Penta-Ocean – Concentric – Alchmex Joint Venture

Contract No. KL/2010/02

Kai Tak Development – Kai Tak Approach Channel and Kwun Tong Typhoon Shelter Improvement Works (Phase 1)

Monthly EM&A Report

November 2011

(version 4.0)

Certified By

(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties

CINOTECH CONSULTANTS LTD
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong
Tel: (852) 2151 2083 Fax: (852) 3107 1388
Email: info@cinotech.com.hk

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDIX

EXECUTIVE SUMMARY

Introduction

1. This is the 1st Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for the "Contract No. KL/2010/02 – Kai Tak Development – Kai Tak Approach Channel (KTAC) and Kwun Tong Typhoon Shelter (KTTS) Improvement Works" (hereinafter called "the Project"). This report documents the findings of EM&A Works conducted in November 2011.

Water quality monitoring works

2. Water quality monitoring for Bioremediation works, but not limited to seabed preparation, the optimization trial, full-scale in-situ treatment and any additional injections during the post-treatment phase for the Project was performed in accordance with the Kai Tak Development Schedule 3 EM&A Manual and Particular Specification of Contract No. KL/2010/02 and the monitoring results were checked and reviewed.

3. Summary of the non-compliance of the reporting month is tabulated in Table I.

Table I Summary Table for Non-compliance Recorded in the Reporting Month

Parameter	No. of Exceedance		No. of Exceedance Due to the Project		Action Taken
	Action Level	Limit Level	Action Level	Limit Level	
Water	0	0	0	0	N/A

Water Quality

4. Optimization trail was conducted on 30 November 2011. All water quality monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

1. INTRODUCTION

Background

1.1 The Kai Tak Development (KTD) is located in the south-eastern part of Kowloon Peninsula, comprising the apron and runway areas of the former Kai Tak Airport and existing waterfront areas at To Kwa Wan, Ma Tau Kok, Kowloon Bay, Kwun Tong and Cha Kwo Ling. It covers a land area of about 328 hectares.

1.2 Civil Engineering and Development Department (CEDD) had completed an Environmental Impact Assessment (EIA) study for KTD under Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design and Construction of Advance Works – Investigation, Design and Construction (hereafter called "Schedule 3 EIA Report"). The Schedule 3 EIA Report was approved under Environmental Impact Assessment Ordinance (EIAO) in March 2009.

1.3 Penta-Ocean – Concentric – Alchmex Joint Venture (PCAJV) was awarded as the main contractor of the Contract No. KL/2010/02 – Kai Tak Development – Kai Tak Approach Channel (KTAC) and Kwun Tong Typhoon Shelter (Phase 1) (hereinafter referred to as the Project) and Cinotech Consultants Limited was commissioned by PCAJV to undertake the water quality monitoring for bioremediation works for the Project in accordance with EM&A Manual and Particular Specification.

1.4 According to the Particular Specification, Section 25 – Environmental Protection (PS25) and Environmental Monitoring and Audit Manual (EM&A Manual) for Kai Tak Developemnt, Section 7.2.2, impact water quality monitoring for Bioremediation for the period from commencement of and throughout the duration of Bioremediation works, including but not limit to seabed preparation, the optimization trial, full-scale in-situ treatment and any additional injections during the post-treatment phase shall be conducted at the locations likely to be affected by bioremediation.

1.5 This is the 1st Monthly EM&A report summarizing the water quality monitoring works for bioremediation works for the Project in November 2011. The other EM&A information of Contract No. KL/2010/02 is presented in the Monthly EM&A Reports under Schedule 3 EIA (Contract No. KLN/2010/04).

2. WATER QUALITY MONITORING FOR BIOREMEDIATION

Monitoring Requirements

2.1 Marine water quality monitoring shall be carried out three times per week, at mid-flood and mid-ebb tides at the locations likely to be affected by bioremediation.

2.2 The interval between two sets of monitoring shall not be less than 36 hours except where there are exceedances of AL levels, in which case monitoring frequency shall be increased.

2.3 For all the monitoring stations, sampling should be taken at 3 water depths, namely 1m below the water surface, mid depth and 1m above the sea bed. For stations that are less than 3m in depth, only the mid depth sample should be taken. Shall the water depth is less than 6m, in which case the mid-depth station may be omitted.

2.4 At each monitoring station, duplicate samples shall be collected at each water depth. Sufficient volume of each water sample (not less than 1 litre) shall be collected for analysis to achieve the required detection limit.

Monitoring Locations

2.5 According to EM&A Manual, Section 7.2.2 and PS25, two monitoring locations in the vicinity of the works area (i.e. one 100m upstream and one 100m downstream of the works area) shall be selected as the impact monitoring stations. Three control stations shall also included for comparing the water quality from potentially impacted sites with the ambient water quality. The control stations shall be sited outside the area of influence of the works, as far as practical, not affected by any other works.

2.6 The indicative locations of water quality monitoring stations for bioremediation works which was approved by EPD on 30 November 2011 are shown on **Figure 1**. The coordinates of the water quality monitoring stations are presented in Table 2.1.

Table 2.1 Location for Marine Water Quality Monitoring Locations

Monitoring Stations	Coordinates	
	Easting	Northing
W1	838772.203	820413.345
W2	838741.308	820330.290
W3	838749.902	820278.615
W4	840663.244	818653.087
W5	840792.106	818435.346

Monitoring Equipment

Dissolved Oxygen (DO) and Temperature Measuring Equipment

2.7 The instrument for measuring dissolved oxygen and temperature was portable and weatherproof complete with cable, sensor, comprehensive operation manuals and use DC power source. It was capable of measuring:

- a dissolved oxygen level in the range of 0-20 mg/L and 0-200% saturation; and
- a temperature of 0-45 degree Celsius.

2.8 It has a membrane electrode with automatic temperature compensation complete with a cable.

2.9 Sufficient stocks of spare electrodes and cables were available for replacement where necessary.

2.10 Salinity compensation was built-in in the DO equipment.

Turbidity

2.11 Turbidity was measured *in situ* by the nephelometric method. The instrument was portable and weatherproof using a DC power source complete with cable, sensor and comprehensive operation manuals. The equipment was capable of measuring turbidity between 0-1000 NTU. The probe cable was not less than 25m in length. The meter was calibrated in order to establish the relationship between NTU units and the levels of suspended solids. The turbidity measurement was carried out on split water sample collected from the same depths of suspended solids samples.

Sampler

2.12 A water sampler, consisting of a transparent PVC or glass cylinder of a capacity of not less that two litres which can be effectively sealed with cups at both ends was used. The water sampler has a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler was at the selected water depth.

Water Depth Detector

2.13 A portable, battery-operated echo sounder was used for the determination of water depth at each designated monitoring station.

pH

2.14 The instrument was consisting of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It was readable to 0.1pH in a range

of 0 to 14. Standard buffer solutions of at least pH 7 and pH 10 were used for calibration of the instrument before and after use.

Salinity

2.15 A portable salinometer capable of recording salinity within the range of 0-40 ppt was used for salinity measurements.

Position System

2.16 A hand held differential Global Positioning System (GPS) was used during water quality monitoring to ensure the monitoring vessel is at the correct location before taking measurements. GPS was calibrated at checkpoint (Quarry Bay Survey Nail at Easting 840683.49 and Northing 816709.55) to ensure the monitoring station was at the correct position before taking measurement and water samples.

Sample Container and Storage

2.17 Following collection, water samples for laboratory analysis were stored in high density polythene bottles with appropriate preservatives added, packed in ice (cooled to 4°C without being frozen), delivered to the laboratory and analysed as soon as possible. Sufficient volume of samples was collected to achieve the detection limit.

