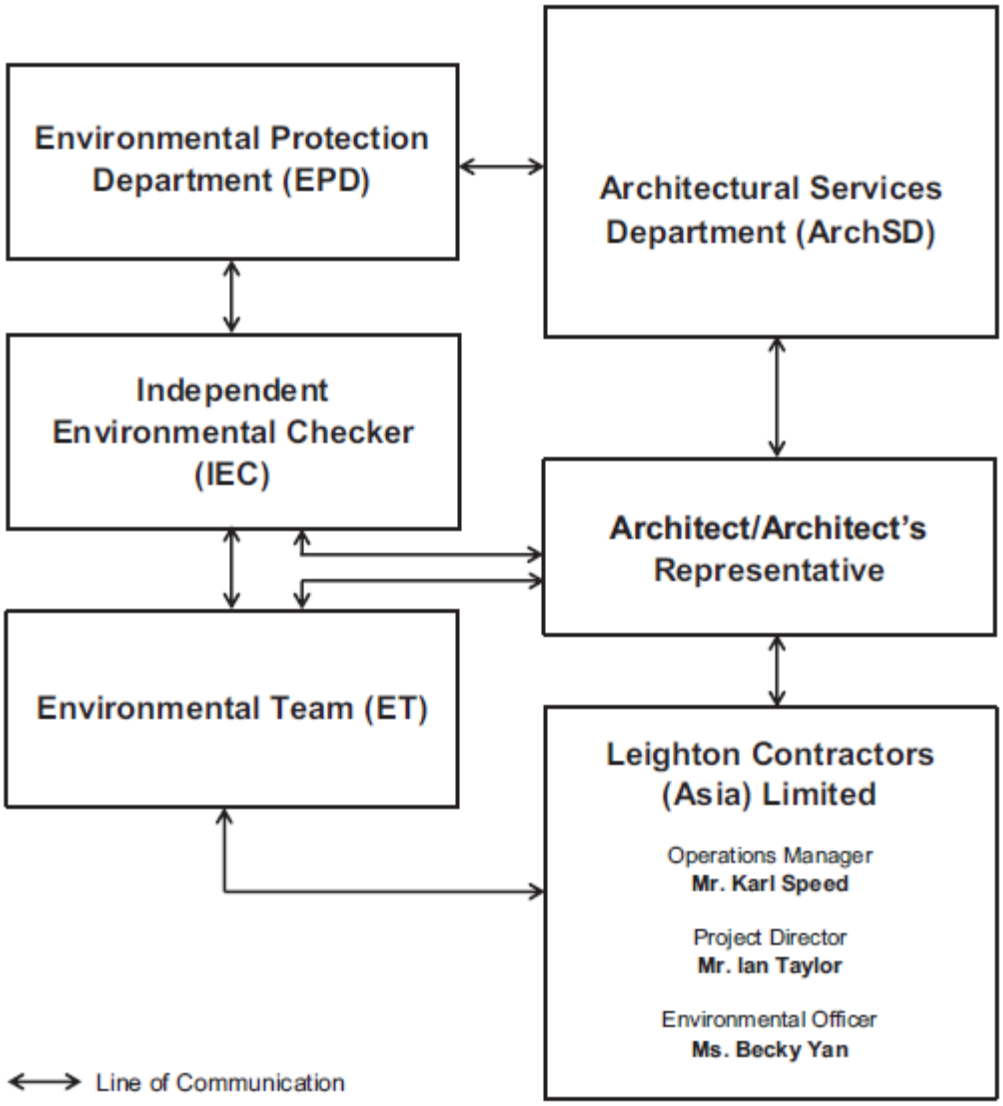
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

KRS JV (Main Contractor) –Kwan On-Richwell-SCG Joint Venture

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organigram

Environmental Management Organization for Contract SS C505

Contact Details of Key Personnel for Contract SS C505

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
ArchSD	Works agent for the Development Bureau (DEVB)	Mr. William Cheng	2867 3904	2804 6805
Ronald Lu & Partners	Architect/ Architect's Representative	Mr. Justin Cheung	3189 9272	2834 5442
SMEC	Independent Environmental Checker	Mr. Antony Wong	3995 8120	3995 8101
Leighton	Operation Manager	Mr. Karl Speed	2823 1433	25298784
Leighton	Project Director	Mr. Ian Taylor	2858 1519	2858 1899
Leighton	Environmental Officer	Ms. Becky Yan	3973 1069	-
Leighton	Assistant Environmental Officer	Ms. Penny Yiu	3973 0818	-
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Mr. Ben Tam	2959 6059	2959 6079

Legend:

ArchSD (Project Proponent) –Architectural Services Department

Ronald Lu & Partners (Architect/ Architect's Representative) –Ronald Lu & Partners (Hong Kong) Ltd

Leighton (Main Contractor) – Leighton Contractors (Asia) Limited

SMEC (IEC) – SMEC Asia Limited

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

Appendix C

3-month rolling construction program

Contract 2

Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
CEDD Contract No: CV/2012/08
Main Contractor: Dragages Hong Kong Ltd

Tentative Three Months (May, June, July 2016) Construction Rolling Progam

Item	Construction Activites
1	Admin Bldg - Building foundations and superstructure works
2	Mid Vent Portal - Adit invert slab
3	Mid Vent Portal - Adit lining works
4	Mid Vent Portal - Traditional tunnel excavation
5	Mid Vent Portal - Ventilation building superstructure works
6	North Portal - N/B tunnel - Traditional tunnel excavation
7	North Portal - S/B tunnel - TBM tunnel excavation
8	North Portal - S/B tunnel - Tunnel enlargement
9	North Portal - Retaining walls and slope stabilizations
10	South Portal - Traditional tunnel excavation
11	South Portal - Ventilation Building superstructure works

Contract 3

Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
CEDD Contract No: CV/2012/09
Main Contractor: Chun Wo Construction Ltd

俊和建築工程有限公司
CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.

Tentative Three Months (May, June, July 2016) Construction Rolling Progam

Item	Construction Activites
1	Fanling Highway South Portion - Zones 1, 2 and 3
2	Fanling Highway North Portion - Zone 4
3	Fanling Highway Kiu Tau Footbridge Reprovision (East)
4	Remaining Works for Noise Barrier along widened Fanling Highway
5	Section II - Remainder of the Works (KD-3)
6	WSD Works - Pipe Laying
7	Water Mains - Pipe Laying
8	Kau Lung Hang Valve Control & Telemetry House Reprovision
9	Existing Nam Wa Po Trunk Sewage Pumping Station (PST3)
10	Stage 1A - Realignment of Tai Wo Service Road West (KD-7)
11	Stage N4A & N4B - Realignment of Tai Wo Service Road East (KD-13 & KD-14)
12	Foundation & Pier Construction - Bridge A
13	Foundation & Pier Construction - Bridge B
14	Foundation & Pier Construction - Bridge C
15	Foundation & Pier Construction - Bridge D
16	Pier Table Construction - Bridge A
17	Pier Table Construction - Bridge B
18	Pier Table Construction - Bridge C
19	Pier Table Construction - Bridge D
20	Viaduct Bridge Segement Erection - Bridge A
21	Viaduct Bridge Segement Erection - Bridge B
22	Viaduct Bridge Segement Erection - Bridge C
23	Viaduct Bridge Segement Erection - Bridge D
24	Section VI - Works in Portion FH9 (KD-6A)
25	Secton III - Remainder of Landscaping Softworks Not Included in Secton IIIA

Contract 5

Tentative Three Months (May, June, July 2016) Construction Rolling Progam

Item	Construction Activites
1	Construction Works at Lin Ma Hang Road between Chaninage 0 to 190
2	Landscape Works

Contract 6

Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
CEDD Contract No: CV/2013/08
Main Contractor: CRBE-CEC-Kaden Joint Venture

CRBC-CEC-KADEN Joint Venture

Tentative Three Months (May, June, July 2016) Construction Rolling Progam

Item	Construction Activites
1	Slope Works
2	Bored Piling
3	Abutment and Pier Construction
4	Sewage Treatment Plant Construction
5	Road Works
6	Tunnel Works

Contract 7

Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
CEDD Contract No: NE/2014/03
Main Contractor: Kwan On-Richwell-SCG Joint Venture

均安 - 顯豐機械 - 上海建工 聯營
Kwan On - Richwell - SCG JV

Tentative Three Months Construction Rolling Progamme (May, June and July 2016)

Item	Construction Activites
1	**Bridge A - Piling**
2	**Bridge A - G.I. Works**
3	**Bridge B - Piling**
4	**Bridge B - Caps and Column**
5	**Bridge D - Piling**
6	**Bridge D - Caps and Column**
7	**Bridge E - G.I. Works**
8	**Bridge E - Piling**
9	**Bridge C - Piling**
10	**Bridge C - Caps and Column**

Contract SS C505

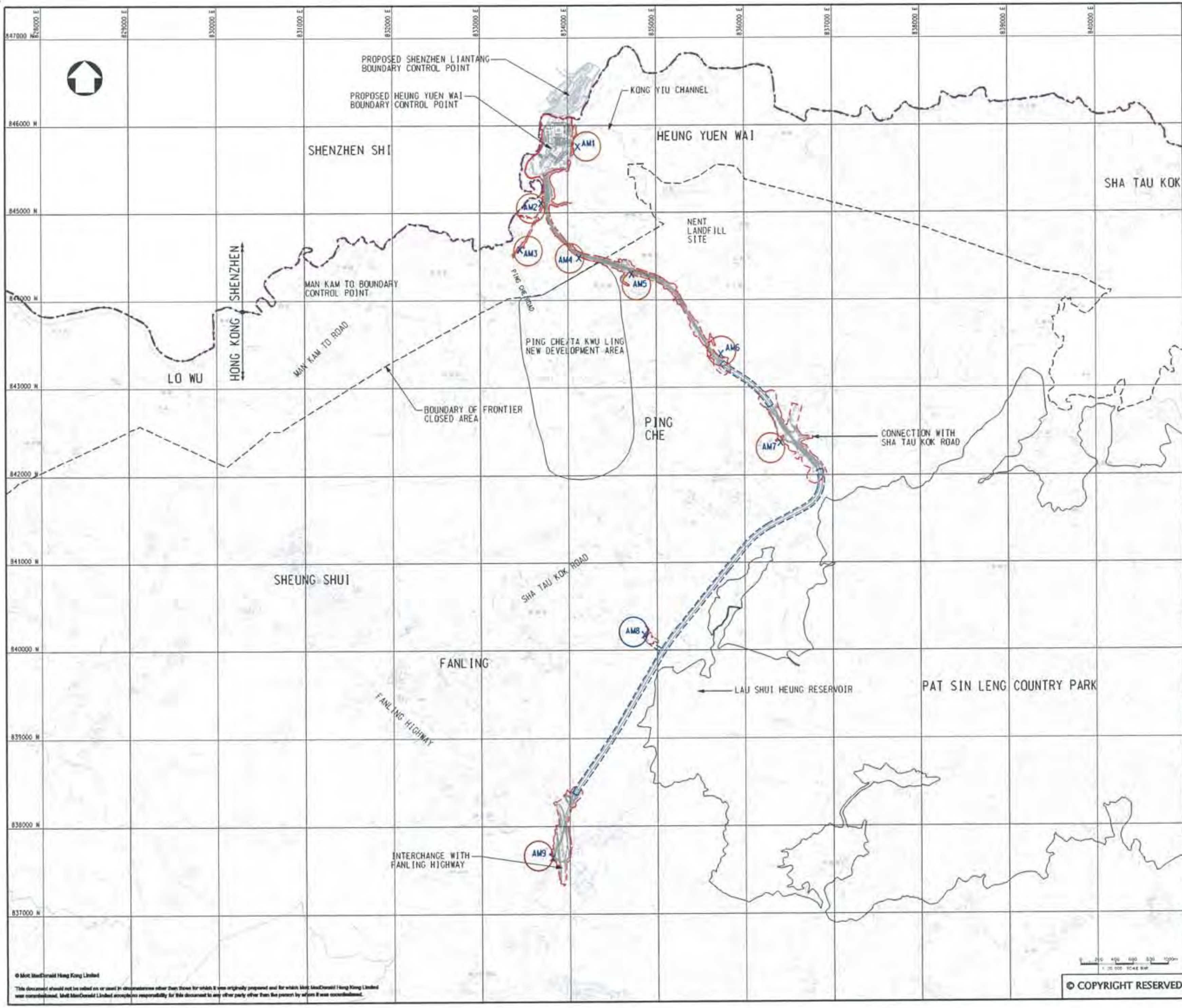
Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
ArchSD Contract No: SSC505
Main Contractor: Leighton

Tentative Three Months(May, June, July 2016) Construction Rolling Progam

Item	Construction Activites
1	Foundation for Ancillary Buildings (Portion 1) - Driven H Piles for HKPF Building
2	Foundation for Ancillary Buildings (Portion 1) - Driven H Piles for Fire Station
3	Foundation for Ancillary Buildings (Portion 1) - Driven H Piles for FXRVIS Building (Outbound)
4	Foundation for Ancillary Buildings (Portion 2) - Driven H Piles for FXRVIS Building (Inbound)
5	Foundation for Ancillary Buildings (Portion 2) - Driven H Piles for Elevated Walkways 1, 3 & 4
6	Curtain Walls, Glass Wall & Aluminium Claddings
7	Roofing
8	Suspended Ceiling, Steel Windows, Louvre and Door
9	Others
10	Bridge Movement Joint Design Submission (Bridge 4 & 5)
11	Bridge Bearing Design Submission (Bridge 1-3)

Appendix D

Designated Monitoring Locations as Recommended in the Approved EM&A Manual



LEGEND:
- BOUNDARY OF HKSAR
- WORKS AREA (ABOVE GROUND)
- WORKS AREA (TUNNEL)
- X AIR MONITORING STATIONS

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	AUG 10	WING	FIRST ISSUE	DC	HT

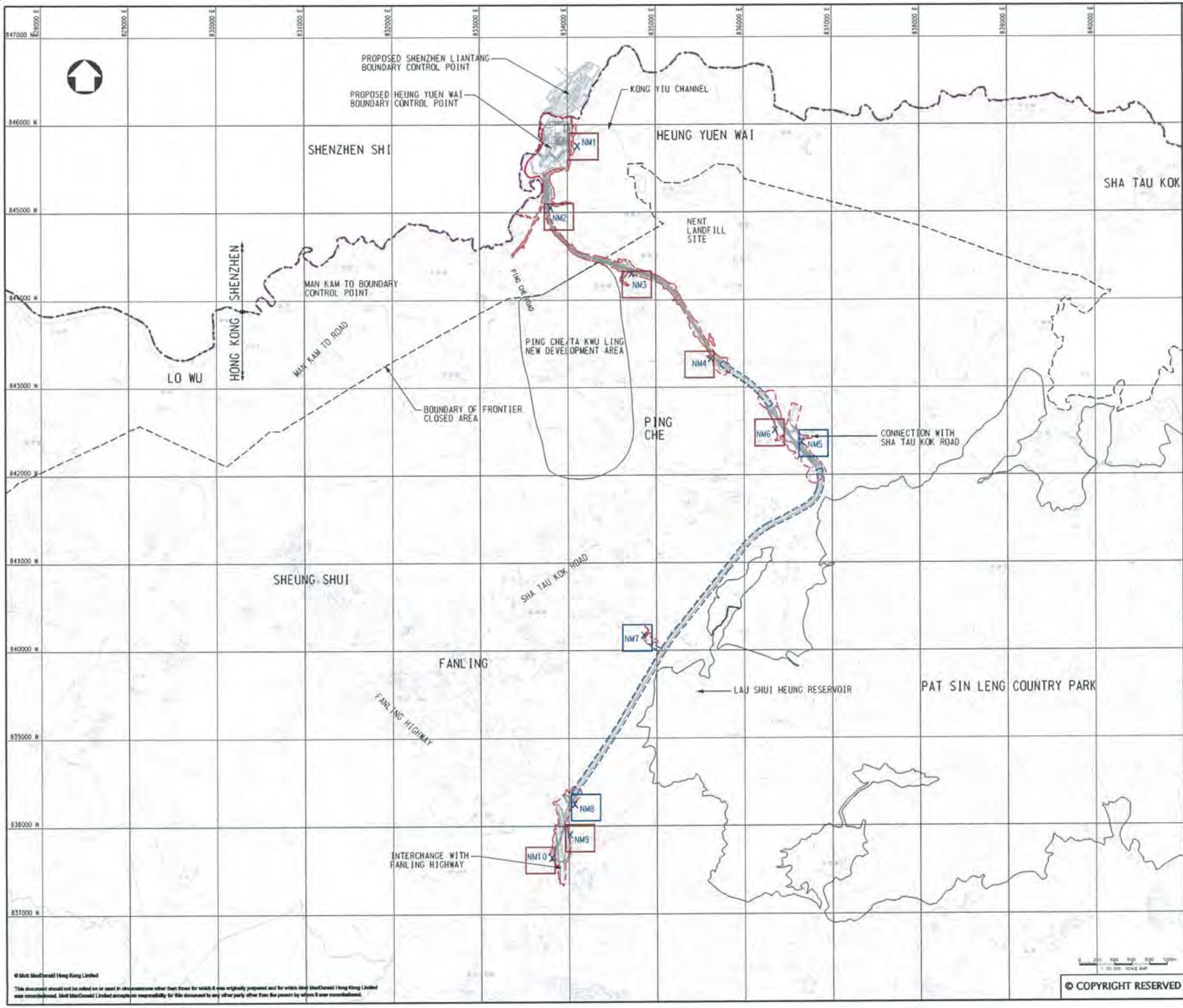
Mott MacDonald

Client: CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project: AGREEMENT NO. CE45/2008(CE) LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title: PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

Designed	DC	Eng.Chk.	EC		
Drawn	WING	Coordination	EC		
Dwg.Chk.	DC	Approved	HT		
Scale at A1	1:20000	Project	255228	Status	PRE
Drawing No	FIGURE 2.1			Rev	P1



LEGEND:

- BOUNDARY OF HKSAR
- WORKS AREA (ABOVE GROUND)
- WORKS AREA (TUNNEL)
- X CONSTRUCTION NOISE MONITORING STATIONS

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	AUG 10	WING	FIRST ISSUE	DC	HT

Mott MacDonald

20/F Two Landmark East
100 How Ming Street
Kwun Tong, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

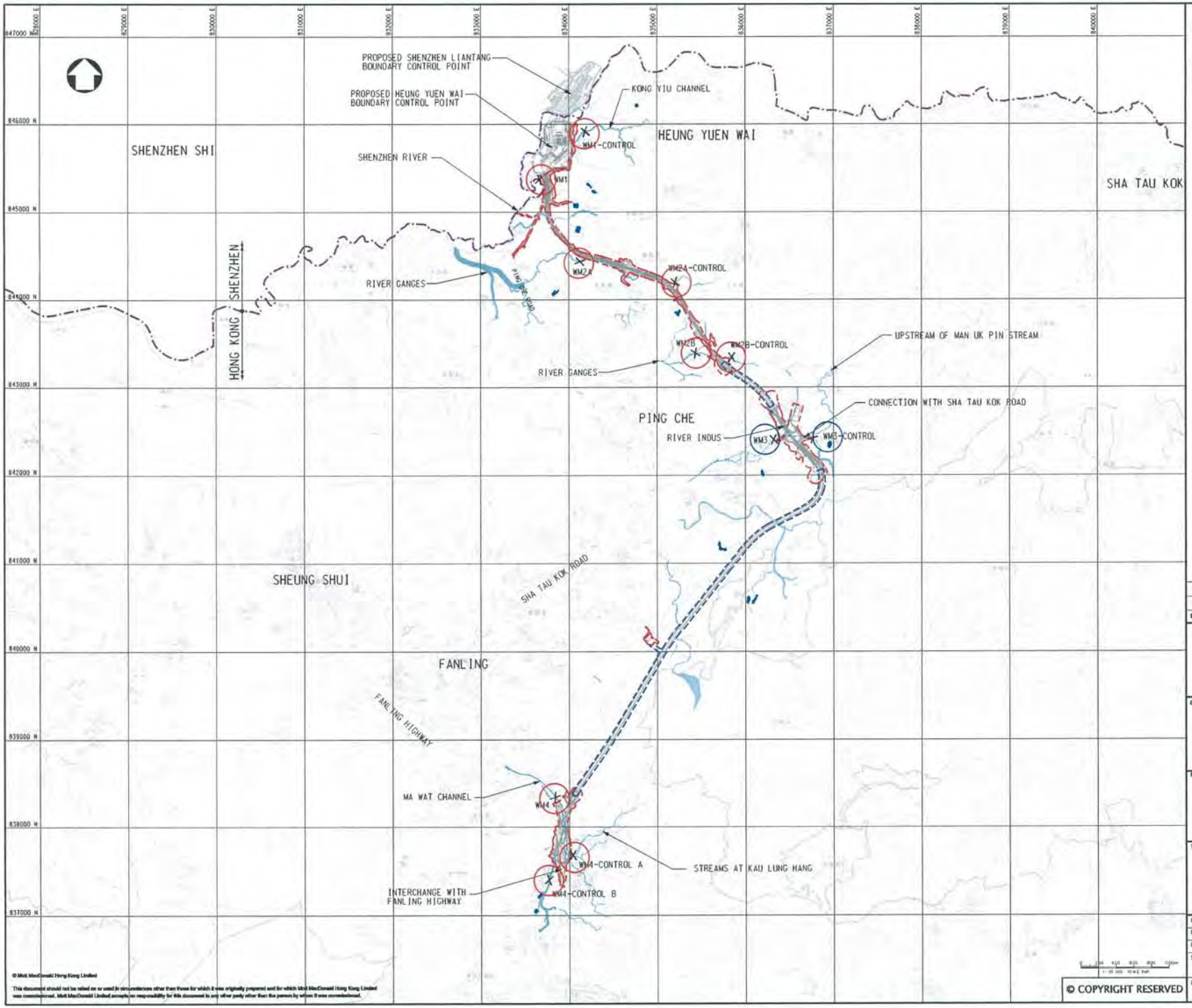
Project

AGREEMENT NO. CE45/2008(CE)
LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title

PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	DC	Eng Chk.	EC
Drawn	WING	Coordination	EC
Dwg Chk.	DC	Approved	HT
Scale at A1	1:20000	Project	255228
Status	PRE		
Drawing No	FIGURE 3.1	Rev	P1



LEGEND:

- BOUNDARY OF HKSAR
- LAND REQUIREMENT LIMIT (ABOVE GROUND)
- LAND REQUIREMENT LIMIT (TUNNEL)
- X PROPOSED WATER QUALITY MONITORING STATION

MONITORING STATION	CO-ORDINATES	
	EAST(NG(m)	NORTHING(m)
WM1	833668.635	845371.097
WM1-CONTROL	834185.480	845916.662
WM2A	834132.193	844432.910
WM2A-CONTROL	835205.329	844200.151
WM2B	835434.744	843394.606
WM2B-CONTROL	835845.878	843343.625
WM3	836323.622	842404.977
WM3-CONTROL	836763.419	842425.507
WM4	833840.783	838344.842
WM4-CONTROL A	834038.937	837688.995
WM4-CONTROL B	833769.123	837406.936

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	NOV 10	WING	GENERAL REVISION	HC	HT
P1	OCT 10	WING	FIRST ISSUE	HC	HT

Mott MacDonald

Client: CEDD — CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

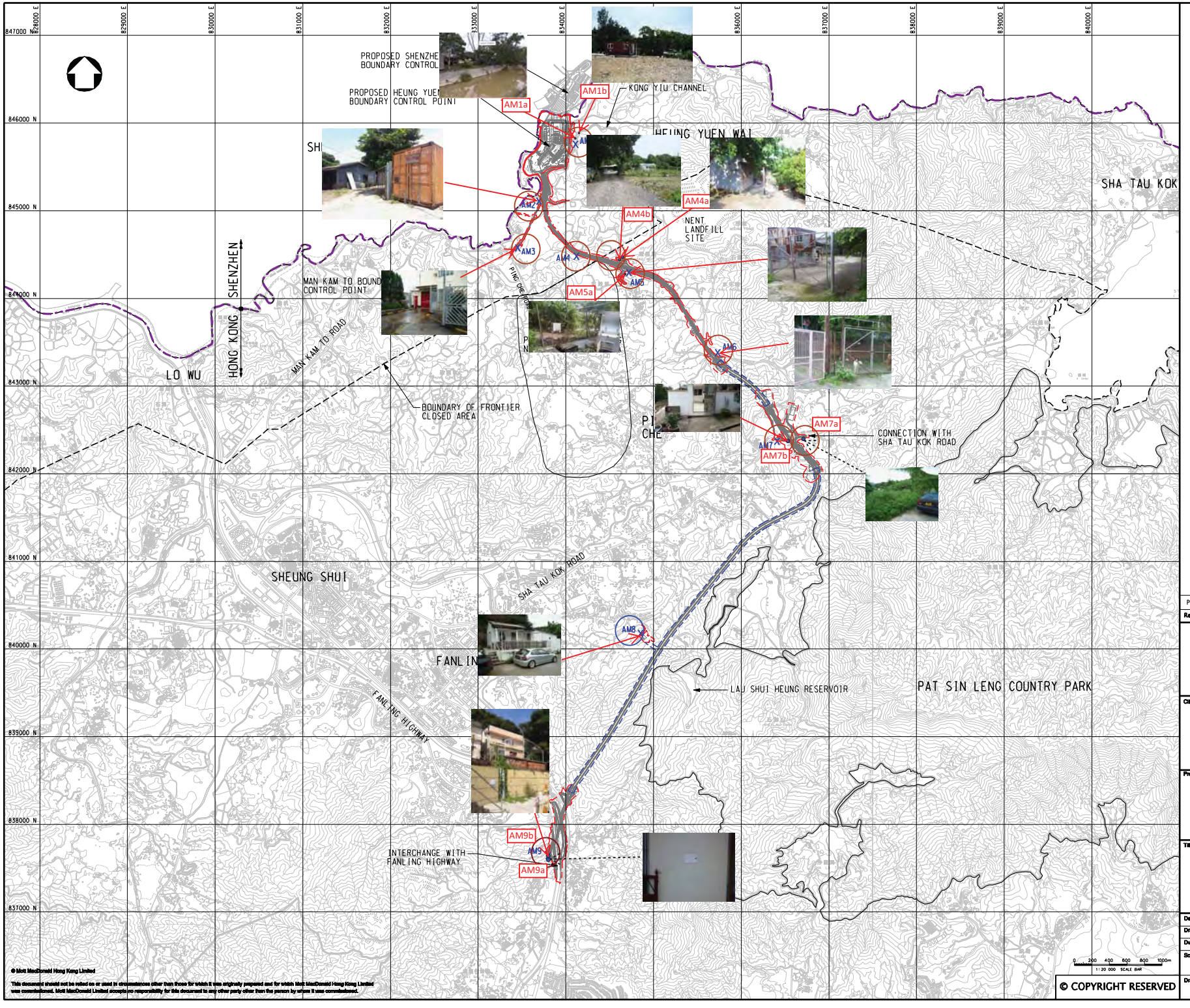
Project: AGREEMENT NO. CE45/2008(CE) LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title: LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

Designed	HC		Eng.Chk.	EC	
Drawn	WING		Coordination	EC	
Eng.Chk.	HC		Approved	HT	
Scale at A1	1:20000	Project	255228		Status PRE
Drawing No	FIGURE 4.1				Rev P2

Appendix E

Monitoring Locations for Impact Monitoring



LEGEND:

- BOUNDARY OF HKSAR
- WORKS AREA (ABOVE GROUND)
- WORKS AREA (TUNNEL)
- X Air Monitoring Stations in the EM&A Manual
- Proposed Air Monitoring Stations

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	AUG 10	MING	FIRST ISSUE	DC	HT

Mott MacDonald
20/F Two Landmark East
100 How Ming Street
Kwun Tong, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

CEDD
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

AGREEMENT NO. CE45/2008(CE)
LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title

PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

Designed	DC		Eng.Chk.	EC	
Drawn	MING		Coordination	EC	
Dwg.Chk.	DC		Approved	HT	
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Drawing No	FIGURE 2.1			Rev	P1

0 200 400 600 800 1000m
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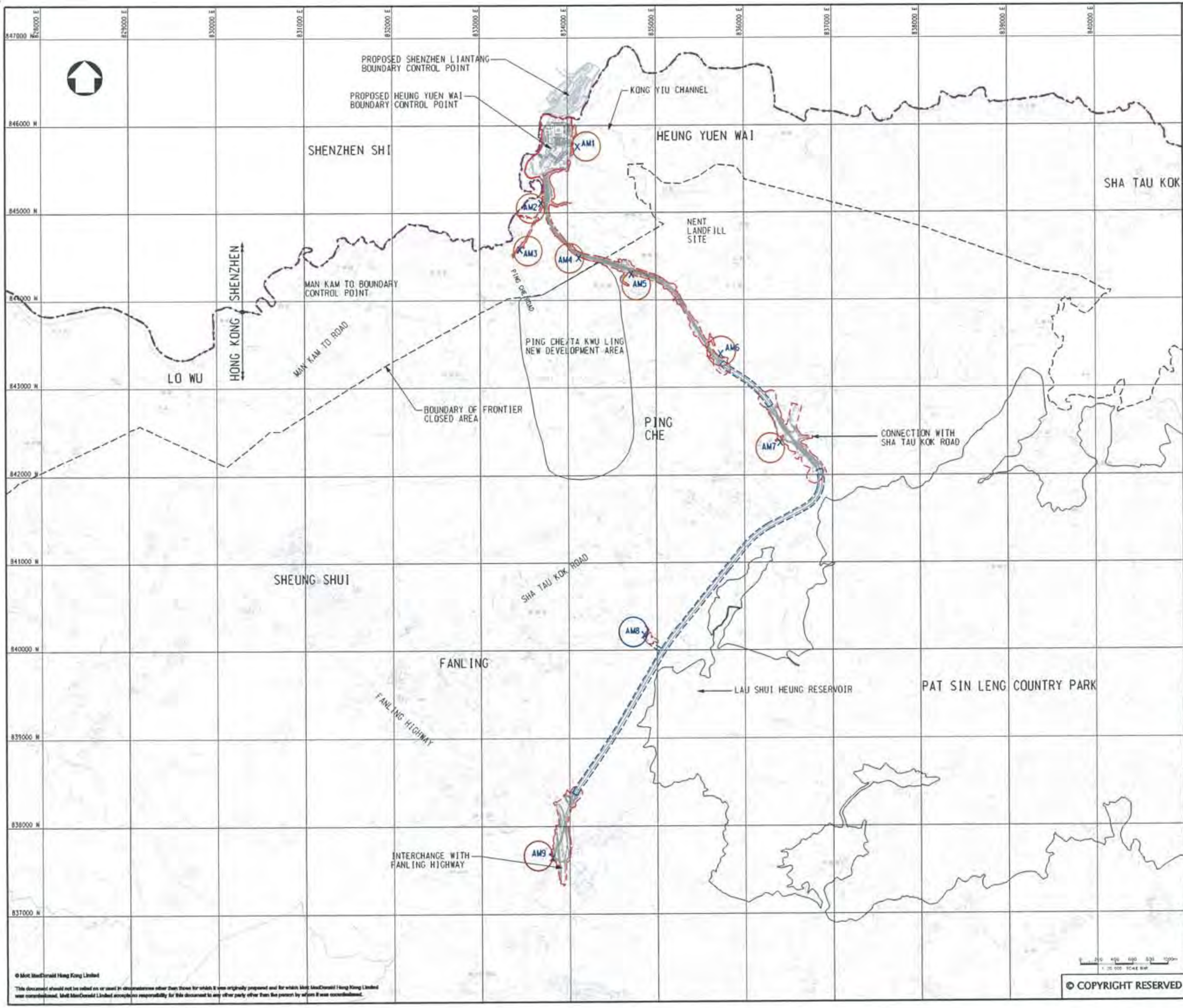


Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	AUG 10	WING	FIRST ISSUE	DC	HT

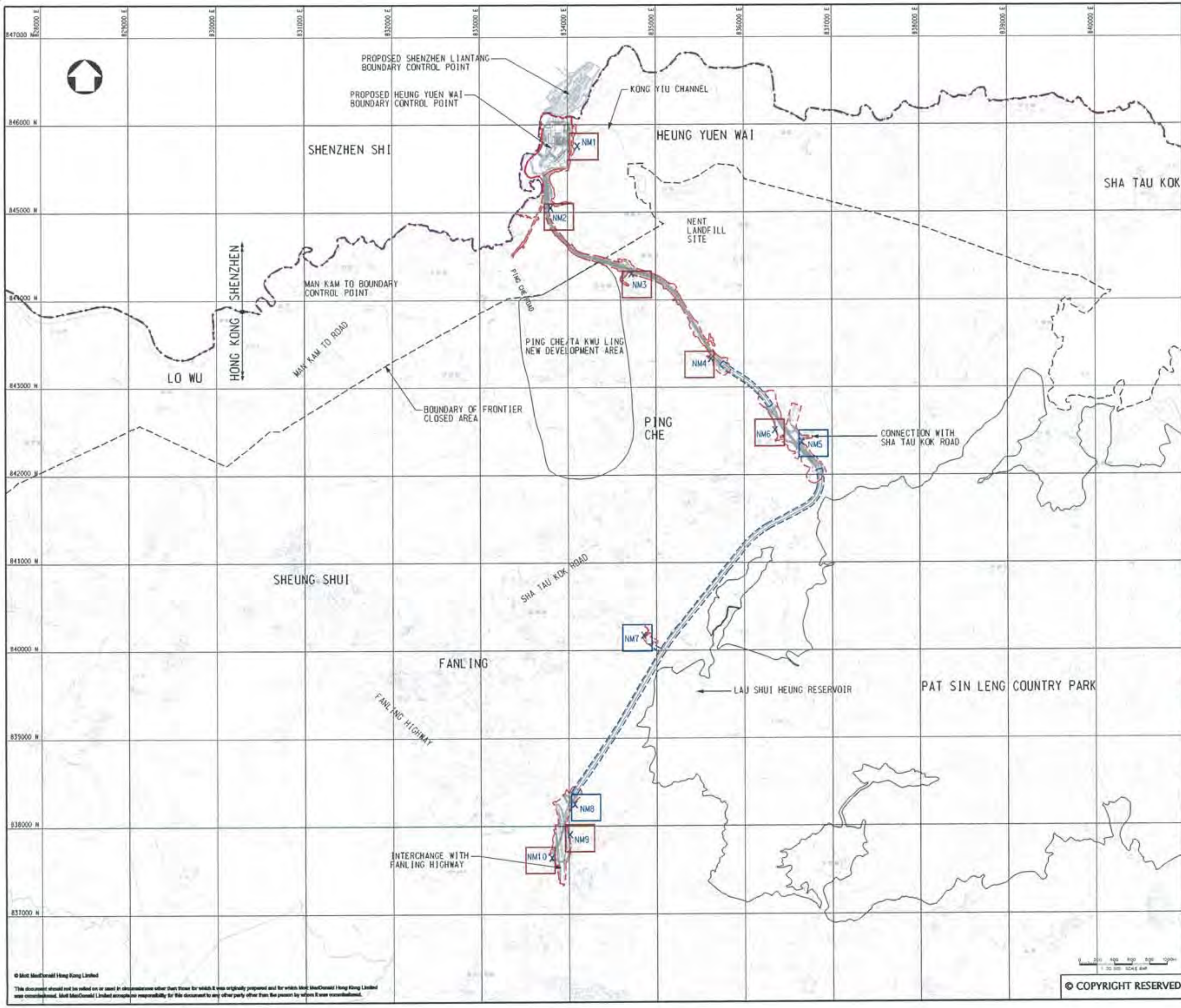
Mott MacDonald

Client: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT (CEDD)

Project: AGREEMENT NO. CE45/2008(CE) LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title: PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

Designed	DC	Eng.Chk.	EC
Drawn	WING	Coordination	EC
Dwg.Chk.	DC	Approved	HT
Scale at A1	1:20000	Project	255228
Status	PRE		
Drawing No	FIGURE 2.1	Rev	P1



LEGEND:

- BOUNDARY OF HKSAR
- WORKS AREA (ABOVE GROUND)
- WORKS AREA (TUNNEL)
- X CONSTRUCTION NOISE MONITORING STATIONS

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	AUG 10	WING	FIRST ISSUE	DC	HT

Mott MacDonald

Client: CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

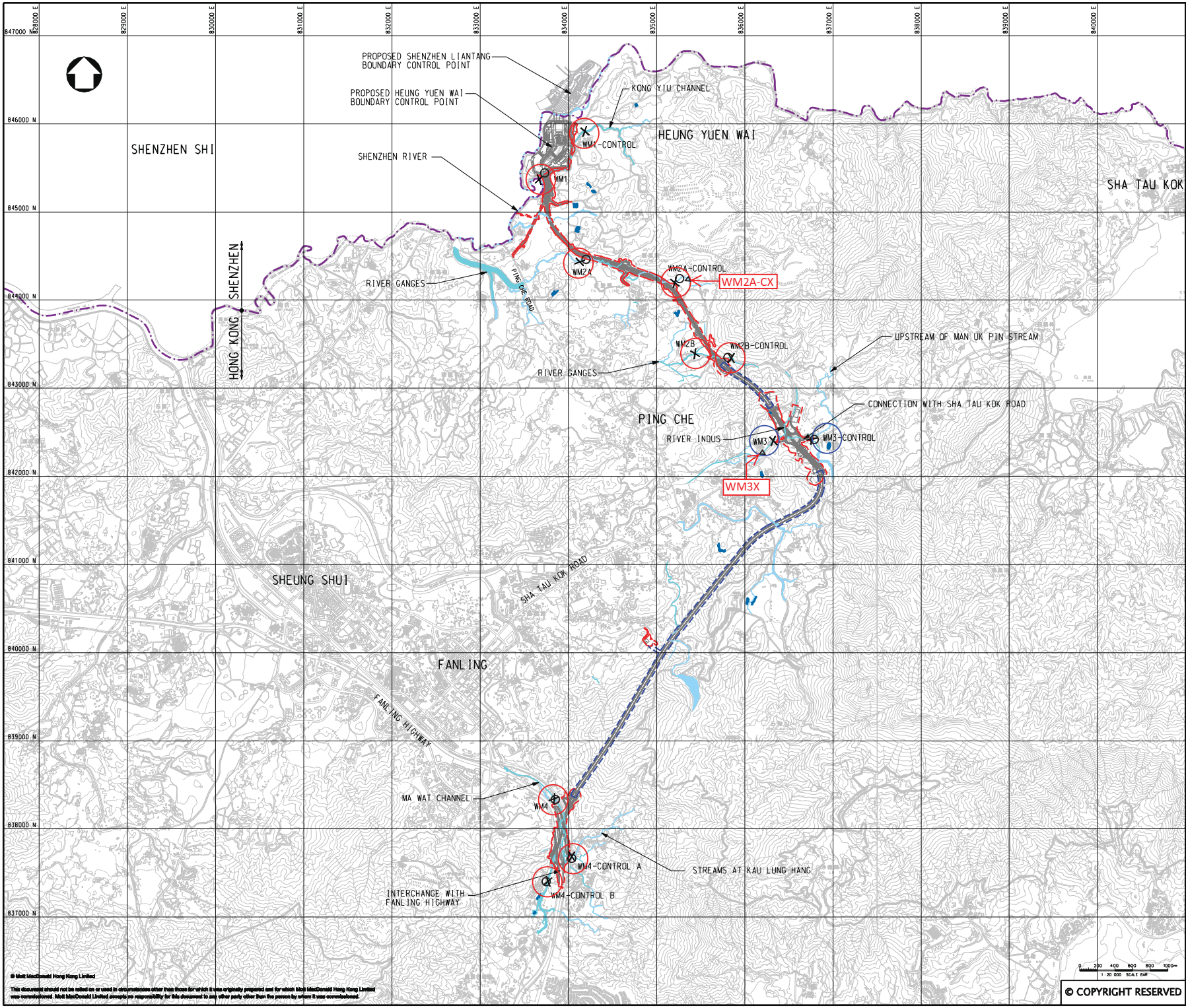
Project: AGREEMENT NO. CE45/2008(CE) LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title: PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	DC	Eng Chk	EC
Drawn	WING	Coordination	EC
Dwg Chk	DC	Approved	HT

Scale at A1: 1:20000 | Project: 255228 | Status: PRE

Drawing No: FIGURE 3.1 | Rev: P1



LEGEND:

- BOUNDARY OF HKSAR
- LAND REQUIREMENT LIMIT (ABOVE GROUND)
- LAND REQUIREMENT LIMIT (TUNNEL)
- X — Water Quality Monitoring Location Recommended in EM&A Manual
- O — Alternative Water Quality Monitoring Location for EM&A Programme
- △ — New Proposed Water Quality Monitoring Location in November 2015

Station ID[1]	Location recommended in EM&A Manual[2] Coordinates[2]		Location found during site visit[3] Coordinates[3]	
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WM2A[2]	834132.193[2]	844432.910[2]	834204[3]	844471[3]
WM2A-Control[2]	835205.329[2]	844200.151[2]	835270[3]	844243[3]
WM2B[2]	835434.744[2]	843394.606[2]	835433[3]	843397[3]
WM2B-Control[2]	835845.878[2]	843343.625[2]	835835[3]	843351[3]
WM3[2]	836323.622[2]	842404.977[2]	836324[3]	842407[3]
WM3-Control[2]	836763.419[2]	842425.507[2]	836763[3]	842400[3]
WM4[2]	833840.783[2]	838344.842[2]	833850[3]	838338[3]
WM4-Control A[2]	834038.937[2]	837668.995[2]	834028[3]	837695[3]
WM4-Control B[2]	833769.123[2]	837406.936[2]	833760[3]	837395[3]

New Proposed Water Quality Monitoring Location in November 2015		
Location ID	Easting	Northing
WM2A-C (Original)	0835270	0844243
WM2A-Cx (Proposed)	0835377	0844188
WM3(Original)	0836324	0842407
WM3x(Proposed)	0836206	0842270

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	NOV 10	MING	GENERAL REVISION	HC	HT
P1	OCT 10	MING	FIRST ISSUE	HC	HT

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Client

CEDD — CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

AGREEMENT NO. CE45/2008(CE)
LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title

LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

Designed	HC		Eng.Chk.	EC	
Drawn	MING		Coordination	EC	
Dwg.Chk.	HC		Approved	HT	
Scale at A1	1:20000	Project	255228	Status	PRE
Drawing No	Appendix C	CAD file	u:\255228\REPORT\ENV\EM&A\DWS\FIG 4-1.dgn	Rev	P2

0 200 400 600 800 1000m
1 : 20 000 SCALE BAR

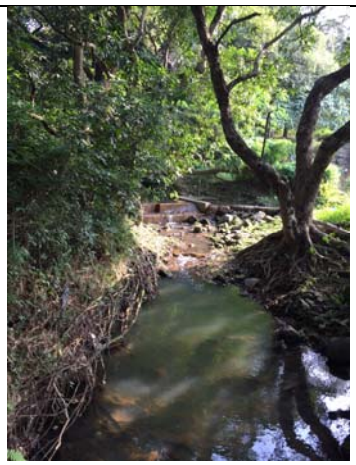
Photographic Records for Water Quality Monitoring Location

Alternative Location of WM1

Alternative Location of WM1 – Control (WM1-C)

Alternative Location of WM2A

Alternative Location of WM2-Control (WM2-C)



Alternative Location of WM2- Control X (WM2-CX)

Location of WM2B-Control (WM2B-C)

Location of WM2B

Location of WM3-Control (WM3-C)

Location of WM3

Alternative Location of WM3X

Location of WM4–Control A (WM4-CA)

Location of WM4–Control B (WM4-CB)

Location of WM4

Appendix F

Calibration Certificate of Monitoring Equipment and HOKLAS-accreditation Certificate of the Testing Laboratory

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Garden Farm, Tsung Yuen Ha Village		Date of Calibration:	23/2/2016
Location ID : AM1b		Next Calibration Date:	23/4/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (°C)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.7	6.7	13.4	1.779	53	54.10	Slope = 33.9477
13	5.2	5.2	10.4	1.567	47	47.98	Intercept = -5.5459
10	4	4	8.0	1.375	41	41.85	Corr. coeff. = 0.9987
7	2.5	2.5	5.0	1.087	31	31.65	
5	1.5	1.5	3.0	0.842	22	22.46	

Calculations :

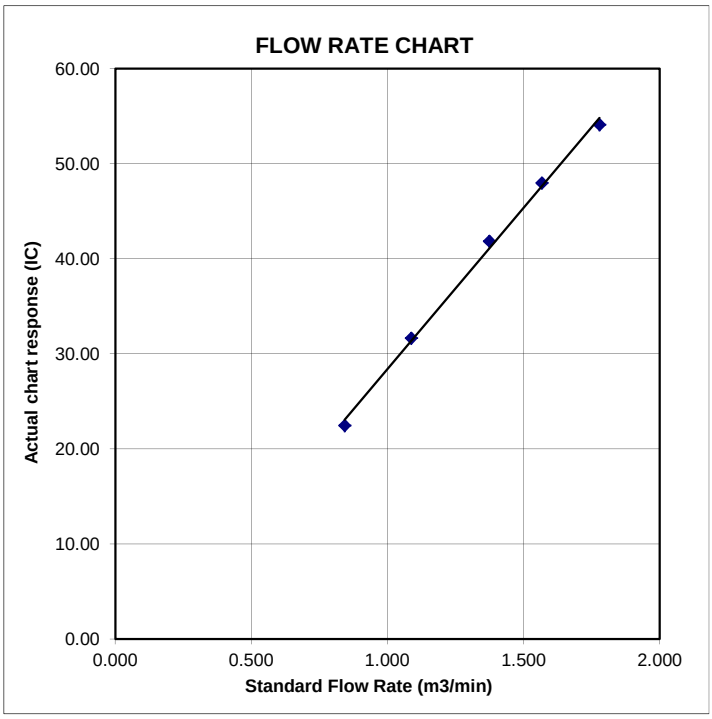
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Garden Farm, Tsung Yuen Ha Village		Date of Calibration:	26/4/2016
Location ID : AM1b		Next Calibration Date:	26/6/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1009.5	Corrected Pressure (mm Hg)	757.125
Temperature (°C)	27.2	Temperature (K)	300

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.8	6.8	13.6	1.845	53	52.71	Slope = 32.4196
13	5.1	5.1	10.2	1.600	46	45.74	Intercept = -6.5421
10	3.9	3.9	7.8	1.401	40	39.78	Corr. coeff. = 0.9984
7	2.6	2.6	5.2	1.147	30	29.83	
5	1.5	1.5	3.0	0.875	22	21.88	

Calculations :

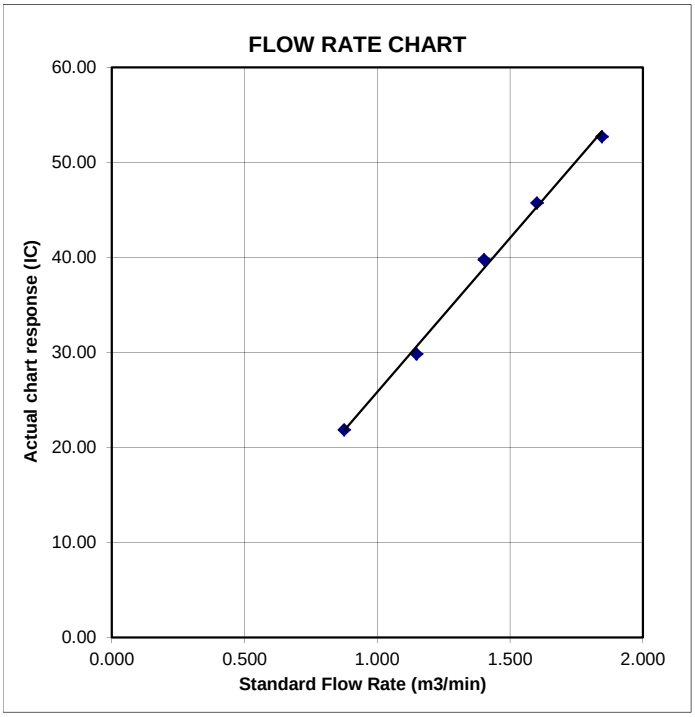
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House near Lin Ma Hang Road		Date of Calibration:	23/2/2016
Location ID : AM2		Next Calibration Date:	23/4/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (°C)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.4	6.4	12.8	1.739	56	57.17	Slope = 34.8659
13	4.8	4.8	9.6	1.506	48	49.00	Intercept = -2.8852
10	3.7	3.7	7.4	1.322	44	44.92	Corr. coeff. = 0.9961
7	2.4	2.4	4.8	1.065	34	34.71	
5	1.5	1.5	3.0	0.842	25	25.52	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

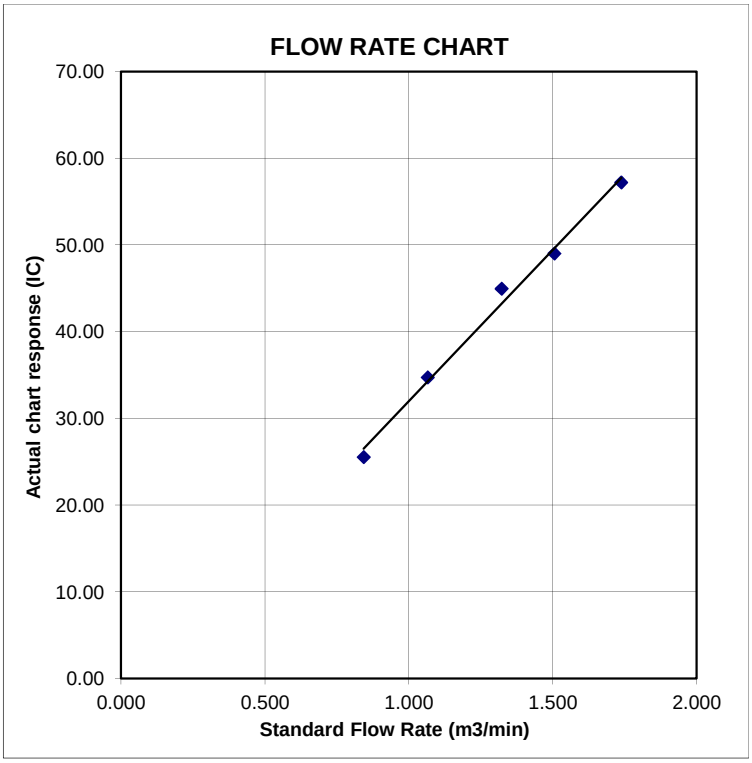
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House near Lin Ma Hang Road		Date of Calibration:	26/4/2016
Location ID : AM2		Next Calibration Date:	26/6/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1009.5	Corrected Pressure (mm Hg)	757.125
Temperature (°C)	27.2	Temperature (K)	300

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.2	6.2	12.4	1.763	53	52.71	Slope = 31.5538
13	5.0	5.0	10.0	1.584	47	46.74	Intercept = -2.8452
10	3.8	3.8	7.6	1.383	42	41.77	Corr. coeff. = 0.9987
7	2.6	2.6	5.2	1.147	33	32.82	
5	1.4	1.4	2.8	0.846	24	23.87	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

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)[Sqrt(298/Tav)(Pav/760)]-b)