Calibration of *In Situ* Instruments

2.18 All *in situ* monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or other international accreditation scheme before use, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring programme. Responses of sensors and electrodes were checked with certified standard solutions before each use. Wet bulb calibration for a DO meter was carried out before measurement at each monitoring event.

2.19 For the on site calibration of field equipment (Multi-parameter Water Quality System), the BS 1427:2009, "Guide to on-site test methods for the analysis of waters" was observed.

2.20 Sufficient stocks of spare parts were maintained for replacements when necessary. Backup monitoring equipment was also being made available so that monitoring can proceed uninterrupted even when some equipment was under maintenance, calibration, etc.

2.21 Table 2.2 summarizes the equipment used in the water quality monitoring program. Copies of the calibration certificates of the equipment are shown in **Appendix B**.

Table 2.2 Water Quality Monitoring Equipment

Equipment	Model and Make	Qty.
Water Sampler	Kahlsico Water-Bottle Model 135DW 150	1
Multi-parameter Water Quality System	YSI 6820-C-M	1
Monitoring Position Equipment	"Magellan" Handheld GPS Model GPS-320	1
Water Depth Detector	Fishfinder 140	1

Monitoring Parameters

2.22 The monitoring parameters to be measured *in-situ* and in laboratory are summarized in Table 2.3.

Table 2.3 Water Quality Monitoring Parameters

In-situ Measurement	Laboratory Measurement
Dissolved Oxygen	Suspended Solids (SS)
pH	Nitrate-nitrogen (NO3-N)
Water Temperature	Cadmium (Cd)
Salinity	Chromium (Cr)
Turbidity	Copper (Cu)
	Mercury (Hg)
	Nickel (Ni)
	Lead (Pb)
	Silver (Ag)
	Zinc (Zn)

2.23 Monitoring location/position, time, water depth, sampling depth, pH, salinity, DO saturation, water temperature, tidal stages, weather conditions and any special phenomena or work underway nearby were recorded.

Monitoring Frequency

2.24 Table 2.4 summarizes the monitoring parameters, monitoring period and frequencies of the water quality monitoring.

Table 2.4 Water Quality Monitoring Parameters and Frequency

Monitoring Stations	Parameters, unit	Depth	Frequency
W1 W2 W3 W4 W5	**In-situ Measurement** • DO, mg/L • DO Saturation, % • Salinity, ppt • Turbidity, NTU • pH • water temperature, °C **Laboratory Measurement** • SS, mg/L • NO_3-N, mg/L • Cd, mg/L • Cr, mg/L • Cu, mg/L • Hg, mg/L • Ni, mg/L • Pb, mg/L • Ag, mg/L • Zn, mg/L	• 3 water depths: 1m below water surface, mid-depth and 1m above sea bed. • If the water depth is less than 3m, mid-depth sampling only. • If the water depth is between 3-6m, omit mid-depth sampling.	• 3 times per week (each series of sampling / measurement should not be less than 36 hours) unless the optimization trial is only carried out for a short time period.

2.25 The water quality monitoring schedule in the reporting period is provided in **Appendix C.**

Monitoring Methodology

2.26 The monitoring stations were accessed using survey boat to within 3 m by the guide of a hand-held Global Positioning System (GPS). The depth of the monitoring location was measured using depth meter in order to determine the sampling depths. Afterwards, the probes of the in-situ measurement equipment were lowered to the predetermined depths (1 m below water surface, mid-depth and 1 m above seabed) and the measurements were carried out accordingly. The in-situ measurements at predetermined depths were carried out in duplicate. In case the difference in the duplicate in-situ measurement results was larger than 25%, the third set of in-situ measurement would be carried out for result confirmation purpose.

2.27 Water sampler was lowered into the water to the required depths of sampling. Upon reaching the pre-determined depth, a messenger to activate the sampler was then released to travel down the wire. The water sample was sealed within the sampler before retrieving. At each station, water samples at three depths (1 m below water surface, mid-depth and 1 m above seabed) were collected accordingly. Water samples were stored in a cool box and kept at less than 4°C but without frozen and sent to the

laboratory as soon as possible. In addition, field information as described in Section 2.24 was also recorded.

Laboratory Analytical Methods

2.28 The testing of all parameters was conducted by Wellab Ltd. (HOKLAS Registration No.083) and comprehensive quality assurance and control procedures in place in order to ensure quality and consistency in results. The testing method, lowest detection limit and limit of reporting are provided in Table 2.5.

Table 2.5 Methods for Laboratory Analysis for Water Samples

Determinant	Proposed Method	Limit of Reporting	Lowest Detection Limit
Cadmium (Cd)	In-house Method SOP 053 (ICP-ES) and SOP 076 (ICP-MS) [Ref. Method: APHA 19e 3030F 3b and 3120B, USEPA 3005A & 6020A]	0.1 μg/L	0.1 μg/L
Chromium (Cr)		0.2 μg/L	0.2 μg/L
Copper (Cu)		0.2 μg/L	0.2 μg/L
Silver (Ag)		0.2 μg/L	0.2 μg/L
Nickel (Ni)		0.2 μg/L	0.2 μg/L
Zinc (Zn)		0.4 μg/L	0.4 μg/L
Lead (Pb)		0.2 μg/L	0.2 μg/L
Mercury (Hg)		0.2 μg/L	0.2 μg/L
Suspended Solids (SS)	APHA 17ed 2540 D	0.5 mg/L	0.5 mg/L
Nitrate-nitrogen (NO_3-N)	In-house Method SOP056 (FIA) [Ref. Method: APHA 20e 4500-NO_3^- F (FIA)]	0.01 mg NO_3^--N/L	0.01 mg NO_3^--N/L

QA/QC Requirements

Decontamination Procedures

2.29 Water sampling equipment used during the course of the monitoring programme was decontaminated by manual washing and rinsed clean seawater/distilled water after each sampling event. All disposal equipment was discarded after sampling.

Sampling Management and Supervision

2.30 Water samples were dispatched to the testing laboratory for analysis as soon as possible after the sampling. All samples were stored in a cool box and kept at less than 4°C but without frozen. All water samples were handled under chain of custody protocols and relinquished to the laboratory representatives at locations specified by the laboratory.

Quality Control Measures for Sample Testing

2.31 The samples testing were performed by HOKLAS accredited laboratories. The following quality control programme was performed by the laboratories for each batch of samples:

- ✧ Method blank;
- ✧ Sample duplicate (at 5% level i.e. one for every 20 samples);
- ✧ Sample spike (at 5% level i.e. one for every 20 samples); and
- ✧ Quality control samples.

Results and Observation

2.32 The established Action/Limit Levels for the water quality monitoring works for bioremediation based on the baseline water quality monitoring results under Contract No. KLN/2009/10 is presented in **Appendix A.**

2.33 All water quality monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. The monitoring data are shown in **Appendix D**.