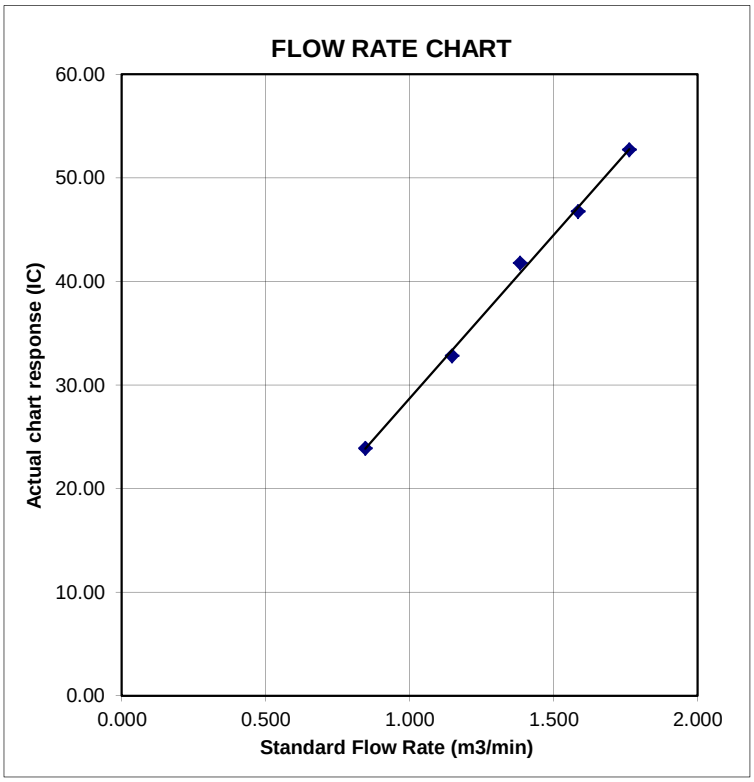
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Ta Kwu Ling Fire Service Station		Date of Calibration:	23/2/2016
Location ID : AM3		Next Calibration Date:	23/4/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (°C)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6	6	12.0	1.683	56	57.17	Slope = 30.9841
13	4.6	4.6	9.2	1.474	50	51.04	Intercept = 5.5195
10	3.5	3.5	7.0	1.286	45	45.94	Corr. coeff. = 0.9902
7	2	2	4.0	0.973	37	37.77	
5	1.5	1.5	3.0	0.842	29	29.60	

Calculations :

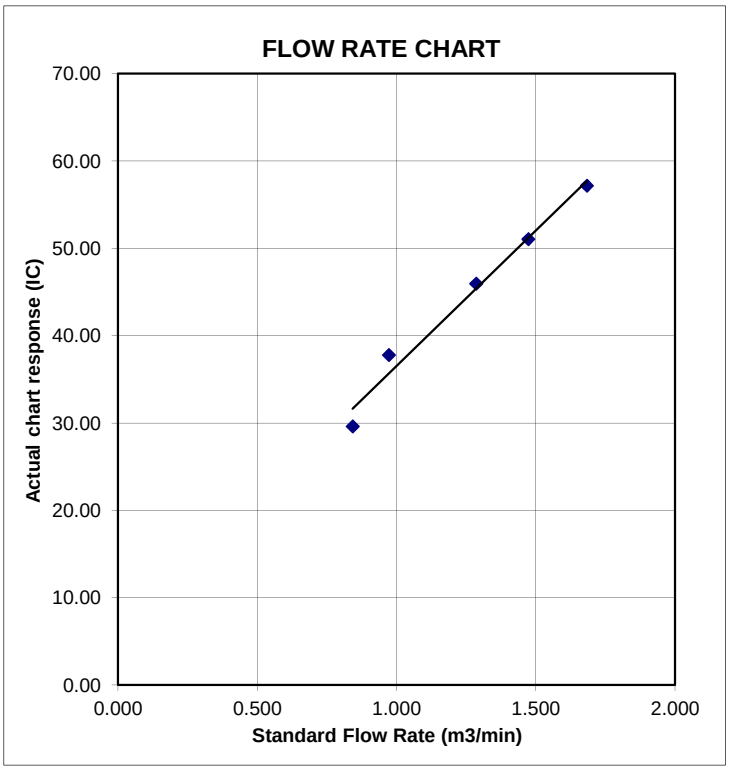
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Ta Kwu Ling Fire Service Station		Date of Calibration:	26/4/2016
Location ID : AM3		Next Calibration Date:	26/6/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1009.5	Corrected Pressure (mm Hg)	757.125
Temperature (ºC)	27.2	Temperature (K)	300

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.0	6.0	12.0	1.734	57	56.68	Slope = 29.5137
13	4.9	4.9	9.8	1.569	49	48.73	Intercept = 3.8880
10	3.7	3.7	7.4	1.365	43	42.76	Corr. coeff. = 0.9909
7	2.4	2.4	4.8	1.102	38	37.79	
5	1.3	1.3	2.6	0.815	28	27.84	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

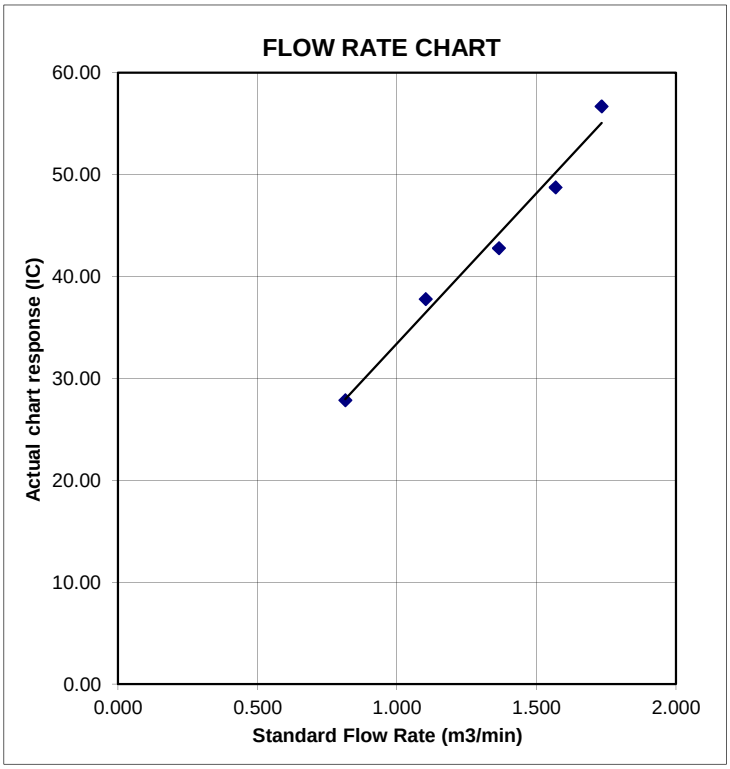
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Ping Yeung Village House		Date of Calibration:	23/2/2016
Location ID : AM4a		Next Calibration Date:	23/4/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (ºC)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.4	6.4	12.8	1.739	57	58.19	Slope = 32.1143
13	5	5	10.0	1.537	49	50.02	Intercept = 1.5084
10	3.8	3.8	7.6	1.340	43	43.90	Corr. coeff. = 0.9979
7	2.3	2.3	4.6	1.043	35	35.73	
5	1.4	1.4	2.8	0.814	27	27.56	

Calculations :

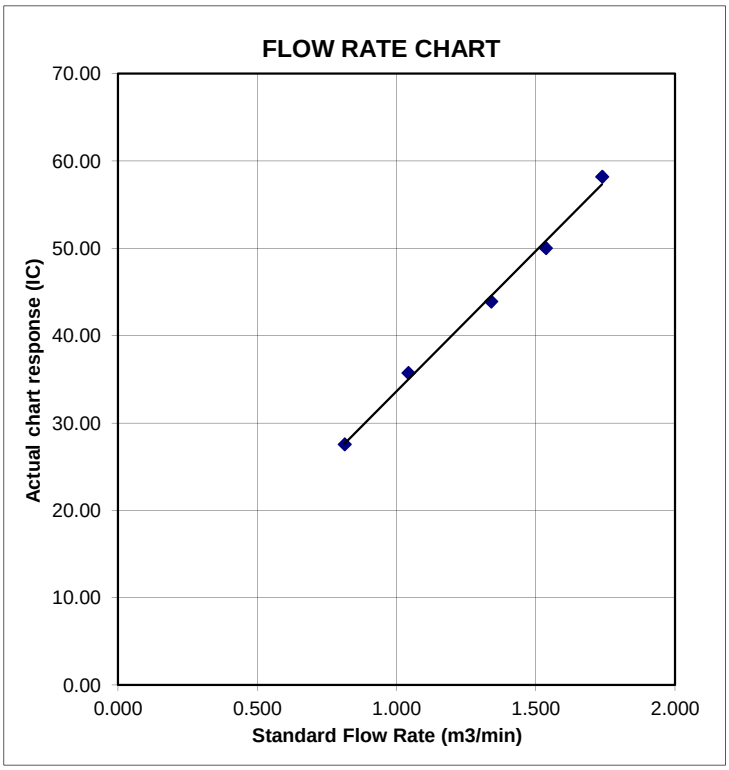
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Ping Yeung Village House		Date of Calibration:	28/4/2016
Location ID : AM4a		Next Calibration Date:	28/6/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1010.4	Corrected Pressure (mm Hg)	757.8
Temperature (ºC)	26.0	Temperature (K)	299

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.4	6.4	12.8	1.795	57	56.82	Slope = 31.6136
13	5.2	5.2	10.4	1.619	51	50.84	Intercept = -0.1984
10	4	4	8.0	1.422	45	44.86	Corr. coeff. = 0.9994
7	2.8	2.8	5.6	1.192	37	36.88	
5	1.5	1.5	3.0	0.877	28	27.91	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

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)[Sqrt(298/Tav)(Pav/760)]-b)

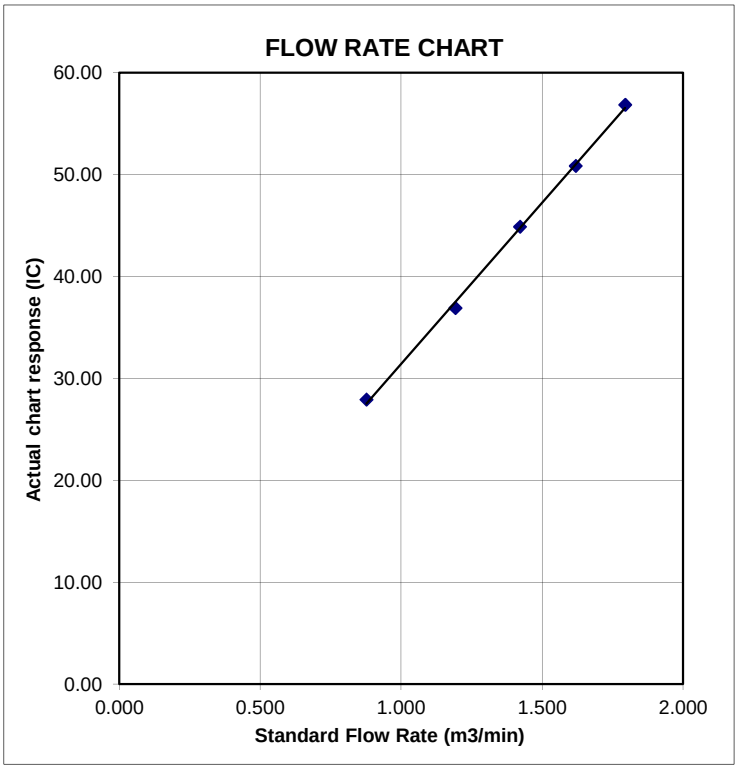
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Ping Yeung Village House		Date of Calibration:	23/2/2016
Location ID : AM5		Next Calibration Date:	23/4/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (°C)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.8	6.8	13.6	1.792	57	58.19	Slope = 33.3494
13	5.4	5.4	10.8	1.597	51	52.06	Intercept = -1.3144
10	3.8	3.8	7.6	1.340	42	42.87	Corr. coeff. = 0.9960
7	2.5	2.5	5.0	1.087	36	36.75	
5	1.6	1.6	3.2	0.870	26	26.54	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

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)[Sqrt(298/Tav)(Pav/760)]-b)

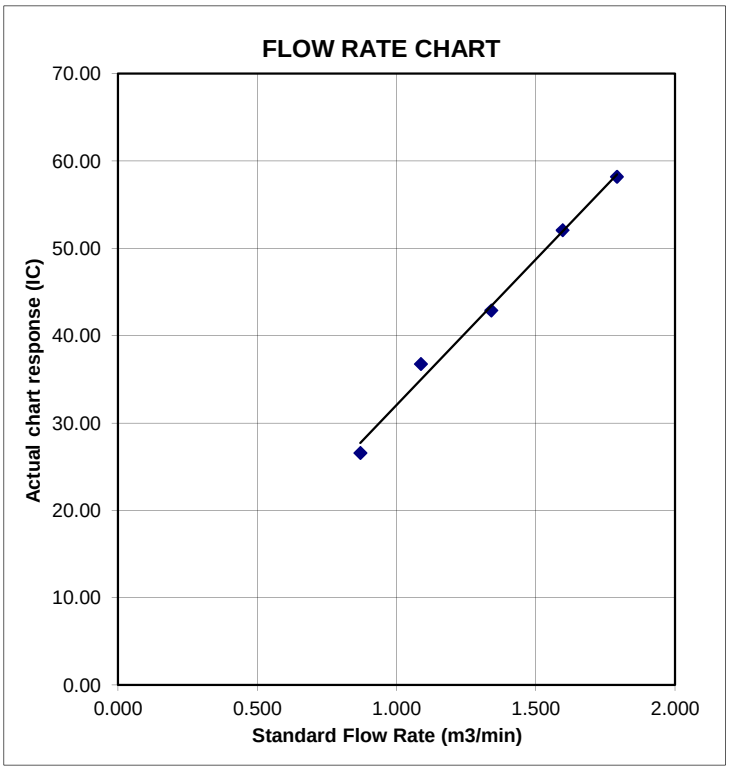
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Ping Yeung Village House		Date of Calibration:	28/4/2016
Location ID : AM5		Next Calibration Date:	28/6/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1010.4	Corrected Pressure (mm Hg)	757.8
Temperature (ºC)	26.0	Temperature (K)	299

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.6	6.6	13.2	1.822	55	54.83	Slope = 31.0094
13	5.3	5.3	10.6	1.635	50	49.84	Intercept = -1.2784
10	3.8	3.8	7.6	1.387	42	41.87	Corr. coeff. = 0.9997
7	2.4	2.4	4.8	1.105	33	32.90	
5	1.4	1.4	2.8	0.848	25	24.92	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

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)[Sqrt(298/Tav)(Pav/760)]-b)

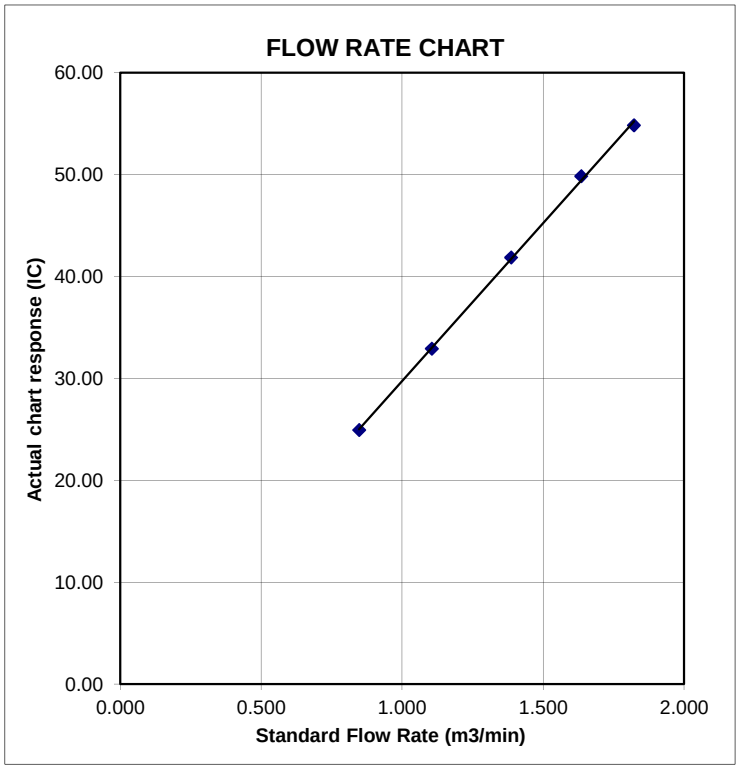
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Wo Keng Shan Village House		Date of Calibration:	23/2/2016
Location ID : AM6		Next Calibration Date:	23/4/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (ºC)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.6	6.6	13.2	1.765	58	59.21	Slope = 28.4255
13	5.3	5.3	10.6	1.582	51	52.06	Intercept = 7.9294
10	3.7	3.7	7.4	1.322	44	44.92	Corr. coeff. = 0.9966
7	2.4	2.4	4.8	1.065	37	37.77	
5	1.5	1.5	3.0	0.842	32	32.67	

Calculations :

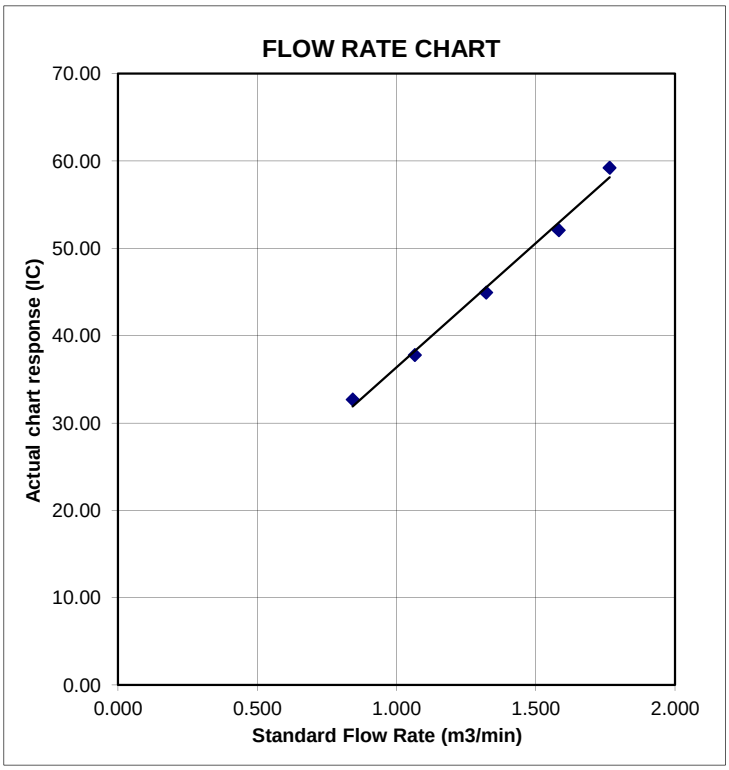
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Wo Keng Shan Village House		Date of Calibration:	28/4/2016
Location ID : AM6		Next Calibration Date:	28/6/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1010.4	Corrected Pressure (mm Hg)	757.8
Temperature (ºC)	26.0	Temperature (K)	299

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.6	6.6	13.2	1.822	56	55.83	Slope = 26.5427
13	5.4	5.4	10.8	1.650	51	50.84	Intercept = 7.4260
10	3.8	3.8	7.6	1.387	45	44.86	Corr. coeff. = 0.9993
7	2.3	2.3	4.6	1.082	36	35.89	
5	1.4	1.4	2.8	0.848	30	29.91	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

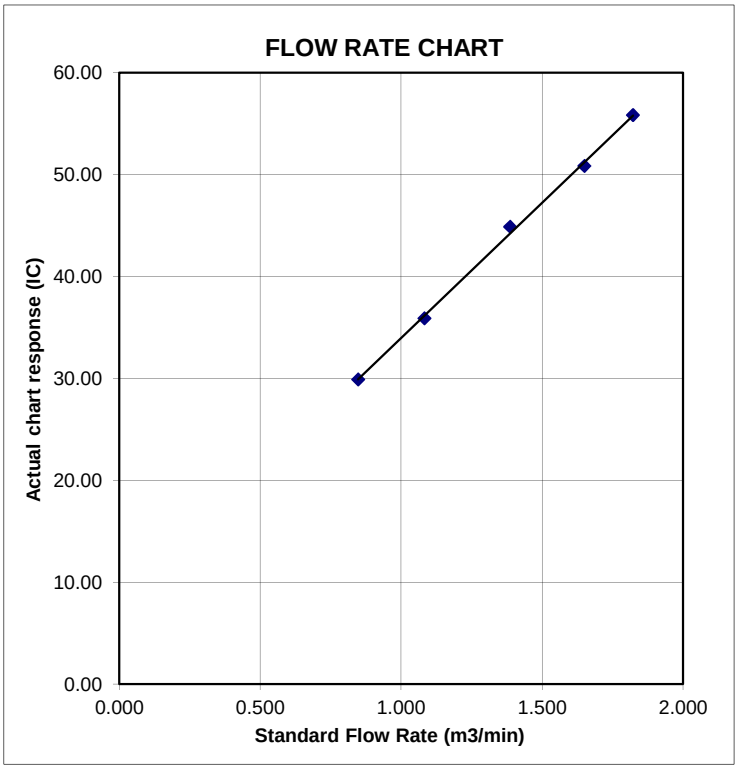
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House of Loi Tung Village
Location ID : AM7b

Date of Calibration: 23/2/2016
Next Calibration Date: 23/4/2016
Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (°C)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.9	4.9	9.8	1.521	55	56.14	Slope = 36.9465
13	4	4	8.0	1.375	50	51.04	Intercept = 0.0791
10	3.3	3.3	6.6	1.249	45	45.94	Corr. coeff. = 0.9991
7	2	2	4.0	0.973	36	36.75	
5	1.3	1.3	2.6	0.784	28	28.58	

Calculations :

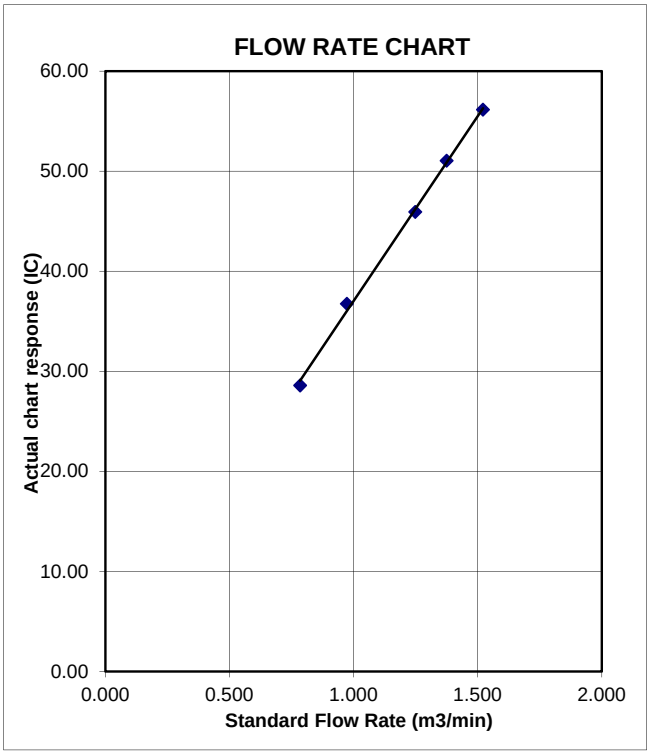
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House of Loi Tung Village
Location ID : AM7b

Date of Calibration: 28/4/2016
Next Calibration Date: 28/6/2016
Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa)	1010.4	Corrected Pressure (mm Hg)	757.8
Temperature (°C)	26.0	Temperature (K)	299

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.1	5.1	10.2	1.604	54	53.83	Slope = 34.5062
13	4.2	4.2	8.4	1.457	49	48.85	Intercept = -1.4232
10	3.2	3.2	6.4	1.274	43	42.87	Corr. coeff. = 0.9997
7	2.1	2.1	4.2	1.035	34	33.89	
5	1.3	1.3	2.6	0.817	27	26.92	

Calculations :

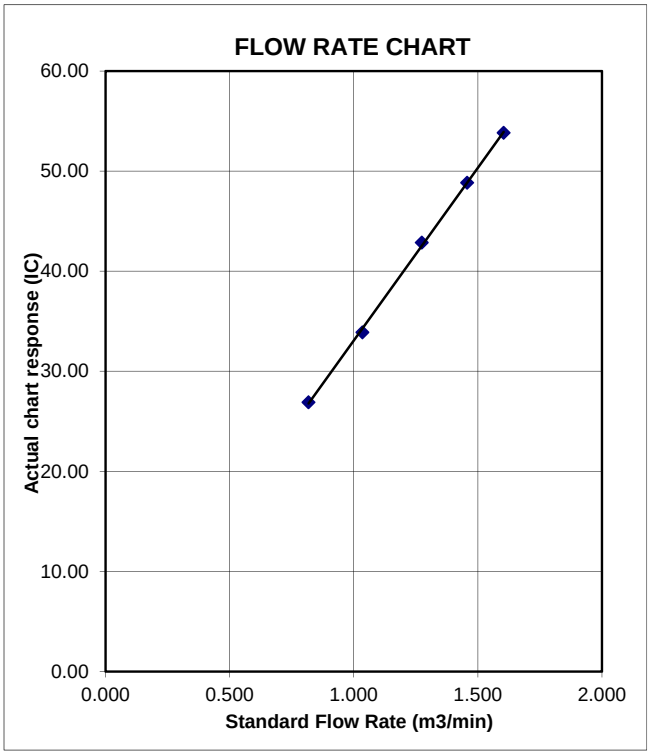
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Po Kat Tsai Village No. 4
Location ID : AM8

Date of Calibration: 23/2/2016
Next Calibration Date: 23/4/2016
Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (°C)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.5	6.5	13.0	1.752	66	67.37	Slope = 33.4105
13	5.2	5.2	10.4	1.567	58	59.21	Intercept = 7.6575
10	4	4	8.0	1.375	52	53.08	Corr. coeff. = 0.9967
7	2.6	2.6	5.2	1.109	43	43.90	
5	1.5	1.5	3.0	0.842	36	36.75	

Calculations :

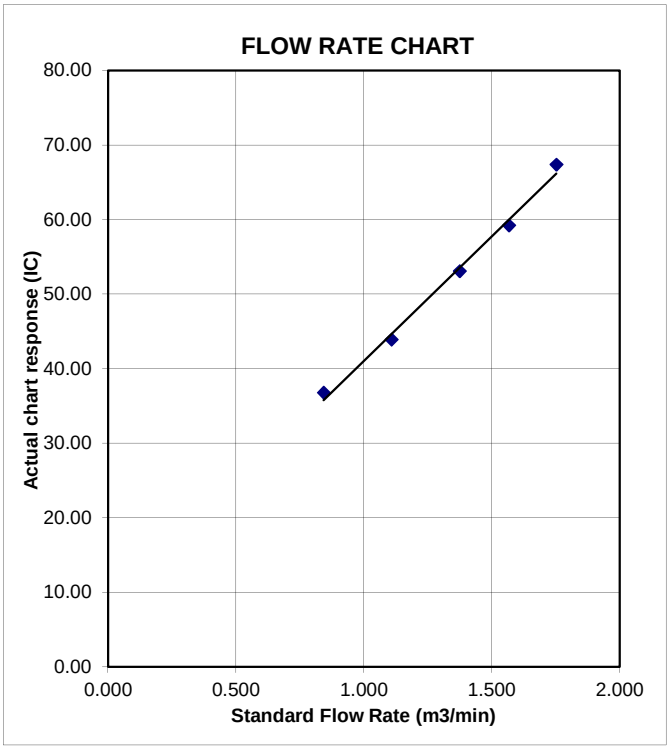
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Po Kat Tsai Village No. 4
Location ID : AM8

Date of Calibration: 28/4/2016
Next Calibration Date: 28/6/2016
Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa)	1010.4	Corrected Pressure (mm Hg)	757.8
Temperature (°C)	26.0	Temperature (K)	299

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.5	6.5	13.0	1.809	63	62.80	Slope = 30.5066
13	5.2	5.2	10.4	1.619	56	55.83	Intercept = 7.1116
10	3.9	3.9	7.8	1.404	50	49.84	Corr. coeff. = 0.9992
7	2.5	2.5	5.0	1.128	42	41.87	
5	1.4	1.4	2.8	0.848	33	32.90	

Calculations :

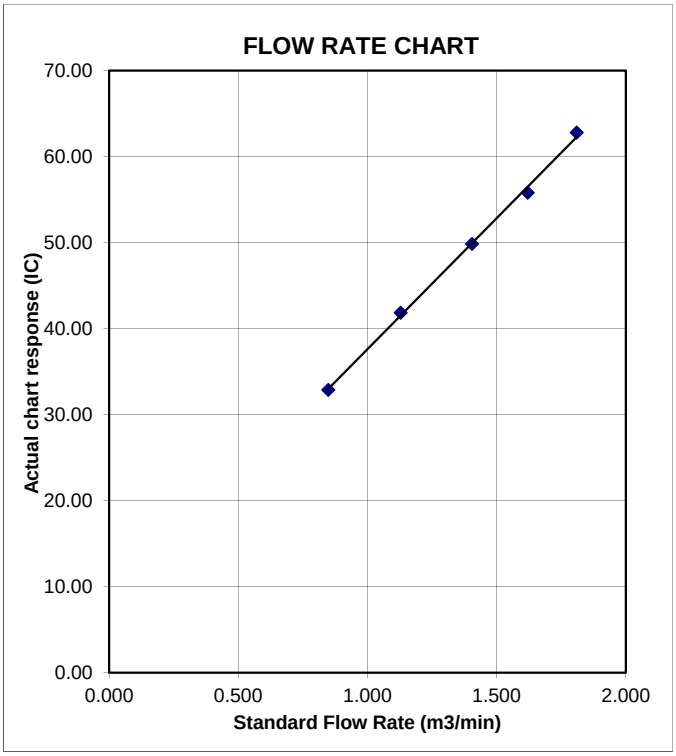
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Nam Wa Po Village House No. 80		Date of Calibration:	23/2/2016
Location ID : AM9b		Next Calibration Date:	23/4/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (ºC)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION	
18	6.5	6.5	13.0	1.752	54	55.12	Slope =	29.3935
13	5.2	5.2	10.4	1.567	50	51.04	Intercept =	4.3436
10	4.0	4	8.0	1.375	44	44.92	Corr. coeff. =	0.9985
7	2.5	2.5	5.0	1.087	36	36.75		
5	1.5	1.5	3.0	0.842	28	28.58		

Calculations :

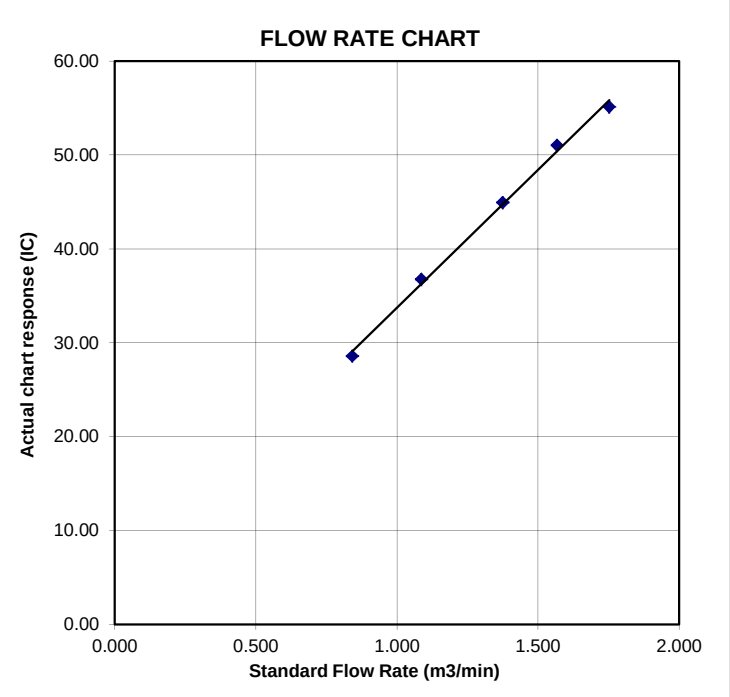
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Nam Wa Po Village House No. 80		Date of Calibration:	26/4/2016
Location ID : AM9b		Next Calibration Date:	26/6/2016
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1009.5	Corrected Pressure (mm Hg)	757.125
Temperature (ºC)	27.2	Temperature (K)	300

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.4	6.4	12.8	1.791	55	54.69	Slope = 27.9614
13	5.1	5.1	10.2	1.600	50	49.72	Intercept = 4.2062
10	4.0	4.0	8.0	1.419	43	42.76	Corr. coeff. = 0.9952
7	2.7	2.7	5.4	1.168	36	35.80	
5	1.4	1.4	2.8	0.846	29	28.84	

Calculations :

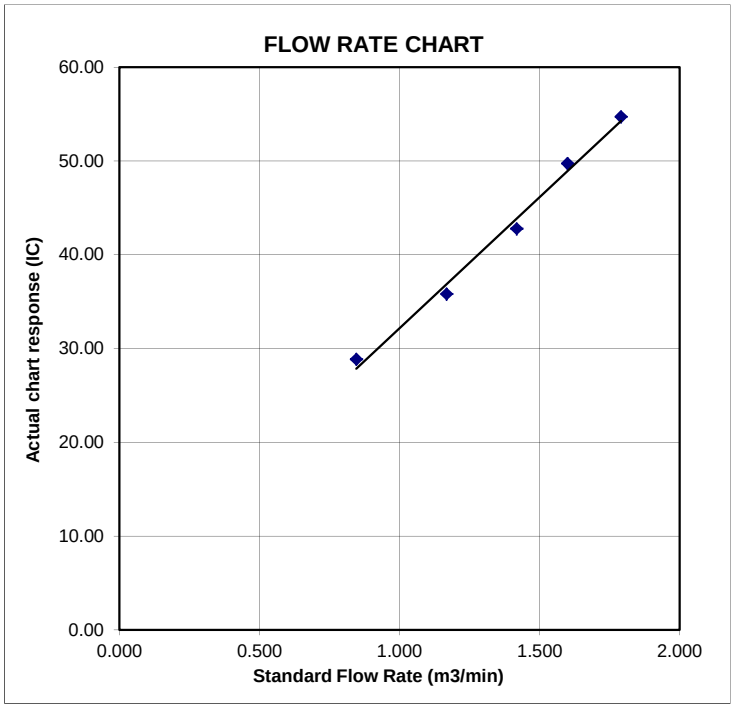
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TISCH Environmental

TISCH ENVIRONMENTAL, INC.
145 SOUTH MIAMI AVE
VILLAGE OF CLEVES, OH
45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 24, 2015 Rootsmeter S/N 0438320 Ta (K) - 292
Operator Tisch Orifice I.D. - 1941 Pa (mm) - 756.92

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4880	3.2	2.00
2	NA	NA	1.00	1.0510	6.4	4.00
3	NA	NA	1.00	0.9360	7.9	5.00
4	NA	NA	1.00	0.8920	8.8	5.50
5	NA	NA	1.00	0.7360	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
1.0121	0.6802	1.4258		0.9958	0.6692	0.8784
1.0078	0.9589	2.0163		0.9916	0.9434	1.2422
1.0057	1.0745	2.2543		0.9895	1.0571	1.3888
1.0046	1.1262	2.3644		0.9884	1.1080	1.4566
0.9993	1.3578	2.8515		0.9832	1.3358	1.7568
Qstd slope (m) =		2.10265		Qa slope (m) =		1.31664
intercept (b) =		-0.00335		intercept (b) =		-0.00206
coefficient (r) =		0.99999		coefficient (r) =		0.99999
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

TISCH Environmental

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145 SOUTH MIAMI AVE
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513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 14, 2016 Rootsmeter S/N 0438320 Ta (K) - 295
Operator Tisch Orifice I.D. - 1612 Pa (mm) - 745.49

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3770	3.2	2.00
2	NA	NA	1.00	0.9710	6.4	4.00
3	NA	NA	1.00	0.8710	7.8	5.00
4	NA	NA	1.00	0.8310	8.7	5.50
5	NA	NA	1.00	0.6860	12.6	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9866	0.7165	1.4078		0.9957	0.7231	0.8896
0.9824	1.0117	1.9909		0.9914	1.0210	1.2581
0.9804	1.1256	2.2259		0.9894	1.1360	1.4066
0.9793	1.1785	2.3345		0.9883	1.1893	1.4753
0.9741	1.4200	2.8155		0.9830	1.4330	1.7792
Qstd slope (m) =		2.00411		Qa slope (m) =		1.25494
intercept (b) =		-0.03059		intercept (b) =		-0.01933
coefficient (r) =		0.99995		coefficient (r) =		0.99995
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	2X6145
Equipment Ref:	EQ105
Job Order	HK1603558

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	2 January 2016

Equipment Verification Results:

Testing Date: 4 to 6 January 2016

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr17min	17:30 ~ 19:47	20.6	1018.9	0.027	1602	11.7
2hr42min	17:00 ~ 19:42	20.7	1015.9	0.021	1522	9.3
2hr21min	18:00 ~ 20:21	20.9	1018.8	0.051	3347	23.6

Sensitivity Adjustment Scale Setting (Before Calibration) 593 (CPM)

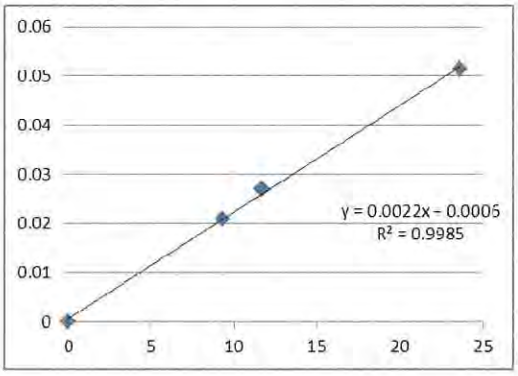
Sensitivity Adjustment Scale Setting (After Calibration) 596 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9985

Date of Issue 11 January 2016



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Donald Kwok Signature : Date : 12 January 2016

QC Reviewer : Ben Tam Signature : Date : 12 January 2016

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	2-Jan-16
Location ID :	Calibration Room	Next Calibration Date:	2-Apr-16

CONDITIONS

Sea Level Pressure (hPa)	1022	Corrected Pressure (mm Hg)	766.5
Temperature (°C)	18.9	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Calibration Date->	24-Mar-15	Expiry Date->	24-Mar-16

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.1	4.1	8.2	1.384	56	56.82	Slope = 30.1332
13	3.2	3.2	6.4	1.222	52	52.76	Intercept = 15.8637
10	2.4	2.4	4.8	1.059	48	48.71	Corr. coeff. = 0.9950
8	1.6	1.6	3.2	0.865	42	42.62	
5	1.0	1.0	2.0	0.684	35	35.51	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

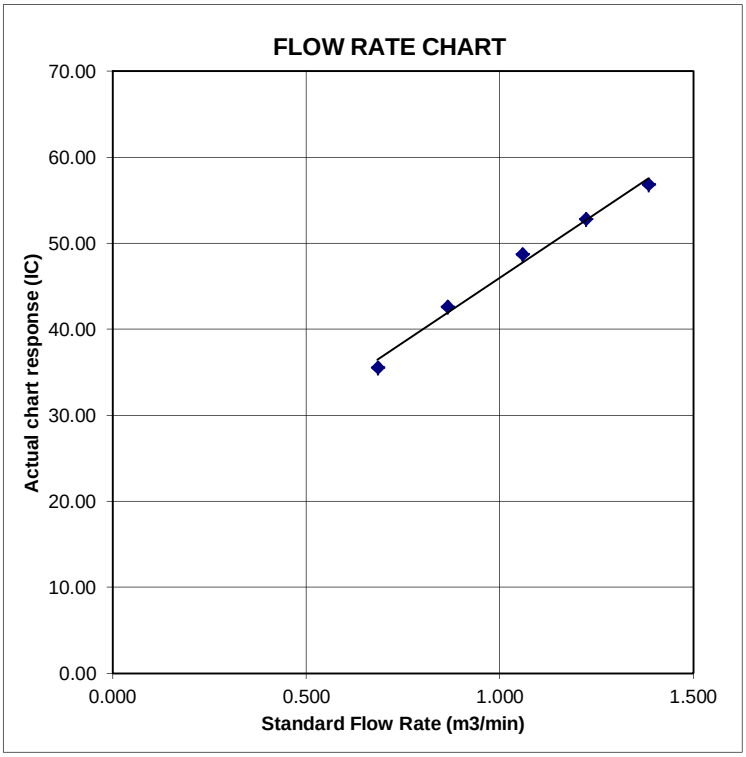
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	366409
Equipment Ref:	EQ109
Job Order	HK1603560

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	2 January 2016

Equipment Verification Results:

Testing Date: 4 to 6 January 2016

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr17min	17:30 ~ 19:47	20.6	1018.9	0.027	1577	11.5
2hr42min	17:00 ~ 19:42	20.7	1015.9	0.021	1433	8.8
2hr21min	18:00 ~ 20:21	20.9	1018.8	0.051	3328	23.5

Sensitivity Adjustment Scale Setting (Before Calibration) 540 (CPM)

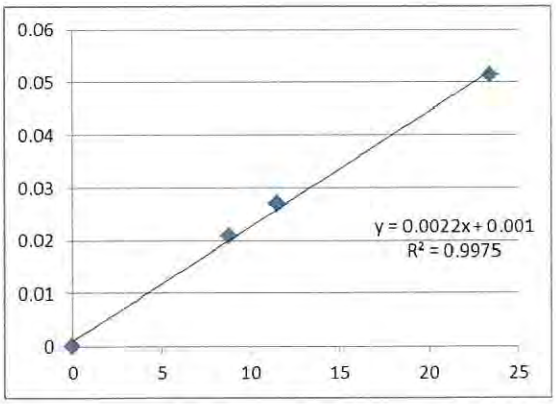
Sensitivity Adjustment Scale Setting (After Calibration) 540 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9975

Date of Issue 11 January 2016



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Donald Kwok Signature : Date : 12 January 2016

QC Reviewer : Ben Tam Signature : Date : 12 January 2016

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	2-Jan-16
Location ID :	Calibration Room	Next Calibration Date:	2-Apr-16

CONDITIONS

Sea Level Pressure (hPa)	1022	Corrected Pressure (mm Hg)	766.5
Temperature (°C)	18.9	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Calibration Date->	24-Mar-15	Expiry Date->	24-Mar-16

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.1	4.1	8.2	1.384	56	56.82	Slope = 30.1332
13	3.2	3.2	6.4	1.222	52	52.76	Intercept = 15.8637
10	2.4	2.4	4.8	1.059	48	48.71	Corr. coeff. = 0.9950
8	1.6	1.6	3.2	0.865	42	42.62	
5	1.0	1.0	2.0	0.684	35	35.51	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

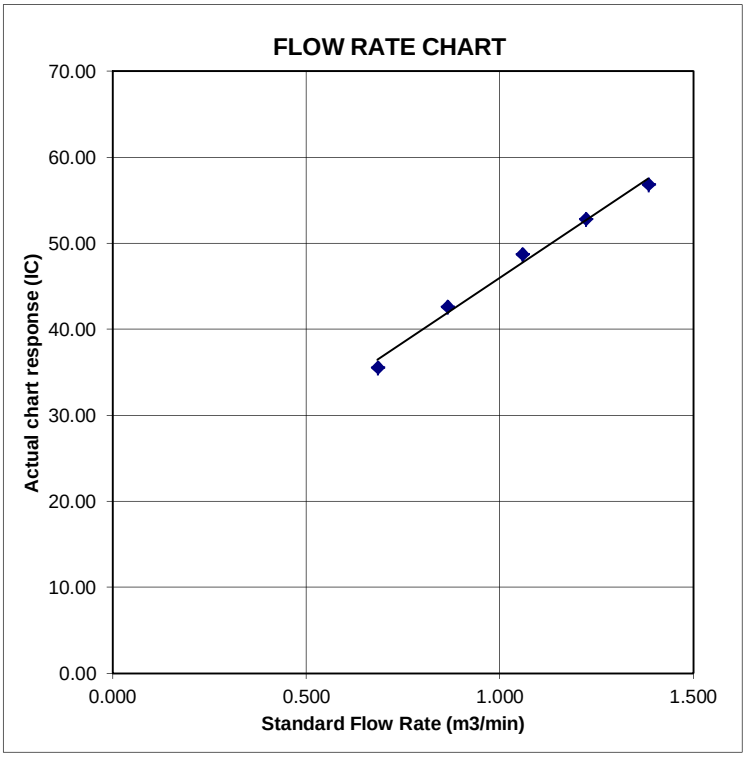
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	366410
Equipment Ref:	EQ110
Job Order	HK1603561

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	2 January 2016

Equipment Verification Results:

Testing Date: 4 to 6 January 2016

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr17min	17:30 ~ 19:47	20.6	1018.9	0.027	1566	11.4
2hr42min	17:00 ~ 19:42	20.7	1015.9	0.021	1422	8.7
2hr21min	18:00 ~ 20:21	20.9	1018.8	0.051	3318	23.4

Sensitivity Adjustment Scale Setting (Before Calibration) 660 (CPM)

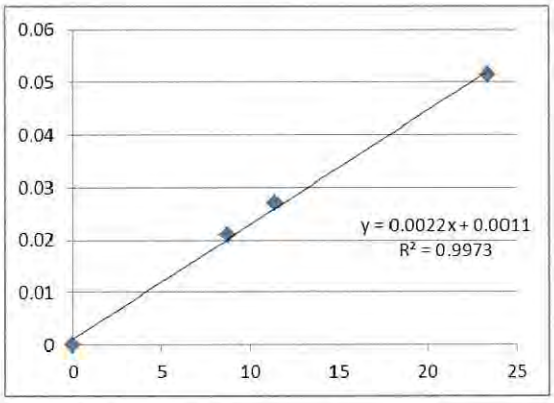
Sensitivity Adjustment Scale Setting (After Calibration) 661 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9973

Date of Issue 11 January 2016



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Donald Kwok Signature : Date : 12 January 2016

QC Reviewer : Ben Tam Signature : Date : 12 January 2016

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	2-Jan-16
Location ID :	Calibration Room	Next Calibration Date:	2-Apr-16

CONDITIONS

Sea Level Pressure (hPa)	1022	Corrected Pressure (mm Hg)	766.5
Temperature (°C)	18.9	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Calibration Date->	24-Mar-15	Expiry Date->	24-Mar-16

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.1	4.1	8.2	1.384	56	56.82	Slope = 30.1332
13	3.2	3.2	6.4	1.222	52	52.76	Intercept = 15.8637
10	2.4	2.4	4.8	1.059	48	48.71	Corr. coeff. = 0.9950
8	1.6	1.6	3.2	0.865	42	42.62	
5	1.0	1.0	2.0	0.684	35	35.51	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

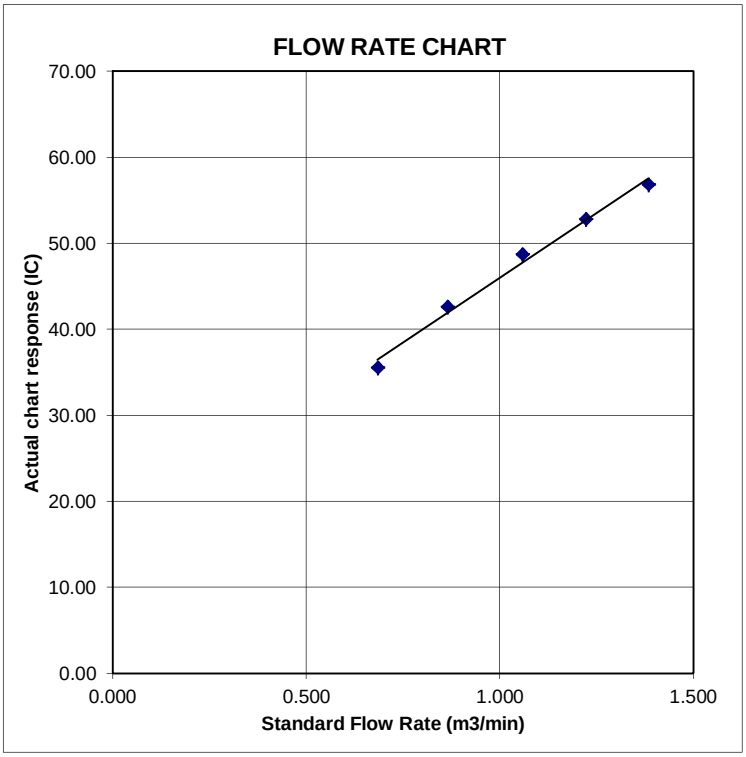
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	3Y6503
Equipment Ref:	EQ112
Job Order	HK1603553

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	2 January 2016

Equipment Verification Results:

Testing Date: 4 to 6 January 2016

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr17min	17:30 ~ 19:47	20.6	1018.9	0.027	1633	11.9
2hr42min	17:00 ~ 19:42	20.7	1015.9	0.021	1502	9.2
2hr21min	18:00 ~ 20:21	20.9	1018.8	0.051	3365	23.8

Sensitivity Adjustment Scale Setting (Before Calibration) 642 (CPM)

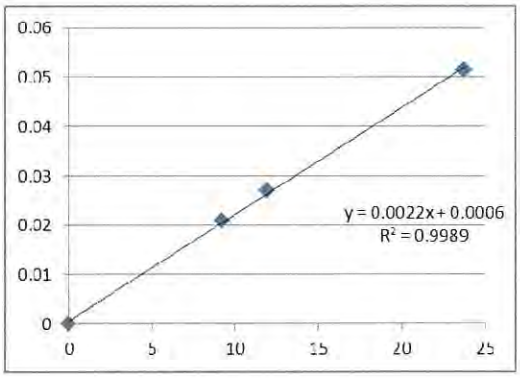
Sensitivity Adjustment Scale Setting (After Calibration) 648 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9989

Date of Issue 11 January 2016



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Donald Kwok Signature : Date : 12 January 2016

QC Reviewer : Ben Tam Signature : Date : 12 January 2016

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	2-Jan-16
Location ID :	Calibration Room	Next Calibration Date:	2-Apr-16

CONDITIONS

Sea Level Pressure (hPa)	1022	Corrected Pressure (mm Hg)	766.5
Temperature (°C)	18.9	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Calibration Date->	24-Mar-15	Expiry Date->	24-Mar-16

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.1	4.1	8.2	1.384	56	56.82	Slope = 30.1332
13	3.2	3.2	6.4	1.222	52	52.76	Intercept = 15.8637
10	2.4	2.4	4.8	1.059	48	48.71	Corr. coeff. = 0.9950
8	1.6	1.6	3.2	0.865	42	42.62	
5	1.0	1.0	2.0	0.684	35	35.51	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

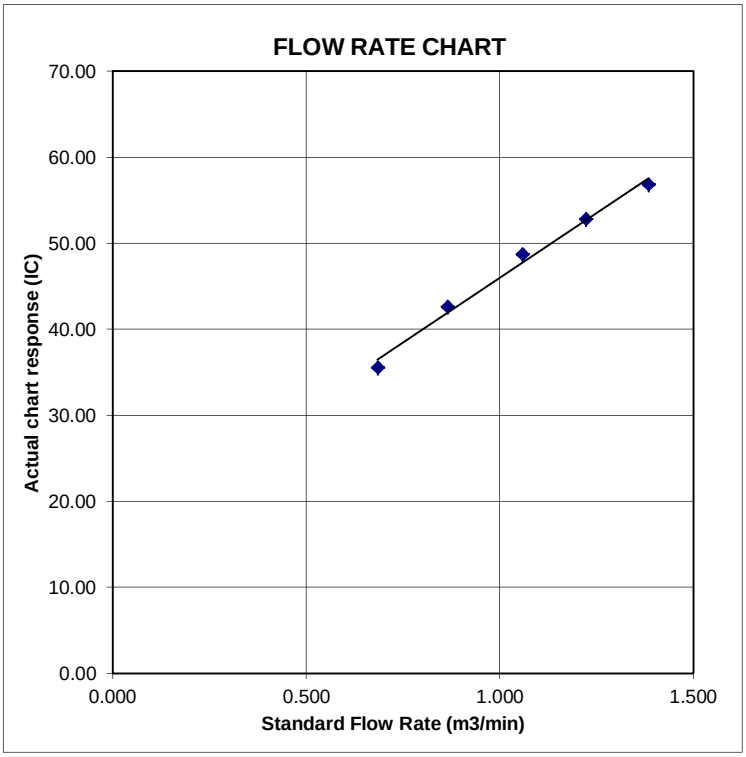
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	3Y6505
Equipment Ref:	EQ114
Job Order	HK1603562

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	2 January 2016

Equipment Verification Results:

Testing Date: 4 to 6 January 2016

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr17min	17:30 ~ 19:47	20.6	1018.9	0.027	1589	11.6
2hr42min	17:00 ~ 19:42	20.7	1015.9	0.021	1473	9.0
2hr21min	18:00 ~ 20:21	20.9	1018.8	0.051	3314	23.4

Sensitivity Adjustment Scale Setting (Before Calibration) 588 (CPM)

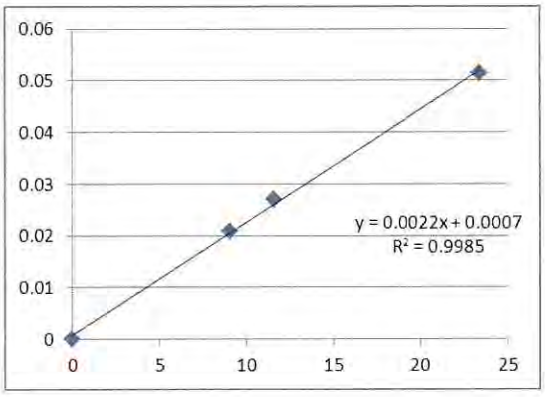
Sensitivity Adjustment Scale Setting (After Calibration) 585 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9985

Date of Issue 11 January 2016



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Donald Kwok Signature : Date : 12 January 2016

QC Reviewer : Ben Tam Signature : Date : 12 January 2016

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	2-Jan-16
Location ID :	Calibration Room	Next Calibration Date:	2-Apr-16

CONDITIONS

Sea Level Pressure (hPa)	1022	Corrected Pressure (mm Hg)	766.5
Temperature (°C)	18.9	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Calibration Date->	24-Mar-15	Expiry Date->	24-Mar-16

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.1	4.1	8.2	1.384	56	56.82	Slope = 30.1332
13	3.2	3.2	6.4	1.222	52	52.76	Intercept = 15.8637
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8	1.6	1.6	3.2	0.865	42	42.62	
5	1.0	1.0	2.0	0.684	35	35.51	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

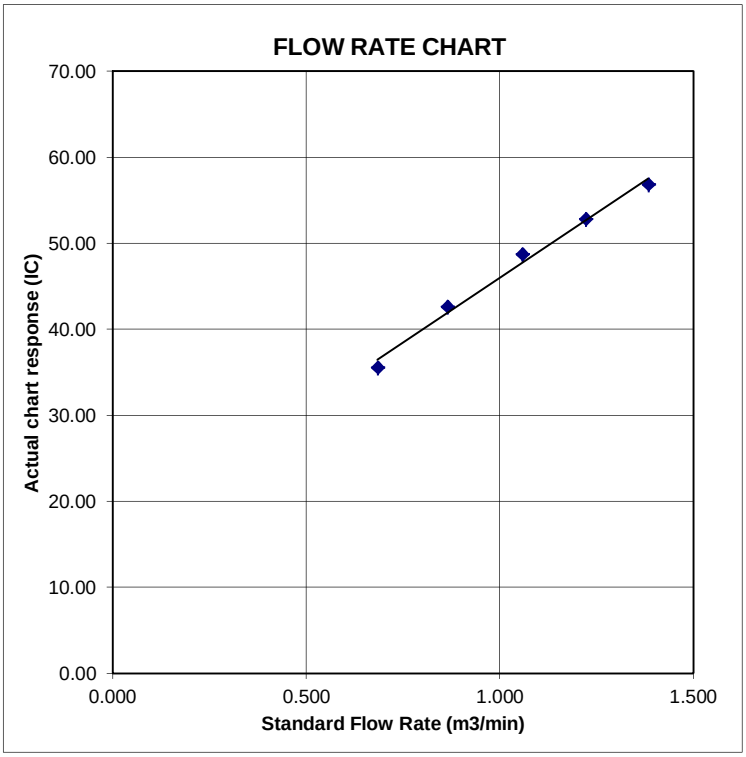
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



SIBATA (EQ111)

SIBATA SCIENTIFIC TECHNOLOGY LTD.
1-1-62, Nakane, Soka, Saitama, 340-0005 Japan
TEL : 048-933-1582 FAX : 048-933-1591

CALIBRATION CERTIFICATE

Date: May 11, 2015

Equipment Name	:	Digital Dust Indicator, Model LD-3B
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	3Y6501
Sensitivity	:	0.001 mg/m3
Sensitivity Adjustment	:	656CPM
Scale Setting	:	April 24, 2015

We hereby certify that the avobe mentioned instrment has been calibrated satisfactory.