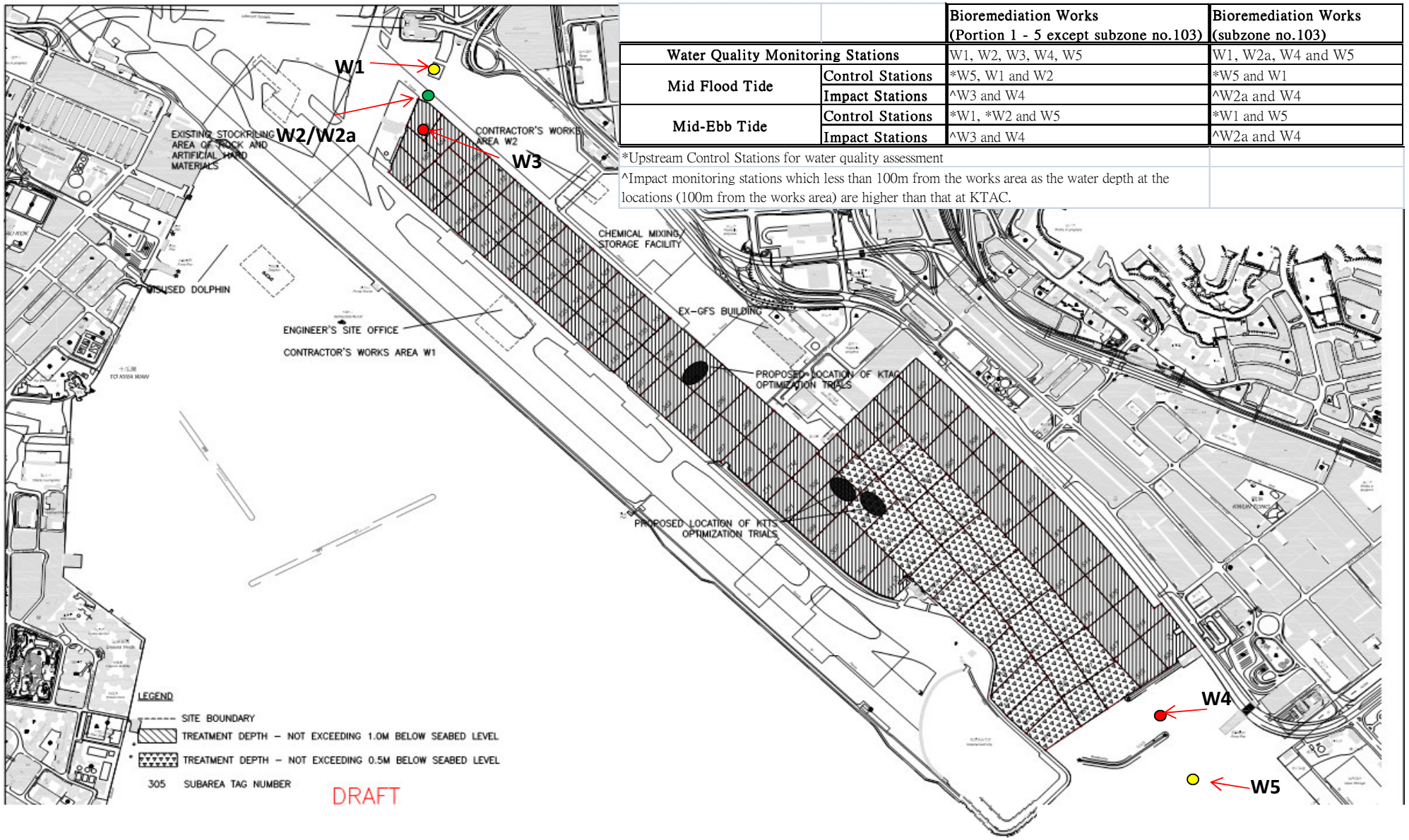
2.34 The weather during the sampling at mid-ebb tide and mid-flood tide was mainly sunny.

2.35 The laboratory testing report and QC report are provided in **Appendix E and Appendix F respectively**.

Event and Action Plan

2.36 If there is Action / Limit Level exceedance in any parameters of the water quality, the actions in accordance with the Event and Action Plan as shown in **Appendix G** will be carried out.

FIGURES



		Bioremediation Works (Portion 1 - 5 except subzone no.103)	Bioremediation Works (subzone no.103)
Water Quality Monitoring Stations		W1, W2, W3, W4, W5	W1, W2a, W4 and W5
Mid Flood Tide	Control Stations	*W5, W1 and W2	*W5 and W1
	Impact Stations	^W3 and W4	^W2a and W4
Mid-Ebb Tide	Control Stations	*W1, *W2 and W5	*W1 and W5
	Impact Stations	^W3 and W4	^W2a and W4

*Upstream Control Stations for water quality assessment

^Impact monitoring stations which less than 100m from the works area as the water depth at the locations (100m from the works area) are higher than that at KTAC.

Title	Contract No. KL/2010/02 Kai Tak Development - Kai Tak Approach Channel and Kwun Tong Typhoon Shelter Indicative Locations of Water Quality Monitoring Stations for Bioremediation Works	Scale: N.T.S Date: Nov-11	Project No.: MA11017 Figure: 1

CINOTECH

APPENDIX A
ACTION AND LIMIT LEVEL FOR WATER QUALITY

Appendix A - Action and Limit Levels for Marine Water Quality

Parameters	Action Level	Limit Level
DO in mg/L (Bottom)	0.01	0.01
SS in mg/L (Bottom)	120% of upstream control station's SS at the same tide of the same day or ***20.4***	130% of upstream control station's SS at the same tide of the same day or ***29.3***
Turbidity in NTU	120% of upstream control station's turbidity at the same tide of the same day or ***21.9***	130% of upstream control station's turbidity at the same tide of the same day or ***29.7***
Nitrate-Nitrogen in mg/L (depth average)	120% of upstream control station's nitrate-nitrogen (depth average) at the same tide of the same day + 0.9mg/L of anticipated increase due to nitrate injection or ***5.9***	130% of upstream control station's nitrate-nitrogen (depth average) at the same tide of the same day + 0.9mg/L of anticipated increase due to nitrate injection or ***7.1***
Heavy metals	120% of upstream control station's level at the same tide of the same day or	130% of upstream control station's level at the same tide of the same day or
Cr	***24.0***	***40.7***
Cd	***0.8***	***1.5***
Cu	***54.8***	***95.0***
Zn	***120.0***	***150.0***
Ag	***0.5***	***0.8***
Hg	***5.1***	***8.7***
Ni	***36.8***	***71.3***
Pb	***46.0***	***82.6***

Note:

- For SS & turbidity non-compliance of the water quality limits occur when monitoring result is higher than the limits.
- All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered as necessary
- For stations that only the mid depth sample was taken, the results at mid depth will be treated as SS (Bottom)

APPENDIX B
COPIES OF CALIBRATION CERTIFICATES FOR WATER QUALITY MONITORING

WELLAB 匯力 Testing & Research

WELLAB LIMITED
Rms 816, 1516 & 1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

ATTN: **Mr. W.K. Tang**

Test Report No.:	C/W/111005-1
Date of Issue:	2011-10-05
Date Received:	2011-10-05
Date Tested:	2011-10-05
Date Completed:	2011-10-05
Next Due Date:	2012-01-04
Page:	1 of 2

Certificate of Calibration

Item for calibration:

Description	: Sonde Environmental Monitoring System
Manufacturer	: YSI
Model No.	: 6820-C-M
Serial No.	: 02D0126AA
Equipment No.	: W.03.01

Test conditions:

Room Temperature	: 25 degree Celsius
Relative Humidity	: 58%

Test Specifications:

Conductivity & Salinity Sensor, Model: 6560, S/N: 11J100025
1. Conductivity performance check with Potassium Chloride standard solution
2. Salinity performance check with Sodium Chloride standard solution

Dissolved Oxygen Sensor, Model: 6562, S/N: 07E100029
1. Performance check against Winkler titration

Turbidity Sensor, Model: 6136, S/N: 11J1000475
1. Calibration check with Formazin standard solution

pH Meter, Model: 6561, S/N: 11H
1. Calibration check with standard pH buffer

Depth Meter
1. Calibration check at 1m water level depth

Methodologies:

1. YSI 6-Series Sonde Environmental Monitoring System Instruction Manual
2. In-house method with reference to APHA and ISO standards

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
Laboratory Manager

WELLAB 匯力
Testing & Research

WELLAB LIMITED
Rms 816, 1516 & 1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

Test Report No.:	C/W/111005-1
Date of Issue:	2011-10-05
Date Received:	2011-10-05
Date Tested:	2011-10-05
Date Completed:	2011-10-05
Next Due Date:	2012-01-04
Page:	2 of 2

Results:

1. Conductivity performance check

Specific Conductivity, µS/cm		Correction, µS/cm	Acceptable range
Salinity Meter (C1)	Theoretical Value (C2)	D = C1 - C2	
1420	1420	0	1420 ± 20

2. Salinity Performance check

Salinity, ppt		Correction, ppt	Acceptable range
Instrument Reading	Theoretical Value		
30.0	30.0	0.0	30.0 ± 3

3. Dissolved Oxygen check

Oxygen level in water at 20°C	Dissolved Oxygen, mg O_2/L		Correction, mg O_2/L	Acceptable range
	D.O. Meter	Winkler Titration		
Saturated	9.1	9.1	0.0	± 0.2
Half-saturated	5.6	5.6	0.0	± 0.2
Zero	0.0	0.0	0.0	± 0.2

4. Turbidity check

Turbidity value in solution, NTU	Calibration Value, NTU	Correction, NTU	Acceptable range
0.00	0.00	0.00	0.00 ± 0.05
100	100	0	100 ± 5
1000	1000	0	1000 ± 100

5. pH Meter check

Test Parameters	Performance characteristic	Acceptable range
Liquid junction error ΔpH_j , pH unit	0.01	Less than 0.05
Shift on stirring ΔpH_s , pH unit	0.01	Less than 0.02
Noise ΔpH_n , pH unit	0.00	Less than 0.02

6. Depth Meter check

Instrument Reading, m	Calibration Value, m	Correction, m	Acceptable range
1.0	1.00	0.00	1.00 ± 0.05

**********END OF REPORT**********

APPENDIX C
WATER QUALITY MONITORING SCHEDULE

Contract No. KL/2010/02 Kai Tak Development - Kai Tak Approach Channel and Kwun Tong Typhoon Shelter Improvement Works (Phase 1)
Water Quality Monitoring for Bioremediation Works (1st Optimization Trial)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Nov	2-Nov	3-Nov	4-Nov	5-Nov
6-Nov	7-Nov	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov
13-Nov	14-Nov	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov
20-Nov	21-Nov	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov
27-Nov	28-Nov	29-Nov	30-Nov			
			Water Quality Monitoring Mid-Flood 11:04 Mid-Ebb 16:25			

Remark: Reference was made to the tidal information of Hong Kong Observatory

APPENDIX D
MARINE WATER QUALITY MONITORING RESULTS

Appendix D - Action and Limit Levels for Marine Water Quality (Mid-Ebb Tide)

Parameters	Action Level	Limit Level
DO in mg/L (Bottom)	0.01	0.01
SS in mg/L (Bottom)	120% of upstream control station's SS at the same tide of the same day **W1: 9.6 and W2: 8.4** or ***20.4***	130% of upstream control station's SS at the same tide of the same day **W1: 10.4 and W2: 9.1** or ***29.3***
Turbidity in NTU	120% of upstream control station's turbidity at the same tide of the same day **W1: 6.2 and W2: 7.3** or ***21.9***	130% of upstream control station's turbidity at the same tide of the same day **W1: 6.8 and W2: 7.9** or ***29.7***
Nitrate-Nitrogen in mg/L (depth average)	120% of upstream control station's nitrate-nitrogen (depth average) at the same tide of the same day + 0.9mg/L of anticipated increase due to nitrate injection **W1: 6.5 and W2: 4.8** or ***5.9***	130% of upstream control station's nitrate-nitrogen (depth average) at the same tide of the same day + 0.9mg/L of anticipated increase due to nitrate injection **W1: 6.9 and W2: 5.1** or ***7.1***
Heavy metals	120% of upstream control station's level at the same tide of the same day or	130% of upstream control station's level at the same tide of the same day or
Cr	**W1: 2.2 and W2: 3.9** or ***24.0***	**W1: 2.3 and W2: 4.2** or ***40.7***
Cd	**W1: 0.5 and W2: 0.5** or ***0.8***	**W1: 0.5 and W2: 0.6** or ***1.5***
Cu	**W1: 4.0 and W2: 5.6** or ***54.8***	**W1: 4.3 and W2: 6.0** or ***95.0***
Zn	**W1: 19.2 and W2: 21.0** or ***120.0***	**W1: 20.8 and W2: 22.8** or ***150.0***
Ag	**W1: 0.2 and W2: 0.2** or ***0.5***	**W1: 0.3 and W2: 0.3** or ***0.8***
Hg	**W1: 0.4 and W2: 0.4** or ***5.1***	**W1: 0.4 and W2: 0.5** or ***8.7***
Ni	**W1: 1.6 and W2: 1.7** or ***36.8***	**W1: 1.7 and W2: 1.8** or ***71.3***
Pb	**W1: 2.2 and W2: 1.7** or ***46.0***	**W1: 2.3 and W2: 1.8** or ***82.6***

Note:

- For SS & turbidity non-compliance of the water quality limits occur when monitoring result is higher than the limits.
- All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered as necessary
- For stations that only the mid depth sample was taken, the results at mid depth will be treated as SS (Bottom)

Appendix D - Action and Limit Levels for Marine Water Quality (Mid-Flood Tide)

Parameters	Action Level	Limit Level
DO in mg/L (Bottom)	0.01	0.01
SS in mg/L (Bottom)	120% of upstream control station's SS at the same tide of the same day **W5: 9.6** or ***20.4***	130% of upstream control station's SS at the same tide of the same day **W5: 10.4** or ***29.3***
Turbidity in NTU	120% of upstream control station's turbidity at the same tide of the same day **W5: 6.4** or ***21.9***	130% of upstream control station's turbidity at the same tide of the same day **W5: 6.9** or ***29.7***
Nitrate-Nitrogen in mg/L (depth average)	120% of upstream control station's nitrate-nitrogen (depth average) at the same tide of the same day + 0.9mg/L of anticipated increase due to nitrate injection **W5: 2.6** or ***5.9***	130% of upstream control station's nitrate-nitrogen (depth average) at the same tide of the same day + 0.9mg/L of anticipated increase due to nitrate injection **W5: 2.8** or ***7.1***
Heavy metals	120% of upstream control station's level at the same tide of the same day	130% of upstream control station's level at the same tide of the same day
Cr	**W5: 2.5** or ***24.0***	**W5: 2.7** or ***40.7***
Cd	**W5: 0.3** or ***0.8***	**W5: 0.3** or ***1.5***
Cu	**W5: 5.4** or ***54.8***	**W5: 5.9** or ***95.0***
Zn	**W5: 18.8** or ***120.0***	**W5: 20.4** or ***150.0***
Ag	**W5: 0.2** or ***0.5***	**W5: 0.3** or ***0.8***
Hg	**W5: 0.3** or ***5.1***	**W5: 0.4** or ***8.7***
Ni	**W5: 2.9** or ***36.8***	**W5: 3.1** or ***71.3***
Pb	**W5: 1.7** or ***46.0***	**W5: 1.8** or ***82.6***

Note:

- For SS & turbidity non-compliance of the water quality limits occur when monitoring result is higher than the limits.
- All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered as necessary
- For stations that only the mid depth sample was taken, the results at mid depth will be treated as SS (Bottom)

Contract No. KL/2010/02
Kai Tak Development – Kai Tak Approach Channel and Kwun Tong Typhoon Shelter Improvement Works (Phase 1)
Water Quality Monitoring Results on 30 November, 2011 (Mid-Ebb Tide)