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.

Hong

For Kentaro Togo
Overseas Sales Division

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C153055
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720) Date of Receipt / 收件日期 : 15 May 2015

Description / 儀器名稱 : Integrating Sound Level Meter (EQ065)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2238
Serial No. / 編號 : 2337676
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 4 June 2015

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 5 June 2015

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C153055
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C150014
CL281	Multifunction Acoustic Calibrator	DC130171

4. Test procedure : MA101N.

5. Results :

5.1 Sound Pressure Level

UUT Setting				Applied Value		UUT	IEC 60651
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Type 1 Spec. (dB)
50 - 130	L_{AFP}	A	F	94.00	1	94.0	± 0.7

5.1.2 Linearity

UUT Setting				Applied Value		UUT
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)
50 - 130	L_{AFP}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

5.2 Time Weighting

5.2.1 Continuous Signal

UUT Setting				Applied Value		UUT	IEC 60651
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Type 1 Spec. (dB)
50 - 130	L_{AFP}	A	F	94.00	1	94.0	Ref.
	L_{ASP}		S			94.0	± 0.1
	L_{AIP}		I			94.0	± 0.1

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C153055
證書編號

5.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L_{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L_{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				500 ms	102.0	-4.1 ± 1.0

5.3 Frequency Weighting

5.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{AFP}	A	F	94.00	31.5 Hz	54.8	-39.4 ± 1.5
					63 Hz	67.9	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

5.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{CFP}	C	F	94.00	31.5 Hz	91.1	-3.0 ± 1.5
					63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.0
					250 Hz	93.9	0.0 ± 1.0
					500 Hz	94.0	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

Certificate of Calibration
校正證書

Certificate No. : C153055
證書編號

5.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	100.0	± 0.5
						$1/10^2$		90	89.7	± 0.5
			60 sec.			$1/10^3$		80	79.8	± 1.0
			5 min.			$1/10^4$		70	69.7	± 1.0

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2812708

- Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB	: 31.5 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

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Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C152552
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720) Date of Receipt / 收件日期 : 17 April 2015

Description / 儀器名稱 : Sound Level Meter (EQ011)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 01121362
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 8 May 2015

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 12 May 2015

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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Certificate of Calibration
校正證書

Certificate No. : C152552
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C150014
CL281	Multifunction Acoustic Calibrator	DC130171

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	93.6	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L_A	A	Fast	94.00	1	93.6 (Ref.)
				104.00		103.6
				114.00		113.6

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	93.6	Ref.
			Slow			93.6	± 0.3

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Certificate of Calibration
校正證書

Certificate No. : C152552
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_A	A	Fast	94.00	63 Hz	67.3	-26.2 ± 1.5
					125 Hz	77.4	-16.1 ± 1.5
					250 Hz	84.9	-8.6 ± 1.4
					500 Hz	90.3	-3.2 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	94.8	+1.2 ± 1.6
					4 kHz	94.6	+1.0 ± 1.6
					8 kHz	92.6	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.2	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_C	C	Fast	94.00	63 Hz	92.7	-0.8 ± 1.5
					125 Hz	93.4	-0.2 ± 1.5
					250 Hz	93.6	0.0 ± 1.4
					500 Hz	93.6	0.0 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	93.4	-0.2 ± 1.6
					4 kHz	92.8	-0.8 ± 1.6
					8 kHz	90.7	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.2	-6.2 (+3.0 ; -6.0)

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 07459

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C161797
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC16-0662) Date of Receipt / 收件日期 : 22 March 2016

Description / 儀器名稱 : Sound Level Meter (EQ014)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 00142580
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration

DATE OF TEST / 測試日期 : 6 April 2016

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification. (after adjustment)
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong
Technical Officer

Certified By 核證 : K C Lee
Project Engineer

Date of Issue 簽發日期 : 7 April 2016

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
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Certificate of Calibration
校正證書

Certificate No. : C161797
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using the internal standard (After Adjustment) was performed before the test 6.1.1.2 to 6.3.2.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C160077
CL281	Multifunction Acoustic Calibrator	PA160023

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	* 91.9	± 1.1

* Out of IEC 61672 Class 1 Spec.

6.1.1.2 After Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	94.0	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L_A	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

Certificate of Calibration
校正證書

Certificate No. : C161797
證書編號

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	94.0	Ref.
			Slow			94.0	± 0.3

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_A	A	Fast	94.00	63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.5
					250 Hz	85.3	-8.6 ± 1.4
					500 Hz	90.7	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.6
					4 kHz	95.0	+1.0 ± 1.6
					8 kHz	92.9	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.5	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_C	C	Fast	94.00	63 Hz	93.1	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.5
					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.6
					4 kHz	93.2	-0.8 ± 1.6
					8 kHz	91.0	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.6	-6.2 (+3.0 ; -6.0)

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Certificate of Calibration
校正證書

Certificate No. : C161797
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 07725

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

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Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C162177
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC16-0843) Date of Receipt / 收件日期 : 14 April 2016

Description / 儀器名稱 : Integrating Sound Level Meter (EQ006)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2238
Serial No. / 編號 : 2285762
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 25 April 2016

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA
- Rohde & Schwarz Laboratory, Germany

Tested By 測試 : H T Wong, Technical Officer

Certified By 核證 : K C Lee, Project Engineer

Date of Issue 簽發日期 : 27 April 2016

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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Certificate of Calibration
校正證書

Certificate No. : C162177
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C160077
CL281	Multifunction Acoustic Calibrator	PA160023

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L_{AFP}	A	F	94.00	1	94.2

6.1.1.2 After Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.0	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L_{AFP}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		113.9

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

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Certificate of Calibration
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6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.0	Ref.
	L_{ASP}		S			94.0	± 0.1
	L_{AIP}		I			94.1	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L_{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L_{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{AFP}	A	F	94.00	31.5 Hz	55.1	-39.4 ± 1.5
					63 Hz	67.9	-26.2 ± 1.5
					125 Hz	77.9	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	91.0	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

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Certificate of Calibration
校正證書

Certificate No. : C162177
證書編號

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{CFP}	C	F	94.00	31.5 Hz	91.5	-3.0 ± 1.5
					63 Hz	93.4	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					250 Hz	94.1	0.0 ± 1.0
					500 Hz	94.1	0.0 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	92.9	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	100.0	± 0.5
						$1/10^2$		90	89.9	± 0.5
			60 sec.			$1/10^3$		80	79.2	± 1.0
			5 min.			$1/10^4$		70	69.2	± 1.0

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2812705

- Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB	: 31.5 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB : 1 kHz		: ± 0.10 dB (Ref. 94 dB)
114 dB : 1 kHz		: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C152550
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720) Date of Receipt / 收件日期 : 16 April 2015

Description / 儀器名稱 : Acoustical Calibrator (EQ081)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 4231
Serial No. / 編號 : 2326408
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 7 May 2015

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 12 May 2015

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C152550
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C143868
CL281	Multifunction Acoustic Calibrator	DC130171
TST150A	Measuring Amplifier	C141558

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.2	± 0.2
114 dB, 1 kHz	114.0		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000 0	1 kHz ± 0.1 %	± 0.1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C151968
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720) Date of Receipt / 收件日期 : 24 March 2015

Description / 儀器名稱 : Sound Calibrator (EQ083)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NC-74
Serial No. / 編號 : 34246492
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 11 April 2015

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 14 April 2015

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C151968
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C143868
CL281	Multifunction Acoustic Calibrator	DC130171
TST150A	Measuring Amplifier	C141558

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.3	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.001	1 kHz ± 1 %	± 1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

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Certificate of Calibration
校正證書

Certificate No. : C151967
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720) Date of Receipt / 收件日期 : 24 March 2015

Description / 儀器名稱 : Sound Level Calibrator (EQ084)
Manufacturer / 製造商 : Cesva
Model No. / 型號 : CB-5
Serial No. / 編號 : 030023
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration

DATE OF TEST / 測試日期 : 11 April 2015

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification. (after adjustment)
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 14 April 2015

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
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Certificate of Calibration
校正證書

Certificate No. : C151967
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C143868
CL281	Multifunction Acoustic Calibrator	DC130171
TST150A	Measuring Amplifier	C141558

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

5.1.1 Before Adjustment

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	* 94.4	± 0.3	± 0.2
104 dB, 1 kHz	* 104.4		± 0.3

Out of Mfr's Spec.

5.1.2 After Adjustment

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.3	± 0.2
104 dB, 1 kHz	104.0		± 0.3

5.2 Frequency Accuracy

5.2.1 Before Adjustment

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.002	1 kHz ± 1.5 %	± 1

5.2.2 After Adjustment

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.001	1 kHz ± 1.5 %	± 1

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Certificate No. : C151967
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Remark : The uncertainties are for a confidence probability of not less than 95 %.

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1614299
CLIENT:	ACTION UNITED ENVIRO SERVICES	**SUB-BATCH:**	0
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG.	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	11/04/2016
		DATE OF ISSUE:	18/04/2016

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Dissolved Oxygen and Temperature
Equipment Type:	Dissolved Oxygen Meter
Brand Name:	YSI
Model No.:	YSI Pro 20
Serial No.:	12C100570
Equipment No.:	--
Date of Calibration:	18 April, 2016

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1614299
Sub-Batch: 0
Date of Issue: 18/04/2016
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: Dissolved Oxygen Meter
Brand Name: YSI
Model No.: YSI Pro 20
Serial No.: 12C100570
Equipment No.: --
Date of Calibration: 18 April, 2016 Date of next Calibration: 18 July, 2016

Parameters:

Dissolved Oxygen **Method Ref: APHA (21st edition), 4500O: G**

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.00	3.12	+0.12
5.06	5.06	0.00
9.01	9.04	+0.03
	Tolerance Limit (mg/L)	±0.20

Temperature **Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.**

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
10	9.97	-0.0
20	19.5	-0.5
40	41.0	+1.0
	Tolerance Limit (°C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1610840
CLIENT:	ACTION UNITED ENVIRO SERVICES	**SUB-BATCH:**	0
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG.	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	16/03/2016
		DATE OF ISSUE:	23/03/2016

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Dissolved Oxygen and Temperature
Equipment Type:	Dissolved Oxygen Meter
Brand Name:	YSI
Model No.:	550A
Serial No.:	16A104433
Equipment No.:	--
Date of Calibration:	23 March, 2016

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1610840
Sub-Batch: 0
Date of Issue: 23/03/2016
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: Dissolved Oxygen Meter
Brand Name: YSI
Model No.: 550A
Serial No.: 16A104433
Equipment No.: --
Date of Calibration: 23 March, 2016 Date of next Calibration: 23 June, 2016

Parameters:

Dissolved Oxygen **Method Ref: APHA (21st edition), 4500O: G**

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.43	2.37	-0.06
5.50	5.40	-0.10
8.89	8.75	-0.14
	Tolerance Limit (mg/L)	±0.20

Temperature **Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.**

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
12	11.3	-0.7
22	21.7	-0.3
43	42.5	-0.5
	Tolerance Limit (°C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1614295
CLIENT:	ACTION UNITED ENVIRO SERVICES	**SUB-BATCH:**	0
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	11/04/2016
		DATE OF ISSUE:	18/04/2016

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	HACH
Model No.:	2100Q
Serial No.:	12060C018266
Equipment No.:	--
Date of Calibration:	18 April, 2016

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr. Fung Lim Chee, Richard
General Manager
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1614295
Sub-batch: 0
Date of Issue: 18/04/2016
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: Turbidimeter
Brand Name: HACH
Model No.: 2100Q
Serial No.: 12060C018266
Equipment No.: --
Date of Calibration: 18 April, 2016 Date of next Calibration: 18 July, 2016

Parameters:

Turbidity **Method Ref: APHA 21st Ed. 2130B**

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.18	--
4	4.07	+1.8
40	36.4	-9.0
80	75.6	-5.5
400	413	+3.3
800	824	+3.0
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1614292
CLIENT:	ACTION UNITED ENVIRO SERVICES	**SUB-BATCH:**	0
ADDRESS:	RM A 20/F., GOLDEN KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	11/04/2016
		DATE OF ISSUE:	18/04/2016

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	pH and Temperature
Description:	pH Meter
Brand Name:	AZ
Model No.:	AZ 8685
Serial No.:	1064457
Equipment No.:	--
Date of Calibration:	18 April, 2016

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1614292
Sub-batch: 0
Date of Issue: 18/04/2016
Client: ACTION UNITED ENVIRO SERVICES

Description: pH Meter
Brand Name: AZ
Model No.: AZ 8685
Serial No.: 1064457
Equipment No.: --
Date of Calibration: 18 April, 2016 Date of next Calibration: 18 July, 2016

Parameters:

pH Value

Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	3.9	-0.10
7.0	7.1	+0.10
10.0	10.0	0.00
	Tolerance Limit (pH Unit)	±0.20

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
10	10.0	+0.0
20	20.5	+0.5
40	40.5	+0.5
	Tolerance Limit (°C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Fung Lim Chee Richard
General Manager
Greater China & Hong Kong

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1614297
CLIENT:	ACTION UNITED ENVIRO SERVICES	**SUB-BATCH:**	0
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG.	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	11/04/2016
		DATE OF ISSUE:	18/04/2016

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Conductivity, Dissolved Oxygen, pH, Salinity, Temperature and Turbidity
Equipment Type:	Multifunctional Meter
Brand Name:	YSI
Model No.:	Professional DSS
Serial No.:	15H102620/ 15H103928
Equipment No.:	EQW018
Date of Calibration:	18 April, 2016

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1614297
Sub-Batch: 0
Date of Issue: 18/04/2016
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: Multifunctional Meter
Brand Name: YSI
Model No.: Professional DSS
Serial No.: 15H102620/ 15H103928
Equipment No.: EQW018
Date of Calibration: 18 April, 2016 Date of next Calibration: 18 July, 2016

Parameters:

Conductivity

Method Ref: APHA (21st edition), 2510B

Expected Reading (uS/cm)	Displayed Reading (uS/cm)	Tolerance (%)
146.9	141.3	-3.8
6667	6399	-4.0
12890	12596	-2.3
58670	55890	-4.7
	Tolerance Limit (%)	±10.0

Dissolved Oxygen

Method Ref: APHA (21st edition), 4500O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.00	2.98	-0.02
5.06	4.93	-0.13
9.01	8.93	-0.08
	Tolerance Limit (mg/L)	±0.20

pH Value

Method Ref: APHA 21st Ed. 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.08	+0.08
7.0	7.05	+0.05
10.0	10.01	+0.01
	Tolerance Limit (pH unit)	±0.20

Salinity

Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.08	--
10	9.95	-0.5
20	19.80	-1.0
30	29.89	-0.4
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1614297
Sub-Batch: 0
Date of Issue: 18/04/2016
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: Multifunctional Meter
Brand Name: YSI
Model No.: Professional DSS
Serial No.: 15H102620/ 15H103928
Equipment No.: EQW018
Date of Calibration: 18 April, 2016 Date of next Calibration: 18 July, 2016

Parameters:

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
10	10.2	+0.2
20	21.0	+1.0
40	40.1	+0.1
	Tolerance Limit (°C)	±2.0

Turbidity

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.2	--
4	3.8	-5.0
40	37.0	-7.5
80	78.6	-1.8
400	377.1	-5.7
800	738.3	-7.7
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

Hong Kong Accreditation Service
香港認可處

Certificate of Accreditation
認可證書

This is to certify that
特此證明

ALS TECHNICHEM (HK) PTY LIMITED

11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, New Territories, Hong Kong
香港新界葵涌永業街1-3號忠信針織中心11樓

has been accepted by the HKAS Executive, on the recommendation of the Accreditation Advisory Board, as a
為香港認可處執行機關根據認可諮詢委員會建議而接受的

HOKLAS Accredited Laboratory
「香港實驗所認可計劃」認可實驗所

This laboratory meets the requirements of ISO / IEC 17025 : 2005 – General requirements for the competence of testing and calibration laboratories and it has been accredited for performing specific tests or calibrations as listed in the HOKLAS Directory of Accredited Laboratories within the test category of
此實驗所符合ISO / IEC 17025 : 2005 –《測試及校正實驗所能力的通用規定》所訂的要求，獲認可進行載於香港實驗所認可計劃《認可實驗所名冊》內下述測試類別中的指定測試或校正工作

Environmental Testing
環境測試

This laboratory is accredited in accordance with the recognised International Standard ISO / IEC 17025 : 2005.
本實驗所乃根據公認的國際標準 ISO / IEC 17025 : 2005 獲得認可。
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (see joint IAF-ILAC-ISO Communiqué).
這項認可資格演示在指定範疇所需的技術能力及實驗所質量管理體系的運作（見國際認可論壇、國際實驗所認可合作組織及國際標準化組織的聯合公報）。

The common seal of the Hong Kong Accreditation Service is affixed hereto by the authority of the HKAS Executive
香港認可處根據認可處執行機關的權限在此蓋上通用印章

CHAN Sing Sing, Terence, Executive Administrator
執行幹事 陳成城
Issue Date : 5 May 2009
簽發日期：二零零九年五月五日

Registration Number : HOKLAS 066
註冊號碼：

Date of First Registration : 15 September 1995
首次註冊日期：一九九五年九月十五日

This certificate is issued subject to the terms and conditions laid down by HKAS
本證書按照香港認可處訂立的條款及條件發出

L 000552

Appendix G

Event and Action Plan

Event and Action Plan for Air Quality

Event	Action			
	ET	IEC	ER	Contractor
Action Level				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit Level				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Monitor theimplementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	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. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 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.	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 ER until the exceedance is abated.

Event and Action Plan for Construction Noise

Event	ET	IEC	ER	Action Contractor
Action Level	1. Notify ER, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Advise the ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures.	1. Submit noise mitigation proposals to IEC and ER; 2. Implement noise mitigation proposals.
Limit Level	1. Inform IEC, ER, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and ER on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.

Event and Action Plan for Water Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures	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	1. Inform the ER 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 ER; 6. Implement the agreed mitigation measures.
Action Level being exceeded by more than two consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; 8. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures	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	1. Inform the ER 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 ER within 2 working days; 6. Implement the agreed mitigation measures.
Limit Level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures	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	1. Inform the ER 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 ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit level being exceeded by more than one consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	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 no exceedance of Limit Level.	1. Inform the ER 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 ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures; 7. As directed by the ER, to slow down or to stop all or part of the construction activities.

Appendix H

Impact Monitoring Schedule

Impact Monitoring Schedule for the Reporting Period – April 2016

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
Fri	1-Apr-16				
Sat	2-Apr-16	AM4b, AM5, AM6, AM7b & AM8	AM1b, AM2, AM3 & AM9b		All Water Quality Monitoring Locations
Sun	3-Apr-16				
Mon	4-Apr-16				
Tue	5-Apr-16	AM1b, AM2, AM3 & AM9b	AM4b, AM5, AM6, AM7b & AM8	NM1, NM2, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Wed	6-Apr-16				
Thu	7-Apr-16				All Water Quality Monitoring Locations
Fri	8-Apr-16	AM4b, AM5, AM6, AM7b & AM8	AM1b, AM2, AM3 & AM9b	NM2,NM3, NM4, NM5, NM6 & NM7	
Sat	9-Apr-16				All Water Quality Monitoring Locations
Sun	10-Apr-16				
Mon	11-Apr-16	AM1b, AM2, AM3 & AM9b	AM4b, AM5, AM6, AM7b & AM8	NM1, NM2, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Tue	12-Apr-16				
Wed	13-Apr-16				
Thu	14-Apr-16	AM4b, AM5, AM6, AM7b & AM8	AM1b, AM2, AM3 & AM9b	NM2,NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Fri	15-Apr-16				
Sat	16-Apr-16	AM1b, AM2, AM3 & AM9b	AM4b, AM5, AM6, AM7b & AM8		All Water Quality Monitoring Locations
Sun	17-Apr-16				
Mon	18-Apr-16				All Water Quality Monitoring Locations
Tue	19-Apr-16				
Wed	20-Apr-16	AM4b, AM5, AM6, AM7b & AM8	AM1b, AM2, AM3 & AM9b	NM2,NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Thu	21-Apr-16				
Fri	22-Apr-16	AM1b, AM2, AM3 & AM9b	AM4b, AM5, AM6, AM7b & AM8	NM1, NM2, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Sat	23-Apr-16				
Sun	24-Apr-16				
Mon	25-Apr-16				
Tue	26-Apr-16	AM4b, AM5, AM6, AM7b & AM8	AM1b, AM2, AM3 & AM9b	NM2,NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Wed	27-Apr-16				
Thu	28-Apr-16	AM1b, AM2, AM3 & AM9b	AM4b, AM5, AM6, AM7b & AM8	NM1, NM2, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Fri	29-Apr-16				
Sat	30-Apr-16	AM4b, AM5, AM6, AM7b & AM8	AM1b, AM2, AM3 & AM9b		All Water Quality Monitoring Locations

	Monitoring Day
	Sunday or Public Holiday

Monitoring Location

Contract 2 (C2)	Air Quality	AM7b & AM8
	Construction Noise	NM5, NM6, NM7
	Water Quality	WM3, WM3-Control, WM4, WM4-Control A & WM4-Control B
Contract 3 (C3)	Air Quality	AM9b
	Construction Noise	NM8, NM9 & NM10
	Water Quality	WM4, WM4-Control A & WM4-Control B
Contract 5 (C5)	Air Quality	AM1b, AM2 & AM3
	Construction Noise	NM1, NM2
	Water Quality	WM1 & WM1-Control
Contract SS C505	Air Quality	AM1b
	Construction Noise	NM1
	Water Quality	WM1 & WM1-Control
Contract 6 (C6)	Air Quality	AM2, AM3, AM4b, AM5 & AM6
	Construction Noise	NM2,NM3, NM4, NM5 & NM6
	Water Quality	WM1, WM1C, WM2a, WM2A-C, WM2B, WM2B-C, WM3, WM3-C
Contract 7 (C7)	Air Quality	AM1b
	Construction Noise	NM1

Impact Monitoring Schedule for next Reporting Period – May 2016

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
Sun	1-May-16				
Mon	2-May-16				
Tue	3-May-16	AM1b, AM2, AM3 & AM9b		NM1, NM2, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Wed	4-May-16		AM4b, AM5, AM6, AM7b & AM8		
Thu	5-May-16	AM4b, AM5, AM6, AM7b & AM8		NM2,NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Fri	6-May-16		AM1b, AM2, AM3 & AM9b		
Sat	7-May-16				All Water Quality Monitoring Locations
Sun	8-May-16				
Mon	9-May-16	AM1b, AM2, AM3 & AM9b		NM1, NM2, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Tue	10-May-16		AM4b, AM5, AM6, AM7b & AM8		
Wed	11-May-16	AM4b, AM5, AM6, AM7b & AM8		NM2,NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Thu	12-May-16		AM1b, AM2, AM3 & AM9b		
Fri	13-May-16	AM1b, AM2, AM3 & AM9b			All Water Quality Monitoring Locations
Sat	14-May-16				
Sun	15-May-16				
Mon	16-May-16		AM4b, AM5, AM6, AM7b & AM8		
Tue	17-May-16	AM4b, AM5, AM6, AM7b & AM8		NM2,NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Wed	18-May-16		AM1b, AM2, AM3 & AM9b		
Thu	19-May-16	AM1b, AM2, AM3 & AM9b		NM1, NM2, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Fri	20-May-16				
Sat	21-May-16		AM4b, AM5, AM6, AM7b & AM8		All Water Quality Monitoring Locations
Sun	22-May-16				
Mon	23-May-16	AM4b, AM5, AM6, AM7b & AM8		NM2,NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Tue	24-May-16		AM1b, AM2, AM3 & AM9b		
Wed	25-May-16	AM1b, AM2, AM3 & AM9b		NM1, NM2, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Thu	26-May-16				
Fri	27-May-16		AM4b, AM5, AM6, AM7b & AM8		
Sat	28-May-16	AM4b, AM5, AM6, AM7b & AM8			All Water Quality Monitoring Locations
Sun	29-May-16				
Mon	30-May-16		AM1b, AM2, AM3 & AM9b		
Tue	31-May-16	AM1b, AM2, AM3 & AM9b		NM1, NM2, NM8, NM9 & NM10	All Water Quality Monitoring Locations

	Monitoring Day
	Sunday or Public Holiday

Monitoring Location

Contract 2 (C2)	Air Quality	AM7b & AM8
	Construction Noise	NM5, NM6, NM7
	Water Quality#	WM3, WM3-Control, WM4, WM4-Control A & WM4-Control B
Contract 3 (C3)	Air Quality	AM9b

	Construction Noise	NM8, NM9 & NM10
	Water Quality	WM4, WM4-Control A & WM4-Control B
Contract 5 (C5)	Air Quality	AM1b, AM2 & AM3
	Construction Noise	NM1, NM2
	Water Quality	WM1 & WM1-Control
Contract SS C505	Air Quality	AM1b
	Construction Noise	NM1
	Water Quality	WM1 & WM1-Control
Contract 6 (C6)	Air Quality	AM2, AM3, AM4b, AM5 & AM6
	Construction Noise	NM2,NM3, NM4, NM5 & NM6
	Water Quality	WM1, WM1C, WM2a, WM2A-C, WM2B, WM2B-C, WM3, WM3-C
Contract 7 (C7)	Air Quality	AM1b
	Construction Noise	NM1

Appendix I

Database of Monitoring Result

24-hour TSP Monitoring Data

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-HR TSP ($\mu g/m^3$)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m^3/min)	(std m^3)	INITIAL	FINAL	(g)	
AM1b – Open Area, Tsung Yuen Ha Village															
2-Apr-16	29267	11335.60	11359.74	1448.40	36	38	37.0	21.3	1015.6	1.26	1827	2.8355	2.9663	0.1308	72
8-Apr-16	29357	11359.74	11383.88	1448.40	46	46	46.0	25.3	1013.3	1.52	2198	2.8685	2.9540	0.0855	39
14-Apr-16	29367	11383.88	11407.96	1444.80	38	40	39.0	23.1	1008.5	1.31	1897	2.8759	2.9467	0.0708	37
22-Apr-16	29376	11407.96	11432.11	1449.00	46	47	46.5	21.6	1014.6	1.54	2234	2.8730	2.9867	0.1137	51
26-Apr-16	29439	11432.11	11456.30	1451.40	36	38	37.0	27.2	1009.5	1.34	1940	2.8644	2.9190	0.0546	28
30-Apr-16	29447	11456.30	11480.45	1449.00	44	44	44.0	22.5	1012.2	1.56	2266	2.8978	3.1168	0.2190	97
AM2 - Village House near Lin Ma Hang Road															
2-Apr-16	29266	6881.61	6905.45	1430.40	38	40	39.0	21.3	1015.6	1.21	1730	2.8414	3.0797	0.2383	138
8-Apr-16	29356	6905.45	6929.30	1431.00	34	34	34.0	25.3	1013.3	1.06	1513	2.8783	3.0380	0.1597	106
14-Apr-16	29366	6929.30	6953.09	1427.40	32	33	32.5	23.1	1008.5	1.02	1450	2.8671	2.9225	0.0554	38
20-Apr-16	29375	6953.09	6976.86	1426.20	32	32	32.0	21.6	1014.6	1.01	1435	2.8703	3.0198	0.1495	104
26-Apr-16	29438	6976.86	7000.63	1426.20	28	30	29.0	27.2	1009.5	1.00	1432	2.8847	2.9484	0.0637	44
30-Apr-16	29446	7000.63	7024.42	1427.40	32	32	32.0	22.5	1012.2	1.11	1582	2.8867	3.0958	0.2091	132
AM3 - Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village															
2-Apr-16	29265	7994.99	8019.00	1440.60	39	39	39.0	21.3	1015.6	1.09	1570	2.8380	2.9400	0.1020	65
8-Apr-16	29355	8019.00	8042.99	1439.40	48	48	48.0	25.3	1013.3	1.37	1972	2.8720	3.0549	0.1829	93
14-Apr-16	29365	8042.99	8066.99	1440.00	46	46	46.0	23.1	1008.5	1.31	1883	2.8436	2.9113	0.0677	36
20-Apr-16	29377	8066.99	8091.04	1443.00	38	38	38.0	21.6	1014.6	1.06	1524	2.8920	2.9735	0.0815	53
26-Apr-16	29384	8091.04	8115.04	1440.00	48	48	48.0	27.2	1009.5	1.49	2139	2.8823	3.0177	0.1354	63
30-Apr-16	29448	8115.04	8139.04	1440.00	49	49	49.0	22.5	1012.2	1.53	2210	2.8793	3.0694	0.1901	86
AM4 - House no. 10B1 Nga Yiu Ha Village															
5-Apr-16	29272	10002.75	10026.75	1440.00	40	40	40.0	22.3	1013.3	1.20	1734	2.8610	2.9436	0.0826	48
11-Apr-16	29363	10026.75	10050.75	1440.00	40	41	40.5	21.5	1010.1	1.22	1756	2.8575	2.9318	0.0743	42
16-Apr-16	29364	10050.80	10074.79	1439.40	39	41	40.0	24.7	1010.5	1.20	1724	2.8517	2.9797	0.1280	74
22-Apr-16	29379	10074.79	10098.78	1439.40	40	40	40.0	23.7	1010.7	1.20	1727	2.9036	2.9859	0.0823	48
28-Apr-16	29443	10098.78	10122.78	1440.00	40	40	40.0	26.0	1010.4	1.27	1825	2.8858	2.9970	0.1112	61
AM5a - Ping Yeung Village House															
5-Apr-16	29271	7841.06	7865.06	1440.00	31	31	31.0	22.3	1013.3	0.97	1401	2.8290	2.8676	0.0386	28
11-Apr-16	29359	7865.06	7889.06	1440.00	32	33	32.5	21.5	1010.1	1.02	1466	2.8601	2.9052	0.0451	31
16-Apr-16	29370	7889.09	7913.09	1440.00	29	29	29.0	24.7	1010.5	0.91	1308	2.8738	2.9353	0.0615	47

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-HR TSP ($\mu g/m^3$)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m^3/min)	(std m^3)	INITIAL	FINAL	(g)	
22-Apr-16	29378	7913.09	7937.08	1439.40	34	36	35.0	23.7	1010.7	1.09	1569	2.8873	2.9276	0.0403	26
28-Apr-16	29442	7937.08	7961.09	1440.60	20	20	20.0	26	1010.4	0.68	986	2.9038	2.9570	0.0532	54
AM6 - Wo Keng Shan Village House															
5-Apr-16	29270	6412.04	6436.04	1440.00	35	35	35.0	22.3	1013.3	0.96	1379	2.8320	2.9613	0.1293	94
11-Apr-16	29361	6436.04	6460.04	1440.00	33	33	33.0	21.5	1010.1	0.89	1277	2.8689	2.9517	0.0828	65
16-Apr-16	29373	6460.04	6484.04	1440.00	33	33	33.0	24.7	1010.5	0.88	1269	2.8878	2.9580	0.0702	55
22-Apr-16	29380	6484.04	6508.04	1440.00	34	34	34.0	23.7	1010.7	0.92	1322	2.8885	2.9499	0.0614	46
28-Apr-16	29320	6542.33	6566.33	1440.00	32	32	32.0	26.0	1010.4	0.92	1328	2.8390	2.9819	0.1429	108
AM7b - Loi Tung Village House															
5-Apr-16	29269	15445.10	15469.10	1440.00	20	20	20.0	22.3	1013.3	0.54	780	2.8284	2.8974	0.0690	88
11-Apr-16	29360	15469.10	15493.10	1440.00	28	28	28.0	21.5	1010.1	0.76	1093	2.8494	2.9050	0.0556	51
16-Apr-16	29374	15493.10	15517.10	1440.00	27	27	27.0	24.7	1010.5	0.73	1048	2.8826	3.0148	0.1322	126
22-Apr-16	29382	15517.10	15541.09	1439.40	28	28	28.0	23.7	1010.7	0.76	1089	2.8899	2.9557	0.0658	60
28-Apr-16	29330	15578.59	15602.57	1438.80	28	28	28.0	26.0	1010.4	0.85	1223	2.8664	2.9681	0.1017	83
AM8 - Po Kat Tsai Village No. 4															
5-Apr-16	29268	9315.51	9339.51	1440.00	42	42	42.0	22.3	1013.3	1.03	1488	2.8360	2.8999	0.0639	43
11-Apr-16	29368	9339.51	9363.54	1441.80	42	42	42.0	21.5	1010.1	1.03	1490	2.8483	2.8856	0.0373	25
16-Apr-16	29371	9364.54	9388.54	1440.00	34	35	34.5	24.7	1010.5	0.80	1156	2.8743	2.9509	0.0766	66
22-Apr-16	29381	9388.54	9412.53	1439.40	42	42	42.0	23.7	1010.7	1.03	1481	2.9051	2.9628	0.0577	39
28-Apr-16	29329	9449.61	9473.61	1440.00	40	40	40.0	26.0	1010.4	1.07	1547	2.8684	2.9355	0.0671	43
AM9b - Nam Wa Po Village House No. 80															
2-Apr-16	29264	16768.33	16792.33	1440.00	32	32	32.0	21.3	1015.6	0.95	1366	2.8453	2.9133	0.0680	50
8-Apr-16	29358	16792.33	16816.33	1440.00	30	30	30.0	25.3	1013.3	0.87	1256	2.8535	2.9146	0.0611	49
14-Apr-16	29369	16816.33	16840.33	1440.00	28	30	29.0	23.1	1008.5	0.84	1209	2.8408	2.8841	0.0433	36
20-Apr-16	29383	16840.33	16864.33	1440.00	26	28	27.0	21.6	1014.6	0.78	1118	2.8911	2.9335	0.0424	38
26-Apr-16	29440	16864.33	16888.37	1442.40	36	37	36.5	22.8	1012.6	1.16	1672	2.8770	2.9089	0.0319	19
30-Apr-16	29449	16888.37	16912.37	1440.00	30	33	31.5	22.5	1012.2	0.98	1412	2.8740	3.0378	0.1638	116

Construction Noise Monitoring Results, dB(A)

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3rd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30	façade correction
NM1 - Tsung Yuen Ha Village House No. 63																					
5-Apr-16	10:44	65.6	70.0	54.7	61.3	65.1	53.3	58.3	61.5	52.8	63.4	67.4	53.5	67.7	71.9	54.5	60.0	63.3	53.1	64	NA
11-Apr-16	10:03	55.9	57.7	49.4	54.7	58.5	47.8	58.4	60.7	52.1	58.6	61.2	52.5	54.7	57.6	49.1	55.3	58.0	50.8	57	NA
22-Apr-16	10:10	55.2	55.5	46.5	50.2	52.0	47.0	48.3	49.0	45.5	57.0	59.0	46.5	58.1	60.5	48.5	52.1	53.5	46.0	55	NA
28-Apr-16	9:55	60.0	63.9	54.5	59.7	63.2	53.5	62.4	66.4	54.6	63.6	67.2	54.3	60.6	63.9	54.6	63.1	66.2	54.9	62	NA
NM2 - Village House near Lin Ma Hang Road																					
5-Apr-16	10:26	65.9	68.5	58.1	66.8	69.5	63.4	63.1	65.9	57.7	61.4	63.4	59.2	61.8	63.3	57.5	59.7	64.2	53.5	64	NA
11-Apr-16	10:56	59.8	63.0	54.3	58.8	62.4	52.3	56.6	59.6	52.3	60.6	64.8	54.7	59.4	62.2	52.4	59.9	63.2	53.5	59	NA
22-Apr-16	11:00	67.5	70.5	58.5	66.4	69.5	59.0	68.1	71.0	60.5	67.7	71.0	60.0	67.2	70.5	60.0	66.3	69.5	59.5	67	NA
28-Apr-16	10:56	63.2	64.6	56.9	61.2	64.2	55.4	57.6	59.5	54.7	59.5	62.2	54.9	58.7	61.1	55.9	59.9	62.2	55.8	60	NA
NM3 - Ping Yeung Village House																					
8-Apr-16	10:06	57.4	59.6	52.7	55.8	54.8	52.4	56.9	58.5	52.1	62.1	60.4	51.8	57.4	59.1	51.9	58.5	59.5	51.9	59	NA
14-Apr-16	9:41	62.3	63.4	55.9	64.7	67.1	56.3	60.3	61.4	56.2	60.5	62.7	56.7	60.9	63.5	57.3	62.5	63.8	56.3	62	NA
20-Apr-16	10:47	57.0	59.2	52.7	55.9	55.1	52.1	56.3	58.1	52.4	63.0	61.1	51.7	57.4	58.9	51.9	58.0	58.3	52.0	59	NA
26-Apr-16	10:03	63.2	63.7	55.6	64.0	66.5	56.5	62.3	63.2	56.2	61.5	62.9	56.7	62.0	63.5	57.0	62.2	63.5	56.5	63	NA
NM4 - Wo Keng Shan Village House																					
8-Apr-16	9:53	66.4	68.1	59.6	64.9	65.0	58.1	65.3	66.1	57.5	63.0	62.7	55.5	63.7	64.3	56.9	70.5	61.8	55.9	66	NA
14-Apr-16	11:03	63.7	64.9	59.7	66.4	69.6	59.7	62.3	63.4	58.9	62.7	63.3	60.1	62.7	63.7	59.6	66.1	67.2	59.9	64	NA
20-Apr-16	10:01	65.3	64.1	58.9	64.8	65.4	59.4	64.0	64.0	59.1	62.4	64.3	58.8	63.0	64.0	60.5	64.2	67.0	58.7	64	NA
26-Apr-16	11:01	64.0	65.1	59.9	66.0	67.5	59.7	63.6	64.5	58.5	62.7	63.5	60.0	63.0	63.5	59.5	63.0	66.0	60.5	64	NA
NM5– Ping Yeung Village House (façade facing northeast)																					
8-Apr-16	10:34	59.8	55.5	50.0	52.2	53.5	50.0	51.7	53.0	48.5	51.3	53.5	47.5	52.5	53.5	47.5	51.2	53.5	47.5	55	NA
14-Apr-16	10:45	62.3	57.5	46.5	54.7	54.0	45.5	51.1	54.0	46.0	52.8	55.5	48.5	54.0	55.0	45.5	49.0	52.0	42.0	56	NA
20-Apr-16	9:35	60.4	62.5	54.0	59.9	62.0	55.5	61.9	64.0	56.5	60.2	63.0	56.5	61.9	65.0	56.0	68.5	72.0	56.5	63	NA
26-Apr-16	9:25	55.3	56.5	52.0	53.6	54.5	51.5	53.0	54.0	49.5	54.1	55.5	50.5	54.1	55.5	51.5	54.7	56.0	51.5	54	NA
NM6 – Tai Tong Wu Village House 2																					
8-Apr-16	11:24	59.0	61.5	53.0	60.4	62.5	57.5	59.6	62.0	52.5	56.7	60.0	51.0	58.7	62.0	49.5	56.8	59.5	51.5	59	NA
14-Apr-16	11:30	50.9	54.5	43.5	48.5	51.0	41.5	50.5	54.0	43.0	52.2	54.5	44.0	51.5	54.5	42.5	49.6	52.5	44.0	51	NA
20-Apr-16	10:17	58.6	61.0	52.5	57.6	60.5	52.5	60.3	62.0	52.5	58.2	57.0	51.5	60.4	63.5	52.5	55.7	58.0	52.0	59	NA
26-Apr-16	10:07	61.9	64.5	57.5	61.8	64.5	58.0	62.4	65.0	58.0	62.7	65.0	58.0	63.2	66.0	58.0	66.6	69.0	57.5	63	NA
NM7 – Po Kat Tsai Village																					
8-Apr-16	13:02	59.6	63.0	50.0	56.9	59.0	50.0	59.6	61.5	50.5	61.1	65.5	51.0	60.9	65.5	50.5	59.0	61.0	50.5	60	NA

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3nd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30	façade correction
14-Apr-16	13:07	60.9	63.5	49.5	59.7	62.5	51.0	68.8	68.0	53.5	60.8	61.0	52.5	58.2	60.5	50.0	63.9	67.0	48.5	64	NA
20-Apr-16	13:06	66.2	69.0	60.0	62.2	65.0	58.5	64.2	67.5	57.0	65.7	70.5	53.5	57.3	59.5	53.5	56.7	59.0	53.0	63	NA
26-Apr-16	13:14	64.3	66.5	59.0	62.6	64.5	58.5	63.0	65.0	56.5	66.2	66.5	56.5	62.6	65.0	59.0	63.2	64.5	56.0	64	NA
NM8 - Village House, Tong Hang																					
9-Apr-15	10:28	58.2	63.5	50.7	56.9	63.4	50.7	58.0	63.2	52.1	56.7	55.7	51.4	56.9	61.9	52.6	59.2	66.1	52.6	58	NA
13-Apr-15	14:05	56.2	55.9	51.2	55.2	58.1	50.5	57.3	59.8	52.4	57.5	62.3	50.3	58.1	63.8	49.8	57.6	62.5	51.3	57	NA
18-Apr-15	15:37	60.6	63.5	53.5	59.4	63.0	53.5	60.1	64.0	53.0	59.7	64.0	54.0	59.0	63.0	53.5	59.3	63.0	54.0	60	NA
24-Apr-15	14:09	60.3	60.5	52.5	57.9	61.0	53.5	58.9	62.5	52.0	59.1	62.0	53.5	9.1	62.5	53.5	59.5	62.0	54.0	58	NA
29-Apr-15	16:38	60.2	63.0	55.5	59.8	62.5	52.0	56.9	62.0	49.5	56.3	61.0	51.0	58.6	63.5	50.5	55.8	57.5	50.0	58	NA
NM9 - Village House, Kiu Tau Village																					
9-Apr-15	11:21	56.0	60.6	51.0	63.8	62.3	51.9	53.8	57.2	50.4	54.9	58.2	51.2	53.6	54.6	50.7	56.2	58.8	51.4	58	NA
13-Apr-15	15:23	59.3	62.5	51.1	56.8	61.0	50.8	57.0	61.7	50.9	58.2	61.9	51.7	55.5	58.3	51.5	58.4	61.8	53.7	58	NA
18-Apr-15	16:28	60.1	63.0	57.0	60.8	63.5	57.0	59.4	62.0	56.0	59.1	61.0	56.0	59.6	63.0	54.5	56.2	58.5	54.0	59	NA
24-Apr-15	15:03	57.1	58.5	53.0	63.0	62.0	54.0	59.3	60.0	53.5	63.0	6.0	53.0	57.7	59.5	53.5	59.6	61.0	52.0	61	NA
29-Apr-15	17:21	52.4	55.7	50.9	53.4	55.8	51.9	57.1	61.6	52.2	57.0	59.8	51.5	54.4	56.6	52.0	54.7	59.2	52.5	55	NA
NM10 - Nam Wa Po Village House No. 80																					
5-Apr-16	14:26	62.7	64.8	59.6	65.4	63.3	58.1	59.9	61.8	57.8	62.4	64.1	58.5	61.8	63.9	56.8	60.9	62.2	58.8	63	66
11-Apr-16	9:13	71.6	73.0	60.5	61.8	65.5	51.0	57.5	60.5	50.0	57.1	61.5	48.5	57.9	62.0	47.0	62.3	63.0	50.0	65	68
22-Apr-16	13:10	69.3	72.7	64.1	67.9	71.5	59.7	71.7	74.6	66.5	71.9	73.4	67.0	69.5	70.5	66.1	65.7	68.4	64.0	70	73
28-Apr-16	13:03	62.0	64.2	57.0	62.1	64.2	59.4	59.7	62.0	56.8	61.0	63.4	56.7	62.7	64.8	58.6	60.4	62.2	57.4	61	64
5-Apr-16	14:26	62.7	64.8	59.6	65.4	63.3	58.1	59.9	61.8	57.8	62.4	64.1	58.5	61.8	63.9	56.8	60.9	62.2	58.8	63	66

Water Quality Monitoring Data for Contract 5, 6 and SS C505

Date	2-Apr-16															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:49	0.41	22.3	22.3	8.04	8.1	92.6	92.9	9.9	9.9	7.9	7.9	10	9.0
			22.3		8.14		93.1		9.9		7.9		8	
WM1	11:36	0.35	22.5	22.5	7.47	7.5	86.2	86.6	25.6	26.2	7.8	7.8	43	40.5
			22.5		7.5		87.0		26.7		7.8		38	

Date	5-Apr-16															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:47	0.27	24.9	24.9	7.31	7.3	88.3	88.5	19.1	19.3	8.9	8.9	41	39.5
			24.9		7.35		88.7		19.4		8.9		38	
WM1	10:24	0.36	25.1	25.1	7.34	7.3	89.0	89.2	122.0	**124.5**	8.8	8.8	224	**220.0**
			25.1		7.35		89.4		127.0		8.8		216	

Date	6-Apr-16															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	9:37	0.27							9.3	9.3			16	16.0
									9.4					
WM1	9:51	0.35							105.0	**108.0**			269	**269.0**
									111.0					

Date	7-Apr-16															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	9:35	0.31	24.6	24.6	8.21	8.2	99.1	99.3	7.6	7.7	9.6	9.6	5	5.5
			24.6		8.24		99.5		7.7		9.6		6	
WM1	9:53	43.00	24.8	24.8	7.55	7.6	91.1	91.4	94.6	**94.1**	8.7	8.7	153	**150.5**
			24.8		7.59		91.7		93.6		8.7		148	

Date	8-Apr-16															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:45	0.27							9.4	9.6			10	10.0
									9.9				10	
WM1	10:38	0.35							98.5	**101.8**			298	**298.0**
									105.0				298	

Date	9-Apr-16															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:09	0.29	25	25.0	8.3	8.3	100.6	100.8	6.8	6.8	8.9	8.9	11	11.0
			25		8.34		101.0		6.9		8.9		11	
WM1	9:52	0.37	25.5	25.5	7.81	7.8	95.2	95.6	49.3	49.9	9.3	9.3	51	54.0
			25.5		7.86		96.0		50.4		9.3		57	

Date	11-Apr-16															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:03	0.27	22.9	22.9	7.55	7.6	88.0	88.2	18.1	18.6	9.1	9.1	18	18.5
			22.9		7.57		88.3		19.0		9.1		19	
WM1	9:48	0.37	23.3	23.3	8.11	8.1	95.0	95.1	81.9	**82.2**	8.5	8.5	120	**125.0**
			23.3		8.15		95.2		82.4		8.5		130	

Date	12-Apr-16															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:50	0.29							13.6	13.1			17	17.0
									12.6				17	
WM1	10:45	0.37							26.3	24.9			33	33.0
									23.5				33	

Date	13-Apr-16															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	13:35	0.35							105.0	106.0			114	114.0
									107.0					
WM1	13:20	0.43							69.0	**71.0**			74	**74.0**
									73.0					

Date	14-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	9:29	0.29	22.7	22.7	7.99	8.0	92.6	92.8	9.1	9.3	9	9.0	12	11.0
			22.7		8.04		93.0		9.4		9		10	
WM1	9:17	0.35	22.8	22.8	7.44	7.5	86.6	86.8	19.2	19.9	9.1	9.1	42	42.0
			22.8		7.47		86.9		20.6		9.1		42	

Date	16-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	9:01	0.30	24.7	24.7	7.8	7.8	93.6	93.8	10.1	9.9	9.1	9.1	11	11.0
			24.7		7.83		94.0		9.7		9.1		11	
WM1	8:45	0.27	24.4	24.6	7.87	7.9	94.1	94.3	14.7	15.1	8.8	8.8	19	19.5
			24.7		7.91		94.5		15.4		8.8		20	

Date	18-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	12:22	0.37	23.1	23.1	7.48	7.5	87.5	87.7	597.0	607.5	9	9.0	467	470.0
			23.1		7.53		87.9		618.0		9		473	
WM1	12:39	0.32	23.3	23.3	7.31	7.3	85.6	85.7	164.0	**164.5**	9.1	9.1	150	**147.5**
			23.3		7.34		85.8		165.0		9.1		145	