Location	Weather Condition	Sea Condition*	Sampling Time	Depth (m)		Temp (°C)		pH		Salinity (ppt)		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
W1	Sunny	Calm	18:12	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	5.2	-	-	8.0
						-		-		-		-		-			-			-		
				Middle	0.6	25.6	25.6	7.2	7.2	9.1	9.1	95.8	95.6	7.4	7.4		5.2	5.2		8.0	8.0	
						25.6		7.2		9.1		95.4		7.4			5.2			8.0		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
W2	Sunny	Calm	17:43	Surface	-	-	-	-	-	-	-	-	-	-	-	2.7	-	-	6.1	-	-	7.0
						-		-		-		-		-			-			-		
				Middle	1.4	23.8	23.8	7.6	7.6	26.8	26.9	37.1	36.6	2.7	2.7		5.9	6.1		7.0	7.0	
						23.7		7.6		27.0		36.0		2.6			6.3			7.0		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
W3	Sunny	Calm	17:33	Surface	1	24.7	24.8	7.5	7.5	22.3	22.3	52.1	51.6	3.8	3.8	3.8	3.8	3.8	3.6	6.0	6.0	5.5
						24.8		7.5		22.2		51.0		3.7			3.7			6.0		
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Bottom	3	23.2	23.2	7.7	7.7	29.7	29.7	35.3	35.5	2.5	2.6	2.6	3.5	3.4		5.0	5.0	
						23.2		7.7		29.7		35.6		2.6			3.2			5.0		
W4	Sunny	Calm	16:51	Surface	1	23.4	23.4	8.0	8.0	28.5	28.5	107.8	107.8	7.8	7.8	7.2	4.0	4.0	5.6	5.0	5.0	6.3
						23.4		8.0		28.5		107.7		7.8			4.0			5.0		
				Middle	4.5	23.0	23.0	7.9	7.9	29.8	29.8	89.3	89.3	6.5	6.5		4.9	5.1		6.0	6.0	
						23.0		7.9		29.7		89.3		6.5			5.2			6.0		
				Bottom	8	22.9	22.9	7.9	7.9	30.0	30.0	84.2	83.9	6.1	6.1	6.1	7.3	7.6		8.0	8.0	
						22.9		7.9		30.0		83.5		6.0			7.8			8.0		
W5	Sunny	Calm	16:34	Surface	1	23.0	23.0	7.8	7.8	29.8	29.8	106.9	107.1	7.7	7.8	7.4	4.1	4.1	4.6	6.0	6.0	6.0
						23.0		7.8		29.8		107.3		7.8			4.1			6.0		
				Middle	4	22.9	22.9	7.8	7.8	30.0	30.0	95.9	95.6	6.9	6.9		4.6	4.7		5.0	5.0	
						22.9		7.8		30.0		95.3		6.9			4.7			5.0		
				Bottom	7	22.9	22.9	7.8	7.8	30.0	30.0	92.5	92.4	6.7	6.7	6.7	4.9	5.0		7.0	7.0	
						22.9		7.8		30.0		92.3		6.7			5.1			7.0		

Contract No. KL/2010/02
Kai Tak Development – Kai Tak Approach Channel and Kwun Tong Typhoon Shelter Improvement Works (Phase 1)
Water Quality Monitoring Results on 30 November, 2011 (Mid-Flood Tide)

Location	Weather Condition	Sea Condition*	Sampling Time	Depth (m)		Temp (°C)		pH		Salinity (ppt)		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
W1	Sunny	Calm	12:05	Surface	-	-	-	-	-	-	-	-	-	-	-	8.4	-	-	4.6	-	-	3.0
						-		-		-		-		-			-			-		
				Middle	0.6	26.3	26.3	7.5	7.5	8.7	8.7	108.8	108.7	8.4	8.4		4.6	4.6		3.0	3.0	
						26.3		7.4		8.7		108.5		8.3			4.6			3.0		
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
						-		-		-		-		-			-			-		
W2	Sunny	Calm	10:20	Surface	1	24.0	24.0	7.3	7.3	24.6	24.9	24.1	24.0	1.8	1.8	1.8	5.0	4.9	3.4	8.0	8.0	8.0
						23.9		7.3		25.1		23.9		1.7			4.7			8.0		
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Bottom	2	23.3	23.3	7.5	7.5	29.1	29.1	26.2	25.9	1.9	1.9	1.9	1.8	1.9		8.0	8.0	
						23.3		7.5		29.1		25.6		1.9			2.0			8.0		
W3	Sunny	Calm	10:06	Surface	1	24.5	24.5	7.2	7.2	20.3	20.2	27.5	26.8	2.0	2.0	2.0	5.2	5.3	3.8	8.0	8.0	7.5
						24.5		7.2		20.1		26.1		1.9			5.3			8.0		
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	
						-		-		-		-		-			-			-		
				Bottom	2	23.3	23.3	7.6	7.6	29.3	29.3	29.2	29.1	2.1	2.1	2.1	2.3	2.3		7.0	7.0	
						23.3		7.6		29.3		29.0		2.1			2.3			7.0		
W4	Sunny	Calm	10:57	Surface	1	23.2	23.2	7.8	7.8	27.8	27.8	104.4	104.3	7.6	7.6	7.8	2.9	2.9	3.8	8.0	8.0	8.0
						23.2		7.8		27.8		104.1		7.6			2.9			8.0		
				Middle	4	22.9	22.9	7.9	7.9	29.7	29.7	108.7	108.7	7.9	7.9		2.1	2.1		8.0	8.0	
						22.9		7.9		29.7		108.6		7.9			2.1			8.0		
				Bottom	7	22.9	22.9	7.9	7.9	30.0	30.0	96.9	96.7	7.0	7.0	7.0	6.0	6.3		8.0	8.0	
						22.9		7.9		30.0		96.4		7.0			6.5			8.0		
W5	Sunny	Calm	11:12	Surface	1	23.1	23.1	7.9	7.9	29.6	29.6	87.7	87.6	6.3	6.3	6.2	4.6	4.6	5.3	12.0	12.0	9.0
						23.1		7.9		29.6		87.4		6.3			4.6			12.0		
				Middle	4	23.0	23.0	7.8	7.8	29.9	29.9	83.3	83.2	6.0	6.0		4.8	4.8		7.0	7.0	
						23.0		7.8		29.9		83.0		6.0			4.8			7.0		
				Bottom	7	22.9	22.9	7.8	7.8	30.0	30.0	82.5	82.5	6.0	6.0	6.0	6.4	6.6		8.0	8.0	
						22.9		7.8		30.0		82.4		6.0			6.8			8.0		

Remark: *Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Contract No. KL/2010/02
Kai Tak Development – Kai Tak Approach Channel and Kwun Tong Typhoon Shelter Improvement Works (Phase 1)
Metal Results on 30 November 2011