Date	20-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:43	0.27	23.5	23.5	7.87	7.9	92.8	93.2	9.3	9.3	9.1	9.1	8	8.0
			23.5		7.93		93.6		9.4		9.1		8	

WM1	11:24	0.27	23.2 23.2	23.2	7.57 7.6	7.6	88.4 88.9	88.7	23.0 23.3	23.2	8.4 8.4	8.4	23 22	22.5

Date	**22-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:37	0.27	22.4 22.4	22.4	7.95 7.97	8.0	91.6 92.0	91.8	553.0 560.0	556.5	9.4 9.4	9.4	492 498	495.0
WM1	10:21	0.39	22.6 22.6	22.6	8.13 8.17	8.2	93.9 94.3	94.1	575.0 581.0	**578.0**	9.3 9.3	9.3	531 529	**530.0**

Date	**26-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:59	0.34	2.9 24.9	13.9	6.94 6.97	7.0	83.9 84.3	84.1	14.5 14.7	14.6	8.6 8.6	8.6	12 14	13.0
WM1	11:39	0.21	25 25	25.0	6.26 6.34	6.3	75.9 76.4	76.2	24.1 24.6	24.4	8.4 8.4	8.4	26 26	26.0

Date	**28-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:10	0.27	25.6 25.6	25.6	7.9 7.9	7.9	95.9 96.0	96.0	10.5 10.5	10.5	8.8 8.8	8.8	9 9	9.0
WM1	10:20	0.27	25.2 25.2	25.2	7.58 7.58	7.6	92.0 92.0	92.0	33.8 36.9	35.4	8.7 8.7	8.7	50 51	50.5

Date	**30-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:40	0.31	23.5 23.5	23.5	7.12 8.07	7.6	95.9 95.3	95.6	10.7 10.4	10.6	9 9	9.0	11 12	11.5
WM1	11:29	0.26	23.4 23.4	23.4	7.89 7.94	7.9	93.1 93.7	93.4	16.4 15.9	16.2	9.1 9.1	9.1	21 22	21.5

Water Quality Monitoring Data for Contract 2 and 3

Date	2-Apr-16															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	9:37	0.27	21.2	21.2	8.6	8.6	96.8	97.0	205.0	208.0	9.4	9.4	109	100.0
			21.2		8.63		97.1		211.0		9.4		91	
WM4-CB	9:56	0.50	21.4	21.4	6.77	6.8	76.5	76.7	11.1	11.0	8.6	8.6	20	21.5
			21.4		6.79		76.9		10.9		8.6		23	
WM4	9:21	0.29	21.5	21.5	8.37	8.4	95.1	95.3	10.9	11.1	9.1	9.1	14	15.0
			21.5		8.39		95.4		11.3		9.1		16	

Date	5-Apr-16															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	13:19	0.23	24.7	24.7	8.14	8.2	90.8	91.4	59.3	60.2	8.8	8.8	79	75.0
			24.7		8.21		91.9		61.1		8.8		71	
WM4-CB	13:37	0.30	25.1	25.1	5.88	5.9	71.3	71.6	10.1	10.0	8.5	8.5	13	12.5
			25.1		5.9		71.8		9.9		8.5		12	
WM4	13:00	0.18	25	25.0	7.37	7.4	89.5	89.7	10.8	11.0	8.8	8.8	18	18.5
			25		7.4		89.9		11.2		8.8		19	

Date	7-Apr-16															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	12:56	0.31	27.1	27.1	8.16	8.2	102.4	102.6	8.0	8.1	9	9.0	8	7.5
			27.1		8.19		102.7		8.2		9		7	
WM4-CB	13:27	0.37	27.5	27.5	6.01	6.0	76.2	76.4	6.2	6.2	8.5	8.5	11	10.5
			27.5		6.04		76.5		6.3		8.5		10	
WM4	12:37	0.29	27.7	27.7	7.29	7.3	92.7	93.0	10.5	10.5	9	9.0	15	15.5
			27.7		7.35		93.2		10.4		9		16	

Date	9-Apr-16															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	12:56	0.19	26	26.0	7.96	8.0	98.3	98.7	31.7	32.2	9.4	9.4	44	44.5
			26		8.01		99.1		32.6		9.4		45	

WM4-CB	13:27	0.33	26.5	26.5	5.3	5.3	66.0	66.3	16.5	16.1	9.1	9.1	26	26.0
			26.5		5.34		66.6		15.7		9.1		26	
WM4	12:37	0.24	26.6	26.6	6.84	6.9	84.9	85.2	19.7	20.0	9.4	9.4	35	36.0
			26.6		6.87		85.4		20.2		9.4		37	

Date	**11-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	12:57	0.31	22.8	22.8	8.05	8.1	93.5	93.7	5.5	5.5	9.1	9.1	5	4.5
			22.8		8.07		93.9		5.4		9.1		4	
WM4-CB	11:21	0.35	23.1	23.1	5.74	5.8	67.0	67.2	10.5	10.4	8.7	8.7	13	14.0
			23.1		5.79		67.3		10.2		8.7		15	
WM4	12:27	0.27	23.3	23.3	7.47	7.5	87.5	87.7	18.7	18.8	9.1	9.1	21	21.0
			23.3		7.49		87.9		18.8		9.1		21	

Date	**14-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:59	0.25	22.8	22.8	8.31	8.3	96.4	96.8	7.0	6.9	9.6	9.6	8	7.0
			22.8		8.37		97.1		6.9		9.6		6	
WM4-CB	12:27	0.37	23.2	23.2	6.47	6.5	75.6	76.1	15.1	14.9	9.3	9.3	18	17.0
			23.2		6.51		76.6		14.7		9.3		16	
WM4	11:43	0.27	23.2	23.2	7.46	7.5	87.5	87.9	25.5	25.6	9.7	9.7	28	28.0
			23.2		7.49		88.3		25.7		9.7		28	

Date	**16-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:46	0.19	25.3	25.3	8.08	8.1	98.5	98.9	9.7	9.3	9.7	9.7	6	6.0
			25.3		8.14		99.3		8.9		9.7		6	
WM4-CB	11:59	0.29	25.7	25.7	5.81	5.9	71.5	72.3	15.5	15.2	9.4	9.4	19	19.5
			25.7		5.9		73.0		14.8		9.4		20	
WM4	11:23	0.29	25.5	25.5	7.23	7.3	88.1	88.5	13.7	13.3	9.9	9.9	15	14.0
			25.5		7.27		88.9		12.8		9.9		13	

Date	**18-Apr-16**

Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:51	0.27	24.4	24.4	8.14	8.2	97.6	97.7	13.4	13.6	9.4	9.4	9	9.0
			24.4		8.17		97.8		13.7		9.4		9	
WM4-CB	15:08	0.35	25.1	25.1	7	7.0	85.1	85.4	18.1	17.9	9	9.0	13	13.0
			25.1		7.07		85.7		17.7		9		13	
WM4	14:32	0.33	25.3	25.3	7.38	7.4	90.3	90.0	28.3	28.5	9.3	9.3	17	16.5
			25.3		7.43		89.6		28.6		9.3		16	

Date	20-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:28	0.19	23.7	23.7	8.3	8.3	98.1	98.1	8.1	8.2	9.9	9.9	8	8.0
			23.7		8.31		98.1		8.3		9.9		8	
WM4-CB	14:45	0.29	24.1	24.1	6.62	6.6	78.2	78.3	13.8	14.1	9.2	9.2	15	15.5
			24.1		6.63		78.3		14.4		9.2		16	
WM4	14:15	0.29	24.3	24.3	7.62	7.6	90.5	90.6	14.7	14.9	9.9	9.9	14	13.5
			24.3		7.63		90.7		15.1		9.9		13	

Date	22-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	13:29	0.27	23.6	23.6	8.09	8.1	95.8	96.1	22.6	22.8	9.5	9.5	23	23.0
			23.6		8.17		96.4		22.9		9.5		23	
WM4-CB	13:47	0.36	24.3	24.3	6.96	7.0	83.0	83.3	38.6	39.3	8.7	8.7	37	37.0
			24.3		6.99		83.6		39.9		8.7		37	
WM4	13:07	0.37	24.4	24.4	7.39	7.4	88.5	88.9	44.2	**45.1**	9.5	9.5	43	43.0
			24.4		7.43		89.3		45.9		9.5		43	

Date	26-Apr-16													
Location	Time	Depth (m)	26		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:42	0.18	26	26.0	7.93	8.0	97.7	98.1	10.4	10.8			3	3.5
			26		7.98		98.4		11.1				4	
WM4-CB	14:59	0.31	27	27.0	6.62	6.7	83.0	83.4	10.0	10.4			9	10.0
			27		6.7		83.8		10.7				11	
WM4	14:29	0.27	27.3	27.3	7.25	7.3	91.1	91.5	15.4	15.1			10	11.0

			27.3		7.29		91.8		14.8				12	

Date	28-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	14:25	0.19	26.2	26.2	7.98	8.0	95.5	95.4	12.4	12.8	9.7	9.7	9	9.5
			26.2		7.98		95.2		13.2		9.7		10	
WM4-CB	14:40	0.29	27.1	27.1	6.53	6.5	81.0	81.0	14.8	14.9	8.8	8.8	24	24.0
			27.1		6.53		81.0		14.9		8.8		24	
WM4	14:15	0.29	27.5	27.5	7.39	7.4	92.9	92.9	14.3	14.6	9.5	9.5	23	23.5
			27.5		7.39		92.9		14.8		9.5		24	

Date	30-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	9:34	0.17	23.2	23.2	8.63	8.7	101.1	101.5	8.8	8.6	8.5	8.5	14	13.5
			23.2		8.7		101.8		8.4		8.5		13	
WM4-CB	8:57	0.27	23.4	23.4	7.78	7.8	90.2	90.7	5.7	5.6	8.6	8.6	20	19.5
			23.4		7.81		91.1		5.6		8.6		19	
WM4	9:21	0.19	23.1	23.1	8.25	8.3	96.4	96.9	11.4	11.2	8.4	8.4	6	5.5
			23.1		8.31		97.4		10.9		8.4		5	

Water Quality Monitoring Data for Contract 6

Date	2-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	11:09	0.27	22.3	22.3	8.34	8.4	96.0	96.3	4.1	4.1	7.90	7.9	<2	<2
			22.3		8.37		96.6		4.1		7.90		<2	
WM2A	11:19	0.16	22.7	22.7	8.4	8.4	97.5	97.7	19.5	19.9	7.80	7.8	14	13.0
			22.7		8.43		97.9		20.3		7.80		12	

Date	5-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	11:20	0.35	24	24.0	8.05	8.1	95.6	95.9	5.8	5.8	8.90	8.9	4	3.5
			24		8.07		96.1		5.9		8.90		3	
WM2A	11:05	0.19	25.5	25.5	8.03	8.1	98.1	98.3	17.4	17.5	9.00	9.0	12	12.0
			25.5		8.09		98.4		17.6		9.00		12	

Date	7-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:29	0.37	25.1	25.1	7.98	8.0	96.8	97.2	4.3	4.3	8.20	8.2	<2	<2
			25.1		8.03		97.5		4.3		8.20		<2	
WM2A	10:17	0.15	25.4	25.4	8.15	8.2	99.3	99.5	18.7	18.3	8.40	8.4	11	11.5
			25.4		8.19		99.7		17.9		8.40		12	

Date	9-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:54	0.31	24.8	24.8	7.83	7.9	94.4	94.6	3.8	3.8	8.40	8.4	<2	2.0
			24.8		7.87		94.7		3.9		8.40		2	
WM2A	10:39	0.19	25.6	25.6	8.36	8.4	102.1	102.5	10.8	10.9	8.50	8.5	15	14.5
			25.6		8.4		102.9		11.0		8.50		14	

Date	11-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	

WM2A-C	10:41	0.27	22.9	22.9	8.44	8.5	98.2	98.3	6.4	6.5	8.60	8.6	<2	<2
			22.9		8.47		98.4		6.5		8.60		<2	
WM2A	10:24	0.17	23	23.0	8.41	8.4	98.1	98.3	66.0	**68.6**	8.90	8.9	92	**93.5**
			23		8.45		98.5		71.1		8.90		95	

Date	**12-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM2A-C	10:00	0.31							4.5	4.7			<2	<2
									4.9				<2	
WM2A	10:15	0.19							24.4	23.8			14	14.0
									23.2				14	

Date	**13-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM2A-C	13:00	0.40							23.2	23.3			22	22.0
									23.4					
WM2A	13:10	0.18							102.0	**103.0**			104	**104.0**
									104.0					

Date	**14-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM2A-C	9:59	0.29	22.9	22.9	8.19	8.2	95.3	95.5	4.4	4.4	8.70	8.7	3	3.0
			22.9		8.23		95.7		4.5		8.70		3	
WM2A	9:43	0.19	22.8	22.8	8.39	8.4	97.4	97.7	18.1	17.6	8.80	8.8	20	**20.5**
			22.8		8.47		97.9		17.1		8.80		21	

Date	**15-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM2A-C	11:10	0.40							2.8	3.0			<2	<2
									3.1				<2	
WM2A	11:00	0.18							11.1	11.3			13	13.0
									11.5				13	

Date	16-Apr-16															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	9:46	0.29	23.9	23.9	8.31	8.3	98.9	98.7	4.8	4.7	8.70	8.7	<2	<2
			23.9		8.27		98.5		4.6		8.70		<2	
WM2A	9:27	0.16	24.9	24.9	8.08	8.1	97.7	98.1	8.8	8.8	8.90	8.9	6	5.5
			24.9		8.11		98.4		8.9		8.90		5	

Date	18-Apr-16															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	13:09	0.19	22.9	22.9	7.92	7.9	92.3	92.6	19.4	19.9	8.40	8.4	9	9.5
			22.9		7.97		92.8		20.4		8.40		10	
WM2A	12:54	0.57	24.3	24.3	8.09	8.1	96.8	96.8	84.7	**83.6**	8.70	8.7	84	**84.0**
			24.3		8.14		96.7		82.5		8.70		84	

Date	19-Apr-16															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	12:30	0.29							5.8	6.0			2	2.0
									6.3				2	
WM2A	12:20	0.16							22.5	22.6			26	**26.0**
									22.7					

Date	20-Apr-16															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:40	0.29	21.7	21.7	8.24	8.3	92.9	93.4	4.3	4.3	9.10	9.1	3	2.5
			21.7		8.28		93.9		4.3		9.10		2	
WM2A	11:06	0.11	23.9	23.9	8.13	8.2	96.3	96.5	20.7	20.3	8.70	8.7	15	14.0
			23.9		8.17		96.7		19.8		8.70		13	

Date	22-Apr-16															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	

WM2A-C	11:13	0.37	22.1	22.1	8.46	8.5	96.7	97.0	48.6	48.9	9.00	9.0	27	27.5
			22.1		8.51		97.3		49.1		9.00		28	
WM2A	10:56	0.21	23.7	23.7	8.15	8.2	98.1	98.3	55.3	**56.0**	9.90	9.5	92	**92.5**
			23.7		8.19		98.5		56.7		9.10		93	

Date	**26-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM2A-C	10:07	0.31	23.8	23.8	8.21	8.3	93.4	93.7	4.7	4.7	8.90	8.9	3	3.0
			23.8		8.29		94.0		4.8		8.90		3	
WM2A	11:14	0.21	26.2	26.2	7.59	7.6	93.9	94.3	15.4	15.5	8.60	8.6	14	14.0
			26.2		7.67		94.7		15.6		8.60		14	

Date	**28-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM2A-C	11:44	0.29	24.2	24.2	7.93	7.9	95.1	95.1	5.7	5.8	8.80	8.8	2	2.5
			24.2		7.93		95.1		5.9		8.80		3	
WM2A	11:20	0.11	26.7	26.7	7.8	7.8	96.7	96.7	17.5	17.9	8.60	8.6	12	12.0
			26.7		7.8		96.7		18.2		8.60		12	

Date	**30-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM2A-C	10:56	0.21	23.3	23.3	8.24	8.3	96.9	97.4	5.3	5.3	9.60	9.6	<2	<2
			23.3		8.31		97.8		5.3		9.60		<2	
WM2A	11:08	0.18	24.5	24.5	8.09	8.1	97.3	97.5	21.5	21.7	9.20	9.2	13	13.5
			24.5		8.11		97.7		21.9		9.20		14	

Date	**2-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM2B-C	10:45	0.01	22.7	22.7	8.23	8.3	95.5	95.9	2.8	2.8	8.40	8.4	<2	<2
			22.7		8.31		96.3		2.9		8.40		<2	

WM2B	10:59	0.01	23.4 23.4	23.4	8.5 8.54	8.5	99.3 100.1	99.7	6.3 6.5	6.4	7.80 7.80	7.8	10 11	10.5

Date	**5-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM2B-C	11:57	0.01	23.9 23.9	23.9	7.8 7.84	7.8	92.5 92.9	92.7	4.2 4.3	4.2	8.80 8.80	8.8	6 5	5.5
WM2B	11:35	0.01	24.8 24.8	24.8	8.34 8.36	8.4	101.0 101.5	101.3	10.7 10.9	10.8	8.50 8.50	8.5	11 11	11.0

Date	**7-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM2B-C	11:09	0.01	26 26	26.0	7.88 7.91	7.9	97.1 97.5	97.3	4.9 5.0	4.9	8.40 8.40	8.4	<2 <2	<2
WM2B	10:54	0.02	26.6 26.6	26.6	8.3 8.35	8.3	103.4 103.7	103.6	783.0 797.0	**790.0**	8.10 8.10	8.1	810 802	**806.0**

Date	**8-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM2B-C	11:17	0.01							3.2 3.3	3.2			<2 <2	<2
WM2B	11:02	0.02							8.5 8.3	8.4			9 10	9.5

Date	**9-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM2B-C	11:30	0.01	25.1 25.1	25.1	7.77 7.79	7.8	94.1 94.7	94.4	3.8 3.7	3.7	8.50 8.50	8.5	<2 <2	<2
WM2B	11:17	0.01	26.3 26.3	26.3	8.11 8.14	8.1	100.4 100.7	100.6	3.6 3.7	3.6	8.40 8.40	8.4	3 3	3.0

Date	11-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	11:19	0.01	23.2	23.2	7.86	7.9	92.0	92.4	3.2	3.2	8.50	8.5	<2	<2
			23.2		7.9		92.7		3.2		8.50		<2	
WM2B	10:57	0.02	23.7	23.7	8.18	8.2	97.8	98.1	10.7	10.8	8.20	8.2	17	**17.0**
			23.7		8.21		98.3		10.9		8.20		17	

Date	14-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	10:29	0.02	23.3	23.3	7.39	7.4	86.8	87.1	7.4	7.4	8.60	8.6	3	3.5
			23.3		7.41		87.3		7.4		8.60		4	
WM2B	10:18	0.02	22.9	22.9	8.62	8.7	100.3	100.7	72.4	**73.1**	8.40	8.4	123	**120.0**
			22.9		8.69		101.0		73.8		8.40		117	

Date	15-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	11:21	0.01							1.8	1.9			<2	<2
									2.0				<2	
WM2B	11:18	0.02							4.9	5.0			10	10.0
									5.1				10	

Date	16-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	10:19	0.01	24.5	24.5	7.33	7.4	87.5	87.7	4.4	4.5	8.70	8.7	4	4.0
			24.5		7.39		87.9		4.5		8.70		4	
WM2B	10:07	0.02	24.6	24.6	8.35	8.4	100.4	100.7	10.2	10.0	8.60	8.6	4	4.0
			24.6		8.39		101.0		9.7		8.60		4	

Date	18-Apr-16															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	13:39	0.01	22.7	22.7	7.34	7.4	85.3	85.6	5.4	5.4	9.30	9.3	2	2.0
			22.7		7.37		85.8		5.5		9.30		2	
WM2B	13:24	0.01	25.8	25.8	8.54	8.6	104.7	105.0	7.2	7.2	8.80	8.8	10	10.0
			25.8		8.57		105.3		7.3		8.80		10	

Date	20-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	10:17	0.01	22.3	22.3	7.41	7.4	85.1	85.5	2.1	2.1	9.30	9.4	<2	<2
			22.3		7.46		85.8		2.2		9.40		<2	
WM2B	10:06	0.02	22.4	22.4	8.91	8.9	103.0	102.6	12.3	**12.5**	9.40	9.3	13	**13.0**
			22.3		8.89		102.1		12.7		9.10		13	

Date	21-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	10:30	0.01							3.7	4.0			4	4.0
									4.4					
WM2B	10:40	0.02							10.2	10.8			11	11.0
									11.3					

Date	22-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	11:40	0.02	22.6	22.6	7.27	7.3	84.0	84.4	7.9	7.9	9.50	9.5	8	8.0
			22.6		7.34		84.7		7.9		9.50		8	
WM2B	11:29	0.03	23.6	23.6	8.49	8.5	100.1	100.5	138.0	**136.5**	9.00	9.0	133	**135.0**
			23.6		8.54		100.9		135.0		9.00		137	

Date	23-Apr-16

Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	10:24	0.02							3.1	3.2			<2	<2
									3.2					
WM2B	10:12	0.02							<999	**<999**			934	**934.0**
									<999					

Date	25-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	10:10	0.02							3.0	3.1			5	5.0
									3.2					
WM2B	10:00	0.02							76.2	**77.1**			75	**75.0**
									78.0					

Date	26-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	10:30	0.02	23.5	23.5	7.37	7.4	87.1	87.1	3.9	3.9	9.60	9.6	4	4.5
			23.5		7.38		87.1		4.0		9.60		5	
WM2B	10:05	0.02	24.9	24.9	8.41	8.4	102.2	102.4	173.0	**175.0**	9.30	9.3	141	**138.5**
			24.9		8.42		102.6		177.0		9.30		136	

Date	27-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	10:42	0.01							3.4	3.3			<2	<2
									3.2					
WM2B	10:50	0.02							10.5	10.9			10	10.0
									11.2					

Date	28-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	

WM2B-C	12:05	0.01	23.7	23.7	7.28	7.3	86.2	86.2	3.5	3.8	9.20	9.2	2	3.0
			23.7		7.28		86.2		4.0		9.20		4	
WM2B	11:55	0.02	27.4	27.4	7.99	8.0	101.1	101.1	8.8	9.5	8.60	8.6	11	10.5
			27.4		7.99		101.1		10.2		8.60		10	

Date	**30-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM2B-C	10:28	0.01	23.7	23.7	7.51	7.5	88.5	88.7	3.2	3.2	10.20	10.2	<2	<2
			23.7		7.58		88.9		3.2		10.20		<2	
WM2B	10:39	0.02	24.1	24.1	8.65	8.7	102.9	103.2	9.4	9.3	9.80	9.8	7	7.0
			24.1		8.69		103.4		9.3		9.80		7	

Water Quality Monitoring Data for Contract 2 and 6

Date	2-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	9:47	0.06	22.3	22.3	8.41	8.4	96.6	96.7	4.8	4.9	7.90	7.9	7	6.5
			22.3		8.43		96.8		4.9		7.90		6	
WM3	9:31	0.19	21.4	21.4	8.6	8.6	97.1	97.5	43.4	**44.6**	8.50	8.5	91	**87.5**
			21.4		8.64		97.9		45.8		8.50		84	

Date	5-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	12:07	0.01	24.7	24.7	7.38	7.4	88.8	89.1	3.9	3.9	9.00	9.0	59	51.0
			24.7		7.43		89.4		4.0		9.00		43	
WM3	12:27	0.17	25.3	25.3	8.01	8.0	97.5	97.7	12.9	13.1	9.10	9.1	14	**14.0**
			25.3		8.07		97.8		13.3		9.10		14	

Date	6-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	10:20	0.02							4.0	4.0			7	7.0
									4.0				7	
WM3	10:37	0.19							7.2	7.2			9	9.0
									7.3				9	

Date	7-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	11:29	0.02	27.9	27.9	6.93	7.0	88.3	88.5	3.9	3.9	9.90	9.9	5	5.0
			27.9		7.02		88.7		3.9		9.90		5	
WM3	11:45	0.17	26.5	26.5	7.78	7.8	97.0	97.3	4.7	4.8	9.10	9.1	5	5.5
			26.5		7.83		97.5		4.9		9.10		6	

Date	9-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	11:49	0.02	27	27.0	7.14	7.2	89.4	89.7	3.5	3.5	9.50	9.5	2	2.5
			27		7.17		89.9		3.5		9.50		3	
WM3	11:59	0.19	25.8	25.8	7.75	7.8	95.2	95.6	5.8	5.8	9.40	9.4	3	4.0
			25.8		7.8		96.0		5.8		9.40		5	

Date	11-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	11:32	0.02	23.9	24.0	7.71	7.7	91.4	91.6	3.3	3.4	9.50	9.5	5	5.5
			24		7.74		91.7		3.4		9.50		6	
WM3	11:45	0.17	23.6	23.6	8.05	8.1	94.8	94.9	8.3	8.2	9.20	9.2	10	9.5
			23.6		8.11		95.0		8.2		9.20		9	

Date	14-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	10:49	0.02	23.8	23.8	7.38	7.4	87.3	87.5	7.7	7.5	10.80	10.8	17	16.0
			23.8		7.39		87.7		7.4		10.80		15	
WM3	11:07	0.19	23.2	23.2	7.52	7.6	88.0	88.6	6.4	6.4	10.20	10.2	8	7.5
			23.2		7.59		89.1		6.5		10.20		7	

Date	16-Apr-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	10:35	0.04	25.7	25.7	7.48	7.5	91.9	92.1	<999	<999	10.90	10.9	4380	4485.0
			25.7		7.54		92.3		<999		10.90		4590	
WM3	10:47	0.17	25.6	25.6	7.12	7.1	87.3	87.5	19.2	**18.9**	10.30	10.3	31	**30.5**
			25.6		7.17		87.6		18.6		10.30		30	

Date	18-Apr-16

Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	13:49	0.08	24.9	24.9	7.61	7.6	91.5	91.8	29.8	30.1	10.40	10.4	216	221.5
			24.9		7.67		92.0		30.4		10.40		227	
WM3	14:03	0.13	24.3	24.3	7.13	7.1	85.2	85.5	31.9	**31.4**	9.70	9.7	26	**26.5**
			24.3		7.16		85.7		30.8		9.70		27	

Date	20-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	13:05	0.04	24.6	24.6	6.88	6.9	81.7	82.0	5.5	5.8	10.70	10.7	26	25.5
			24.6		6.89		82.2		6.1		10.70		25	
WM3	13:20	0.17	23.4	23.4	7.31	7.3	86.4	86.5	19.8	**20.1**	10.40	10.4	22	**22.0**
			23.4		7.33		86.5		20.4		10.40		22	

Date	21-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	11:30	0.06							9.4	9.8			58	58.0
									10.2					
WM3	11:15	0.17							27.7	**28.0**			13	**13.0**
									28.2					

Date	22-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	11:59	0.09	23.7	23.7	7.6	7.7	89.9	90.2	50.1	50.4	10.10	10.1	203	197.0
			23.7		7.71		90.4		50.7		10.10		191	
WM3	12:14	0.23	23.1	23.1	7.3	7.3	85.3	85.5	84.6	**86.8**	10.10	10.1	80	**78.0**
			23.1		7.37		85.7		88.9		10.10		76	

Date	23-Apr-16													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	

WM3-C	10:41	0.03							151.0 148.0	149.5			408	408.0
WM3	10:57	0.16							34.3 34.8	**34.6**			56	**56.0**

Date	**25-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	10:18	0.03							7.1 7.7	7.4			53	53.0
WM3	10:32	0.16							11.9 12.4	12.2			22	**22.0**

Date	**26-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	13:59	0.03	28.1 28.1	28.1	6.9 6.97	6.9	88.5 89.3	88.9	9.9 9.8	9.8	10.70 10.70	10.7	152 147	149.5
WM3	13:24	0.15	26.1 26.8	26.5	7.15 7.21	7.2	88.4 89.3	88.9	8.9 9.0	8.9	9.00 9.00	9.0	10 9	9.5

Date	**28-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	12:23	0.04	27.4 27.4	27.4	7.43 7.43	7.4	93.6 93.7	93.7	31.0 33.3	32.2	8.60 8.60	8.6	176 170	173.0
WM3	12:34	0.17	26.6 26.6	26.6	7.43 7.43	7.4	92.9 92.9	92.9	7.5 8.5	8.0	8.70 8.70	8.7	8 8	8.0

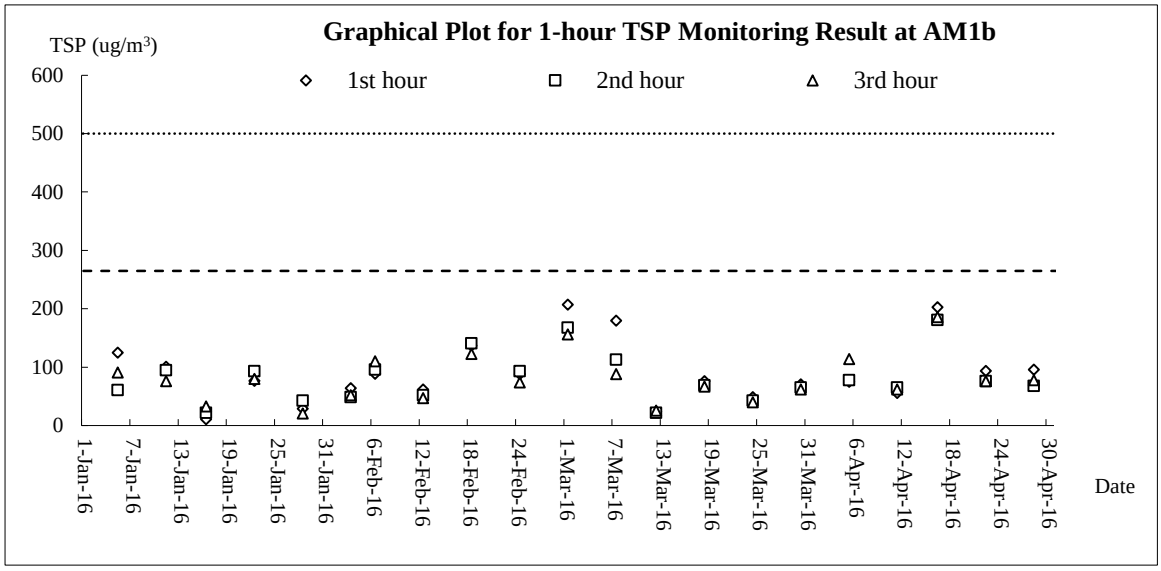
Date	**30-Apr-16**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	10:11	0.04	24.6 24.6	24.6	8.01 8.09	8.1	96.1 96.8	96.5	500.0 476.0	488.0	10.80 10.80	10.8	885 912	898.5

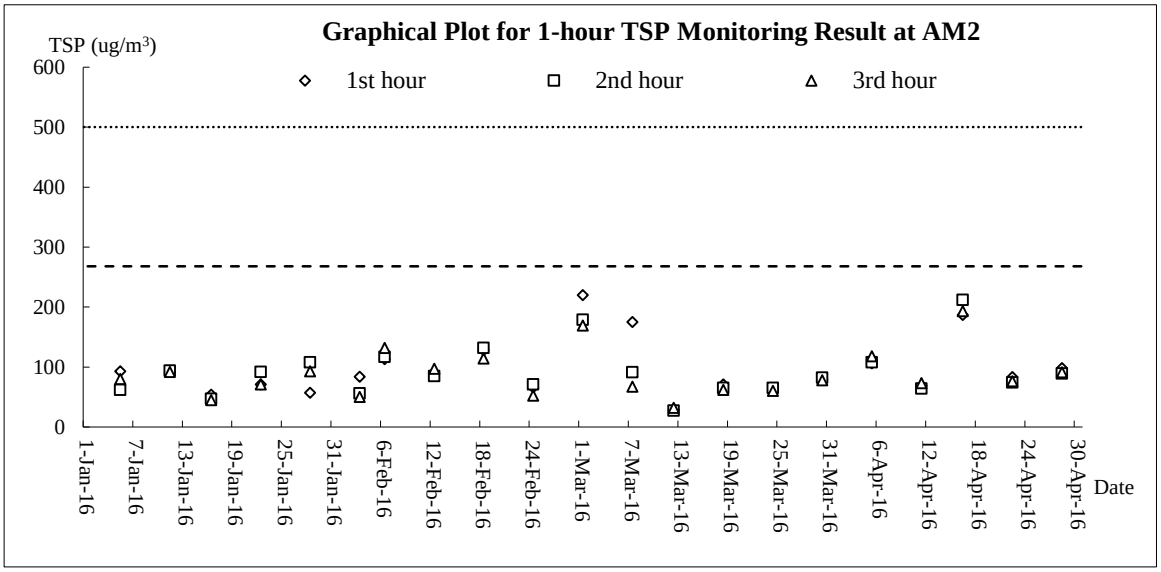
WM3	9:57	0.15	23.4 23.4	23.4	8.3 8.38	8.3	97.5 97.9	97.7	23.0 21.8	**22.4**	8.20 8.20	8.2	62 60	**61.0**

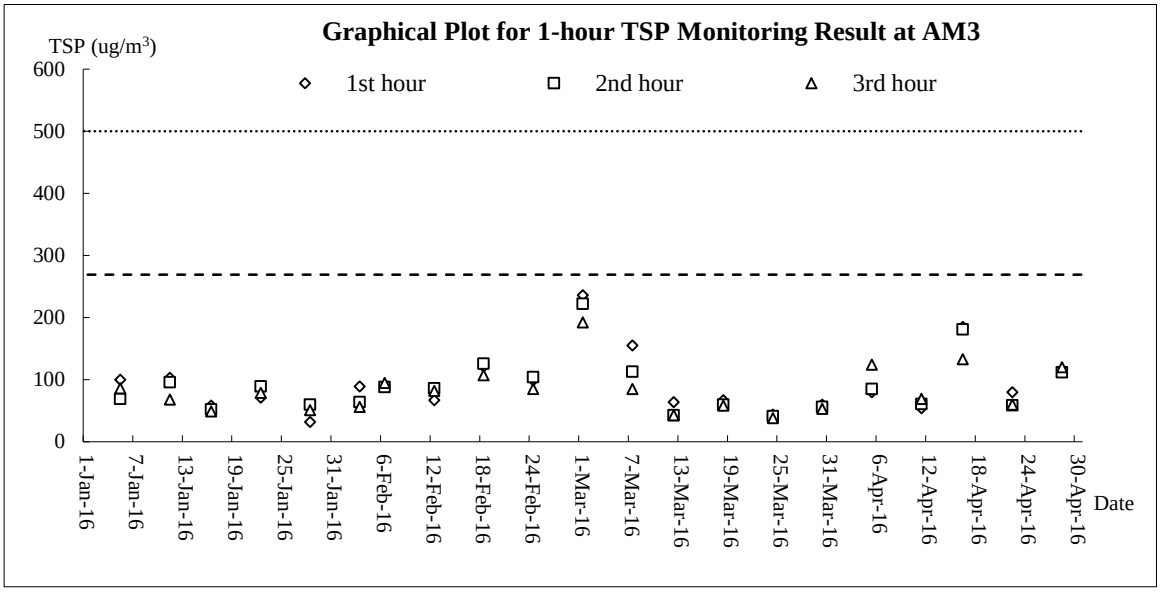
Appendix J

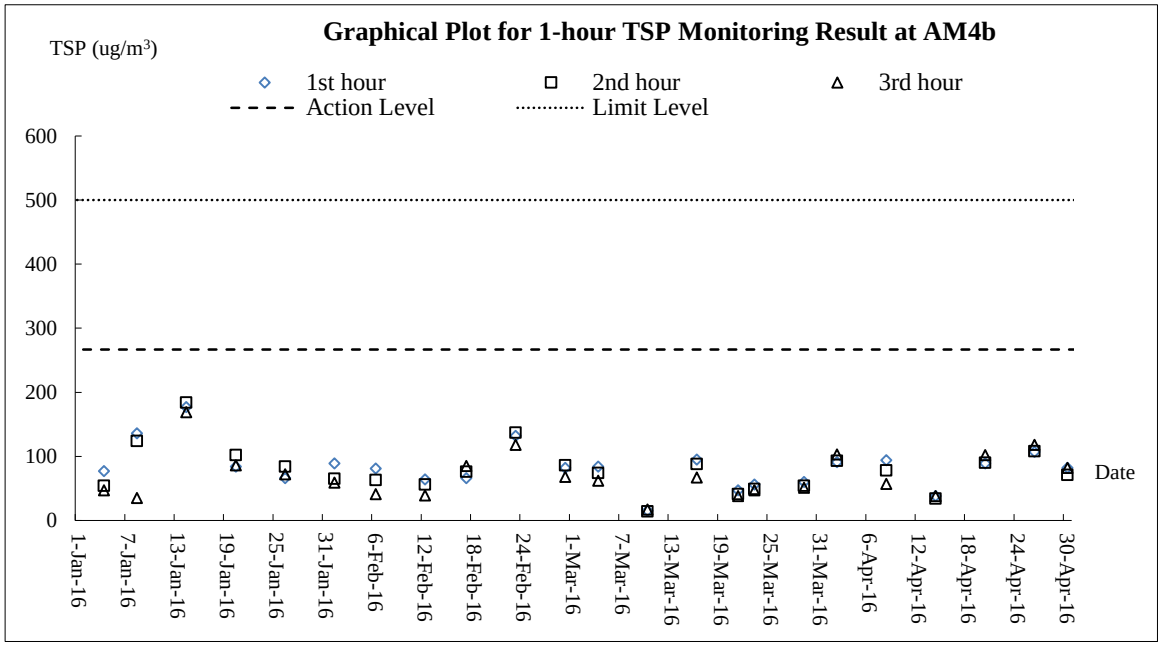
Graphical Plots for Monitoring Result

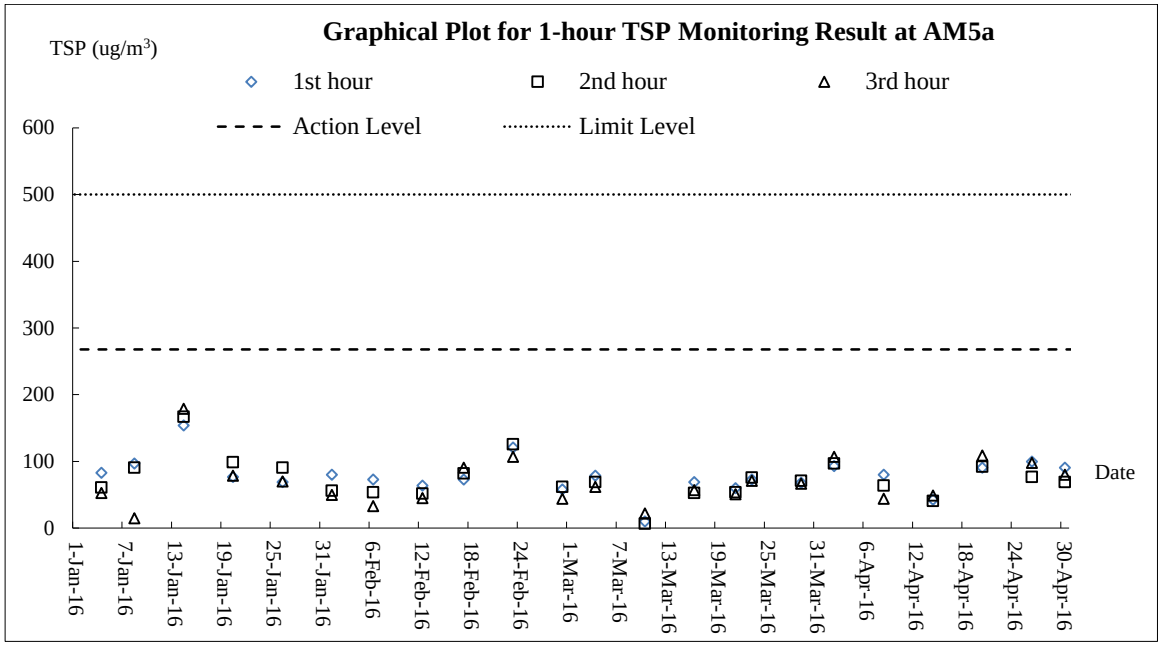
Air Quality – 1-hour TSP

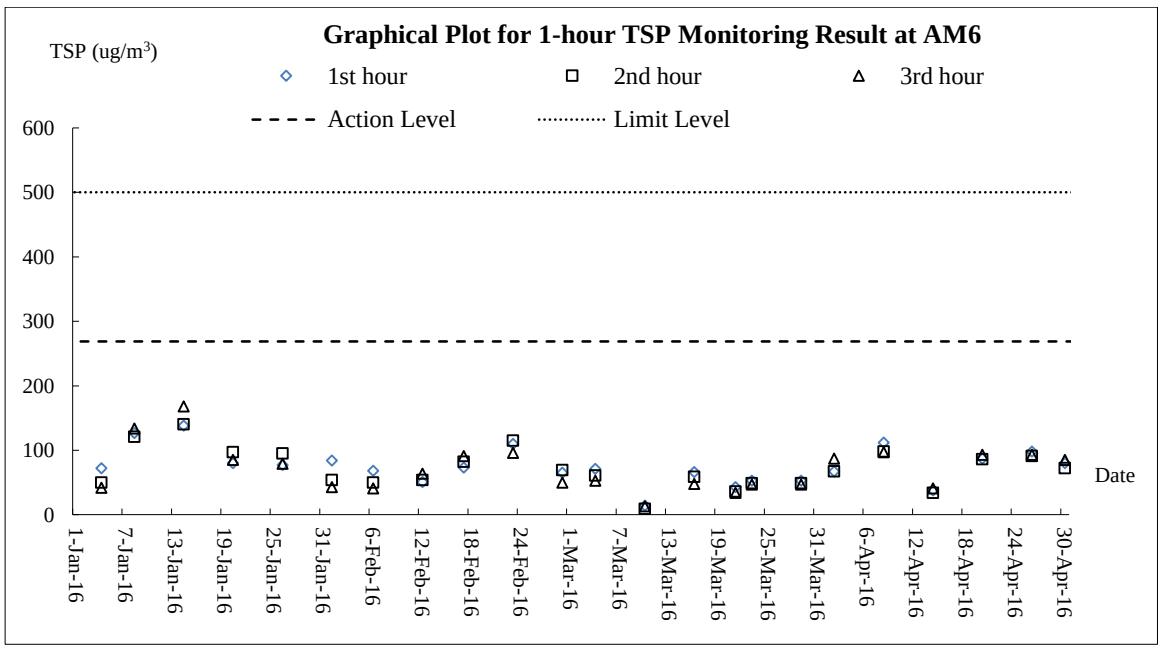


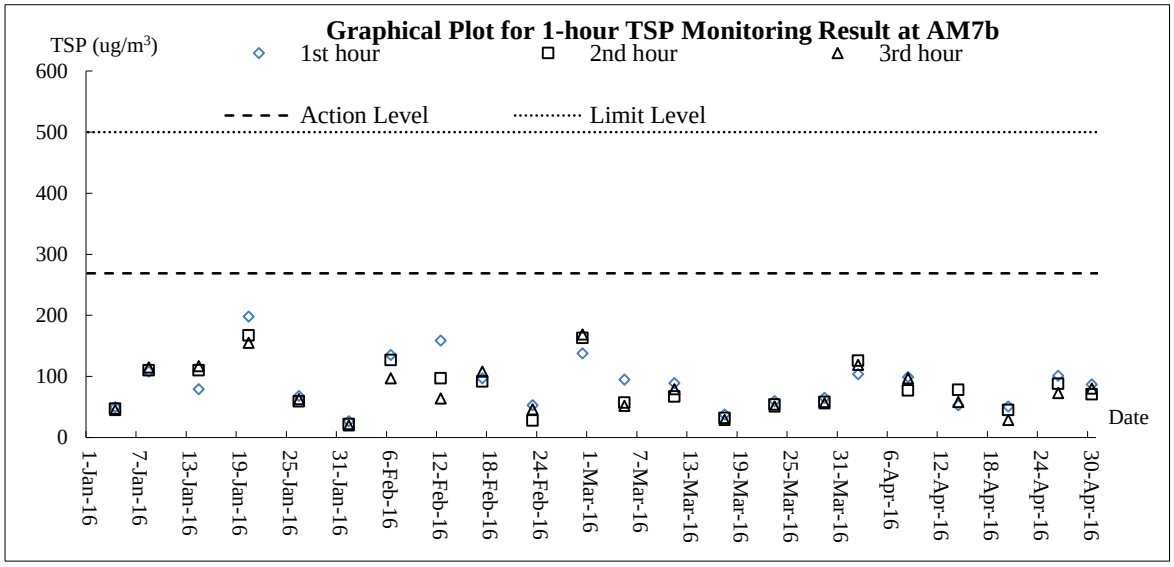


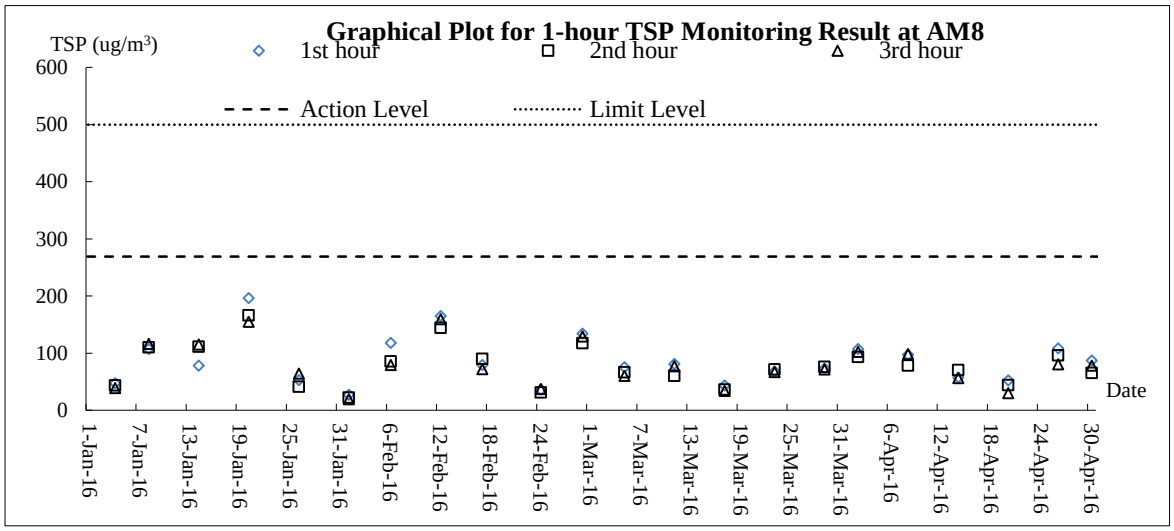


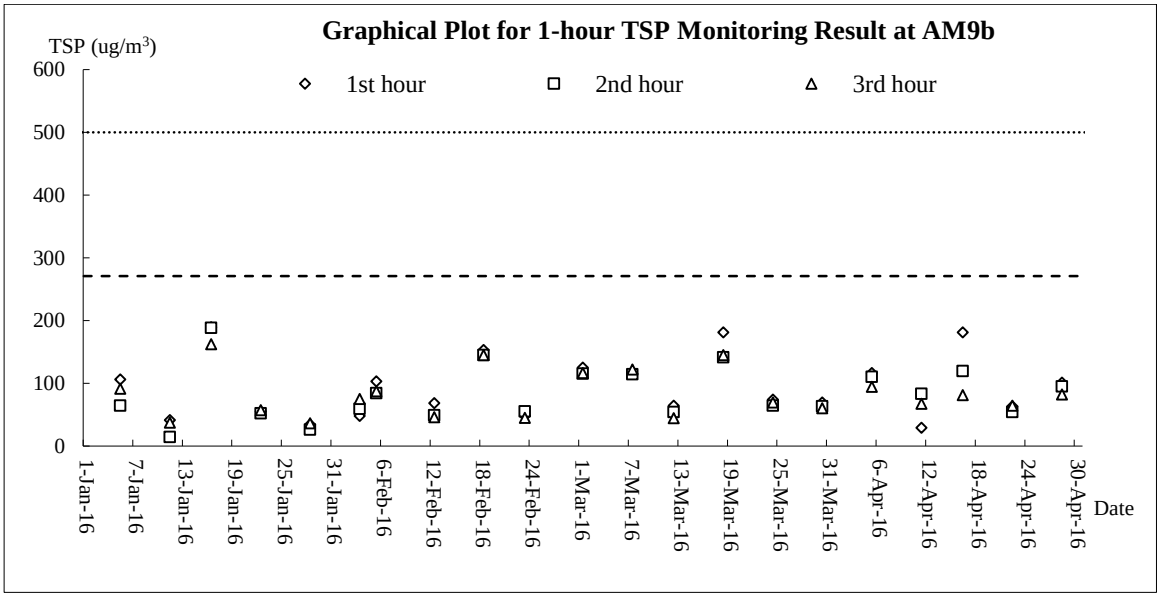

Graphical Plot for 1-hour TSP Monitoring Result at AM4b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16
Date


Graphical Plot for 1-hour TSP Monitoring Result at AM5a
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16
Date

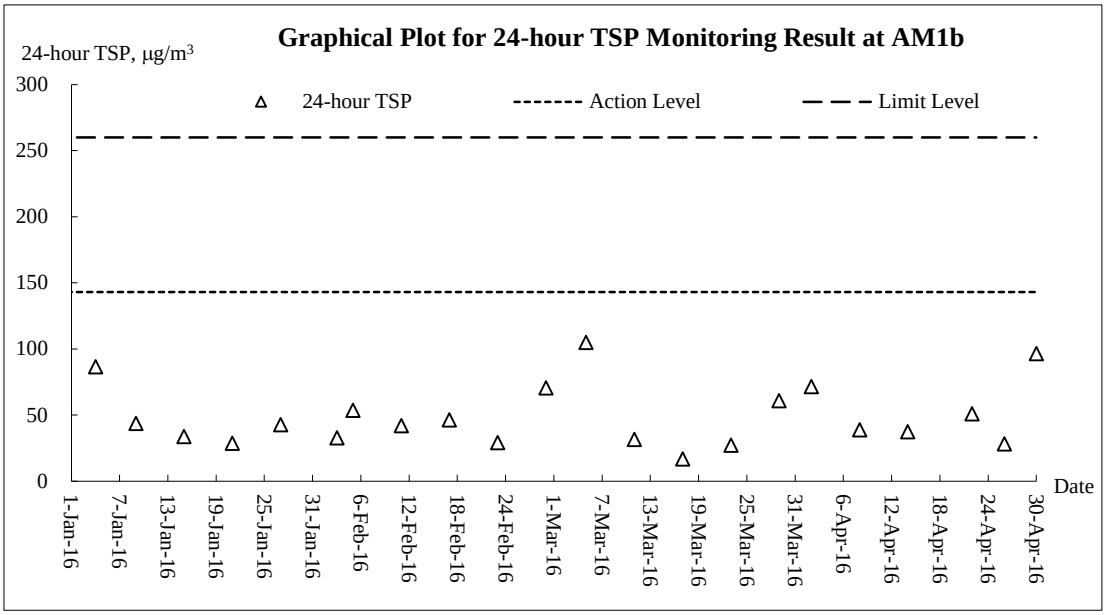

Graphical Plot for 1-hour TSP Monitoring Result at AM6
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16
Date

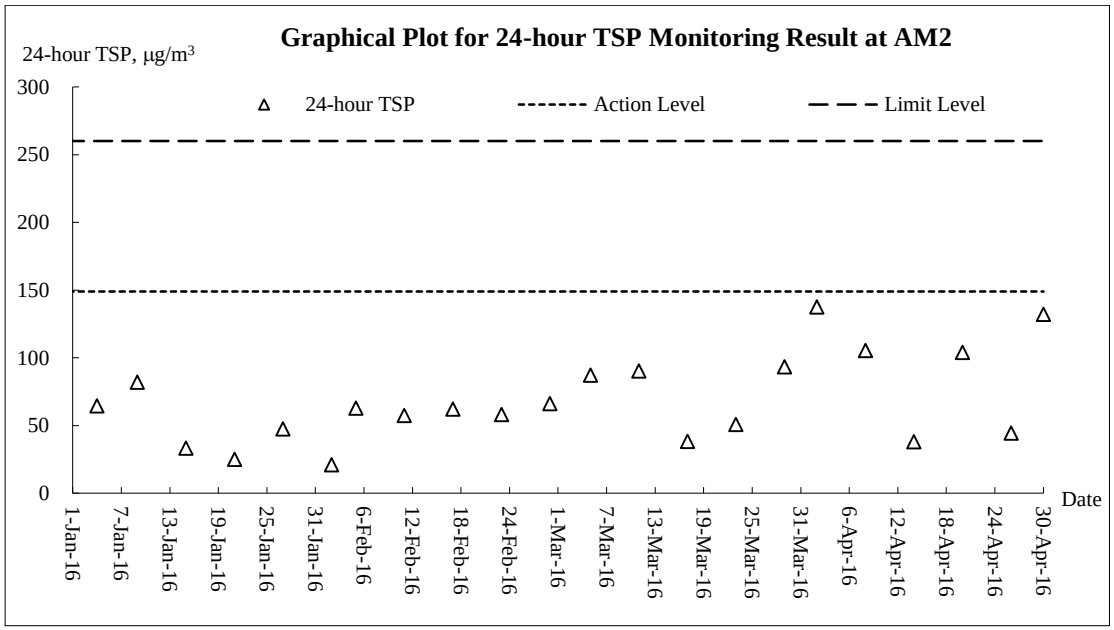

Graphical Plot for 1-hour TSP Monitoring Result at AM7b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16

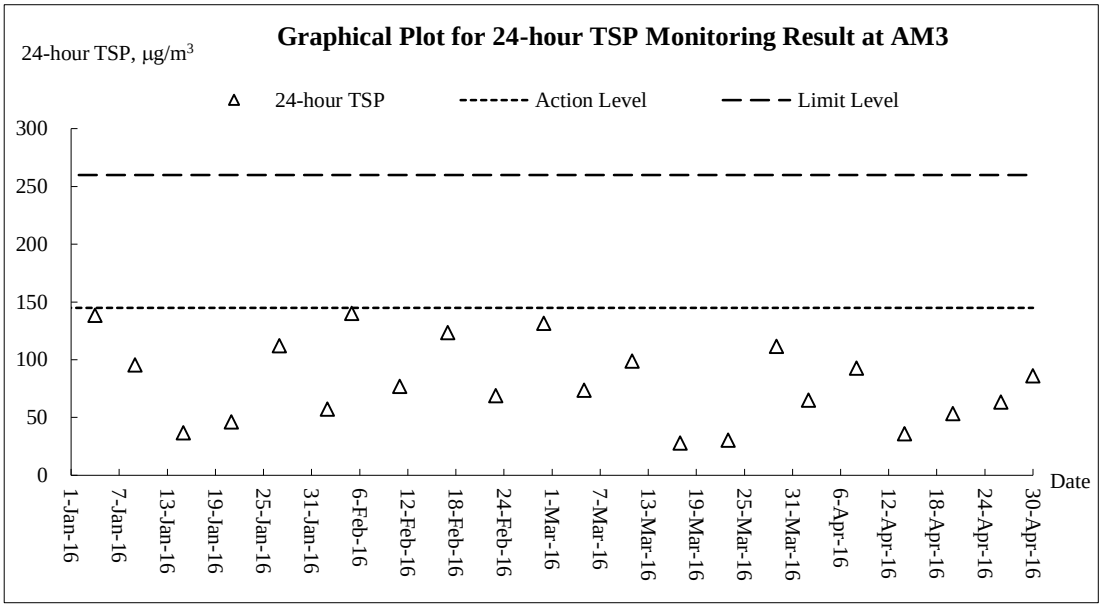

Graphical Plot for 1-hour TSP Monitoring Result at AM8
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16

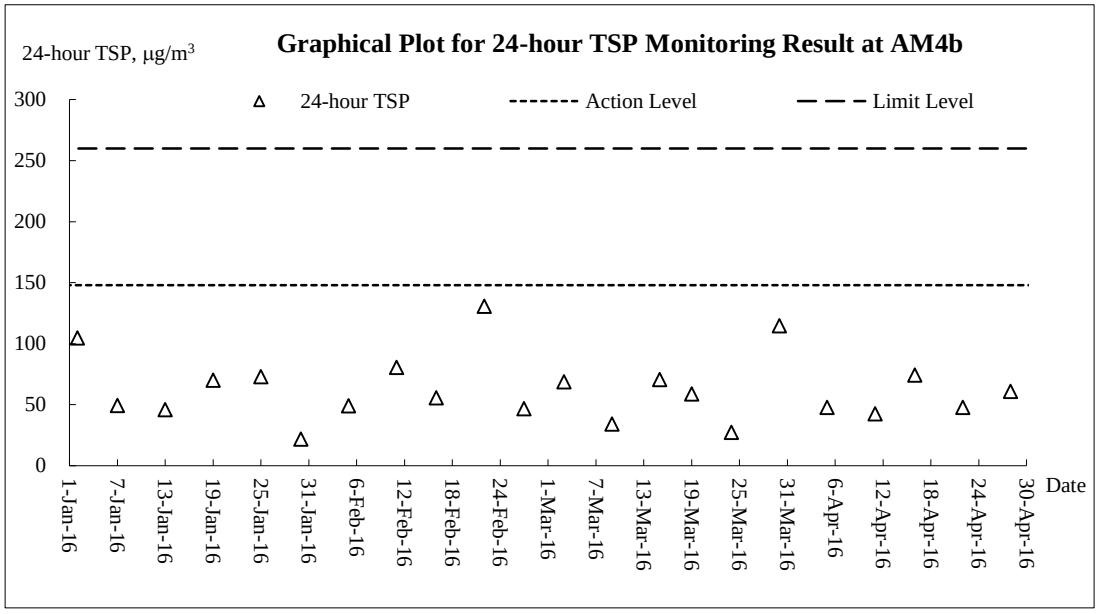

Graphical Plot for 1-hour TSP Monitoring Result at AM9b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
600
500
400
300
200
100
0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16

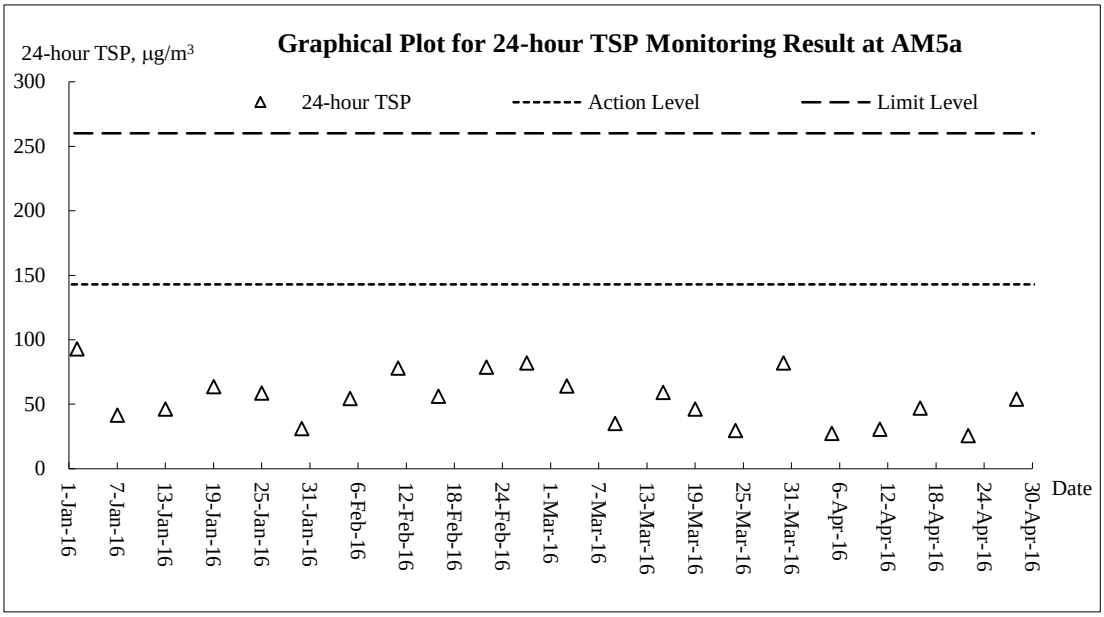
Air Quality – 24-hour TSP

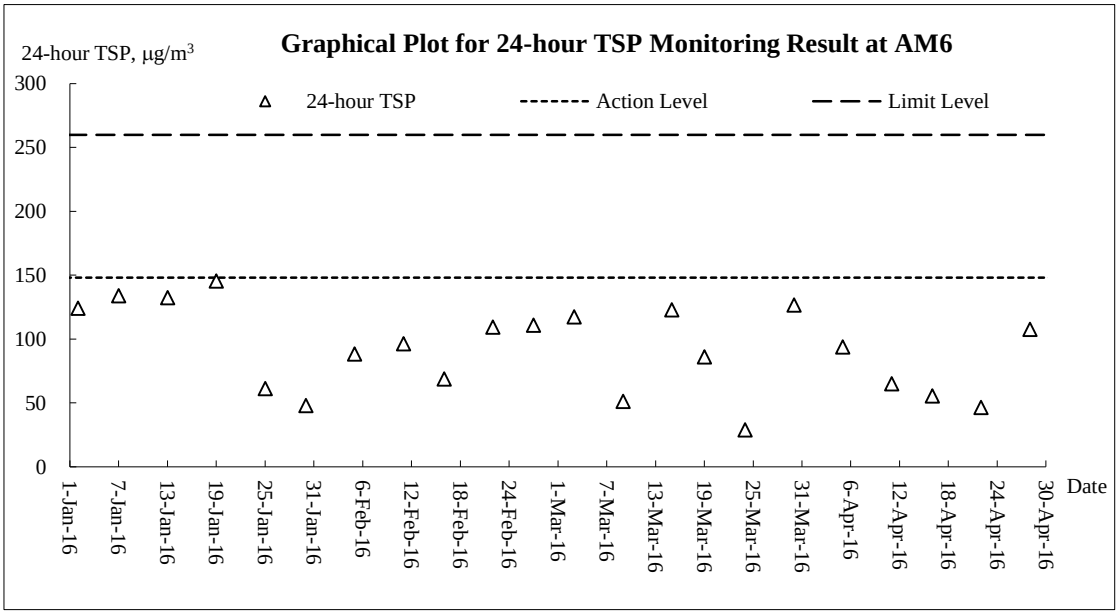


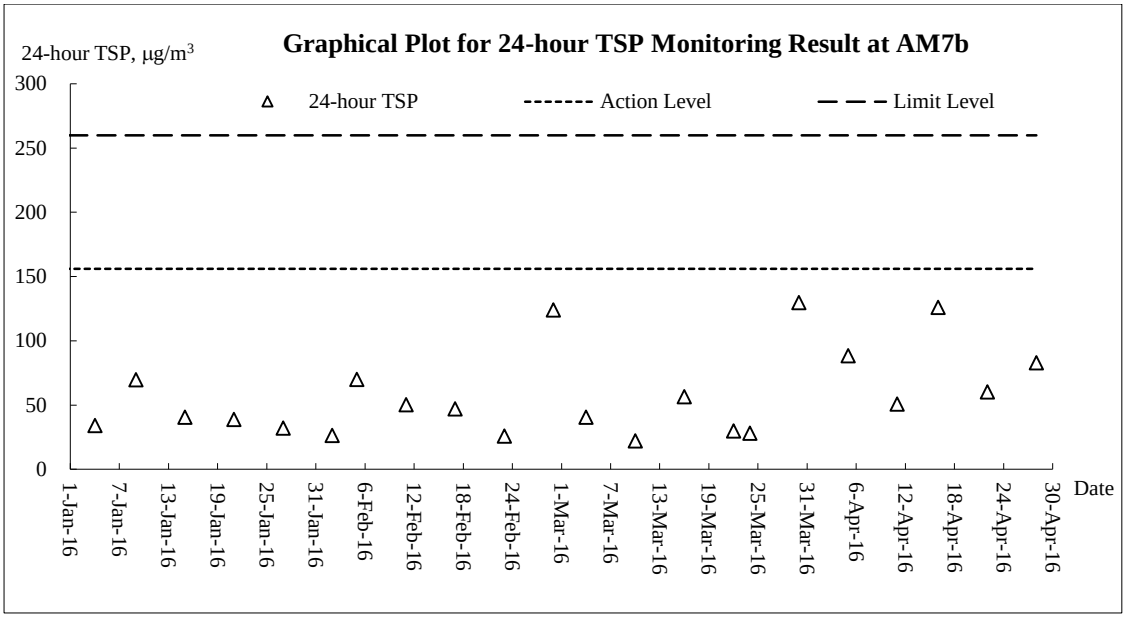


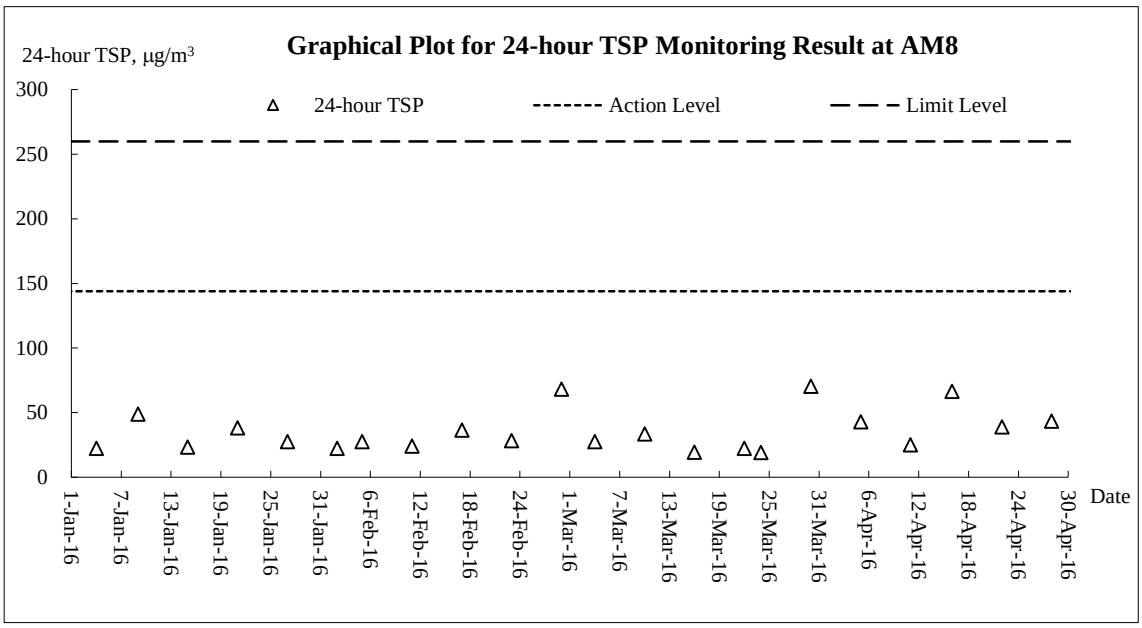


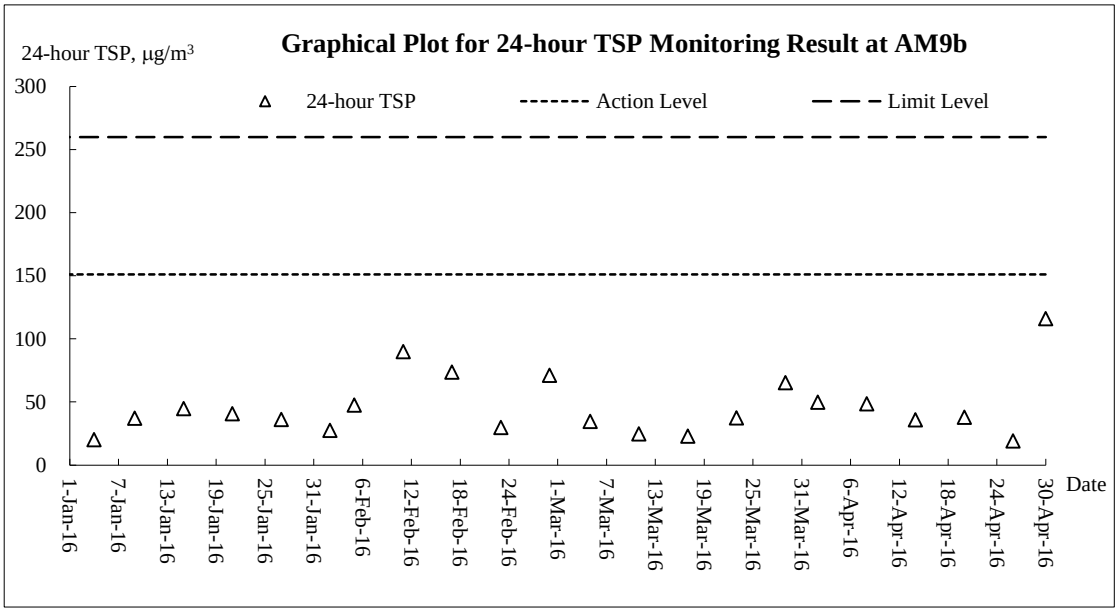

Graphical Plot for 24-hour TSP Monitoring Result at AM4b
24-hour TSP, µg/m3
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16
Date


Graphical Plot for 24-hour TSP Monitoring Result at AM5a
24-hour TSP, µg/m3
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16
Date

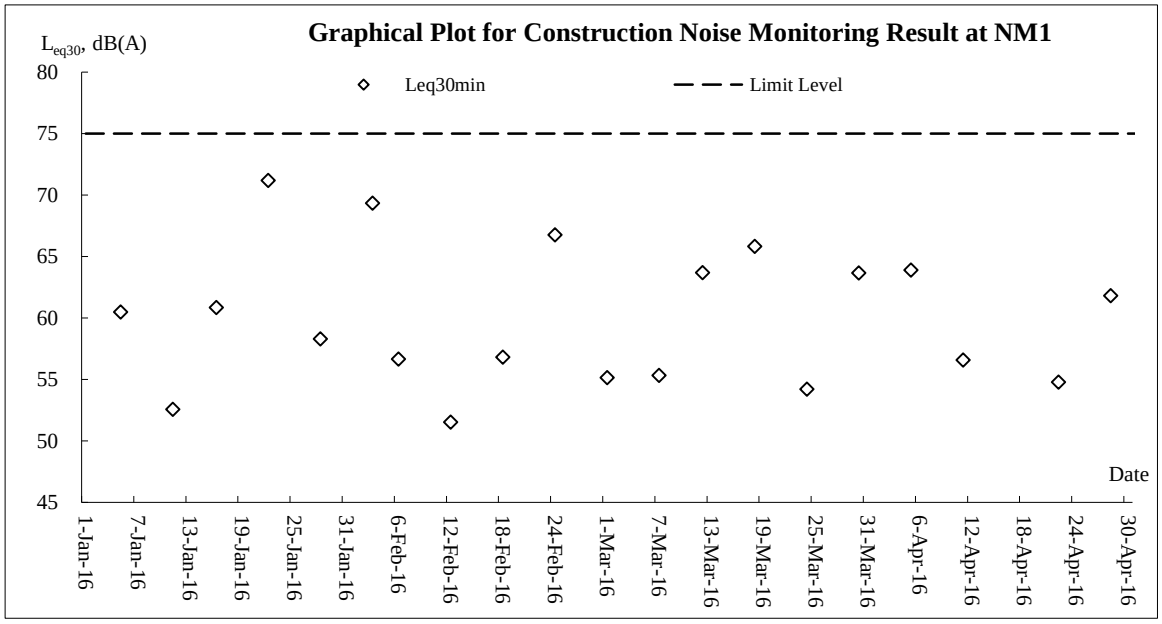

Graphical Plot for 24-hour TSP Monitoring Result at AM6
24-hour TSP, µg/m3
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16
Date


Graphical Plot for 24-hour TSP Monitoring Result at AM7b
24-hour TSP, μg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16
Date


Graphical Plot for 24-hour TSP Monitoring Result at AM8
24-hour TSP, μg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16
Date


Graphical Plot for 24-hour TSP Monitoring Result at AM9b
24-hour TSP, μg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16
Date

Noise


Graphical Plot for Construction Noise Monitoring Result at NM1
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
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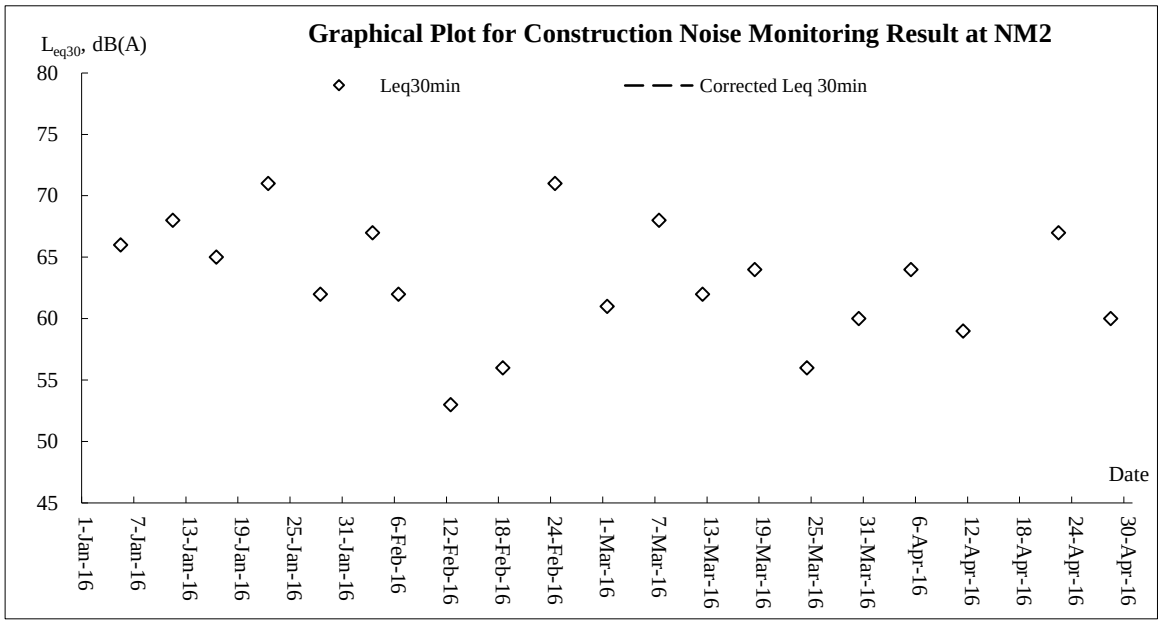
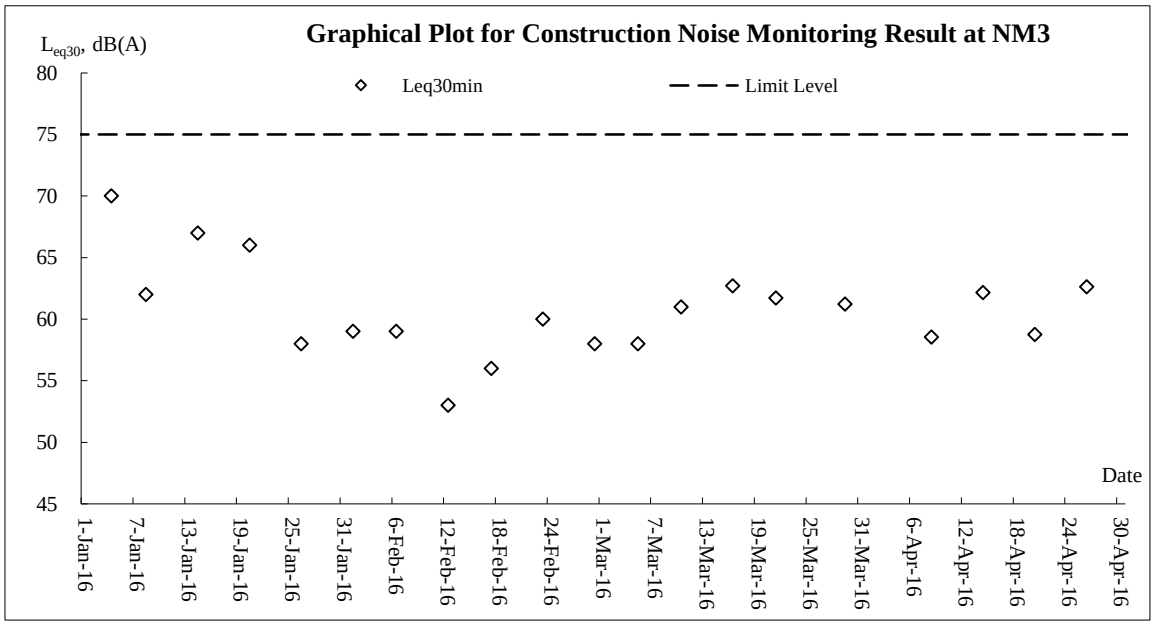
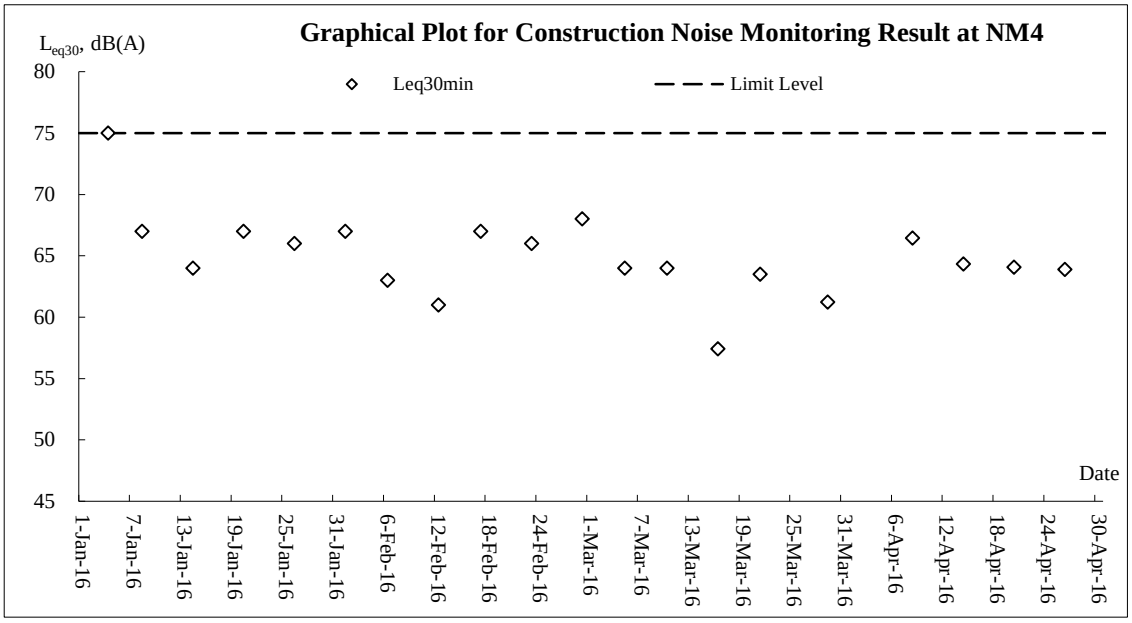
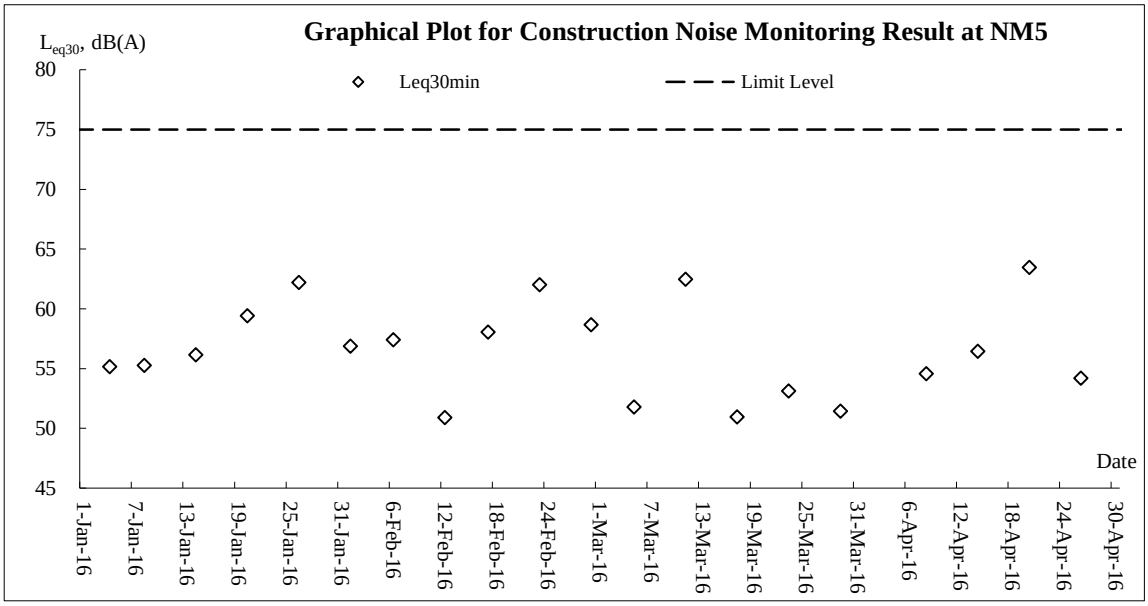
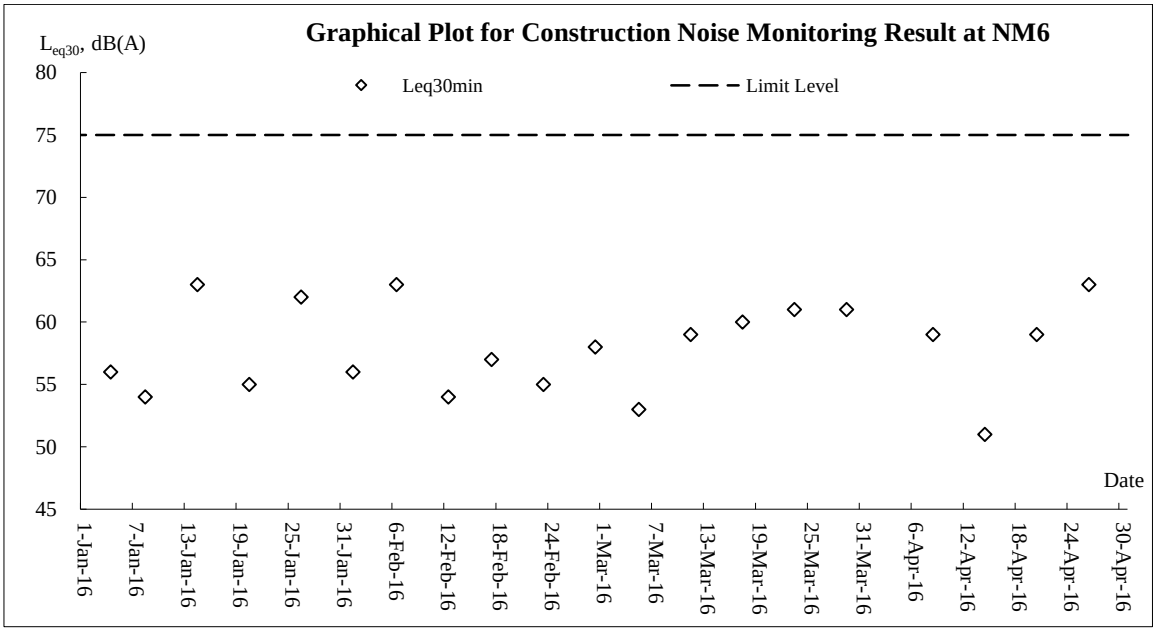
24-Apr-16
30-Apr-16


Graphical Plot for Construction Noise Monitoring Result at NM2
L_{eq30}, dB(A)
Leq30min
Corrected Leq 30min
80
75
70
65
60
55
50
45
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16


Graphical Plot for Construction Noise Monitoring Result at NM3
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16


Graphical Plot for Construction Noise Monitoring Result at NM4
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16


Graphical Plot for Construction Noise Monitoring Result at NM5
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16


Graphical Plot for Construction Noise Monitoring Result at NM6
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
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6-Apr-16
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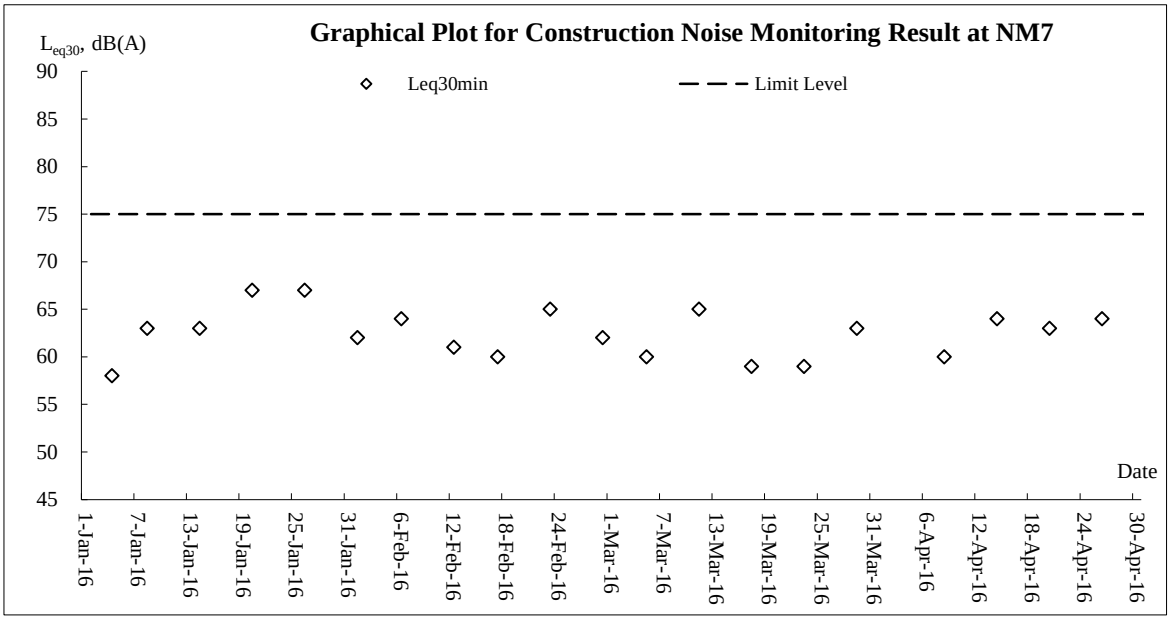
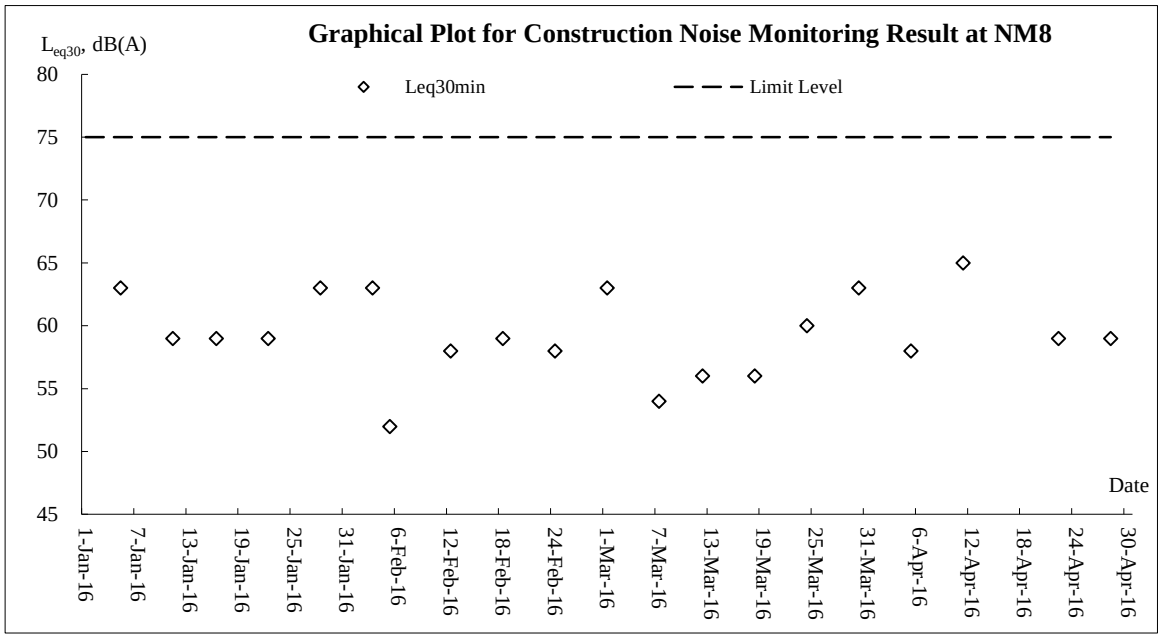
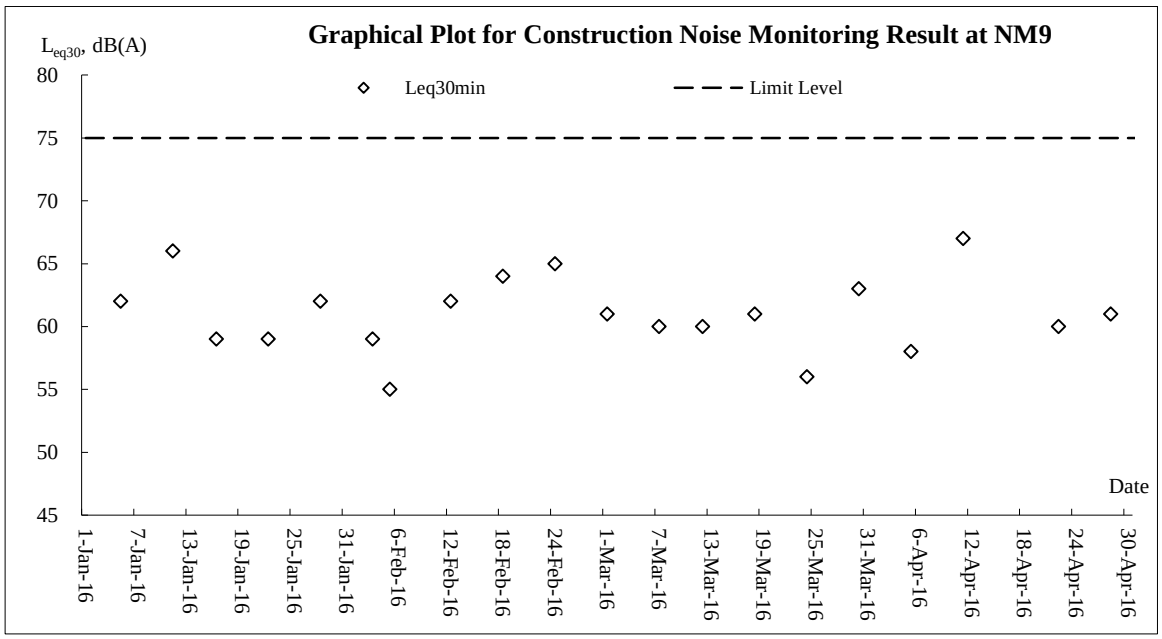
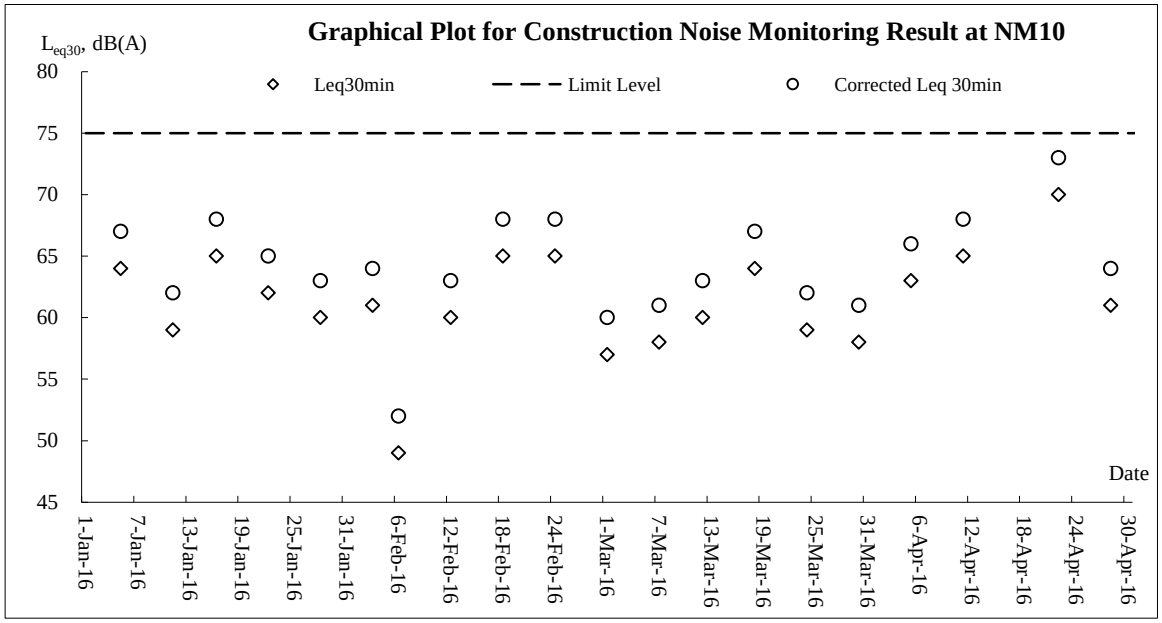
24-Apr-16
30-Apr-16

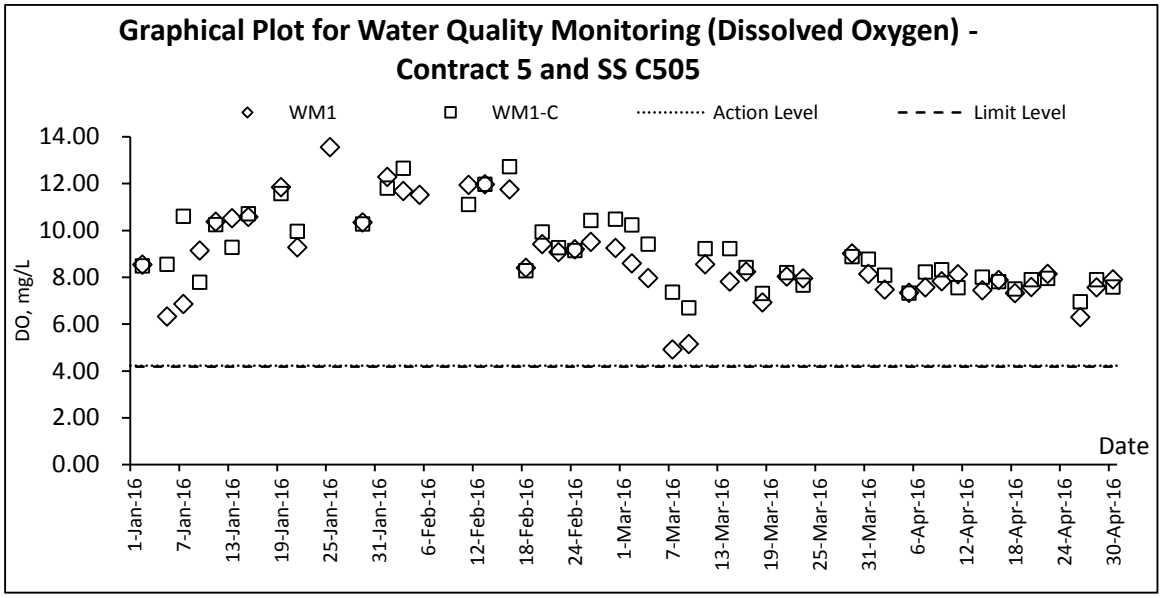

Graphical Plot for Construction Noise Monitoring Result at NM7
L_{eq30}, dB(A)
Leq30min
Limit Level
90
85
80
75
70
65
60
55
50
45
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16

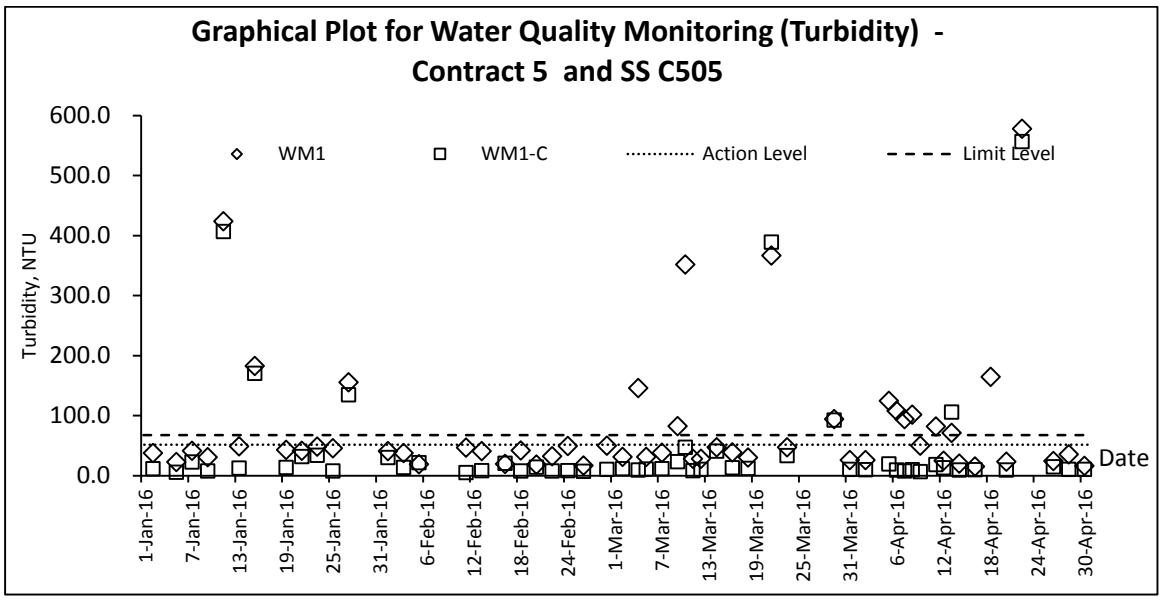

Graphical Plot for Construction Noise Monitoring Result at NM8
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16

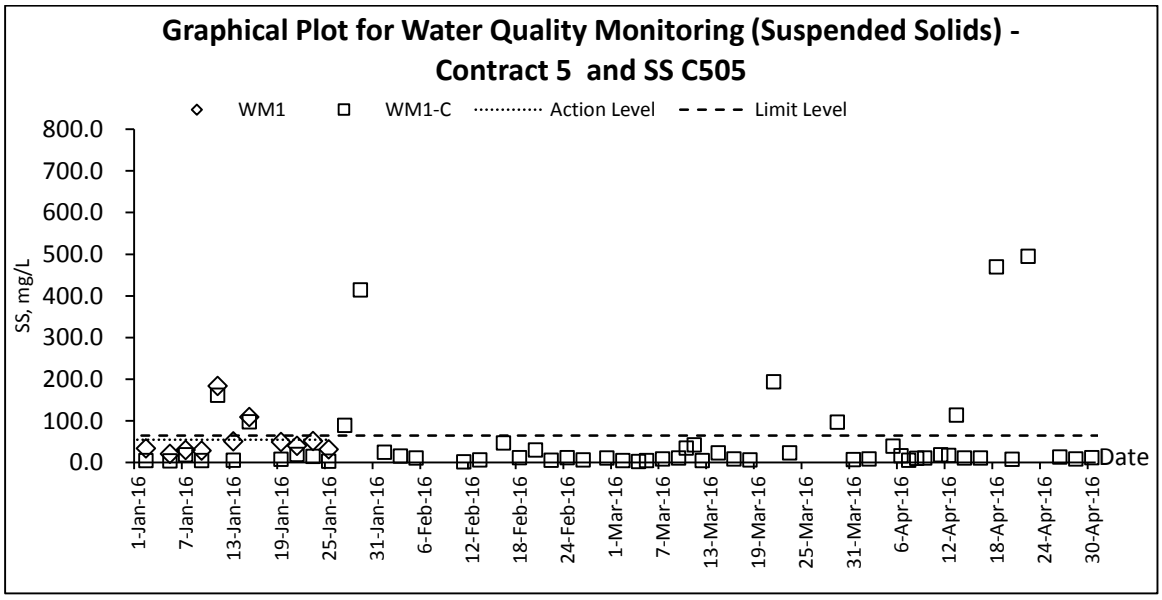

Graphical Plot for Construction Noise Monitoring Result at NM9
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16

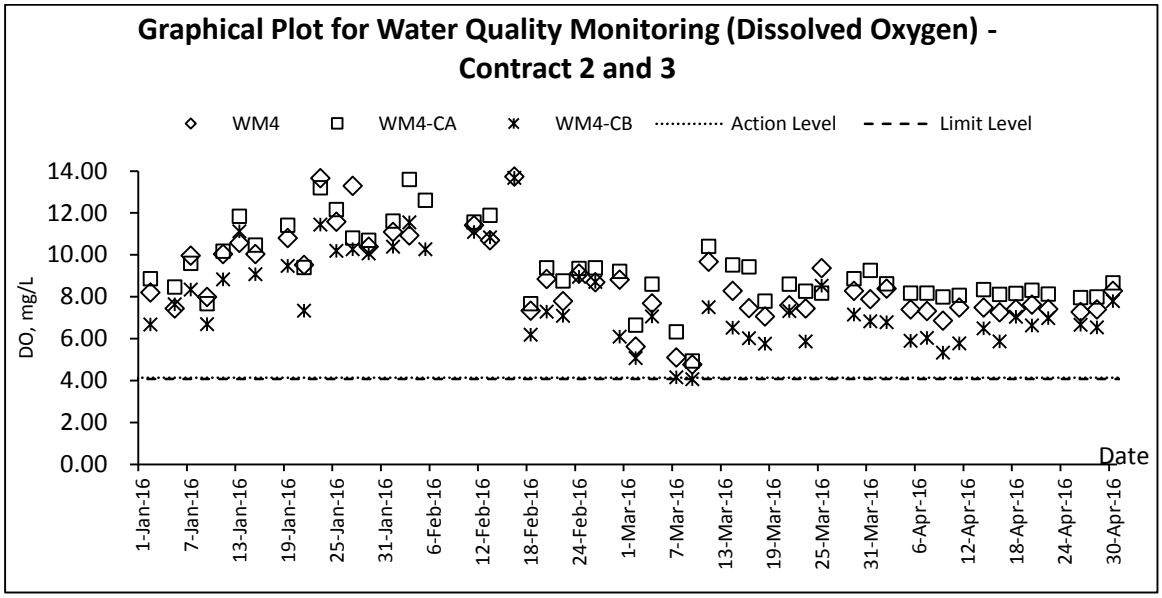

Graphical Plot for Construction Noise Monitoring Result at NM10
L_{eq30}, dB(A)
Leq30min
Limit Level
Corrected Leq 30min
80
75
70
65
60
55
50
45
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16