Mid-Ebb Tide

Location	Depth	Nitrate-Nitrogen,mg NO3-N/L			Cadmium	Chromium	Copper	Mercury	Nickel	Lead	Silver	Zinc
		Value	average	Average	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L
W1	Surface	- -	-	4.7	- -	- -	- -	- -	- -	- -	- -	- -
	Middle	4.6 4.7	4.7		0.4 0.4	1.4 2.2	3.4 3.2	0.3 0.3	1.3 1.3	2.2 1.4	<0.2 <0.2	16 16
	Bottom	- -	-		- -	- -	- -	- -	- -	- -	- -	- -
W2	Surface	- -	-	3.3	- -	- -	- -	- -	- -	- -	- -	- -
	Middle	3.2 3.3	3.3		0.4 0.5	3.1 3.4	4.2 5.1	0.4 0.3	1.5 1.3	1.3 1.5	<0.2 <0.2	18 17
	Bottom	- -	-		- -	- -	- -	- -	- -	- -	- -	- -
W3	Surface	2.6 2.5	2.6	3.0	0.4 0.4	2.1 2.2	3.9 3.8	0.2 0.2	1.2 1.5	1.0 1.3	<0.2 <0.2	14 14
	Middle	- -	-		- -	- -	- -	- -	- -	- -	- -	- -
	Bottom	3.5 3.5	3.5		0.2 0.1	2.1 1.2	3.5 3.3	0.3 0.4	1.1 1.2	1.4 1.3	<0.2 <0.2	11 11
W4	Surface	0.6 0.6	0.6	0.5	0.2 0.3	2.1 2.1	2.5 2.4	0.4 0.5	1.2 1.3	2.1 2.2	<0.2 <0.2	11 14
	Middle	0.4 0.4	0.4		0.4 0.4	2.5 2.5	4.2 4.4	0.4 0.1	1.2 1.4	1.1 1.3	<0.2 <0.2	16 16
	Bottom	0.5 0.6	0.5		0.4 0.3	1.1 1.2	2.5 2.4	0.1 0.4	1.3 1.2	1.3 1.2	<0.2 <0.2	12 11
W5	Surface	0.5 0.6	0.5	0.6	0.4 0.4	2.1 2.3	3.1 3.0	0.3 0.4	1.1 1.1	0.9 1.1	<0.2 <0.2	11 19
	Middle	0.4 0.4	0.4		0.3 0.4	1.2 1.3	3.2 3.0	0.2 0.3	1.2 1.2	1.5 1.2	<0.2 <0.2	13 12
	Bottom	0.8 0.8	0.8		0.4 0.2	2.4 2.2	3.1 3.3	0.2 0.2	1.4 1.4	2.0 2.1	<0.2 <0.2	11 11

Mid-Flood Tide

Location	Depth	Nitrate-Nitrogen			Cadmium	Chromium	Copper	Mercury	Nickel	Lead	Silver	Zinc
		Value	average	Average	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L
W1	Surface	- -	-	1.8	- -	- -	- -	- -	- -	- -	- -	- -
	Middle	1.7 1.8	1.8		0.2 0.1	1.2 1.5	5.3 5.5	0.2 0.2	2.2 1.2	1.2 1.3	<0.2 <0.2	13 12
	Bottom	- -	-		- -	- -	- -	- -	- -	- -	- -	- -
W2	Surface	1.5 1.3	1.4	1.6	0.2 0.2	1.3 2.1	4.0 4.2	0.2 0.2	3.0 3.0	1.0 1.0	<0.2 <0.2	11 15
	Middle	- -	-		- -	- -	- -	- -	- -	- -	- -	- -
	Bottom	1.9 1.8	1.9		0.1 0.1	2.3 1.4	4.2 4.2	0.4 0.4	2.3 2.4	0.9 1.4	<0.2 <0.2	19 16
W3	Surface	1.5 1.6	1.6	1.6	0.1 0.4	2.1 2.1	5.0 4.2	0.2 0.1	0.2 0.8	1.6 2.1	<0.2 <0.2	15 16
	Middle	- -	-		- -	- -	- -	- -	- -	- -	- -	- -
	Bottom	1.6 1.5	1.6		0.1 0.4	2.1 2.0	3.0 3.2	0.2 0.2	3.3 3.4	1.2 0.8	<0.2 <0.2	12 12
W4	Surface	1.4 1.4	1.4	1.4	0.2 0.2	1.4 1.1	5.1 5.0	0.2 0.4	2.1 1.4	1.3 1.2	<0.2 <0.2	13 17
	Middle	1.3 1.3	1.3		0.3 0.2	1.4 2.4	3.2 3.3	0.4 0.4	2.3 3.3	2.0 1.3	<0.2 <0.2	19 14
	Bottom	1.4 1.4	1.4		0.1 0.5	1.1 3.5	4.4 5.3	0.1 0.3	2.4 3.3	1.0 1.4	<0.2 <0.2	15 17
W5	Surface	1.0 1.1	1.1	1.5	0.4 0.1	3.1 3.1	4.2 4.4	0.1 0.4	2.1 1.7	1.6 1.4	<0.2 <0.2	14 10
	Middle	1.8 1.8	1.8		0.4 0.5	2.1 2.1	5.0 4.0	0.5 0.3	3.4 2.8	1.5 1.4	<0.2 <0.2	15 15
	Bottom	1.5 1.5	1.5		0.1 0.1	1.1 1.0	5.3 4.2	0.3 0.1	2.4 1.9	1.2 1.2	<0.2 <0.2	20 20

Remark: *Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

APPENDIX E
LABORATORY TESTING REPORT FOR WATER QUALITY MONITORING

WELLAB 匯力 Testing & Research

WELLAB LIMITED
Rms 816, 1516 &1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
RM 1710, Technology Park,
18 On Lai Street,
Shatin, N.T., Hong Kong

Laboratory No.:	14709-V1
Date of Issue:	2012-03-14
Date Received:	2011-11-30
Date Tested:	2011-11-30
Date Completed:	2011-12-02

ATTN: **Miss Mei Ling Tang** Page: 1 of 5

Sample Description : 42 liquid samples as received by customer said to be water
Project No. : MA11017
Project Name : Contract No. KL/2010/02 Kai Tak Development – Kai Tak Approach Channel & Kwun Tong Typhoon Shelter Improvement Works (Phase 1)
Custody No. : MA11017/111130
Sampling Date : 2011-11-30

Test Requested & Methodology:

Item	Parameters	Ref. Method	Limit of Reporting
1	Suspended Solids (SS)	APHA 17ed 2540 D	*0.5 mg/L
2	Nitrate-nitrogen (NO_3-N)	In-house Method SOP056 (FIA)	*0.01 mg NO_3^--N/L
3	Cadmium (Cd)	In-house Method SOP 053 (ICP-ES) and SOP 076 (ICP-MS)	*0.1 µg/L
4	Chromium (Cr)		*0.2 µg/L
5	Copper (Cu)		*0.2 µg/L
6	Mercury (Hg)		*0.2 µg/L
7	Nickel (Ni)		*0.2 µg/L
8	Lead (Pb)		*0.2 µg/L
9	Silver (Ag)		*0.2 µg/L
10	Zinc (Zn)		*0.4 µg/L

Remark: 1) * Limit of Reporting is reported as Detection Limit
2) This report supersedes the one dated 2011/12/02 with certificate number 14709

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
Laboratory Manager

WELLAB LIMITED
Rms 816, 1516 &1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

Laboratory No.:	14709-V1
Date of Issue:	2012-03-14
Date Received:	2011-11-30
Date Tested:	2011-11-30
Date Completed:	2011-12-02

Results:

Sample ID	W1-a	W2-a	W3-a	W3-a	W4-a	W4-a
Sampling Depth	M	M	S	B	S	M
Tide	Mid-Ebb	Mid-Ebb	Mid-Ebb	Mid-Ebb	Mid-Ebb	Mid-Ebb
Sample Number	14709-1	14709-2	14709-3	14709-4	14709-5	14709-6
Suspended Solids (SS), mg/L	8	7	6	5	5	6
Nitrate-nitrogen (NO_3-N), mg NO_3^--N/L	4.6	3.2	2.6	3.5	0.58	0.35
Cadmium (Cd), µg/L	0.4	0.4	0.4	0.2	0.2	0.4
Chromium (Cr), µg/L	1.4	3.1	2.1	2.1	2.1	2.5
Copper (Cu), µg/L	3.4	4.2	3.9	3.5	2.5	4.2
Mercury (Hg), µg/L	0.3	0.4	0.2	0.3	0.4	0.4
Nickel (Ni), µg/L	1.3	1.5	1.2	1.1	1.2	1.2
Lead (Pb), µg/L	2.2	1.3	1.0	1.4	2.1	1.1
Silver (Ag), µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Zinc (Zn), µg/L	16	18	14	11	11	16