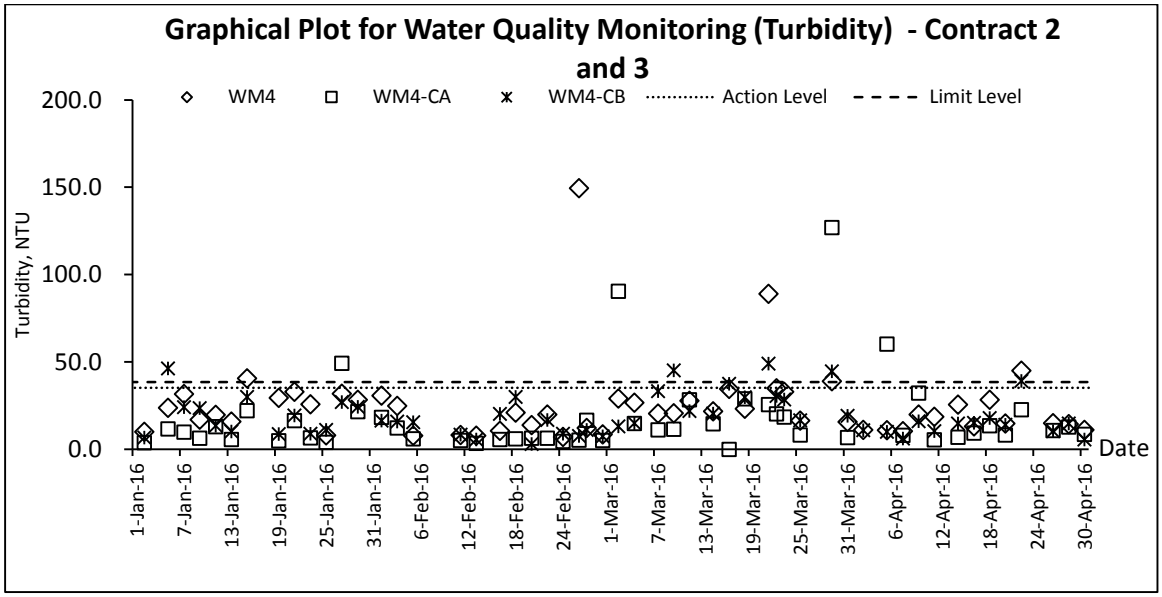
Water Quality








Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contract 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
DO, mg/L
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16


Graphical Plot for Water Quality Monitoring (Turbidity) - Contract 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
Turbidity, NTU
200.0
150.0
100.0
50.0
0.0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
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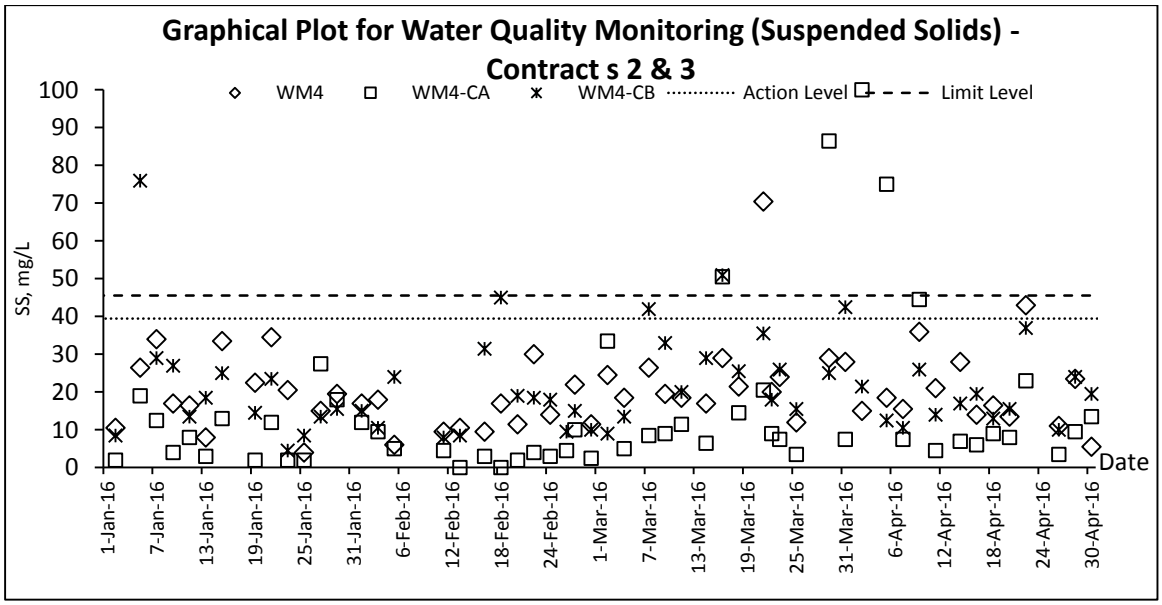
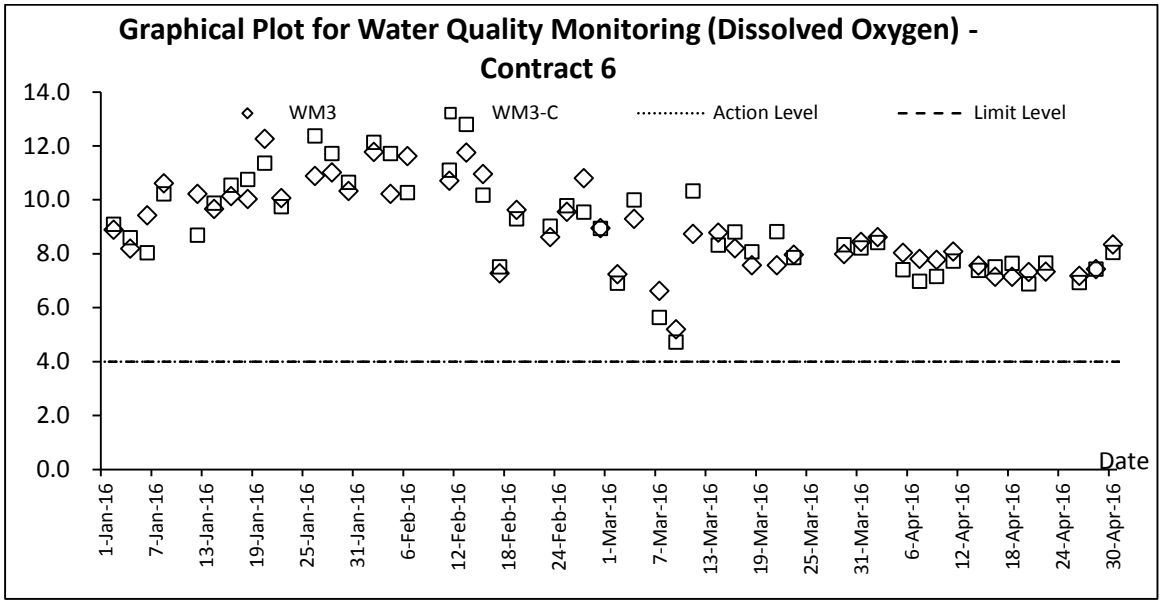
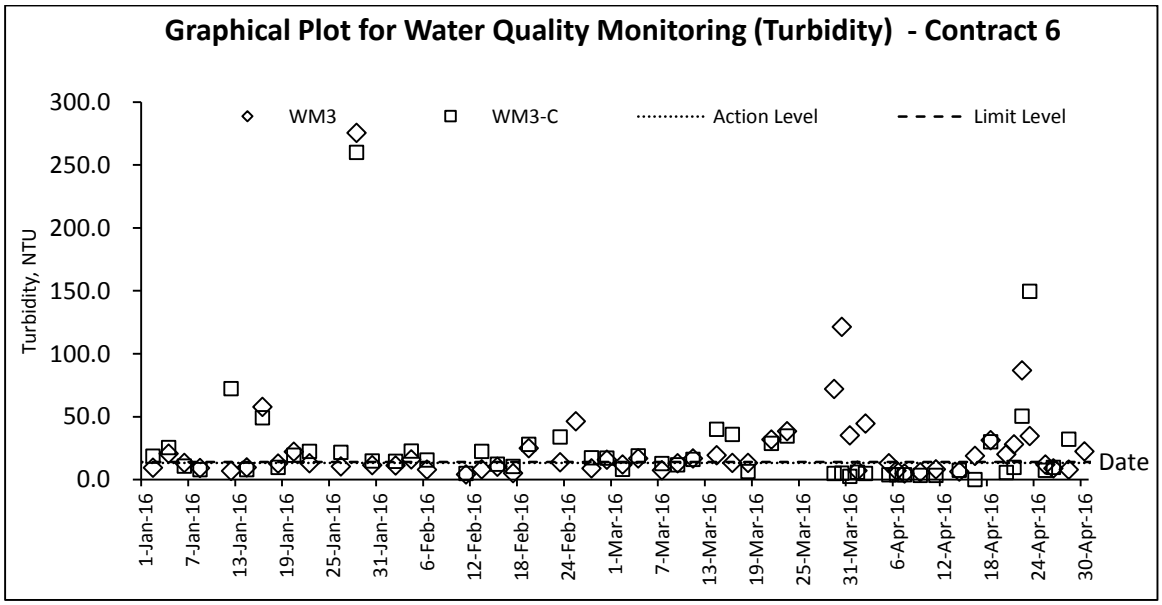
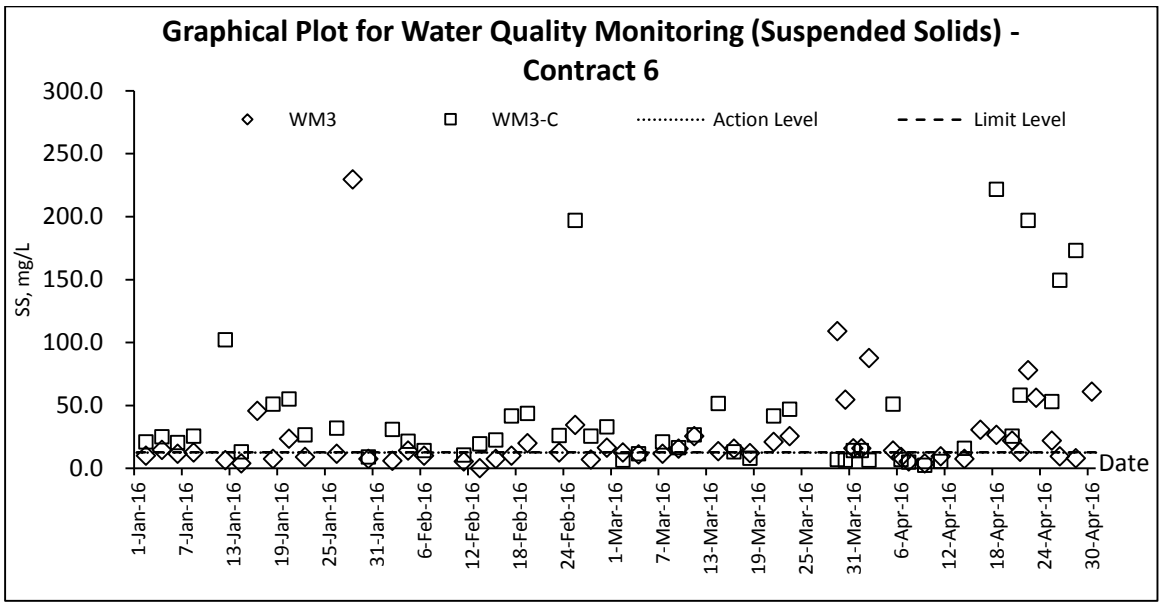
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contract s 2 & 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
SS, mg/L
100
90
80
70
60
50
40
30
20
10
0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16


Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contract 6
WM3
WM3-C
Action Level
Limit Level
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16


Graphical Plot for Water Quality Monitoring (Turbidity) - Contract 6
WM3
WM3-C
Action Level
Limit Level
Turbidity, NTU
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contract 6
WM3
WM3-C
Action Level
Limit Level
SS, mg/L
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
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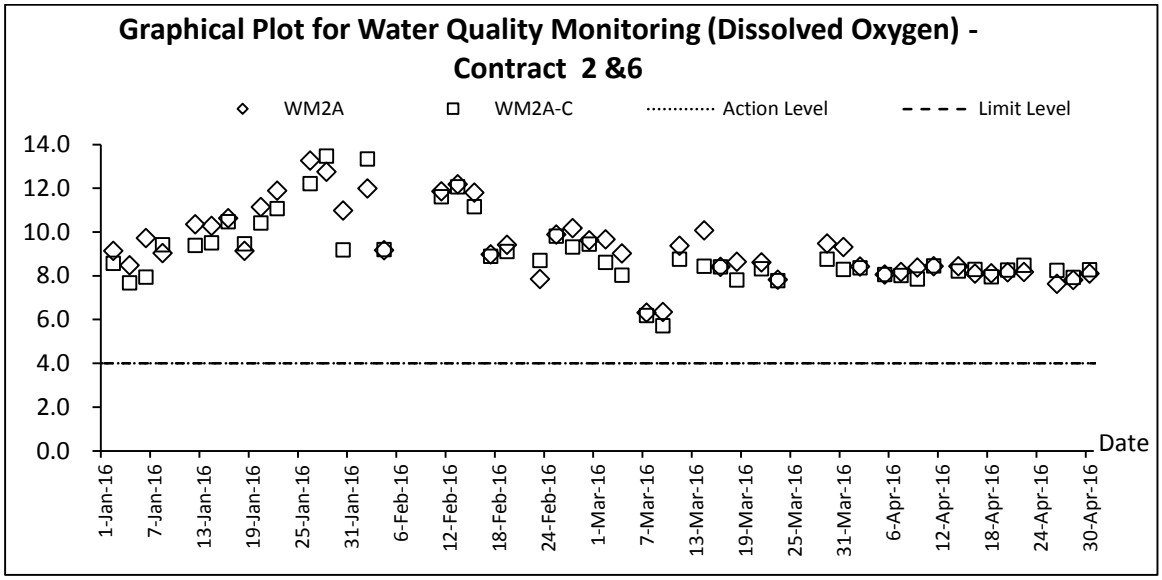
24-Apr-16
30-Apr-16


Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contract 2 &6
WM2A
WM2A-C
Action Level
Limit Level
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
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6-Apr-16
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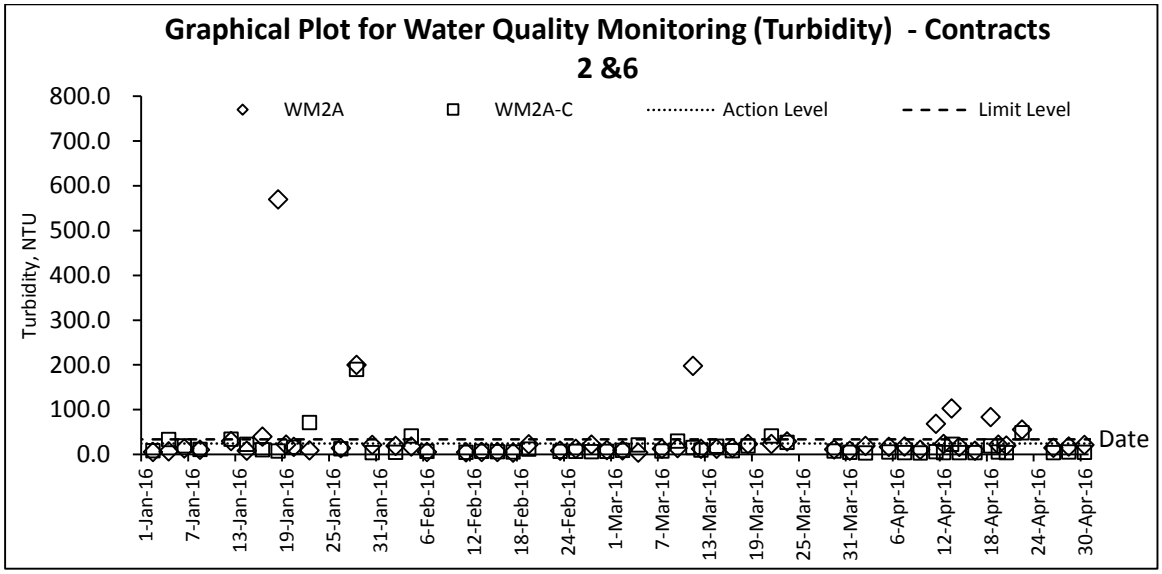
18-Apr-16
24-Apr-16
30-Apr-16


Graphical Plot for Water Quality Monitoring (Turbidity) - Contracts 2 &6
WM2A
WM2A-C
Action Level
Limit Level
Turbidity, NTU
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
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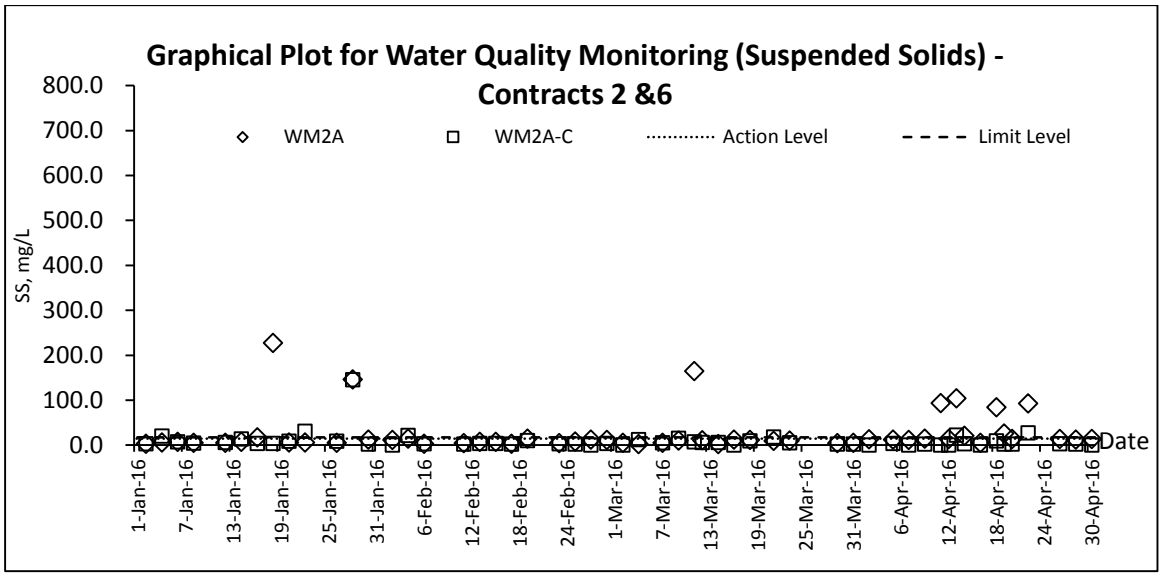
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contracts 2 &6
WM2A
WM2A-C
Action Level
Limit Level
SS, mg/L
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
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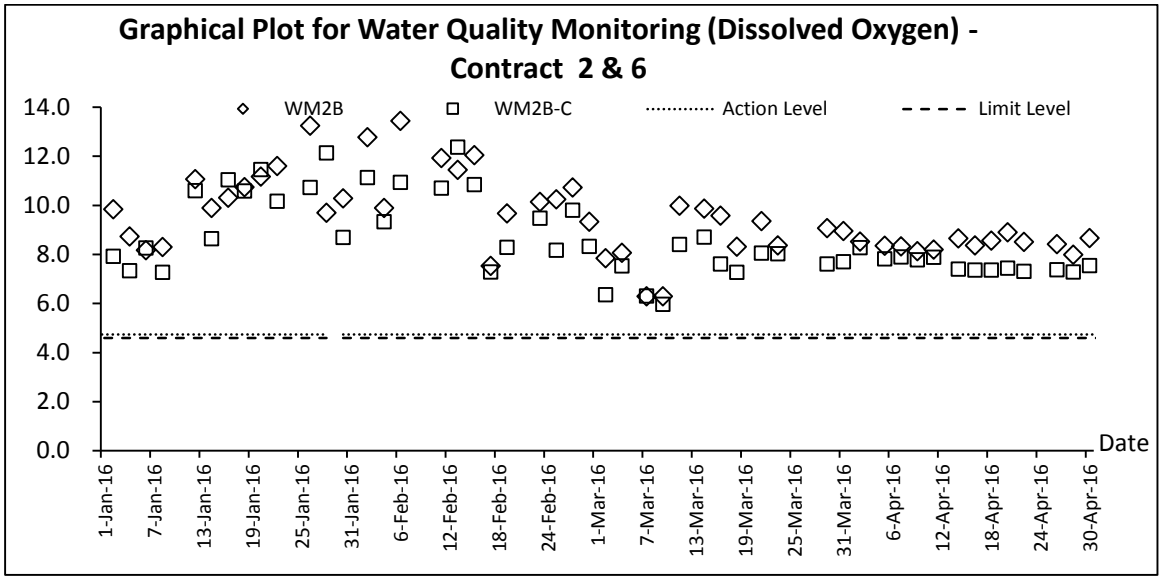
24-Apr-16
30-Apr-16


Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contract 2 & 6
WM2B
WM2B-C
Action Level
Limit Level
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
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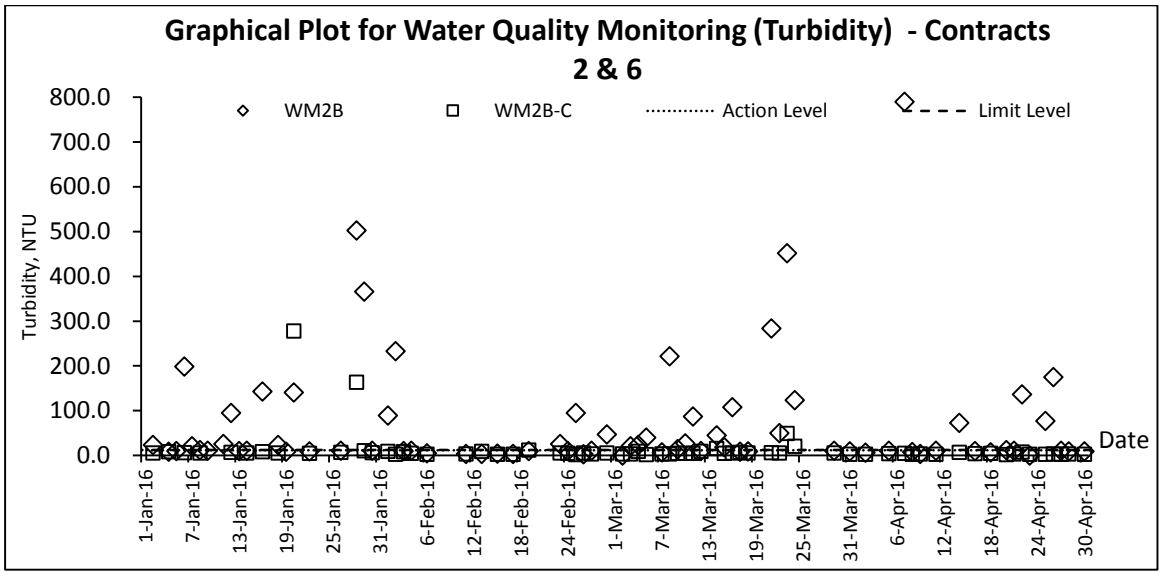
18-Apr-16
24-Apr-16
30-Apr-16


Graphical Plot for Water Quality Monitoring (Turbidity) - Contracts 2 & 6
WM2B
WM2B-C
Action Level
Limit Level
Turbidity, NTU
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
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6-Apr-16
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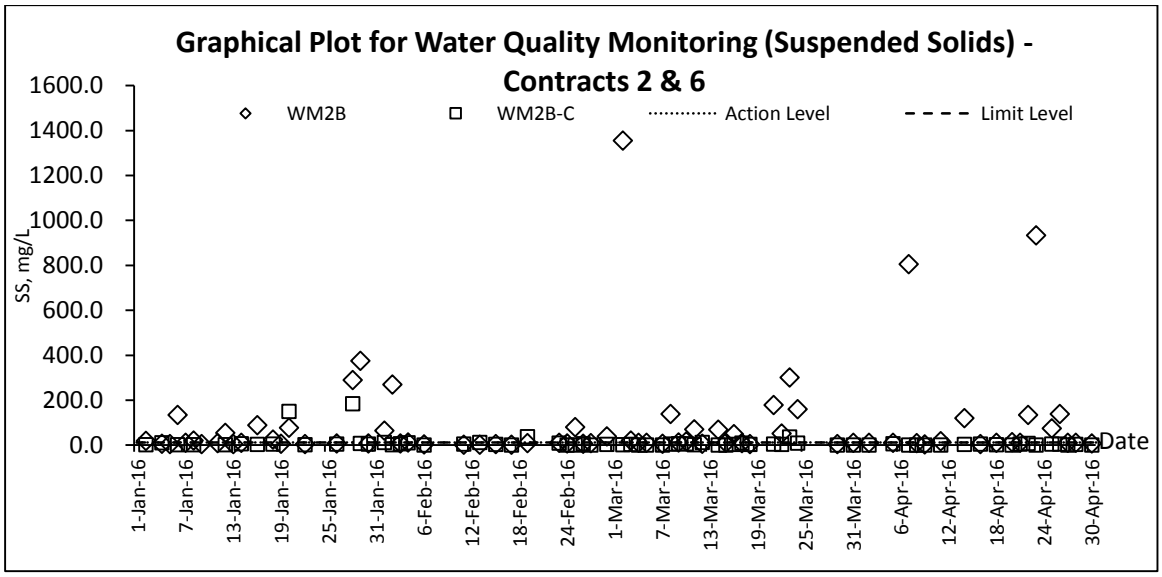
24-Apr-16
30-Apr-16


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contracts 2 & 6
WM2B
WM2B-C
Action Level
Limit Level
SS, mg/L
1600.0
1400.0
1200.0
1000.0
800.0
600.0
400.0
200.0
0.0
Date
1-Jan-16
7-Jan-16
13-Jan-16
19-Jan-16
25-Jan-16
31-Jan-16
6-Feb-16
12-Feb-16
18-Feb-16
24-Feb-16
1-Mar-16
7-Mar-16
13-Mar-16
19-Mar-16
25-Mar-16
31-Mar-16
6-Apr-16
12-Apr-16
18-Apr-16
24-Apr-16
30-Apr-16

Appendix K

Meteorological Data

Date		Weather	Total Rainfall (mm)	Ta Kwu Ling Station			
				Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Apr-16	Fri	Mainly cloudy and foggy with a few showers.	0	22.8	7.5	80.5	E
2-Apr-16	Sat	Mainly cloudy and foggy with a few showers.	Trace	22.5	8	83.2	E
3-Apr-16	Sun	Mainly cloudy and foggy with a few showers.	0	23.9	7.8	82.3	E/SE
4-Apr-16	Mon	Cloudy and foggy with a few showers. Moderate south to southeasterly winds.	4.3	25.1	8.7	78.7	E/SE
5-Apr-16	Tue	Mainly cloudy and foggy with a few showers.	Trace	22.7	6.5	88.2	E
6-Apr-16	Wed	Mainly cloudy and foggy with a few showers.	0	24	8	78	E
7-Apr-16	Thu	Mainly cloudy and foggy with a few showers.	0	25.1	8.5	83.5	E/SE
8-Apr-16	Fri	Cloudy and foggy with a few showers. Moderate south to southeasterly winds.	Trace	26.1	7	77.5	E/SE
9-Apr-16	Sat	Cloudy with a few showers	Trace	25.5	7.3	78.5	E/SE
10-Apr-16	Sun	Cloudy with a few showers	22.1	23.4	7.5	91.7	E/SE
11-Apr-16	Mon	Mainly cloudy and foggy with a few showers.	0.4	22.2	8.2	89.2	E/SE
12-Apr-16	Tue	Mainly cloudy and foggy with a few showers.	11.4	20.8	11.4	88.2	E/SE
13-Apr-16	Wed	Mainly cloudy and foggy with a few showers.	76.4	21.9	10.5	91.5	E/SE
14-Apr-16	Thu	Cloudy and foggy with a few showers. Moderate south to southeasterly winds.	0.7	23	6.2	95.7	E/SE
15-Apr-16	Fri	Cloudy and foggy with a few showers. Moderate south to southeasterly winds.	3.4	22.1	9.5	92.5	E/SE
16-Apr-16	Sat	Mainly cloudy and foggy with a few showers.	Trace	25.4	8.8	89.1	E/SE
17-Apr-16	Sun	Mainly cloudy and foggy with a few showers.	Trace	26.8	10.5	73.7	S/SE
18-Apr-16	Mon	Cloudy with a few showers	23.1	23.5	6.1	81.7	N/NW
19-Apr-16	Tue	Cloudy with a few showers	Trace	20.7	14.2	81.2	E
20-Apr-16	Wed	Moderate southerly winds.	Trace	22.6	13.1	82	E
21-Apr-16	Thu	Moderate southerly winds.	Trace	24.9	6	85	E/NE
22-Apr-16	Fri	Cloudy with a few showers	8.3	23.1	14	84	E
23-Apr-16	Sat	Cloudy with a few showers and thunderstorms.	2.8	24.7	8.4	83	E/SE
24-Apr-16	Sun	Cloudy with a few showers and thunderstorms.	41.4	25.6	7.3	89.7	E/SE
25-Apr-16	Mon	Cloudy with a few showers and thunderstorms.	12.4	26.3	4.5	84.5	S/SW
26-Apr-16	Tue	Sunny intervals and a few showers. Fog patches at first.	Trace	26.9	6.5	83	S/SW
27-Apr-16	Wed	Mainly cloudy with a few showers	0.9	26.9	6	75	SW
28-Apr-16	Thu	Mainly cloudy. A few showers later	1.7	26.5	5.6	75	N/NW
29-Apr-16	Fri	Mainly cloudy with a few showers	Trace	24.6	7.5	75.5	E
30-Apr-16	Sat	Mainly cloudy with a few showers	1.5	22.1	7	78	E

Appendix L

Waste Flow Table

Name of Department : CEDD **Contract No./ Work Order No. :** CV/2012/08

Appendix I - Monthly Summary Waste Flow Table for 2016

(All quantities shall be rounded off to 3 decimal places)

Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (bottles/containers, plastic sheets/ foams from package material) (in '000kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (in '000m3)
January	72.2029	0.0000	0.6482	31.8061	39.7486	0.7684	26.2000	0.0000	0.0000	1.2320	0.1247
February	55.6715	0.0000	1.0145	38.3484	16.3085	0.9343	8.3800	0.9800	0.0000	1.4080	0.1089
March	34.1757	0.0000	0.3241	29.3514	4.5003	1.0325	44.1700	0.0000	0.0000	11.9680	0.0732
April	86.9048	0.0000	0.7045	32.8811	53.3191	0.6599	0.0020	0.4000	0.0000	0.7040	0.1306
May	0.0000										
June	0.0000										
Half-year total	248.9549	0.0000	2.6914	132.3870	113.8765	3.3951	78.7520	1.3800	0.0000	15.3120	0.4374
July	0.0000										
August	0.0000										
September	0.0000										
October	0.0000										
November	0.0000										
December	0.0000										
Yearly Total	248.9549	0.0000	2.6914	132.3870	113.8765	3.3951	78.7520	1.3800	0.0000	15.3120	0.4374

(All quantities shall be rounded off to 3 decimal places)

Year	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (bottles/containers, plastic sheets/ foams from package material) (in '000kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (in '000m3)
2013	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2014	425.4406	0.0000	2.7362	376.3945	46.3099	5.6245	3.2100	0.4390	0.0070	10.8800	2.2609
2015	570.9459	0.0000	20.8159	543.2162	6.9138	4.5492	14.1300	3.9220	1.5000	16.1920	1.1696
2016	248.9549	0.0000	2.6914	132.3870	113.8765	3.3951	78.7520	1.3800	0.0000	15.3120	0.4374
2017											
2018											
Total	1245.3414	0.0000	26.2434	1051.9978	167.1002	13.5688	96.0920	5.7410	1.5070	42.3840	3.8679

Remark:

1) Density of C&D material to be 2.2 metric ton/m3
2) Density of General Refuse to be 1.6 metric ton/m3
3) Density of Spent Oil to be 0.88 metric ton/m3

Name of Department: CEDD

Contract No.: CV/2012/09

Monthly Summary Waste Flow Table for 2016 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in m^3)	(in '000m^3)
Jan	2.683	0.253	0.030	0.000	2.400	0.799	0.001	0.000	0.000	0.000	0.115
Feb	1.877	0.651	0.020	0.000	1.205	1.141	0.000	0.000	0.000	0.000	0.110
Mar	1.501	0.417	0.000	0.000	1.084	0.831	0.000	0.000	0.001	0.000	0.090
Apr	0.472	0.046	0.018	0.000	0.408	0.647	0.000	0.000	0.000	0.000	0.135
May											
Jun											
Sub-total	6.533	1.367	0.068	0.000	5.098	3.419	0.001	0.000	0.001	0.000	0.450
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	6.533	1.367	0.068	0.000	5.098	3.419	0.001	0.000	0.001	0.000	0.450

Note:

1. Assume the density of soil fill is 2 ton/m^3.
2. Assume the density of rock and broken concrete is 2.5 ton/m^3.
3. Assume each truck of C&D wastes is 5m^3.
4. The inert C&D materials except slurry and bentonite are disposed at Tuen Mun 38.
5. The slurry and bentonite are disposed at Tseung Kwun O 137.
6. The non-inert C&D wastes are disposed at NENT.
7. Assume the density of metal is 7,850 kg/m^3.

Contract No. CV/2013/03

Liantang/Heung Yuen Wai Boundary Control Point

Site Formation and infrastructure Works - Contract 5

Name of Department: CEDD

Monthly Summary Waste Flow Table for 2016

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated				Monthly
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(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	0	0	0	0	0	0.235	0	0	0	0	0.06
FEB	0	0	0	0	0	0.141	0	0	0	0	0.045
MAR	0	0	0	0	0	0.1785	0	0	0	0	0.055
APRIL	0	0	0	0	0	0	0	0	0	0	0.03
MAY											
JUN											
Sub Total	0	0	0	0	0	0.5545	0	0	0	0	0.19
JUL											
AUG											
SEP											
OCT											
NOV											
DEC											
Total	0	0	0	0	0	0.55	0	0	0	0	0.19

Notes:

Contract No. CV/2013/03

Liantang/Heung Yuen Wai Boundary Control Point

Site Formation and infrastructure Works - Contract 5

Name of Department: CEDD

	Forecast of Total Quantities of C&D Materials to be Generated from the Contract (see Note 4)										
	Total Quantity Generated	Hard Rocks and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metal	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 '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
	0	0	0	0	0	350	30	4	2	1	4

Notes:

(1) The performance targets are given in PS clause 6(14) above.

(2) The waste flow table shall also include C&D materials that are specified in the Contractor to be imported for use at the Site.

(3) Plastic refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature

- Hard Rocks and Large Broken Concrete = Cannot be defined at this stage
- Imported Fill = Estimated by the Contractor = 1 loading = 8m^3
- Metal = Estimated by the Contractor
- Paper/cardboard packaging = Estimated by the Contractor
- Plastics = Estimated by the Contractor
- Chemical Waste = Estimated by the Contractor (Spent lubricating oil, assume density 0.9kg/L)
- Other, e.g. general refuse = Estimated by the Contractor

Monthly Summary Waste Flow Table for _2016__ (year)

Name of Person completing the record: KM LUI (EO)

Project : Liangtang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 6 Contract No.: CV/2013/08

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported 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 '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m^3)
Jan	58.943	0	3.811	12.131	43.001	31.248	0	0	0	0	0.695
Feb	74.418	0	8.785	39.85	25.783	6.552	0	0.097	0	0	0.339
Mar	43.764	0	6.438	12.034	25.292	3.288	0	0.206	0.007	0	0.042
Apr	33.767	0	1.933	5.759	26.075	0	0	0.221	0	0	0.070
May											
Jun											
Sub-total	210.892	0	20.967	69.774	120.151	41.088	0	0.524	0.007	0	1.146
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	380.115	0	39.501	86.558	254.056	48.337	0	0.818	0.007	32.28	4.222

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(2) Plastics refer to plastic bottles/containers, plastic sheets/ foam from packaging materials.

(3) Broken concrete for recycling into aggregates.

Appendix I

MONTHLY SUMMARY WASTE FLOW TABLE

Name of Department: CEDD

Contract Title: Liantang/ Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 7

Contract No.: NE/2014/03

Monthly Summary Waste Flow Table for 2016 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of Inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/cardboard packaging	Plastic (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m3)
Jan	0	0	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	0.16	0	0	0	0	0	0
Mar	0	0	0	0	0.135	0	0	0	0	0	0.005
Apr	0	0	0	0	0.313	0	0	0	0	0	0.005
May											
June											
Sub-total	0	0	0	0	0.608	0	0	0	0	0	0.01
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total	0	0	0	0	0.608	0	0	0	0	0	0.01

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

Architectural Services Department	**Form No. D/OI.03/09.002**

Contract No. / Works Order No.: - SSC505

Monthly Summary Waste Flow Table for 2016 [year] [to be submitted not later than the 15th day of each month following reporting month]

(All quantities shall be rounded off to 3 decimal places.)

Month	Actual Quantities of Inert Construction Waste Generated Monthly				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Broken Concrete (see Note 4)	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)
Jan	0.800	0	0	0	0.800
Feb	0.858	0	0	0	0.858
Mar	0.793	0	0	0	0.793
Apr	0.1105	0	0	0	0.1105
May					
Jun					
Sub-total	2.561	0	0	0	2.561
Jul					
Aug					
Sep					
Oct					
Nov					
Dec					
Total	2.561	0	0	0	2.561

Month	Actual Quantities of Non-inert Construction Waste Generated Monthly												
	Timber		Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Other Recyclable Materials (see Page 3)		General Refuse disposed of at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000m^3)
	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated
Jan	0.000	0.000	4.73	4.73	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.072
Feb	0.000	0.000	0.0004	0.0004	0.0186	0.0186	0.000	0.000	0.000	0.000	0.021	0.021	0.065
Mar	0	0	52.752	52.752	0.044	0.044	0	0	0	0	0.05	0.05	0.059
Apr	0	0	1465.59	1465.59	0.09	0.09	0	0	0	0	0.084	0.084	0.091
May													
Jun													
Sub-total	0	0	1523.0724	1523.0724	0.1526	0.1526	0	0	0	0	0.155	0.155	0.286
Jul													
Aug													
Sep													
Oct													
Nov													
Dec													
Total	0	0	1523.0724	1523.0724	0.1526	0.1526	0	0	0	0	0.155	0.155	0.286

Description of mode and details of recycling if any for the month e.g. XX kg of used timber was sent to YY site for transformation into fertilizers					
84kg of glass bottles were sent to Action Health for recycling	0.6kg of cans and 90kg of papers were sent to Wong Kei for recycling.	1416.4 tons of scrap metals from LCAL were sent to Hop Hing for recycling.	49.19 tons of scrap metals from subcontractors were sent for recycling.	0	0

Notes:
(1) The performance targets are given in the Particular Specification on Environmental Management Plan.
(2) The waste flow table shall also include construction waste that are specified in the Contract to be imported for use at the site.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
(4) Broken concrete for recycling into aggregates.
(5) If necessary, use the conversion factor: 1 full load of dumping truck being equivalent to 6.5 m^3 by volume.

Appendix M

Implementation Schedule for Environmental Mitigation Measures

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
Air Quality Impact (Construction)							
3.6.1.1	2.1	**General Dust Control Measures** The following dust suppression measures should be implemented: ■ Frequent water spraying for active construction areas (4 times per day for active areas in Po Kak Tsai and 8 times per day for all other active areas), including areas with heavy construction and slope cutting activities ■ 80% of stockpile areas should be covered by impervious sheets ■ Speed of trucks within the site should be controlled to about 10 km/hr ■ All haul roads within the site should be paved to avoid dust emission due to vehicular movement	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation
3.6.1.2	2.1	**Best Practice for Dust Control** The relevant best practices for dust control as stipulated in the Air Pollution Control (Construction Dust) Regulation should be adopted to further reduce the construction dust impacts of the Project. These best practices include: *Good site management* ■ The Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. ■ Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimize the release of visible dust emission. ■ Any piles of materials accumulated on or around the work areas should be cleaned up regularly. ■ Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimizing generation of fugitive dust emissions. ■ The material should be handled properly to prevent fugitive dust emission before cleaning. *Disturbed Parts of the Roads* ■ Each and every main temporary access should be paved with	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or ■ Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. *Exposed Earth* ■ Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies. *Loading, Unloading or Transfer of Dusty Materials* ■ All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. *Debris Handling* ■ Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides. ■ Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. *Transport of Dusty Materials* ■ Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards. *Wheel washing* ■ Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. *Use of vehicles* ■ Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. ■ Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.				

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		Site hoarding ■ Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit. *Blasting* ■ The areas within 30m from the blasting area should be wetted with water prior to blasting.					
Air Quality Impact (Operation)							
3.5.2.2	2.2	The following odour containment and control measures will be provided for the proposed sewage treatment work at the BCP site: ■ The treatment work will be totally enclosed. Negative pressure ventilation will be provided within the enclosure to avoid any fugitive odorous emission from the treatment work. ■ Further odour containment will be achieved by covering or confining the sewage channels, sewage tanks, and equipment with potential odour emission. ■ Proper mixing will be provided at the equalization and sludge holding tanks to prevent sewage septicity. ■ Chemical or biological deodorisation facilities with a minimum odour removal efficiency of 90% will be provided to treat potential odorous emissions from the treatment plant including sewage channels / tanks, filter press and screening facilities so as to minimize any potential odour impact to the nearby ASRs.	To minimize potential odour impact from operation of the proposed sewage treatment work at BCP	DSD	BCP	Operation Phase	EIA recommendation
Noise Impact (Construction)							
4.4.1.4	3.1	**Adoption of Quieter PME** Use of the recommended quieter PME such as those given in the BS5228: Part 1:2009 and presented in **Table 4.14**, which can be found in Hong Kong.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and Noise Control Ordinance (NCO)

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.4.1.4	3.1	**Use of Movable Noise Barrier** The use of movable barrier for certain PME can further alleviate the construction noise impacts. In general, a 5 dB(A) reduction for movable PME and 10 dB(A) for stationary PME can be achieved depending on the actual design of the movable noise barrier. The Contractor shall be responsible for design of the movable noise barrier with due consideration given to the size of the PME and the requirement for intercepting the line of sight between the NSRs and PME. Barrier material with surface mass in excess of 7 kg/m^2 is recommended to achieve the predicted screening effect.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
4.4.1.4	3.1	**Use of Noise Enclosure/ Acoustic Shed** The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the GW-TM.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
4.4.1.4	3.1	**Use of Noise Insulating Fabric** Noise insulating fabric can be adopted for certain PME (e.g. drill rig, pilling auger etc). The insulating fabric should be lapped such that there are no openings or gaps on the joints. Technical data from manufacturers state that by using the Fabric, a noise reduction of over 10 dB(A) can be achieved on noise level.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.4.1.4	3.1	**Good Site Practice** The good site practices listed below should be followed during each phase of construction: • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction programme; • Mobile plant, if any, should be sited as far from NSRs as possible; • Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
Noise Impact (Operation)							
		Road Traffic Noise					
Table 4.42 and Figure 4.20.1 to 4.20.4	3.2	Erection of noise barrier/ enclosure along the viaduct section.	To minimize the road traffic noise along the connecting road of BCP	Contractor	Loi Tung and Fanling Highway Interchange	Before Operation	EIAO and NCO
		Fixed Plant Noise					
Table 4.46	3.2	Specification of the maximum allowable sound power levels of the proposed fixed plants during daytime and night-time.	To minimize the fixed plant noise impact	Managing Authority of the buildings / Contractor	BCP, Administration Building and all ventilation buildings	Before Operation	EIA recommendation, EIAO and NCO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.5.2.4	3.2	The following noise reduction measures shall be considered as far as practicable during operation: • Choose quieter plant such as those which have been effectively silenced; • Include noise levels specification when ordering new plant (including chillier and E/M equipment); • Locate fixed plant/louver away from any NSRs as far as practicable; • Locate fixed plant in walled plant rooms or in specially designed enclosures; • Locate noisy machines in a basement or a completely separate building; • Install direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosure where necessary; and • Develop and implement a regularly scheduled plant maintenance programme so that equipment is properly operated and serviced in order to maintain a controlled level of noise.	To minimize the fixed plant noise impact	Managing Authority of the buildings / Contractor	BCP, Administration Building and all ventilation buildings	Before Operation	EIAO and NCO
Water Quality Impact (Construction)							
5.6.1.1	4.1	**Construction site runoff and drainage** The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts: ▪ At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the Contractor prior to the commencement of construction. ▪ The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas.	To control site runoff and drainage; prevent high sediment loading from reaching the nearby watercourses	Contractor	Construction Works Sites	Construction Phase	Practice Note for Professional Persons on Construction Site Drainage (ProPECC Note PN 1/94)

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		Temporary ditches should be provided to facilitate the runoff discharge into stormwater drainage system through a sediment/silt trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates, if practical. ▪ Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the Contractor prior to the commencement of construction. ▪ All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. ▪ Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities. ▪ If surface excavation works cannot be avoided during the wet season (April to September), temporarily exposed slope/soil surfaces should be covered by tarpaulin or other means, as far as practicable, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Interception channels should be provided (e.g. along the crest/edge of the excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC Note PN 1/94. ▪ The overall slope of the site should be kept to a minimum to reduce					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		the erosive potential of surface water flows. ▪ All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. ▪ Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. ▪ Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers. ▪ Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes. ▪ Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.					
5.6.1.1	4.1	**Good site practices for works within water gathering grounds** The following conditions should be complied, if there is any works to be carried out within the water gathering grounds:	To minimize water quality impacts to the water gathering grounds	Contractor	Construction Works Sites within the water gathering	Construction Phase	ProPECC Note PN 1/94

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		▪ Adequate measures should be implemented to ensure no pollution or siltation occurs to the catchwaters and catchments. ▪ No earth, building materials, oil or fuel, soil, toxic materials or any materials that may possibly cause contamination to water gathering grounds are allowed to be stockpiled on site. ▪ All surplus spoil should be removed from water gathering grounds as soon as possible. ▪ Temporary drains with silt traps should be constructed at the site boundary before the commencement of any earthworks. ▪ Regular cleaning of silt traps should be carried out to ensure proper operation at all time. ▪ All excavated or filled surfaces which have the risk of erosion should always be protected form erosion. ▪ Facilities for washing the wheels of vehicles before leaving the site should be provided. ▪ Any construction plant which causes pollution to catchwaters or catchments due to the leakage of oil or fuel should be removed off site immediately. ▪ No maintenance activities which may generate chemical wastes should be undertaken in the water gathering grounds. Vehicle maintenance should be confined to designated paved areas only and any spillages should be cleared up immediately using absorbents and waste oils should be collected in designated tanks prior to disposal off site. All storm water run-off from these areas should be discharged via oil/petrol separators and sand/silt removal traps. ▪ Any soil contaminated with fuel leaked from plant should be removed off site and the voids arising from removal of contaminated soil should be replaced by suitable material approved by the Director of Water Supplies. ▪ Provision of temporary toilet facilities and use of chemicals or insecticide of any kind are subject to the approval of the Director of Water Supplies. ▪ Drainage plans should be submitted for approval by the Director of			grounds		

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		Water Supplies. ▪ An unimpeded access through the waterworks access road should always be maintained. ▪ Earthworks near catchwaters or streamcourses should only be carried out in dry season between October and March, ▪ Advance notice must be given before the commencement of works on site quoting WSD's approval letter reference.					
5.6.1.2	4.1	**Good site practices of general construction activities** Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby stormwater drain. Stockpiles of cement and other construction materials should be kept covered when not being used. Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby stormwater drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.	To minimize water quality impacts	Contractor	All construction works sites	Construction phase	EIA Recommendation
5.6.1.3	4.1	**Sewage effluent from construction workforce** Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.	To minimize water quality impacts	Contractor	All construction works sites with on-site sanitary facilities	Construction phase	EIA Recommendation and Water Pollution Control Ordinance (WPCO)
5.6.1.4	4.1	**Hydrogeological Impact** Grout injection works would be conducted before blasting, for sealing a limited area around the tunnel with a grout of a suitable strength for controlling the potential groundwater inflows. The pre-injection grouting method would be supplemented by post-injection grouting where necessary to further enhance the groundwater inflow control. On-site treatment for the groundwater ingress pumped out would be required to remove any contamination by grouting materials before discharge off-site.	To minimize water quality impacts	Contractor	Construction works sites of the drill and blast tunnel	Construction phase	EIA Recommendation and WPCO
Water Quality Impact (Operation)							
		No mitigation measure is required.					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
Sewage and Sewerage Treatment Impact (Construction)							
6.7	5	The sewage generated by the on-site workforce should be collected in chemical toilets and disposed of off-site by a licensed waste collector.	To minimize water quality impacts	Contractor	All construction works sites with on-site sanitary facilities	Construction phase	EIA recommendation and WPCO
Sewage and Sewerage Treatment Impact (Operation)							
6.6.3	5	Sewage generated by the BCP and Chuk Yuen Village Resite will be collected and treated by the proposed on-site sewage treatment facility using Membrane Bioreactor treatment with a portion of the treated wastewater reused for irrigation and flushing within the BCP.	To minimize water quality impacts	DSD	BCP	Operation phase	EIA recommendation and WPCO
6.5.3	5	Sewage generated from the Administration Building will be discharged to the existing local sewerage system.	To minimize water quality impacts	DSD	Administration Building	Operation phase	EIA recommendation and WPCO
Waste Management Implication (Construction)							
7.6.1.1	6	**Good Site Practices** Adverse impacts related to waste management such as potential hazard, air, odour, noise, wastewater discharge and public transport as mentioned in section 3.4.7.2 (ii)(c) of the Study Brief are not expected to arise, provided that good site practices are strictly followed. Recommendations for good site practices during the construction activities include: ▪ Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site ▪ Training of site personnel in proper waste management and chemical handling procedures ▪ Provision of sufficient waste disposal points and regular collection of waste ▪ Dust suppression measures as required under the Air Pollution Control (Construction Dust) Regulation should be followed as far as practicable. Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by covering trucks or in enclosed containers ▪ General refuse shall be removed away immediately for disposal. As	To minimize adverse environmental impact	Contractor	Construction works sites (general)	Construction Phase	EIA recommendation; Waste Disposal Ordinance; Waste Disposal (Chemical Wastes) (General) Regulation; and ETWB TC(W) No. 19/2005, Environmental Management on Construction Site

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		such odour is not anticipated to be an issue to distant sensitive receivers ▪ Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction from public road ▪ Covers and water spraying system should be provided for the stockpiled C&D material to prevent dust impact or being washed away ▪ Designate different locations for storage of C&D material to enhance reuse ▪ Well planned programme for transportation of C&D material to lessen the off-site traffic impact. Well planned delivery programme for offsite disposal and imported filling material such that adverse noise impact from transporting of C&D material is not anticipated ▪ Site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" should be adopted as far as practicable, such as cleaning and maintenance of drainage systems regularly ▪ Provision of cover for the stockpile material, sand bag or earth bund as barrier to prevent material from washing away and entering the drains					
7.6.1.2	6	**Waste Reduction Measures** Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include: ▪ Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal ▪ Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force ▪ Proper storage and site practices to minimise the potential for damage or contamination of construction materials ▪ Plan and stock construction materials carefully to minimise amount	To reduce the quantity of wastes	Contractor	Construction works sites (General)	Construction Phase	EIA recommendation and Waste Disposal Ordinance

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		of waste generated and avoid unnecessary generation of waste ▪ In addition to the above measures, specific mitigation measures are recommended below for the identified waste arising to minimise environmental impacts during handling, transportation and disposal of these wastes.					
7.6.1.3	6	**C&D Materials** In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the excavated materials should be reused on-site as backfilling material as far as practicable. The surplus rock and other inert C&D material would be disposed of at the Government's Public Fill Reception Facilities (PFRFs) at Tuen Mun Area 38 for beneficial use by other projects in the HKSAR as the last resort. C&D waste generated from general site clearance and tree felling works would require disposal to the designated landfill site. Other mitigation requirements are listed below: ▪ A Waste Management Plan should be prepared and implemented in accordance with ETWB TC(W) No. 19/2005 Environmental Management on Construction Site; and ▪ In order to monitor the disposal of C&D material and solid wastes at public filling facilities and landfills, and to control fly-tipping, a trip-ticket system (e.g. ETWB TCW No. 31/2004) should be included.	To minimize impacts resulting from C&D material	Contractor	Construction Works Sites (General)	Construction Phase	EIA recommendation; Waste Disposal Ordinance; and ETWB TCW No. 31/2004
7.6.1.4	6	**General refuse** General refuse should be stored in enclosed bins or compaction units separated from other C&D material. A reputable waste collector is to be employed by the Contractor to remove general refuse from the site separately. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' litter.	To minimize impacts resulting from collection and transportation of general refuse for off-site disposal	Contractor	Construction works sites (General)	Construction phase	Waste Disposal Ordinance and Public Health and Municipal Services Ordinance - Public Cleansing and Prevention of Nuisances Regulation
7.6.1.5	6	**Chemical waste** If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical	To minimize impacts resulting from collection and transportation of chemical waste for off-site disposal	Contractor	Construction works sites (General)	Construction phase	Waste Disposal (Chemical Waste) (General) Regulation and Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes

Appendix N

Investigation Report for Exceedance

AUES

Fax Cover Sheet

To	Mr. Daniel Ho	**Fax No**	**2638 7077**
Company	**Chun Wo Construction Ltd**		
cc			
From	**Nicola Hon**	**Date**	**1 April 2016**
Our Ref	TCS00670/13/300/**F0211**	**No of Pages**	4 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008 Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works Investigation Report of Exceedance of Water Quality at Location WM4 on 21 March 2016 (Contract 3)**		

Dear Mr. Ho,

Further to the Notification of Exceedance (NOE) ref.: TCS00670/13/300/F0195 dated 22 March 2016 and TCS00670/13/300/F0205 dated 31 March 2016. Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Alan Lee (ER of C3, AECOM)	Fax:	2171 3498
	Mr. Antony Wong (IEC, SMEC)		By e-mail

安順聯合環境服務及顧問
Action-United Environmental Services & Consulting
Flat A, 20/F, Gold King Industrial Building,
35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

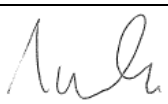
Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		21 March 2016	
Location		**WM4**	
Time		13:00	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		35.2 AND 120% of upstream control station of the same day	39.4 AND 120% of upstream control station of the same day
Limit Level		38.4 AND 130% of upstream control station of the same day	45.5 AND 130% of upstream control station of the same day
Measured Level	**WM4-CA**	25.7	20.5
	WM4-CB	49.1	35.5
	WM4	**89.1**	**70.5**
Exceedance		**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site diary provided by the Contractor, construction works carried out on 21 March 2016 included pre-drilling and no wastewater was generated. Surface runoff of the site was all diverted to the wastewater treatment facilities for de-silting prior to discharge. 2. According to the site record from the monitoring team on 21 March 2016, turbid water was observed at both impact and control station WM4, WM4-CA and WM4-CB under the influence of rain (Photo 1 to 4 and Figure 1) 3. As advised by the Contractor, muddy water flowed from other upstream location which was not under monitored by the Contract was observed on 21 March 2016. (Photo 5 &6) It is considered that the exceedances were due to the stir up of sediment during rain and external muddy water from upstream and not related to the works under the Contract. 4. According to the Event and Action, the monitoring frequency at exceed station shall be increased to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. In view of the subsequent monitoring result, no exceedances were triggered at WM4 on 22 and 23 March 2016. However, the Contractor should continue to implement the environmental mitigation measures recommended in implementation schedule in the EM&A Manual.	

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 1 April 2016

Photo Record

Photo 1
Turbid water was observed at WM4 on 21 March 2016.

Photo 2
Turbid water was observed at WM4-CA on 21 March 2016.

Photo 3
Turbid water was observed at WM4-CB on 21 March 2016.

Photo 4
The water samples collected at WM4, WM4-CA and WM4-C were turbid.

Photo 5
Turbid water flowed from upstream was observed on 21 March 2016.

Photo 6
Turbid water flowed from upstream affecting the water quality throughout the river course as observed on 21 March 2016.

Contract No. CV/2012/09
Liantang / Heung Yuen Wai Boundary Control Point
Site Formation and Infrastructure Works - Contract 3

俊和建築工程有限公司
CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.

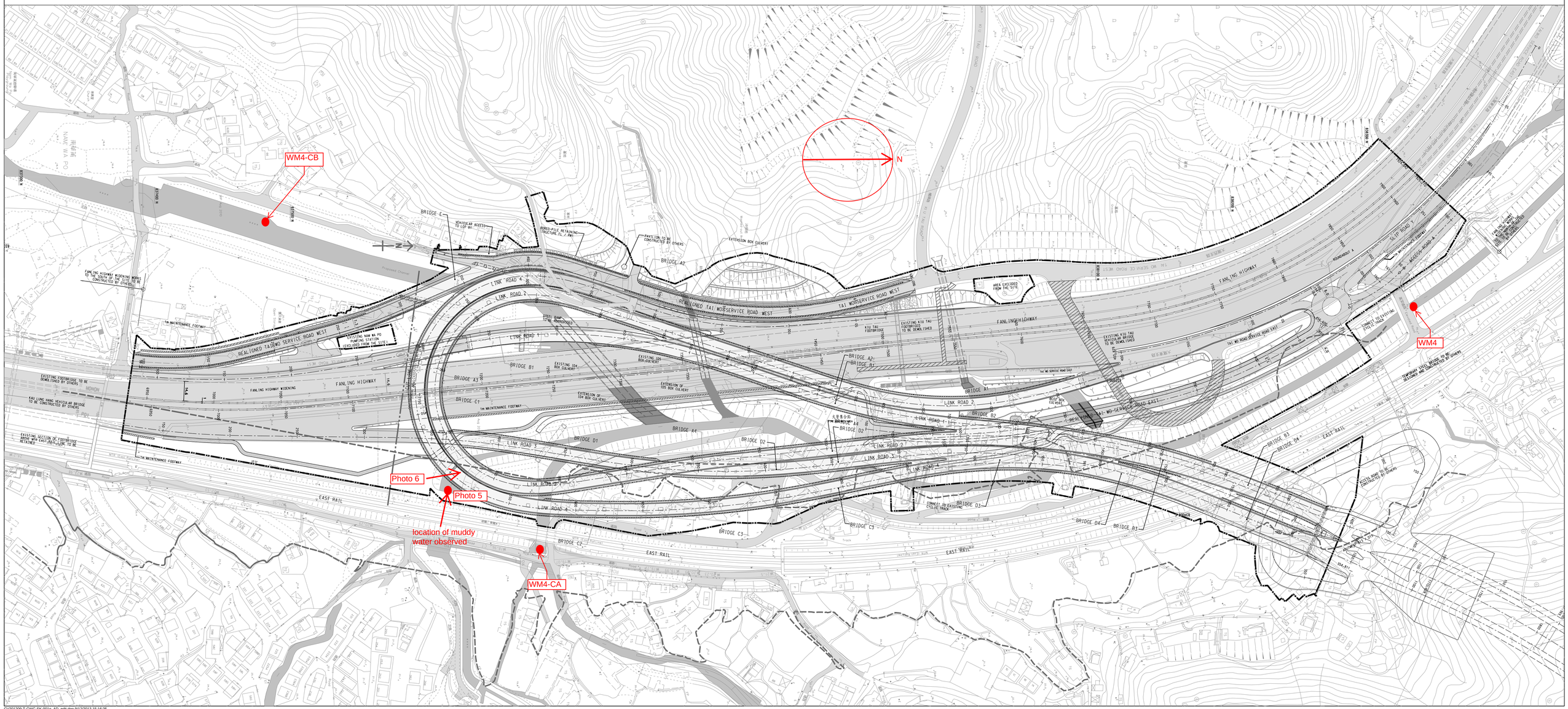


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Figure 1. Location of Water Quality Monitoring Location

AUES

Fax Cover Sheet

To	**Mr. Roger Lee**	**Fax No**	**2717 3299**
Company	**Dragages Hong Kong Limited**		
cc			
From	**Nicola Hon**	**Date**	**1 April 2016**
Our Ref	TCS00697/13/300/**F0212**	**No of Pages**	4 **(Incl. cover sheet)**

RE **Agreement No. CE 45/2008**
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report of Exceedance of Water Quality at Location WM4 on 21 March 2016 (Contract 2)

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Dear Mr. Lee,

Further to the Notification of Exceedance (NOE) ref.: TCS00670/13/300/F0196 dated 22 March 2016 and TCS00670/13/300/F0206 dated 31 March 2016. Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Gregory Lo (ER, AECOM)	Fax:	2171 3498
	Mr. Antony Wong (IEC, SMEC)		By e-mail

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Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		21 March 2016	
Location		**WM4**	
Time		13:00	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		35.2 AND 120% of upstream control station of the same day	39.4 AND 120% of upstream control station of the same day
Limit Level		38.4 AND 130% of upstream control station of the same day	45.5 AND 130% of upstream control station of the same day
Measured Level	**WM4-CA**	25.7	20.5
	WM4-CB	49.1	35.5
	WM4	**89.1**	**70.5**
Exceedance		**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided by the Contractor of Contract 2 (DHK), construction activities carried out at South Portal on 21 March 2016 included tunnel excavation and ventilation building superstructure. The construction activities were carried out away from the river course and no discharge was made on 21 March 2016. 2. According to the site record from the monitoring team on 21 March 2016, turbid water was observed at both impact and control station WM4, WM4-CA and WM4-CB under the influence of rain (Photo 1 to 4 and Figure 1) 3. As advised by the Contractor of C3, muddy water flowed from other upstream location which was not under monitored by the Contract was observed on 21 March 2016. (Photo 5 &6) It is considered that the exceedances were due to the stir up of sediment during rain and external muddy water from upstream and not related to the works under the Contract. 4. According to the Event and Action, the monitoring frequency at exceed station shall be increased to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. In view of the subsequent monitoring result, no exceedances were triggered at WM4 on 22 and 23 March 2016. However, the Contractor should continue to implement the environmental mitigation measures recommended in implementation schedule in the EM&A Manual.	

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 1 April 2016

Photo Record

Photo 1
Turbid water was observed at WM4 on 21 March 2016.

Photo 2
Turbid water was observed at WM4-CA on 21 March 2016.

Photo 3
Turbid water was observed at WM4-CB on 21 March 2016.

Photo 4
The water samples collected at WM4, WM4-CA and WM4-C were turbid.

Photo 5
Turbid water flowed from upstream was observed on 21 March 2016.

Photo 6
Turbid water flowed from upstream affecting the water quality throughout the river course as observed on 21 March 2016.

Contract No. CV/2012/09
Liantang / Heung Yuen Wai Boundary Control Point
Site Formation and Infrastructure Works - Contract 3

俊和建築工程有限公司
CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.

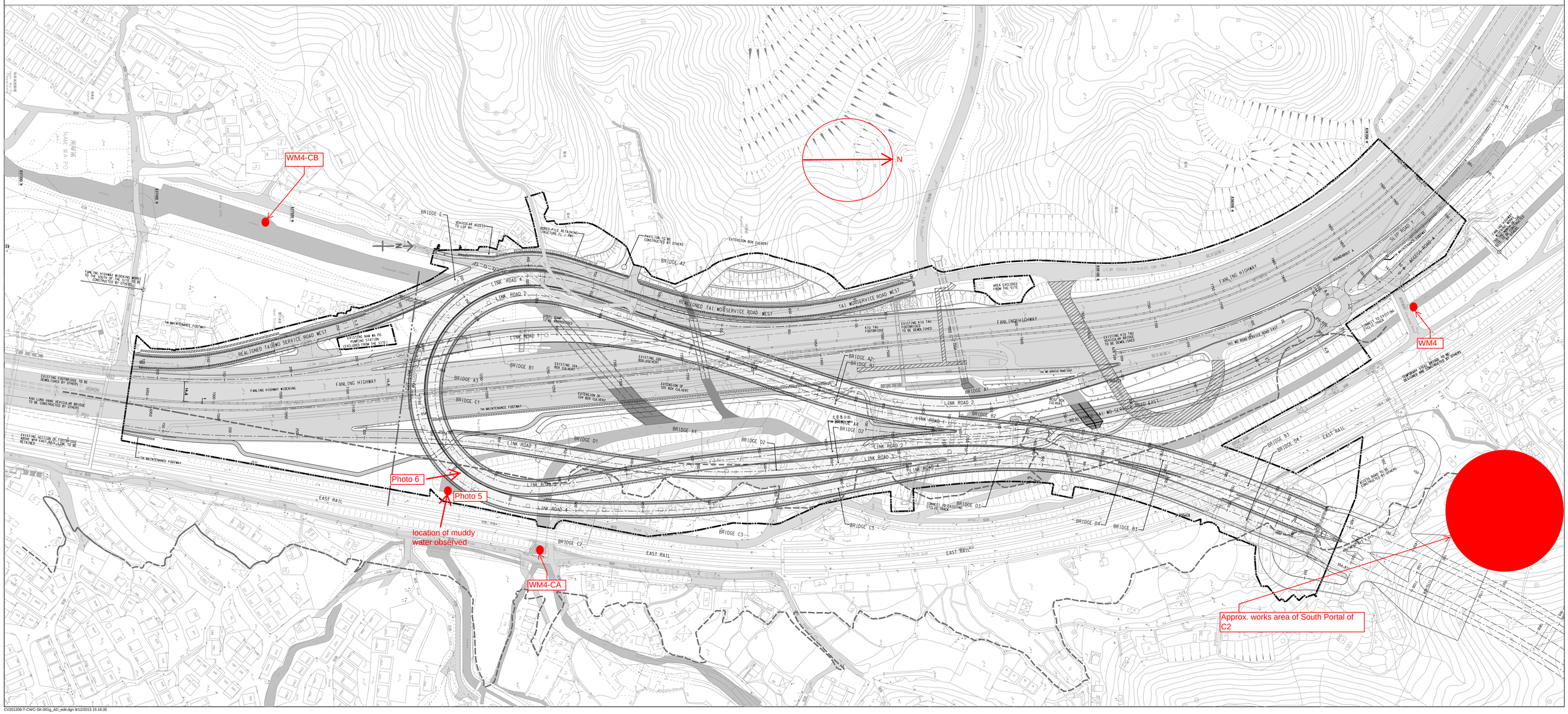

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Figure 1. Location of Water Quality Monitoring Location

AUES

Fax Cover Sheet

To	**Mr. Vincent Chan**	**Fax No**	**By e-mail**
Company	**CRBC-CEC-Kaden JV**		
cc			
From	**Nicola Hon**	**Date**	**7 April 2016**
Our Ref	TCS00694/13/300/**F0221**	**No of Pages**	6 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008** **Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works** **Investigation Report of Exceedance of Water Quality at Location WM2B on 23 and 24 March 2016**		

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Dear Sir,

Further to the Notification of Exceedance (NOE) ref. of following:

TCS00694/13/300/F0199 dated 24 March 2016
TCS00694/13/300/F0219 dated 6 April 2016

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant
Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Simon Leung (ER of C6/ AECOM)	Fax:	2251 0698
	Mr. Antony Wong (IEC, SMEC)		By email

安順聯合環境服務及顧問
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Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008

Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008			
Date		23 March 2016	24 March 2016	23 March 2016	24 March 2016
Location		WM2B			
Time		13:05	11:24	13:05	11:24
Parameter		Turbidity (NTU)		Suspended Solids (mg/L)	
Action Level		11.4 AND 120% of upstream control station of the same day		11.8 AND 120% of upstream control station of the same day	
Limit Level		12.3 AND 130% of upstream control station of the same day		12.4 AND 130% of upstream control station of the same day	
Measured Levels	**WM2B-C**	49.8	20.8	35.5	9.0
	WM2B	**452.0**	**301.5**	**124.0**	**160.0**
Exceedance		**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the CCKJV, construction activities carried out on 23 and 24 March 2016 at North Portal (upstream of WM2B) was pile cap installation work only. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team on 23 and 24 March 2016, very shallow water was measured at WM2B and the water depth was around 0.02m. (Photo 1&3) The water sampling was conducted during rain and it was observed that the water flowing in the open channel was slightly turbid due to stir up of sediment and cumulated silt at the river bed during rain. (Photo 2 & 4) 3. As advised by the Contractor, self-monitoring for the treated water in the wastewater treatment facilities was conducted and effluent was visually clear. As water mitigation measures, sump pit was constructed near the pile cap area to collect the possible runoff and wastewater generated from the works before divert to the AquaSed for proper treatment. Moreover, hydro-seeding and shotcreting were applied on the stabilized slopes which adjacent to existing open channel to minimise muddy runoff during rain. (Photo 6 & 7) 4. Apart from the disturbance of cumulated silt at the river bed during rain, it was observed trails of muddy runoff from the public road surface into the existing channel due to rain. (Photo 1 & 3 & Figure 1) It is considered that the exceedances were likely related to cumulated silt at the river bed and muddy runoff from the public road surface. 5. According to the Event and Action, the monitoring frequency at WM2B has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 29 and 30 March 2016 and no exceedances were triggered. Nevertheless, CCKJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.			

Prepared By :	Nicola Hon
Designation :	Environmental Consultant
Signature :	
Date :	7 April 2016

Photo Record

Photo 1
During water sampling on 23 March 2016, shallow water was observed at WM2B and the water quality at WM2B was turbid.

Photo 2
The water samples collected at WM2B on 23 March 2016 was turbid.

Photo 3
During water sampling on 24 March 2016, shallow water was observed at WM2B and the water quality at WM2B was slightly turbid.

Photo 4
The water samples collected at WM2B on 24 March 2016 was slightly turbid.

Photo 5
Sump pit was constructed near the pile cap area to collect the possible runoff and wastewater generated from the works before divert to the AquaSed for proper treatment.

Photo 6
Hydro-seeding and shotcreting were applied on the stabilized slopes which adjacent to existing open channel to minimise muddy runoff during rain.

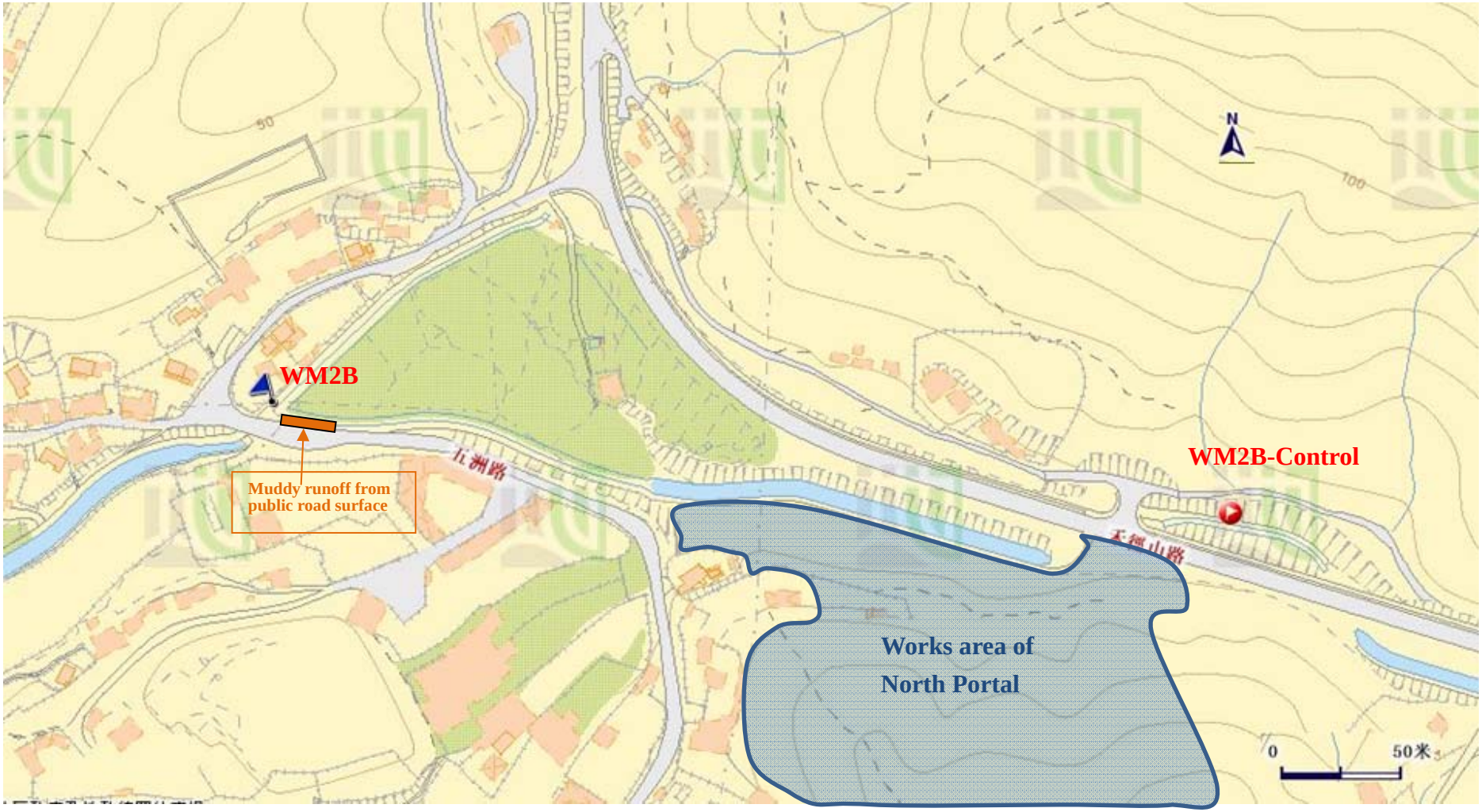

Figure 1 Location Map for Water Quality Monitoring Locations WM2B and WM2B-Control

AUES

Fax Cover Sheet

To	**Mr. Vincent Chan**	**Fax No**	**By e-mail**
Company	**CRBC-CEC-Kaden JV**		
cc			
From	**Nicola Hon**	**Date**	**13 April 2016**
Our Ref	TCS00694/13/300/**F0229a**	**No of Pages**	6 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008** **Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works** **Investigation Report of Exceedance of Water Quality at Location WM3 on 29, 30 and 31 March 2016**		

Dear Sir,

Further to the Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F0201 dated 29 March 2016
TCS00694/13/300/F0208 dated 31 March 2016.
TCS00694/13/300/F0224 dated 7 April 2016.

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Simon Leung (ER of C6/ AECOM)	Fax:	2251 0698
	Mr. Antony Wong (IEC, SMEC)		By email

安順聯合環境服務及顧問
Action-United Environmental Services & Consulting
Flat A, 20/F, Gold King Industrial Building,
35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008

Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008					
Date		29 Mar 16	30 Mar 16	31 Mar 16	29 Mar 16	30 Mar 16	31 Mar 16
Location		WM3					
Time		12:41	12:35	10:43	12:41	12:35	10:43
Parameter		Turbidity (NTU)			Suspended Solids (mg/L)		
Action Level		13.4 AND 120% of upstream control station of the same day			12.6 AND 120% of upstream control station of the same day		
Limit Level		14.0 AND 130% of upstream control station of the same day			12.9 AND 130% of upstream control station of the same day		
Measured Level	**WM3-C**	4.9	5.2	2.6	7.0	6.5	14.0
	WM3	**72.1**	**121.5**	**35.3**	**109.0**	**54.5**	**16.0**
Exceedance		**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the Contractor of C6 (CCKJV), the main construction activities carried out on 29 to 31 March 2016 at upstream of WM3 was bored pile works. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 29 to 31 March 2016, the water quality at WM3 was slightly turbid. (Photo 1 to 3) 3. As water mitigation measures, CCKJV has been set up a temporary drainage channel to divert wastewater from bored pile work and wheel washing bay to the wastewater treatment facilities and they area under normal operation. The effluent from wastewater treatment facilities was mainly recirculated in the wheel washing basin and bored pile work and the excess water would be discharged to the nullah which connected to Ng Tung River. CCKJV would check the performance of discharge water every day to ensure it complied with the relevant standard. No adverse water impact was recorded during site inspection in late March 2016. 4. Upon the exceedance recorded on 29 March 2016, the ET has been liaison with CCKJV to investigate the possible source of turbid water. CCKJV and ET has inspected the treated effluent discharged into nullah which connected to Ng Tung River on 29, 30 March 2016, it was observed that the effluent quality was visually clear. Though some silt cumulated at nullah bed was observed on 31 March 2016, the water flowing in the nullah was visually clear. (Photo 4 to 6) 5. As advised by CCKJV, discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3. (Photo 7 to 9) There were no exceedances triggered in the additional monitoring result on 1 April 2016 when turbid discharge from the unknown outfall was not observed. It is considered that the turbid water detected at WM3 was related to the turbid discharge from the unknown outfall and unlikely due to the works under Contract 6.					
Action to be taken		The Contractor is reminded to fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.					

Prepared By :	Nicola Hon
Designation :	Environmental Consultant
Signature :	
Date :	12 April 2016

Photo Record

Photo 1
Muddy water was observed at WM3 on 29 March 2016

Photo 2
Muddy water was observed at WM3 on 29 March 2016

Photo 3
Muddy water was observed at WM3 on 31 March 2016

Photo 4
The effluent in the nullah which connected to Ng Tung River was visually clear on 29 March 2016.

Photo 5
The effluent in the temporary channel which connected to the discharge nullah and Ng Tung River was visually clear on 30 March 2016.

Photo 6
Though some silt cumulated at nullah bed was observed on 31 March 2016, the water flowing in the nullah was visually clear.

Photo 7
Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 29 March 2016.

Photo 8
Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 30 March 2016.

Photo 9
Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 31 March 2016.

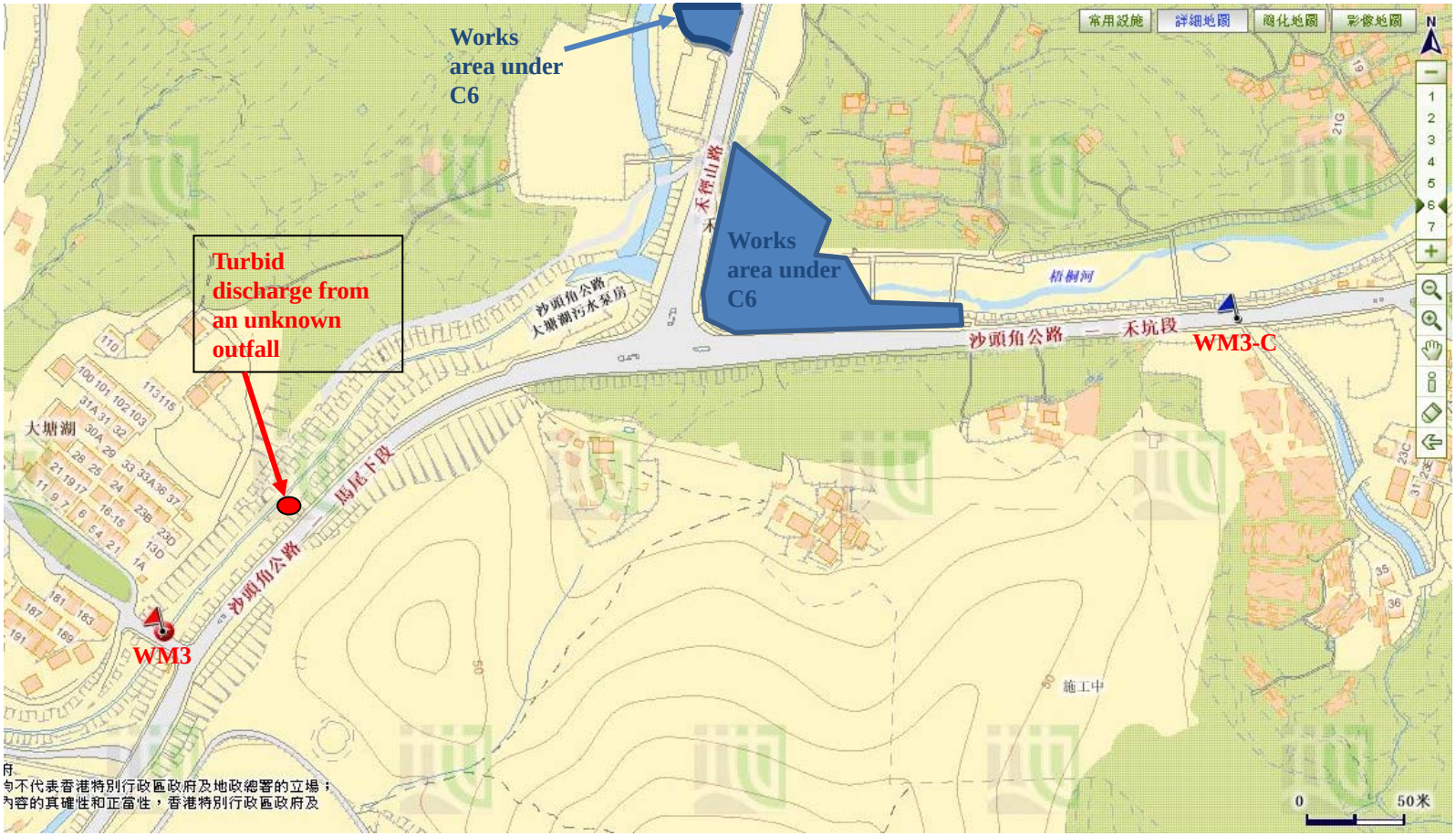

Figure 1 Location Map for Works Area under Contract 6 and Water Quality Monitoring Location

AUES

Fax Cover Sheet

To	**Mr. Roger Lee**	**Fax No**	**2717 3299**
Company	**Dragages Hong Kong Limited**		
cc			
From	**Nicola Hon**	**Date**	**12 April 2016**
Our Ref	TCS00697/13/300/**F0230**	**No of Pages**	5 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008** **Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works** **Investigation Report of Exceedance of Water Quality at Location WM3 on 29, 30 and 31 March 2016 (Contract 2)**		

Dear Mr. Lee,

Further to the Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F0200 dated 29 March 2016
TCS00694/13/300/F0209 dated 31 March 2016.
TCS00694/13/300/F0225 dated 7 April 2016.

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Gregory Lo (ER, AECOM)	Fax:	2171 3498
	Mr. Antony Wong (IEC, SMEC)		By e-mail

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Flat A, 20/F, Gold King Industrial Building,
35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008					
Date		29 Mar 16	30 Mar 16	31 Mar 16	29 Mar 16	30 Mar 16	31 Mar 16
Location		**WM3**					
Time		12:41	12:35	10:43	12:41	12:35	10:43
Parameter		Turbidity (NTU)			Suspended Solids (mg/L)		
Action Level		13.4 AND 120% of upstream control station of the same day			12.6 AND 120% of upstream control station of the same day		
Limit Level		14.0 AND 130% of upstream control station of the same day			12.9 AND 130% of upstream control station of the same day		
Measured Level	**WM3-C**	4.9	5.2	2.6	7.0	6.5	14.0
	WM3	**72.1**	**121.5**	**35.3**	**109.0**	**54.5**	**16.0**
Exceedance		**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the Contractor of C2 (DHK), construction activities carried out on 29 to 31 March 2016 at admin building was building foundation works (rebar fixing and concreting) and no discharge was made. The works area under C2 and the water monitoring location WM3C and WM3 are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 29 to 31 March 2016, the water quality at WM3 was slightly turbid. (Photo 1 to 3) 3. During weekly site inspection on 1 April 2016, it was observed that building foundation works was carried out at Admin Building and the site area was mostly hard paved. (Photo 4) Temporary drainage system and water treatment system was properly implemented. Inspection was carried out at the discharge nullah outside the site boundary and no adverse water impact was observed (Photo 5) 4. As advised by the Contractor of C6, discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C2/ C6 and WM3. (Photo 6 to 8) There were no exceedances triggered in the additional monitoring result on 1 April 2016 when turbid discharge from the unknown outfall was not observed. It is considered that the turbid water detected at WM3 was related to the turbid discharge from the unknown outfall and unlikely due to the works under Contract 2.					
Action to be taken		The Contractor is reminded to fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.					

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 12 April 2016

Photo Record

Photo 1
Muddy water was observed at WM3 on 29 March 2016

Photo 2
Muddy water was observed at WM3 on 29 March 2016

Photo 3
Muddy water was observed at WM3 on 31 March 2016

Photo 4
During weekly site inspection on 1 April 2016, it was observed that building foundation works was carried out at Admin Building and the site area was mostly hard paved.

Photo 5
Inspection was carried out at the discharge nullah outside the site boundary and no adverse water impact was observed

Photo 6
Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 29 March 2016.

	
Photo 7 Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 30 March 2016.	**Photo 8** Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 31 March 2016.

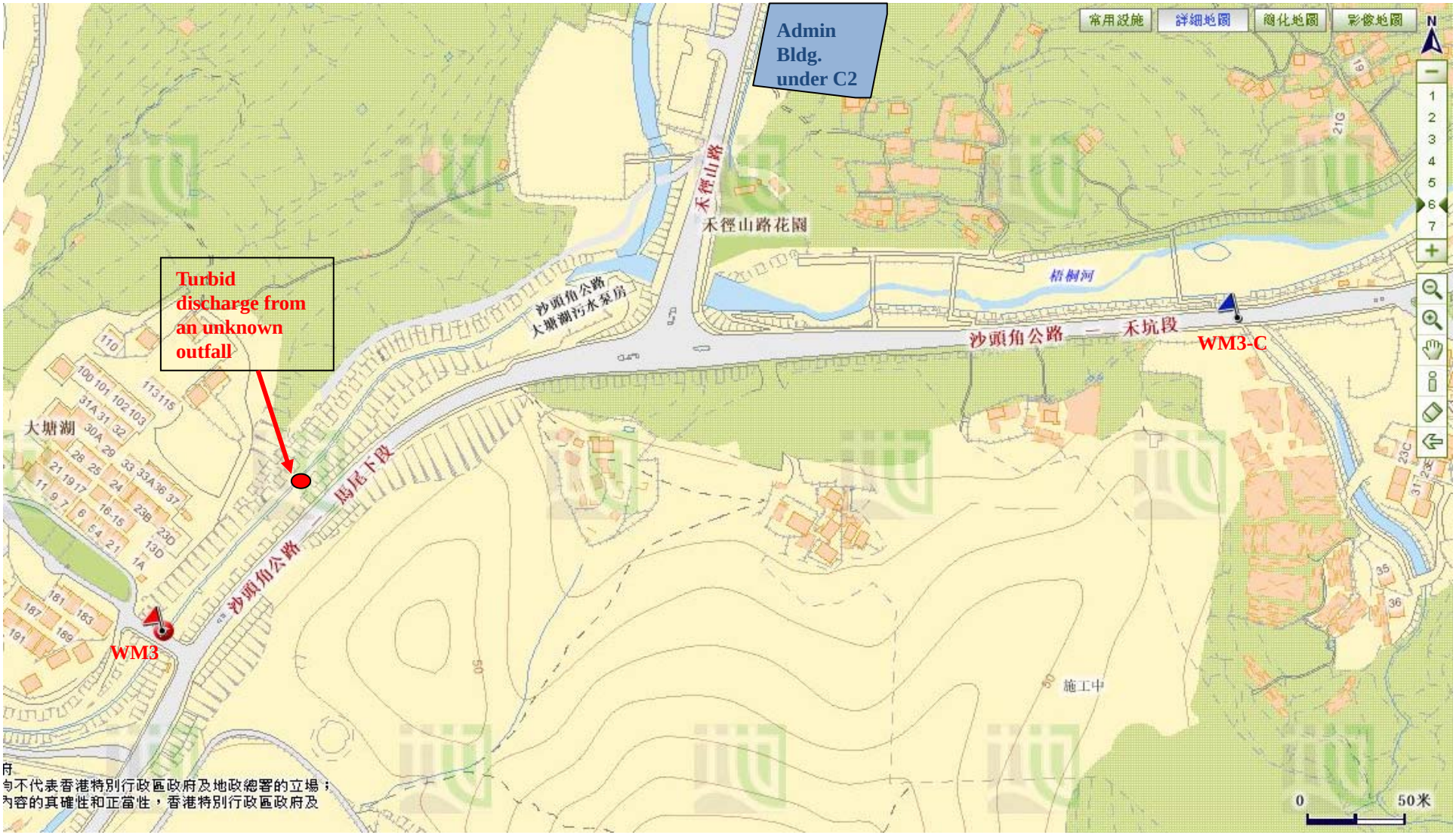

Figure 1 Location Map for Works Area under Contract 2 and Water Quality Monitoring Location

AUES

Fax Cover Sheet

To	**Mr. Vincent Chan**	**Fax No**	**By e-mail**
Company	**CRBC-CEC-Kaden JV**		
cc			
From	**Nicola Hon**	**Date**	**15 April 2016**
Our Ref	TCS00694/13/300/**F0252**	**No of Pages**	5 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008 Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works Investigation Report of Exceedance of Water Quality at Location WM3 on 2 April 2016**		

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Dear Sir,

Further to the Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F0215 dated 5 April 2016
TCS00694/13/300/F0246 dated 13 April 2016.

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Simon Leung (ER of C6/ AECOM)	Fax:	2251 0698
	Mr. Antony Wong (IEC, SMEC)		By email

安順聯合環境服務及顧問
Action-United Environmental Services & Consulting
Flat A, 20/F, Gold King Industrial Building,
35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008

Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		2 April 2016	
Location		WM3	
Time		9:31	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		13.4 AND 120% of upstream control station of the same day	12.6 AND 120% of upstream control station of the same day
Limit Level		14.0 AND 130% of upstream control station of the same day	12.9 AND 130% of upstream control station of the same day
Measured Level	**WM3-C**	4.9	6.5
	WM3	**44.6**	**87.5**
Exceedance		**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the Contractor of C6 (CCKJV), the main construction activities carried out on 2 April 2016 at upstream of WM3 was bored pile works. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 2 April 2016, the water quality at WM3 was slightly turbid. (Photo 1 to 2) 3. As water mitigation measures, CCKJV has been set up a temporary drainage channel to divert wastewater from bored pile work and wheel washing bay to the wastewater treatment facilities and they area under normal operation. The effluent from wastewater treatment facilities was mainly recirculated in the wheel washing basin and bored pile work and the excess water would be discharged to the nullah which connected to Ng Tung River. CCKJV would check the performance of discharge water every day to ensure it complied with the relevant standard. No adverse water impact was recorded during site inspection in late March 2016. 4. Upon the exceedance recorded on 2 April 2016, CCKJV and ET has inspected the treated effluent discharged into nullah which connected to Ng Tung River on 2 April 22016, though some silt cumulated at nullah bed was observed, the water flowing in the nullah was visually clear. (Photo 3) besides, as advised by CCKJV, discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3. (Photo 4) 5. During site inspection on 7 April 2016, it was observed that the discharge water in the nullah was visually clear. (Photo 5) Moreover, accumulated silt at the unknown outfall which located at between the works area of C6 and WM3 was observed. (Photo 6) 6. There were no exceedances triggered in the additional monitoring result on 3 and 4 April 2016 when turbid discharge from the unknown outfall was not observed. It is considered that the turbid water detected at WM3 was related to the turbid discharge from the unknown outfall and unlikely due to the works under Contract 6.	
Action to be taken		The Contractor is reminded to fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.	

Prepared By :	Nicola Hon
Designation :	Environmental Consultant
Signature :	
Date :	15 April 2016

Photo Record

Photo 1
Turbid water was observed at WM3 on 2 April 2016.

Photo 2
Water sample collected at WM3 on 2 April 2016 was slightly turbid.

Photo 3
The effluent in the nullah which connected to Ng Tung River was visually clear on 2 April 2016.

Photo 4
Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 2 April 2016.

Photo 5
The effluent in the nullah which connected to Ng Tung River was visually clear during site inspection on 7 April 2016.

Photo 6
Accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 7 April 2016.

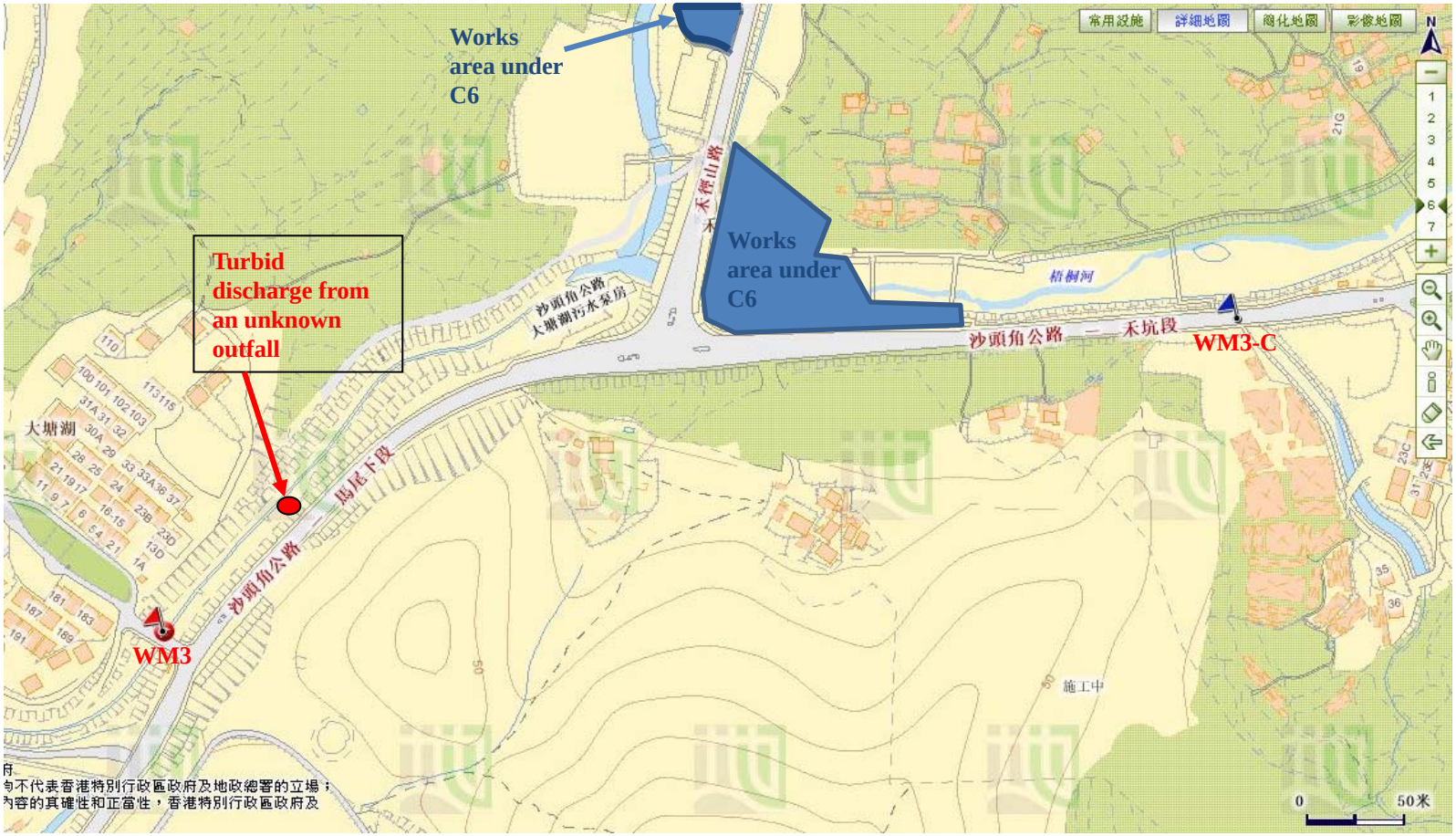

Figure 1 Location Map for Works Area under Contract 6 and Water Quality Monitoring Location

AUES

Fax Cover Sheet

To	**Mr. Roger Lee**	**Fax No**	**2717 3299**
Company	**Dragages Hong Kong Limited**		
cc			
From	**Nicola Hon**	**Date**	**15 April 2016**
Our Ref	TCS00697/13/300/**F0253**	**No of Pages**	4 **(Incl. cover sheet)**

RE **Agreement No. CE 45/2008**
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report of Exceedance of Water Quality at Location WM3 on 2 April 2016 (Contract 2)

If you do not receive all pages, or transmission is illegible, please contact the originator on (852) 2959-6059 to re-send. Should this facsimile be sent to the wrong fax number, would receiver please destroy this copy and notify Action-United Environmental Services & Consulting immediately. Thank you.

Dear Mr. Lee,

Further to the Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F0216 dated 5 April 2016
TCS00694/13/300/F0247 dated 13 April 2016.

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Gregory Lo (ER, AECOM)	Fax:	2171 3498
	Mr. Antony Wong (IEC, SMEC)		By e-mail

安順聯合環境服務及顧問
Action-United Environmental Services & Consulting
Flat A, 20/F, Gold King Industrial Building,
35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		2 April 2016	
Location		WM3	
Time		9:31	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		13.4 AND 120% of upstream control station of the same day	12.6 AND 120% of upstream control station of the same day
Limit Level		14.0 AND 130% of upstream control station of the same day	12.9 AND 130% of upstream control station of the same day
Measured Level	**WM3-C**	4.9	6.5
	WM3	**44.6**	**87.5**
Exceedance		**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the Contractor of C2 (DHK), the construction activities carried out on 2 April 2016 at admin building was building foundation works (rebar fixing and concreting) and no discharge was made. The works area under C2 and the water monitoring location WM3C and WM3 are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 2 April 2016, the water quality at WM3 was slightly turbid. (Photo 1 to 2) 3. During weekly site inspection on 1 April 2016, it was observed that building foundation works was carried out at Admin Building and the site area was mostly hard paved. (Photo 3) Temporary drainage system and water treatment system was properly implemented. Inspection was carried out at the discharge nullah outside the site boundary and no adverse water impact was observed (Photo 4) 4. As advised by the Contractor of C6, discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C2/ C6 and WM3. (Photo 5) There were no exceedances triggered in the additional monitoring result on 3 and 4 April 2016 when turbid discharge from the unknown outfall was not observed. It is considered that the turbid water detected at WM3 was related to the turbid discharge from the unknown outfall and unlikely due to the works under Contract 2.	
Action to be taken		The Contractor is reminded to fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.	

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 15 April 2016

Photo Record

Photo 1
Turbid water was observed at WM3 on 2 April 2016.

Photo 2
Water sample collected at WM3 on 2 April 2016 was slightly turbid.

Photo 3
During weekly site inspection on 1 April 2016, it was observed that building foundation works was carried out at Admin Building and the site area was mostly hard paved.

Photo 4
Inspection was carried out at the discharge nullah outside the site boundary and no adverse water impact was observed

Photo 5
Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 2 April 2016.

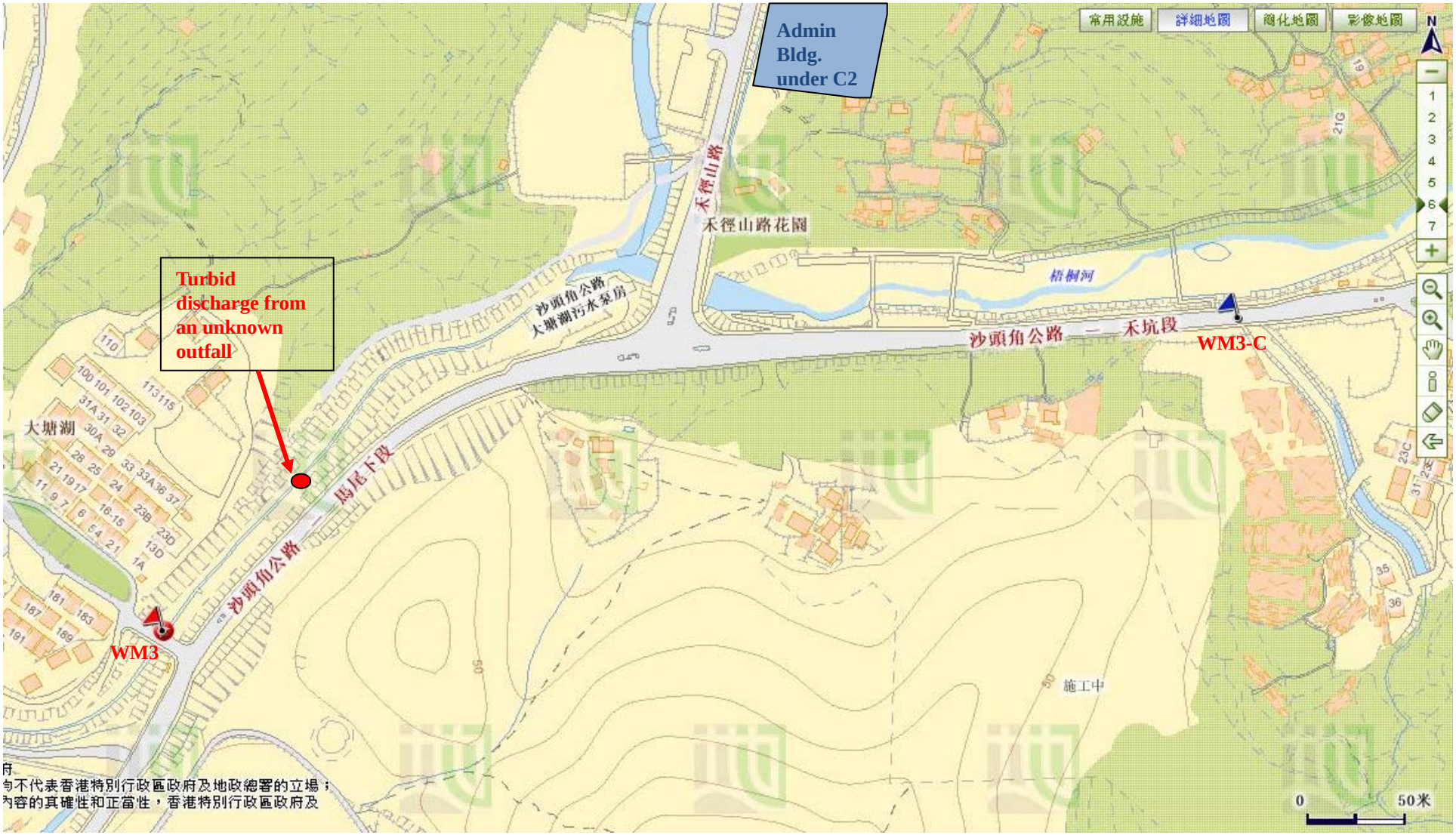

Figure 1 Location Map for Works Area under Contract 2 and Water Quality Monitoring Location

AUES

Fax Cover Sheet

To	Mr. Edwin Au	**Fax No**	**2403 1162**
Company	**Sang Hing Civil – Richwell Machinery JV**		
cc			
From	**Nicola Hon**	**Date**	**18 April 2016**
Our Ref	TCS00694/13/300/**F0255**	**No of Pages**	7 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008 Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works Investigation Report of Exceedance of Water Quality at Location WM1 on 5, 6, 7 and 8 April 2016 (Contract 5)**		

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Dear Sir,

Further to the following Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F0244 dated 13 April 2016
TCS00694/13/300/F0218 dated 6 April 2016
TCS00694/13/300/F0237 dated 12 April 2016

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Kelvin Lee (ER, AECOM)	Fax:	2674 7732
	Mr. Antony Wong (IEC, SMEC)		By email

安順聯合環境服務及顧問
Action-United Environmental Services & Consulting
Flat A, 20/F, Gold King Industrial Building,
35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008

Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008							
Date		5 Apr 2016	6 Apr 2016	7 Apr 2016	8 Apr 2016	5 Apr 2016	6 Apr 2016	7 Apr 2016	8 Apr 2016
Location		WM1							
Time		10:24	9:51	9:53	10:38	10:24	9:51	9:53	10:38
Parameter		Turbidity (NTU)				Suspended Solids (mg/L)			
Action Level		51.3 AND 120% of upstream control station of the same day				54.5 AND 120% of upstream control station of the same day			
Limit Level		67.6 AND 130% of upstream control station of the same day				64.9 AND 130% of upstream control station of the same day			
Measured Levels	**WM1-C**	19.3	9.3	7.7	9.6	39.5	16.0	5.5	10.0
	WM1	**124.5**	**108.0**	**94.1**	**101.8**	**220.0**	**269.0**	**150.5**	**298.0**
Exceedance		**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the SRJV, construction activities carried out from 5 to 8 April 2016 were construction of u-channel and bituminous laying at Lin Ma Hang Road. (Figure 1) No wastewater was generated from the abovementioned work and no construction activities were conducted at Boundary Control Point (BCP) which near Kong Yiu Kong. 2. According to the site records from the monitoring team during monitoring from 6 to 8 April 2016, turbid water was observed at WM1 whereas the water quality at WM1-C was clear. (Photo 4 to 15) On 5 April 2016, turbid water was observed at WM1 whereas slightly turbid water was observed on WM1-C. (Photo 1 to 3) 3. According to the field photos (Photo 1, 4, 7, 10, 13), accumulation of rubbish were observed at the bar screen of box culvert near WM1 after heavy rainstorm on 4 April 2016. Water flow near WM1 was therefore retarded and turbid water would be cumulated at WM1. 4. During site inspection by the RE, IEC, SRJV and ET on 5 and 12 April 2016, no adverse water quality impact was observed. (Photo 16 & 17) Moreover, there were no wastewater generation activities carried out and no discharge made into the river course. In our investigation, it is considered that the exceedances were unlikely due to the Contract. 5. According to the Event and Action, the monitoring frequency at WM1 has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 6, 8 April 2016 in which turbidity and SS exceedances were triggered on both days. SRJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental							

	mitigation measures in the EM&A Manual.

Prepared By :	Nicola Hon
Designation :	Environmental Consultant
Signature :	
Date :	18 April 2016

Photo Record

Photo 1
During water sampling on 5 April 2016, turbid water was observed at WM1.

Photo 2
During water sampling on 5 April 2016, the water quality at WM1-C was slightly turbid.

Photo 3
The water samples collected at both WM1 and WM1-C on 5 April 2016 were slightly turbid.

Photo 4
During water sampling on 6 April 2016, turbid water was observed at WM1.

Photo 5
During water sampling on 6 April 2016, the water quality at WM1-C was clear.

Photo 6
The water samples collected at WM1 on 6 April 2016 were slightly turbid.

Photo 7

During water sampling on 7 April 2016, turbid water was observed at WM1.

Photo 8

During water sampling on 7 April 2016, the water quality at WM1-C was clear.

Photo 9

The water samples collected at WM1 on 7 April 2016 were slightly turbid.

Photo 10

During water sampling on 8 April 2016, turbid water was observed at WM1.

Photo 11

During water sampling on 8 April 2016, the water quality at WM1-C was clear.

Photo 12

The water samples collected at WM1 on 8 April 2016 were slightly turbid.

 **Photo 13** During water sampling on 9 April 2016, turbid water was observed at WM1.	 **Photo 14** During water sampling on 9 April 2016, the water quality at WM1-C was clear.
 **Photo 15** The water samples collected at WM1 on 9 April 2016 were slightly turbid.	**NA**
 **Photo 16** During site inspection on 5 April 2016, construction of u-channel and bituminous laying were observed. No adverse water quality impact was noted.	 **Photo 17** During site inspection on 12 April 2016, construction of u-channel and bituminous laying were observed. No adverse water quality impact was noted.

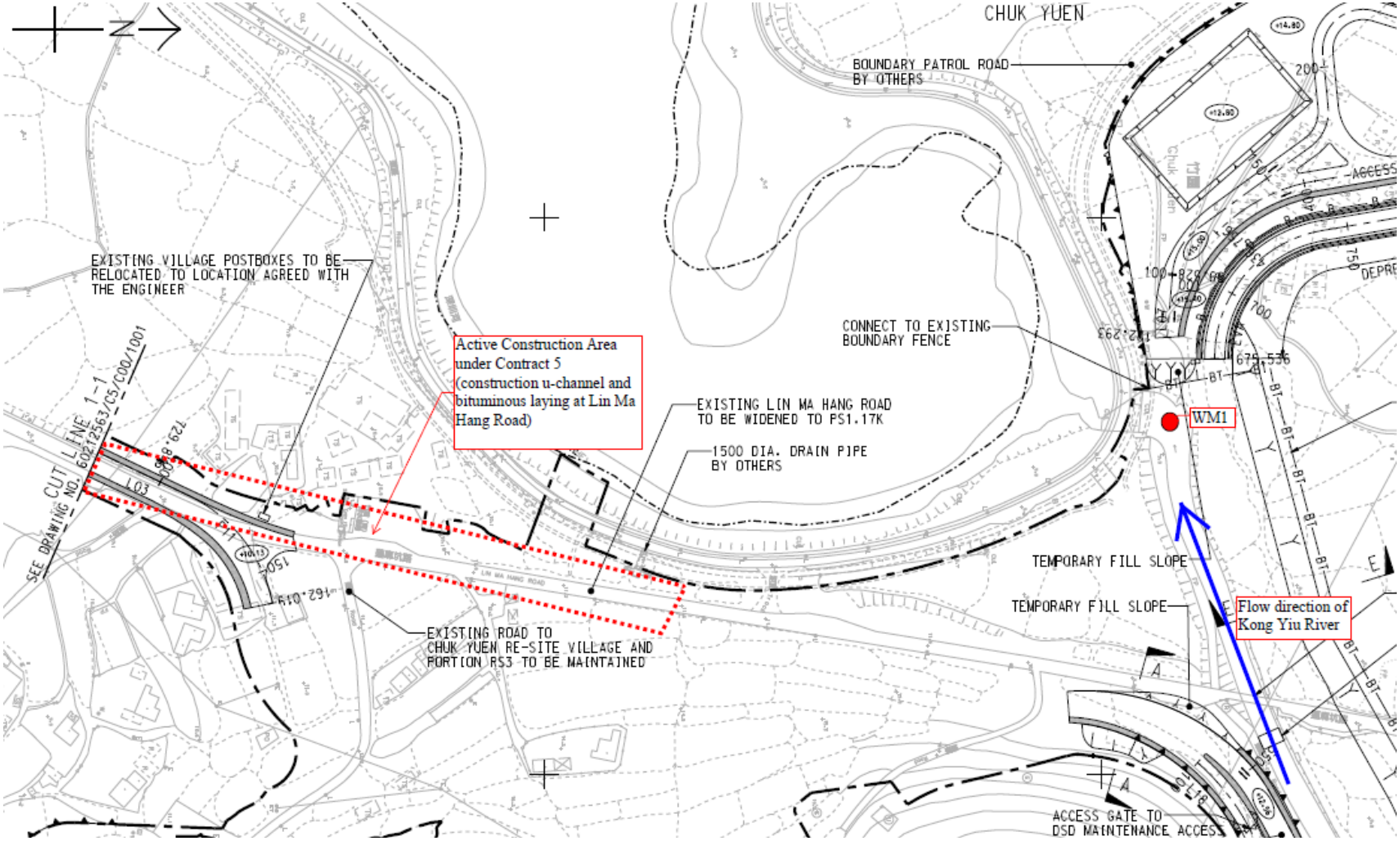

Figure 1 Location Map

AUES

Fax Cover Sheet

To	**Mr. Vincent Chan**	**Fax No**	**By e-mail**
Company	**CRBC-CEC-Kaden JV**		
cc			
From	**Nicola Hon**	**Date**	**19 April 2016**
Our Ref	TCS00694/13/300/**F0256**	**No of Pages**	7 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008 Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works Investigation Report of Exceedance of Water Quality at Location WM1 on 5, 6, 7 and 8 April 2016 (Contract 6)**		

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Dear Sir,

Further to the following Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F0236 dated 12 April 2016
TCS00694/13/300/F0217 dated 6 April 2016
TCS00694/13/300/F0243 dated 13 April 2016

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Simon Leung (ER of C6/ AECOM)	Fax:	2251 0698
	Mr. Antony Wong (IEC, SMEC)		By email

安順聯合環境服務及顧問
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Flat A, 20/F, Gold King Industrial Building,
35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008							
Date		5 Apr 2016	6 Apr 2016	7 Apr 2016	8 Apr 2016	5 Apr 2016	6 Apr 2016	7 Apr 2016	8 Apr 2016
Location		WM1							
Time		10:24	9:51	9:53	10:38	10:24	9:51	9:53	10:38
Parameter		Turbidity (NTU)				Suspended Solids (mg/L)			
Action Level		51.3 AND 120% of upstream control station of the same day				54.5 AND 120% of upstream control station of the same day			
Limit Level		67.6 AND 130% of upstream control station of the same day				64.9 AND 130% of upstream control station of the same day			
Measured Levels	**WM1-C**	19.3	9.3	7.7	9.6	39.5	16.0	5.5	10.0
	WM1	**124.5**	**108.0**	**94.1**	**101.8**	**220.0**	**269.0**	**150.5**	**298.0**
Exceedance		**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the CCKJV, construction activities carried out from 5 to 8 April 2016 at Boundary Control Point (BCP) which upstream of WM1 was bored piling. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring from 6 to 8 April 2016, turbid water was observed at WM1 whereas the water quality at WM1-C was clear. On 5 April 2016, turbid water was observed at WM1 whereas slightly turbid water was observed on WM1-C. 3. According to the field photos (Photo 1, 5, 9 & 13), accumulation of rubbish were observed at the bar screen of the box culvert near WM1 after heavy rainstorm on 4 April 2016. Water flow near WM1 was therefore retarded and turbid water cumulated at WM1. Moreover, turbid water was observed at upstream of site area of Contract 6 on 6 to 8 April 2016 as well. (Photo 4, 7, 12 & 16) 4. During site inspection by the RE, IEC, Contractor and ET on 7 April 2016, it was observed that the wastewater generated from the bored pile works was recirculated to the AquaSed for treatment and discharge would be made when the effluent is overflow from the AquaSed. (Photo 17) Since discharge license was not yet granted for the Contract, self-monitoring for the effluent quality would be conducted by the Contractor if discharge is required to ensure the discharge effluent complied with the relevant requirements. Moreover, turbid water was observed at upstream of site area of Contract 6. (Photo 18) In our investigation, it is considered that the exceedances were unlikely due to the Contract. 5. According to the Event and Action, the monitoring frequency at WM1 has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 9 and 11 April 2016 in which turbidity and SS exceedances were triggered 11 April 2016 as well. CCKJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.							

Prepared By :	Nicola Hon
Designation :	Environmental Consultant
Signature :	
Date :	19 April 2016

Photo Record

Photo 1
During water sampling on 5 April 2016, accumulation of rubbish were observed at the bar screen of the box culvert near WM1 and cumulated turbid water was observed at WM1.

Photo 2
During water sampling on 5 April 2016, the water quality at WM1-C was slightly turbid.

Photo 3
The water samples collected at both WM1 and WM1-C on 5 April 2016 were slightly turbid.

Photo 4
On 5 April 2016, turbid water was observed at upstream of the works area of Contract 6. (works area of Contract 6 is after the Bridge)

Photo 5
During water sampling on 6 April 2016, accumulation of rubbish were observed at the bar screen of the box culvert near WM1 and cumulated turbid water was observed at WM1.

Photo 6
During water sampling on 6 April 2016, the water quality at WM1-C was clear.

Photo 7
The water samples collected at WM1 on 6 April 2016 were slightly turbid.

Photo 8
On 6 April 2016, turbid water was observed at upstream of the works area of Contract 6. (works area of Contract 6 is after the Bridge)

Photo 9
During water sampling on 7 April 2016, accumulation of rubbish were observed at the bar screen of the box culvert near WM1 and cumulated turbid water was observed at WM1.

Photo 10
During water sampling on 7 April 2016, the water quality at WM1-C was clear.

Photo 11
The water samples collected at both WM1 on 7 April 2016 were slightly turbid.

Photo 12
On 7 April 2016, turbid water was observed at upstream of the works area of Contract 6. (works area of Contract 6 is after the Bridge)

Photo 13
During water sampling on 8 April 2016, accumulation of rubbish were observed at the bar screen of the box culvert near WM1 and cumulated turbid water was observed at WM1.

Photo 14
During water sampling on 8 April 2016, the water quality at WM1-C was clear.

Photo 15
The water samples collected at WM1 on 8 April 2016 were slightly turbid.

Photo 16
On 8 April 2016, turbid water was observed at upstream of the works area of Contract 6. (works area of Contract 6 is after the Bridge)

Photo 17
During site inspection by the RE, IEC, Contractor and ET on 7 April 2016, it was observed that the wastewater treatment facility was properly in place and function.

Photo 18
During site inspection by the RE, IEC, Contractor and ET on 7 April 2016, turbid water was observed at upstream of the works area of Contract 6. (works area of Contract 6 is after the Bridge)

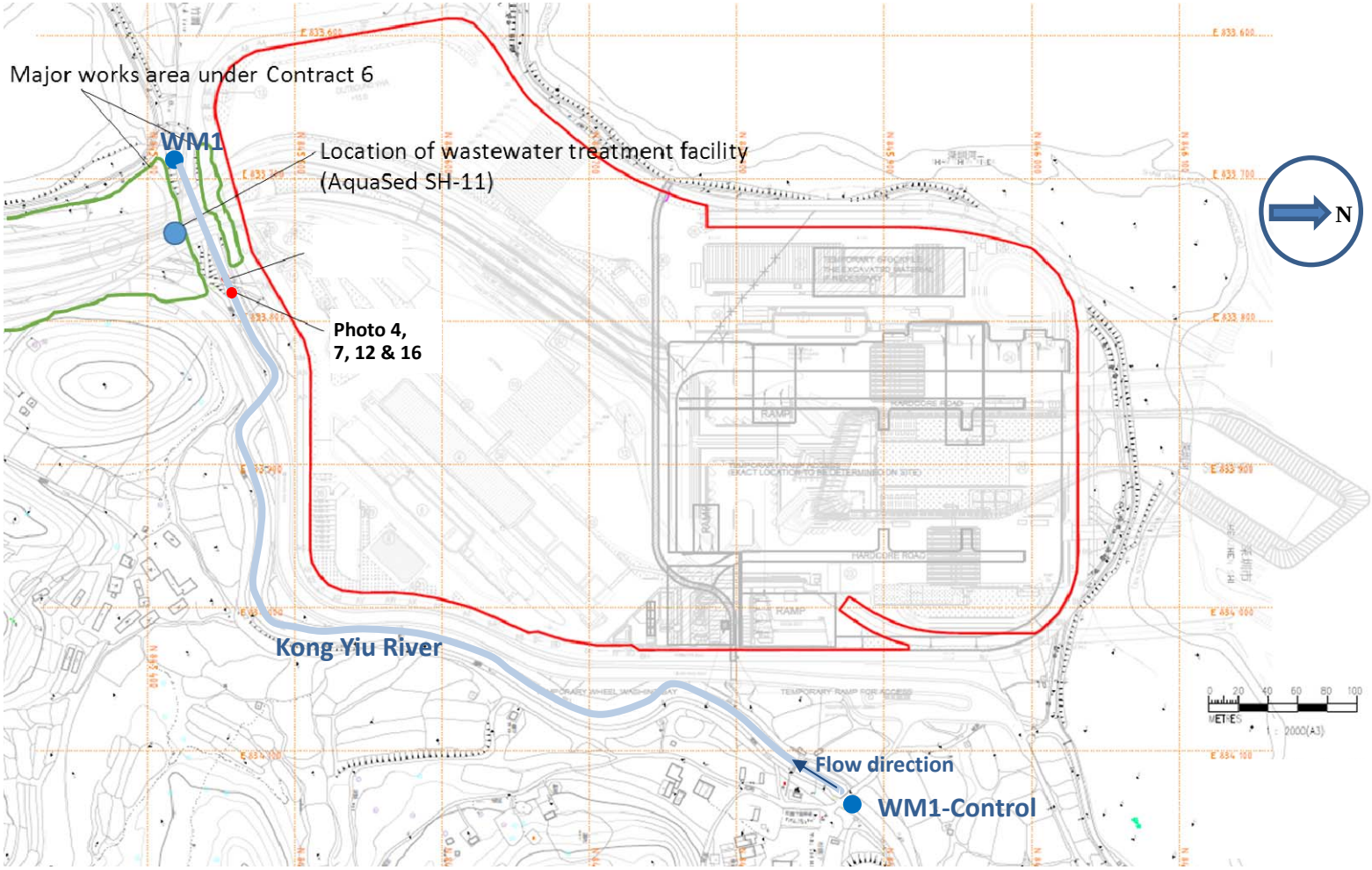

Figure 1 Location Map for Water Quality Monitoring Locations WM1 and WM1-C

AUES

Fax Cover Sheet

To	**Mr. Vincent Chan**	**Fax No**	**By e-mail**
Company	**CRBC-CEC-Kaden JV**		
cc			
From	**Nicola Hon**	**Date**	**20 April 2016**
Our Ref	TCS00694/13/300/**F0259a**	**No of Pages**	5 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008 Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works Investigation Report of Exceedance of Water Quality at Locations WM2A on 11 April 2016**		

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Dear Sir,

Further to the Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F0239 dated 12 April 2016
TCS00694/13/300/F0248 dated 14 April 2016.

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Simon Leung (ER of C6/ AECOM)	Fax:	2251 0698
	Mr. Antony Wong (IEC, SMEC)		By email

安順聯合環境服務及顧問
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Flat A, 20/F, Gold King Industrial Building,
35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008

Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		11 April 2016	
Location		WM2A	
Time		10:24	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		24.9 AND 120% of upstream control station of the same day	14.6 AND 120% of upstream control station of the same day
Limit Level		33.8 AND 130% of upstream control station of the same day	17.3 AND 130% of upstream control station of the same day
Measured Levels	**WM2A-C**	6.5	<2
	WM2A	**68.6**	**93.5**
Exceedance		**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the CCKJV, construction activities carried out on 11 April 2016 at Bridge D (upstream of WM2A) were mainly piling works. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 11 April 2016, turbid water was observed at WM2A and the water samples collected was slightly turbid (Photo 1 & 2). 3. As water mitigation measures, wastewater treatment facilities including one AquaSed and three series of sedimentation tank have been installed for piling work. (Photo 3) As advised by the Contractor, the wastewater generated from piling was recirculated and discharge could be made when water overflow from the AquaSed. Since discharge license was not yet granted for the Contract, self-monitoring for the effluent quality would be conducted by the Contractor if discharge is required to ensure the discharge effluent complied with the relevant requirements. 4. To minimize the runoff flowing out of the site, concrete block and sand bag as a temporary bund was set up near the piling works area which besides Ping Yuen River of Bridge D. (Photo 4) CCKJV advised that the construction of concrete bund will be continuously constructed along the piling area. 5. As reported by CCKJV, since too much silt accumulated inside the sedimentation tank, the quality of effluent was not desirable and some turbid effluent was discharged into Ping Yuen River. (Photo 4) Upon this incident, CCKJV has been increased the desilting frequency of the AquaSed and sedimentation tanks to 3 times per week and adjusted the chemical dosage for better treatment result. It is considered that the exceedance was related to the poor effluent from the works under C6 and CCKJV is urged to improve the relevant facilities. 6. According to the Event and Action, the monitoring frequency at WM2A has been increase to daily due to the limit level	

	exceedance recorded until no exceedances were triggered in consecutive days. There were no exceedances triggered at WM2A for monitoring on 12 April 2016. Nevertheless, the Contractor should continue to fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 20 April 2016

Photo Record

Photo 1

During water sampling on 11 April 2016, turbid water was observed at WM2A.

Photo 2

The water samples collected at WM2A on 11 April 2016 was slightly turbid.

Photo 3

Wastewater treatment facilities including one AquaSed and three series of sedimentation tank have been installed for piling work at Bridge D.

Photo 4

As reported by CCKJV, malfunction of AquaSed was recorded on 11 April 2016 and some turbid effluent was discharged into Ping Yuen River. Besides, concrete block and sand bag as temporary bund was set up near the piling works which besides Ping Yuen River of Bridge D.

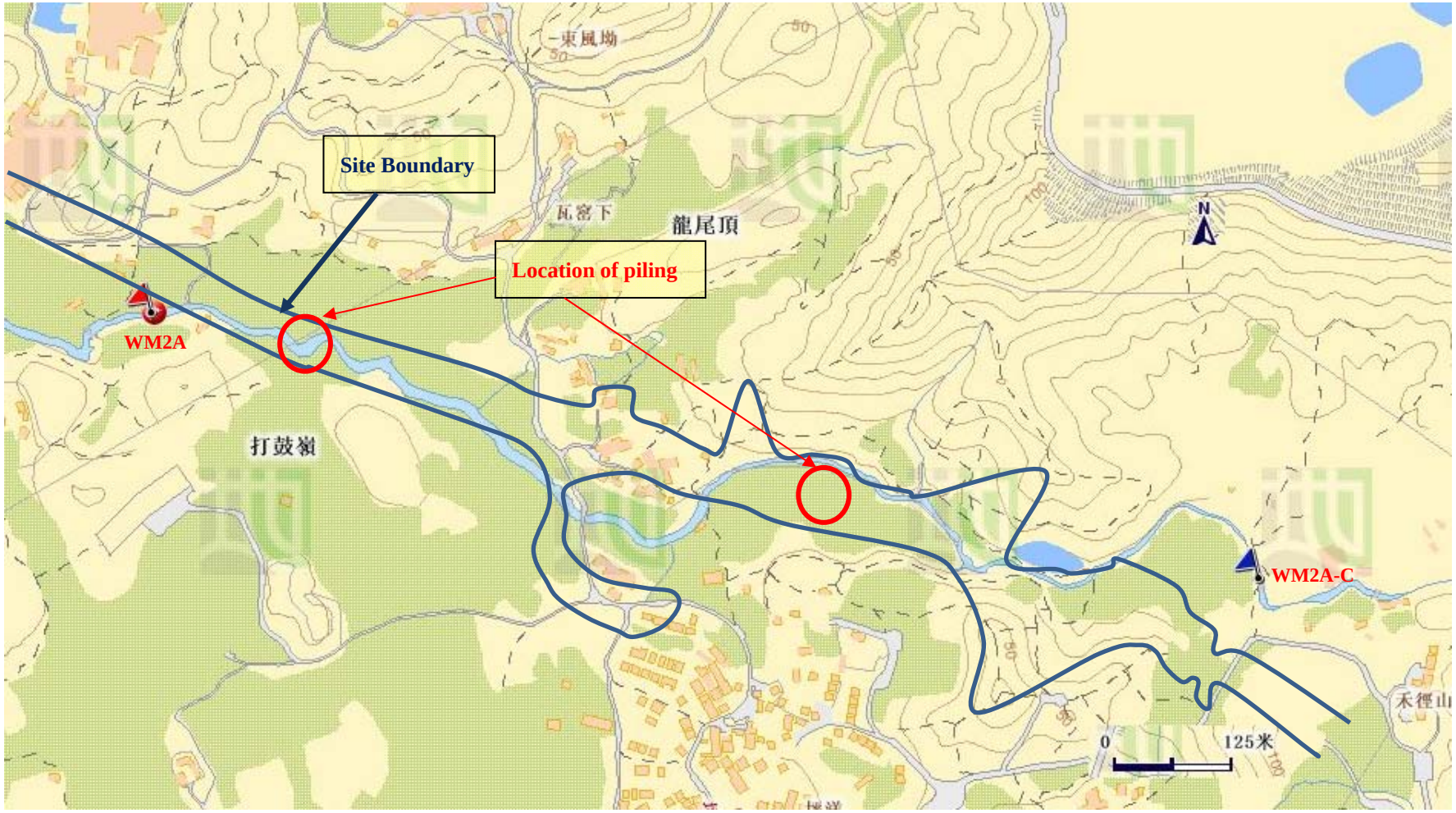

Figure 1 Location Map for Water Quality Monitoring Locations WM2A and WM2A-Control

AUES

Fax Cover Sheet

To	**Mr. Vincent Chan**	**Fax No**	**By e-mail**
Company	**CRBC-CEC-Kaden JV**		
cc			
From	**Nicola Hon**	**Date**	**20 April 2016**
Our Ref	TCS00694/13/300/**F0261**	**No of Pages**	4 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008 Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works Investigation Report of Exceedance of Water Quality at Location WM2B on 7 April 2016**		

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Dear Sir,

Further to the Notification of Exceedance (NOE) ref. of following:

TCS00694/13/300/F0238 dated 12 April 2016

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant
Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Simon Leung (ER of C6/ AECOM)	Fax:	2251 0698
	Mr. Antony Wong (IEC, SMEC)		By email

安順聯合環境服務及顧問
Action-United Environmental Services & Consulting
Flat A, 20/F, Gold King Industrial Building,
35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008

Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		7 April 2016	
Location		WM2B	
Time		10:54	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		11.4 AND 120% of upstream control station of the same day	11.8 AND 120% of upstream control station of the same day
Limit Level		12.3 AND 130% of upstream control station of the same day	12.4 AND 130% of upstream control station of the same day
Measured Levels	**WM2B-C**	4.9	<2
	WM2B	**790.0**	**806.0**
Exceedance		**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the CCKJV, construction activities carried out on 7 April 2016 at North Portal (upstream of WM2B) were bored piling and slope work. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team on 7 April 2016, it was observed that the water flowing in the channel and the water samples collected at WM2B was turbid. (Photo 1 & 2) 3. As advised by the Contractor, self-monitoring for the treated water in the wastewater treatment facilities was conducted and the effluent was visually clear. However, the silt cumulated at the channel bed which blocked by the bar screen to prevent it getting to downstream was disturbed by the flow of discharge from the AquaSed and the mixture of silt and discharge water was overflow to the downstream. (Photo 3) 4. CCKJV was immediately provided a water pump at the bar screen to drain the turbid water in the channel back to the wastewater treatment system. In our investigation, it is considered that the exceedances were related to the Contract. CCKJV was advised that removal of silt in the open channel shall be carried out regularly with proper care to prevent over-accumulation of silt and affect the water quality in the channel. 5. According to the Event and Action, the monitoring frequency at WM2B has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 8 and 9 April 2016 and no exceedance was triggered. CCKJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.	

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 20 April 2016

Photo Record

Photo 1
During water sampling on 7 April 2016, it was observed that the water at WM2B was turbid.

Photo 2
The water samples collected at WM2B on 7 April 2016 was turbid.

Photo 3
The silt cumulated at the channel bed was blocked by the bar screen to prevent it getting to downstream. However, it was disturbed by the flow of discharge from the AquaSed and the mixture of silt and discharge water was overflow to the downstream.

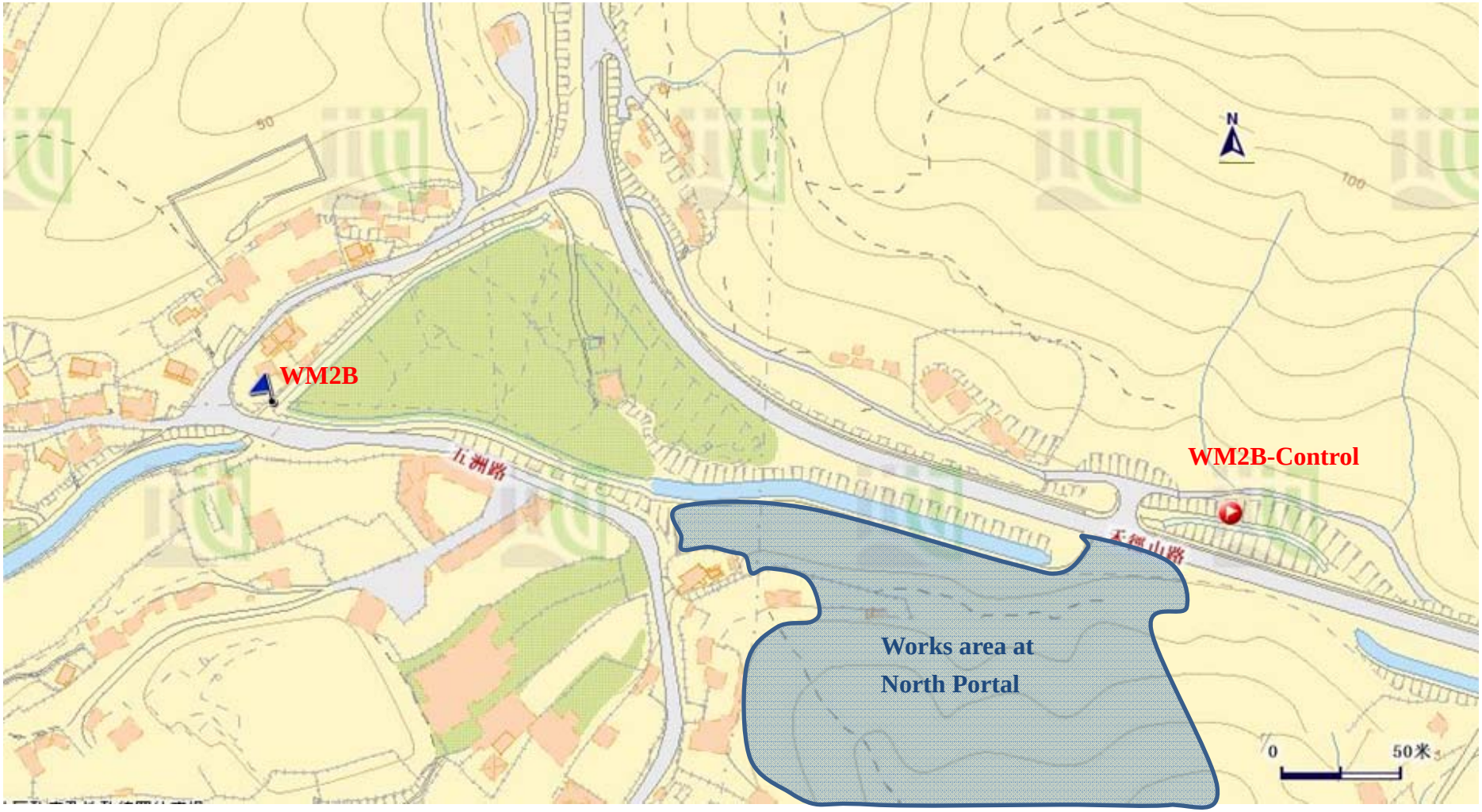

Figure 1 Location Map for Water Quality Monitoring Locations WM2B and WM2B-Control

AUES

Fax Cover Sheet

To	Mr. Edwin Au	**Fax No**	**2403 1162**
Company	**Sang Hing Civil – Richwell Machinery JV**		
cc			
From	**Nicola Hon**	**Date**	**22 April 2016**
Our Ref	TCS00694/13/300/**F0269**	**No of Pages**	5 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008 Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works Investigation Report of Exceedance of Water Quality at Location WM1 on 11 April 2016 (Contract 5)**		

Dear Sir,

Further to the following Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F0241 dated 12 April 2016
TCS00694/13/300/F0262 dated 20 April 2016

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Kelvin Lee (ER, AECOM)	Fax:	2674 7732
	Mr. Antony Wong (IEC, SMEC)		By email

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Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008

Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		11 April 2016	
Location		WM1	
Time		9:48	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		51.3 AND 120% of upstream control station of the same day	54.5 AND 120% of upstream control station of the same day
Limit Level		67.6 AND 130% of upstream control station of the same day	64.9 AND 130% of upstream control station of the same day
Measured Levels	**WM1-C**	18.6	18.5
	WM1	**82.2**	**125.0**
Exceedance		**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the SRJV, construction activities carried out on 11 April 2016 was construction of u-channel and bituminous laying at Lin Ma Hang Road. (Figure 1) No wastewater was generated from the abovementioned work and no construction activities were conducted at Boundary Control Point (BCP) which near Kong Yiu River. 2. According to the site records from the monitoring team during monitoring on 11 April 2016, turbid water was observed at WM1 whereas the water quality at WM1-C was clear. (Photo 1 to 3) 3. According to the field photos (Photo 1), accumulation of rubbish were observed at the bar screen of box culvert near WM1 after heavy rainstorm on 10 April 2016. Water flow near WM1 was therefore retarded and turbid water would be cumulated at WM1. 4. During site inspection by the RE, IEC, SRJV and ET on 12 April 2016, no adverse water quality impact was observed. (Photo 4) Moreover, there were no wastewater generation activities carried out and no discharge made into the river course. In our investigation, it is considered that the exceedances were unlikely due to the Contract. 5. According to the Event and Action, the monitoring frequency at WM1 has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 12, 13 April 2016 and no exceedances were triggered on both days. Nevertheless, SRJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.	

Prepared By :	Nicola Hon
Designation :	Environmental Consultant
Signature :	
Date :	22 April 2016

Photo Record

Photo 1
During water sampling on 11 April 2016, turbid water was observed at WM1.

Photo 2
During water sampling on 11 April 2016, the water quality at WM1-C was clear.

Photo 3
The water samples collected at WM1 on 11 April 2016 were slightly turbid.

Photo 4
During site inspection on 12 April 2016, construction of u-channel and bituminous laying were observed. No adverse water quality impact was noted.

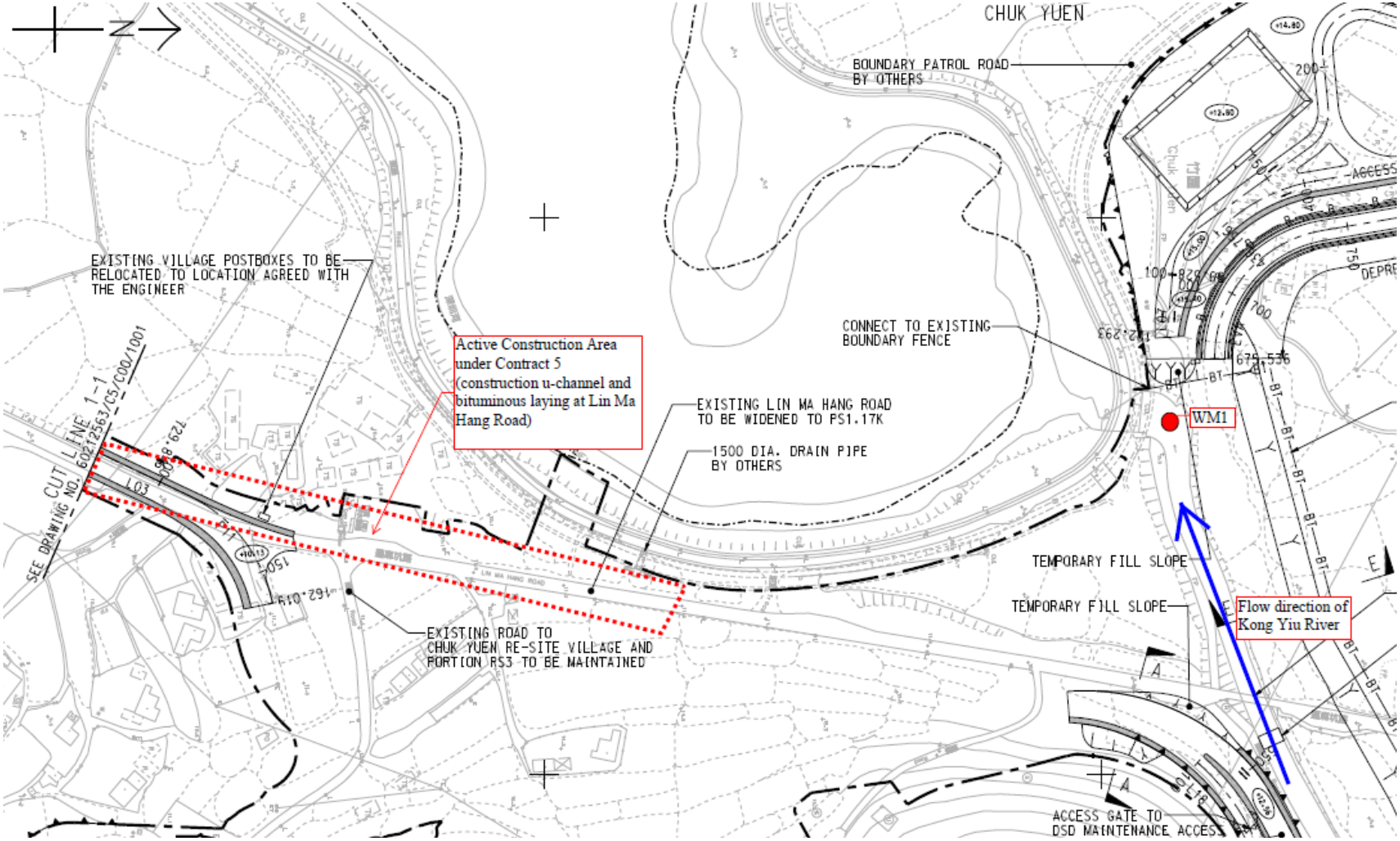

Figure 1 Location Map

AUES

Fax Cover Sheet

To	**Mr. Vincent Chan**	**Fax No**	**By e-mail**
Company	**CRBC-CEC-Kaden JV**		
cc			
From	**Nicola Hon**	**Date**	**22 April 2016**
Our Ref	TCS00694/13/300/**F0270**	**No of Pages**	5 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008 Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works Investigation Report of Exceedance of Water Quality at Location WM1 on 11 April 2016 (Contract 6)**		

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Dear Sir,

Further to the following Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F0240 dated 12 April 2016
TCS00694/13/300/F0264 dated 20 April 2016

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Simon Leung (ER of C6/ AECOM)	Fax:	2251 0698
	Mr. Antony Wong (IEC, SMEC)		By email

安順聯合環境服務及顧問
Action-United Environmental Services & Consulting
Flat A, 20/F, Gold King Industrial Building,
35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		11 April 2016	
Location		WM1	
Time		9:48	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		51.3 AND 120% of upstream control station of the same day	54.5 AND 120% of upstream control station of the same day
Limit Level		67.6 AND 130% of upstream control station of the same day	64.9 AND 130% of upstream control station of the same day
Measured Levels	**WM1-C**	18.6	18.5
	WM1	**82.2**	**125.0**
Exceedance		**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the CCKJV, construction activities carried out on 11 April 2016 at Boundary Control Point (BCP) which upstream of WM1 was bored piling. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 11 April 2016, turbid water was observed at WM1 whereas the water quality at WM1-C was clear. 3. According to the field photos (Photo 1), accumulation of rubbish were observed at the bar screen of the box culvert near WM1 after heavy rainstorm on 10 April 2016. Water flow near WM1 was therefore retarded and turbid water cumulated at WM1. Moreover, turbid water was observed at upstream of site area of Contract 6 on 11 April 2016 as well. (Photo 4) 4. During site inspection by the RE, IEC, Contractor and ET on 14 April 2016, it was observed that the wastewater generated from the bored pile works was recirculated to the AquaSed for treatment and discharge would be made when the effluent is overflow from the AquaSed. (Photo 5) Since discharge license was not yet granted for the Contract, self-monitoring for the effluent quality would be conducted by the Contractor if discharge is required to ensure the discharge effluent complied with the relevant requirements. 5. In our investigation, since turbid water was observed at upstream of site area of Contract 6, it is considered that the exceedances were unlikely due to the Contract. 6. According to the Event and Action, the monitoring frequency at WM1 has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 12 and 13 April 2016 and no exceedances were triggered on both days. Nevertheless, CCKJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.	

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 22 April 2016

Photo Record

Photo 1
During water sampling on 11 April 2016, turbid water was observed at WM1.

Photo 2
During water sampling on 11 April 2016, the water quality at WM1-C was clear.

Photo 3
The water samples collected at WM1 on 11 April 2016 were slightly turbid.

Photo 4
On 11 April 2016, turbid water was observed at upstream of the works area of Contract 6. (works area of Contract 6 is after the Bridge)

Photo 5
During site inspection by the RE, IEC, Contractor and ET on 14 April 2016, it was observed that the wastewater treatment facility was properly in place and function.

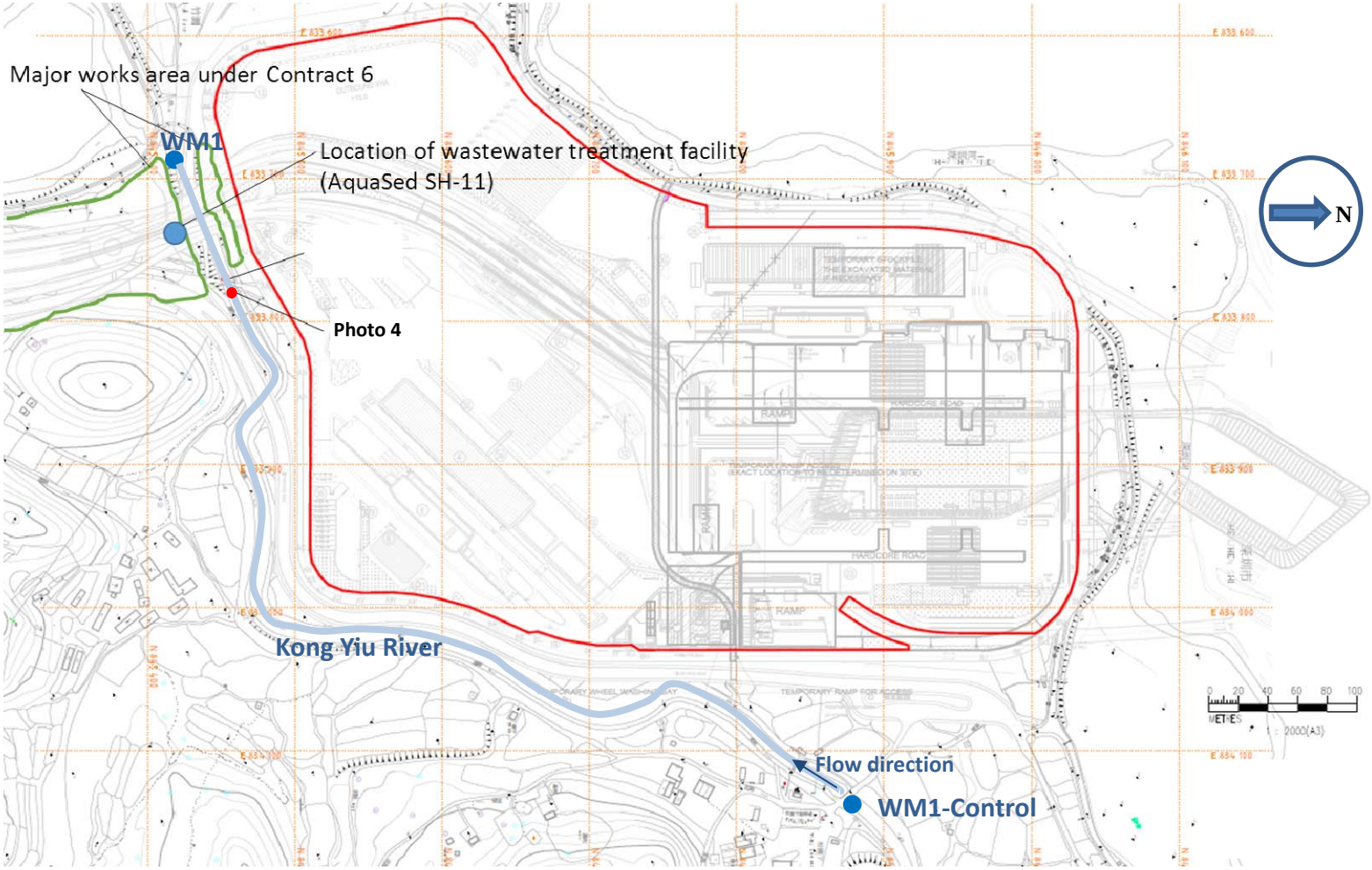

Figure 1 Location Map for Water Quality Monitoring Locations WM1 and WM1-C

AUES

Fax Cover Sheet

To	**Mr. Vincent Chan**	**Fax No**	**By e-mail**
Company	**CRBC-CEC-Kaden JV**		
cc			
From	**Winnie Chiu**	**Date**	**29 April 2016**
Our Ref	TCS00694/13/300/**F0274a**	**No of Pages**	7 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008** **Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works** **Investigation Report of Exceedance of Water Quality at Locations WM2A on 13 and 14 April 2016**		

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Dear Sir,

Further to the Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F0248 dated 14 April 2016.
TCS00694/13/300/F0265 dated 20 April 2016

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Winnie Chiu
Assistant Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Simon Leung (ER of C6/ AECOM)	Fax:	2251 0698
	Mr. Antony Wong (IEC, SMEC)		By email

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Action-United Environmental Services & Consulting
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35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008

Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008		
Date		13 Apr 2016	14 Apr 2016	13 Apr 2016
Location		WM2A		
Time		13:10	9:43	13:10
Parameter		Suspended Solids (mg/L)		Turbidity (NTU)
Action Level		14.6 AND 120% of upstream control station of the same day		24.9 AND 120% of upstream control station of the same day
Limit Level		17.3 AND 130% of upstream control station of the same day		33.8 AND 130% of upstream control station of the same day
Measured Levels	**WM2A-C**	22.0	3.0	23.3
	WM2A	**104.0**	**20.5**	**103.0**
Exceedance		**Limit Level**	**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the CCKJV, construction activities carried out on 13 and 14 April 2016 at Bridge D (upstream of WM2A) were mainly piling works. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 13 April 2016, turbid water was observed at WM2A and the water samples collected on WM2A-C were slightly turbid (Photo 1, 2, 3). On 14 April 2016, turbid water was observed at WM2A and the water samples collected on WM2A-C were clear.(Photo 4, 5) 3. According to the Daily Extract of Meteorological Observations from the Hong Kong Observatory, a total rainfall at 76.4 mm was recorded on 13 April 2016. (Figure 2) Due to the heavy rainfall, the soil slope at the river side was eroded and ran into the Ping Yuen River and muddy water was observed after passing the suspected soil erosion point. (Photo 6) As reported by CCKJV, the suspected soil erosion point was out of the site boundary. (Photo 7 and Figure 1) In our investigation, it is considered that the exceedances were unlikely due to the Contract. 4. As water mitigation measures, wastewater treatment facilities including one AquaSed and three series of sedimentation tank have been installed for piling work. (Photo 8) As advised by the Contractor, the wastewater generated from piling was recirculated and discharge could be made when water overflow from the AquaSed. Since discharge license was not yet granted for the Contract, self-monitoring for the effluent quality would be conducted by the Contractor if discharge is required to ensure the discharge effluent complied with the relevant requirements. 5. According to the Event and Action, the monitoring frequency at WM2A has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. There were no exceedances triggered at		

	WM2A for monitoring on 15 and16 April 2016. Nevertheless, the Contractor should continue to fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.

Prepared By : Winnie Chiu

Designation : Assistant Environmental Consultant

Signature : 

Date : 29 April 2016

Photo Record

Photo 1

During water sampling on 13 April 2016, turbid water was observed at WM2A.

Photo 2

The water samples collected at WM2A on 13 April 2016 was clear.

Photo 3

During water sampling on 13 April 2016, the water quality at WM2A-C was slightly turbid.

Photo 4

During water sampling on 14 April 2016, turbid water was observed at WM2A.

Photo 5

During water sampling on 14 April 2016, the water quality at WM2A-C was clear.

Photo 6

Muddy water was observed after passing the suspected soil erosion point.

Photo 7

The suspected soil erosion point was out of the site boundary of Contract 6.

Photo 8

Wastewater treatment facilities including one AquaSed and three series of sedimentation tank have been installed for piling work at Bridge D.

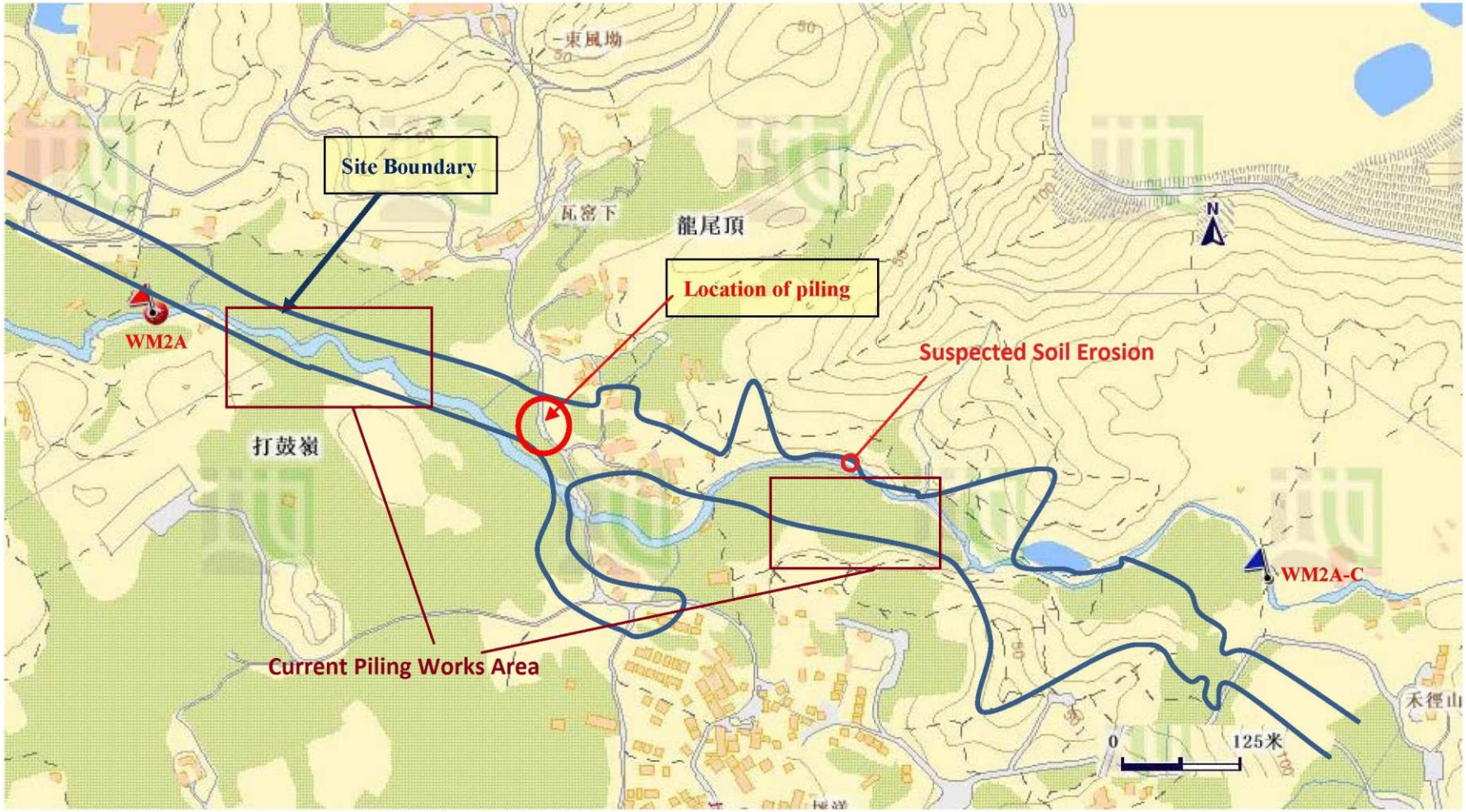

Figure 1 Location Map for Water Quality Monitoring Locations WM2A, WM2A-Control and suspended soil erosion point

2016 年 4 月 13 日等雨量線圖

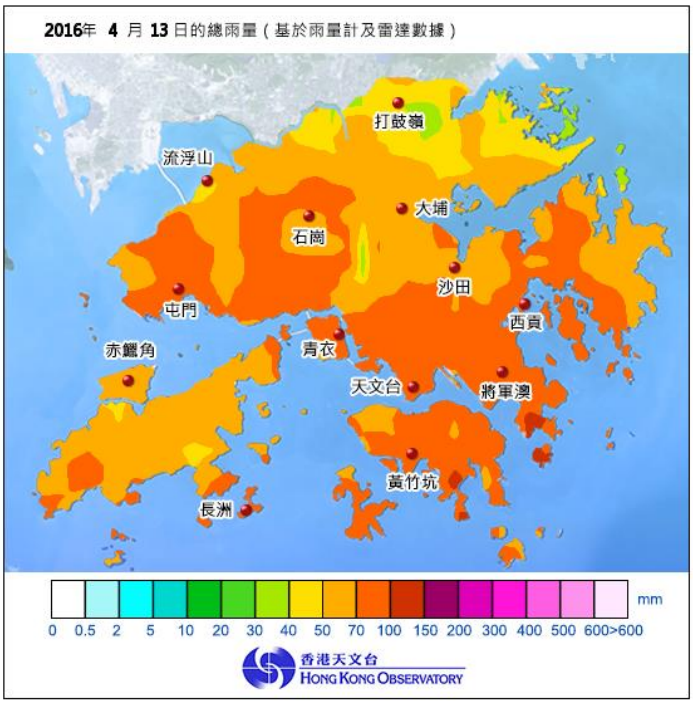

Figure 2 Rainfall distribution on 13 April 2016