Sample ID	W4-a	W5-a	W5-a	W5-a	W1-a	W2-a
Sampling Depth	B	S	M	B	M	S
Tide	Mid-Ebb	Mid-Ebb	Mid-Ebb	Mid-Ebb	Mid-Flood	Mid-Flood
Sample Number	14709-7	14709-8	14709-9	14709-10	14709-11	14709-12
Suspended Solids (SS), mg/L	8	6	5	7	3	8
Nitrate-nitrogen (NO_3-N), mg NO_3^--N/L	0.54	0.53	0.44	0.83	1.7	1.5
Cadmium (Cd), µg/L	0.4	0.4	0.3	0.4	0.2	0.2
Chromium (Cr), µg/L	1.1	2.1	1.2	2.4	1.2	1.3
Copper (Cu), µg/L	2.5	3.1	3.2	3.1	5.3	4.0
Mercury (Hg), µg/L	0.1	0.3	0.2	0.2	0.2	0.2
Nickel (Ni), µg/L	1.3	1.1	1.2	1.4	2.2	3.0
Lead (Pb), µg/L	1.3	0.9	1.5	2.0	1.2	1.0
Silver (Ag), µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Zinc (Zn), µg/L	12	11	13	11	13	11

Remark: 1) < = less than

2) S = Surface, M = Middle, B = Bottom

3) This report supersedes the one dated 2011/12/02 with certificate number 14709

****

WELLAB 滙力 Testing & Research

WELLAB LIMITED
Rms 816, 1516 &1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

Laboratory No.:	14709-V1
Date of Issue:	2012-03-14
Date Received:	2011-11-30
Date Tested:	2011-11-30
Date Completed:	2011-12-02

Results:

Sample ID	W2-a	W3-a	W3-a	W4-a	W4-a	W4-a
Sampling Depth	B	S	B	S	M	B
Tide	Mid-Flood	Mid-Flood	Mid-Flood	Mid-Flood	Mid-Flood	Mid-Flood
Sample Number	14709-13	14709-14	14709-15	14709-16	14709-17	14709-18
Suspended Solids (SS), mg/L	8	8	7	8	8	8
Nitrate-nitrogen (NO_3-N), mg NO_3^--N/L	1.9	1.5	1.6	1.4	1.3	1.4
Cadmium (Cd), µg/L	0.1	0.1	0.1	0.2	0.3	0.1
Chromium (Cr), µg/L	2.3	2.1	2.1	1.4	1.4	1.1
Copper (Cu), µg/L	4.2	5.0	3.0	5.1	3.2	4.4
Mercury (Hg), µg/L	0.4	0.2	0.2	0.2	0.4	0.1
Nickel (Ni), µg/L	2.3	0.2	3.3	2.1	2.3	2.4
Lead (Pb), µg/L	0.9	1.6	1.2	1.3	2.0	1.0
Silver (Ag), µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Zinc (Zn), µg/L	19	15	12	13	19	15

Sample ID	W5-a	W5-a	W5-a	W1-b	W2-b	W3-b
Sampling Depth	S	M	B	M	M	S
Tide	Mid-Flood	Mid-Flood	Mid-Flood	Mid-Ebb	Mid-Ebb	Mid-Ebb
Sample Number	14709-19	14709-20	14709-21	14709-22	14709-23	14709-24
Suspended Solids (SS), mg/L	12	7	8	8	7	6
Nitrate-nitrogen (NO_3-N), mg NO_3^--N/L	1.0	1.8	1.5	4.7	3.3	2.5
Cadmium (Cd), µg/L	0.4	0.4	0.1	0.4	0.5	0.4
Chromium (Cr), µg/L	3.1	2.1	1.1	2.2	3.4	2.2
Copper (Cu), µg/L	4.2	5.0	5.3	3.2	5.1	3.8
Mercury (Hg), µg/L	0.1	0.5	0.3	0.3	0.3	0.2
Nickel (Ni), µg/L	2.1	3.4	2.4	1.3	1.3	1.5
Lead (Pb), µg/L	1.6	1.5	1.2	1.4	1.5	1.3
Silver (Ag), µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Zinc (Zn), µg/L	14	15	20	16	17	14

Remark: 1) < = less than

2) S = Surface, M = Middle, B = Bottom

3) This report supersedes the one dated 2011/12/02 with certificate number 14709

****

WELLAB 匯力 Testing & Research

WELLAB LIMITED
Rms 816, 1516 &1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

Laboratory No.:	14709-V1
Date of Issue:	2012-03-14
Date Received:	2011-11-30
Date Tested:	2011-11-30
Date Completed:	2011-12-02

Results:

Sample ID	W3-b	W4-b	W4-b	W4-b	W5-b	W5-b
Sampling Depth	B	S	M	B	S	M
Tide	Mid-Ebb	Mid-Ebb	Mid-Ebb	Mid-Ebb	Mid-Ebb	Mid-Ebb
Sample Number	14709-25	14709-26	14709-27	14709-28	14709-29	14709-30
Suspended Solids (SS), mg/L	5	5	6	8	6	5
Nitrate-nitrogen (NO_3-N), mg NO_3^--N/L	3.5	0.58	0.36	0.55	0.55	0.44
Cadmium (Cd), µg/L	0.1	0.3	0.4	0.3	0.4	0.4
Chromium (Cr), µg/L	1.2	2.1	2.5	1.2	2.3	1.3
Copper (Cu), µg/L	3.3	2.4	4.4	2.4	3.0	3.0
Mercury (Hg), µg/L	0.4	0.5	0.1	0.4	0.4	0.3
Nickel (Ni), µg/L	1.2	1.3	1.4	1.2	1.1	1.2
Lead (Pb), µg/L	1.3	2.2	1.3	1.2	1.1	1.2
Silver (Ag), µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Zinc (Zn), µg/L	11	14	16	11	19	12

Sample ID	W5-b	W1-b	W2-b	W2-b	W3-b	W3-b
Sampling Depth	B	M	S	B	S	B
Tide	Mid-Ebb	Mid-Flood	Mid-Flood	Mid-Flood	Mid-Flood	Mid-Flood
Sample Number	14709-31	14709-32	14709-33	14709-34	14709-35	14709-36
Suspended Solids (SS), mg/L	7	3	8	8	8	7
Nitrate-nitrogen (NO_3-N), mg NO_3^--N/L	0.84	1.8	1.3	1.8	1.6	1.5
Cadmium (Cd), µg/L	0.2	0.1	0.2	0.1	0.4	0.4
Chromium (Cr), µg/L	2.2	1.5	2.1	1.4	2.1	2.0
Copper (Cu), µg/L	3.3	5.5	4.2	4.2	4.2	3.2
Mercury (Hg), µg/L	0.2	0.2	0.2	0.4	0.1	0.2
Nickel (Ni), µg/L	1.4	1.2	3.0	2.4	0.8	3.4
Lead (Pb), µg/L	2.1	1.3	1.0	1.4	2.1	0.8
Silver (Ag), µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Zinc (Zn), µg/L	11	12	15	16	16	12

Remark: 1) < = less than

2) S = Surface, M = Middle, B = Bottom

3) This report supersedes the one dated 2011/12/02 with certificate number 14709

****

WELLAB LIMITED
Rms 816, 1516 &1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

Laboratory No.:	14709-V1
Date of Issue:	2012-03-14
Date Received:	2011-11-30
Date Tested:	2011-11-30
Date Completed:	2011-12-02

Results:

Sample ID	W4-b	W4-b	W4-b	W5-b	W5-b	W5-b
Sampling Depth	S	M	B	S	M	B
Tide	Mid-Flood	Mid-Flood	Mid-Flood	Mid-Flood	Mid-Flood	Mid-Flood
Sample Number	14709-37	14709-38	14709-39	14709-40	14709-41	14709-42
Suspended Solids (SS), mg/L	8	8	8	12	7	8
Nitrate-nitrogen (NO_3-N), mg NO_3^--N/L	1.4	1.3	1.4	1.1	1.8	1.5
Cadmium (Cd), µg/L	0.2	0.2	0.5	0.1	0.5	0.1
Chromium (Cr), µg/L	1.1	2.4	3.5	3.1	2.1	1.0
Copper (Cu), µg/L	5.0	3.3	5.3	4.4	4.0	4.2
Mercury (Hg), µg/L	0.4	0.4	0.3	0.4	0.3	0.1
Nickel (Ni), µg/L	1.4	3.3	3.3	1.7	2.8	1.9
Lead (Pb), µg/L	1.2	1.3	1.4	1.4	1.4	1.2
Silver (Ag), µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Zinc (Zn), µg/L	17	14	17	10	15	20

Remark: 1) < = less than

2) S = Surface, M = Middle, B = Bottom

3) This report supersedes the one dated 2011/12/02 with certificate number 14709

**********END OF REPORT**********

APPENDIX F
QUALITY CONTROL REPORT FOR WATER QUALITY MONITORING

WELLAB 匯力 Testing & Research

WELLAB LIMITED
Rms 816, 1516 &1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
RM 1710, Technology Park,
18 On Lai Street,
Shatin, N.T., Hong Kong

Laboratory No.:	QC14709-V1
Date of Issue:	2012-03-14
Date Received:	2011-11-30
Date Tested:	2011-11-30
Date Completed:	2011-12-02

ATTN: **Miss Mei Ling Tang**

Page: 1 of 2

QC report:

Method Blank

Parameter	Method Blank 1	Method Blank 2	Method Blank 3	Acceptance
Suspended Solids (SS), mg/L	<0.5	<0.5	<0.5	<0.5
Nitrate-nitrogen (NO_3-N), mg NO_3^--N/L	<0.01	<0.01	<0.01	<0.01
Cadmium (Cd), µg/L	<0.1	<0.1	<0.1	<0.1
Chromium (Cr), µg/L	<0.2	<0.2	<0.2	<0.2
Copper (Cu), µg/L	<0.2	<0.2	<0.2	<0.2
Mercury (Hg), µg/L	<0.2	<0.2	<0.2	<0.2
Nickel (Ni), µg/L	<0.2	<0.2	<0.2	<0.2
Lead (Pb), µg/L	<0.2	<0.2	<0.2	<0.2
Silver (Ag), µg/L	<0.2	<0.2	<0.2	<0.2
Zinc (Zn), µg/L	<0.4	<0.4	<0.4	<0.4

Method QC

Parameter	MQC1	MQC2	MQC3	Acceptance
Suspended Solids (SS), %	92	94	97	80-120
Nitrate-nitrogen (NO_3-N), %	98	95	98	80-120
Cadmium (Cd), %	94	93	96	80-120
Chromium (Cr), %	92	95	97	80-120
Copper (Cu), %	91	100	91	80-120
Mercury (Hg), %	94	90	92	80-120
Nickel (Ni), %	99	94	91	80-120
Lead (Pb), %	95	97	94	80-120
Silver (Ag), %	99	93	91	80-120
Zinc (Zn), %	92	94	92	80-120

Remark: 1) < = less than

2) N/A = Not applicable

3) This report is the summary of quality control data for report number 14709-V1

****

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**

Patrick Tse

PATRICK TSE

Laboratory Manager

WELLAB LIMITED
Rms 816, 1516 &1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

Laboratory No.:	QC14709-V1
Date of Issue:	2012-03-14
Date Received:	2011-11-30
Date Tested:	2011-11-30
Date Completed:	2011-12-02
Page:	2 of 2

QC report:

Sample Spike

Parameter	14709-1 spk	14709-21 spk	14709-41 spk	Acceptance
Suspended Solids (SS)	N/A	N/A	N/A	N/A
Nitrate-nitrogen (NO_3-N), %	86	90	87	80-120
Cadmium (Cd), %	97	88	89	80-120
Chromium (Cr), %	92	97	93	80-120
Copper (Cu), %	94	92	96	80-120
Mercury (Hg), %	93	97	88	80-120
Nickel (Ni), %	96	92	92	80-120
Lead (Pb), %	99	96	91	80-120
Silver (Ag), %	87	91	90	80-120
Zinc (Zn), %	93	89	91	80-120

Sample Duplicate

Parameter	14709-20 chk	14709-40 chk	14709-42 chk	Acceptance
Suspended Solids (SS), %	5	5	7	RPD≤20
Nitrate-nitrogen (NO_3-N), %	6	5	6	RPD≤20
Cadmium (Cd), %	4	6	6	RPD≤20
Chromium (Cr), %	7	5	5	RPD≤20
Copper (Cu), %	5	5	5	RPD≤20
Mercury (Hg), %	4	6	5	RPD≤20
Nickel (Ni), %	7	8	4	RPD≤20
Lead (Pb), %	5	5	5	RPD≤20
Silver (Ag), %	N/A	N/A	N/A	RPD≤20
Zinc (Zn), %	5	5	6	RPD≤20

Remark: 1) < = less than

2) N/A = Not applicable

3) This report is the summary of quality control data for report number 14709-V1

**********END OF REPORT**********

APPENDIX G
EVENT AND ACTION PLAN FOR MARINE WATER QUALITY

Appendix G Event and Action Plan for Water Quality

EVENT	ACTION			
	ET	IEC	Engineer	Contractor
Action level being exceeded by one sampling day	1. Repeat *in-situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all work process and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; (The above actions should be taken within 1 working day after the exceedance is identified) 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 Engineer accordingly; 3. Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented. (The above actions should be taken within 1 working day after the exceedance is identified)	1. Inform the Engineer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all work process and methods; 4. Consider changes of working methods or slow down the work process; 5. Discuss with ET and IEC and propose mitigation measures to IEC and the Engineer; 6. Implement the agreed mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)

EVENT	ACTION			
	ET	**IEC**	**Engineer**	**Contractor**
Action level being exceeded by more than one consecutive sampling days	1. Identify source(s) of impact; 2. Inform IEC and Contractor; 3. Check monitoring data, all work process and Contractor's working methods; 4. Discuss mitigation measures with IEC and Contractor; 5. Ensure mitigation measures are implemented; 6. Prepare to increase the monitoring frequency to daily; The above actions should be taken within 1 working day after the exceedance is identified) 7. Repeat measurement on next working 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 Engineer accordingly; 3. Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	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. (The above actions should be taken within 1 working day after the exceedance is identified)	1. Inform the Engineer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check work process and methods; 4. Consider changes of working methods or slow down the work process; 5. Discuss with ET and IEC and propose mitigation measures to IEC and the Engineer within 3 working days; 6. Implement the agreed mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)
Limit level being exceeded by one sampling day	1. Repeat *in-situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods;	1. Inform the Engineer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all work process and methods; 4. Consider changes of working methods

EVENT	ACTION			
	ET	IEC	Engineer	Contractor
	work process and Contractor's working methods; 5. Discuss mitigation measures with IEC, the Engineer and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level. (The above actions should be taken within 1 working day after the exceedance is identified)	and advise the Engineer accordingly; 3. Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	or slow down the work process; 5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within 3 working days; 6. Implement the agreed mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)

EVENT	ACTION			
	ET	IEC	Engineer	Contractor
Limit level being exceeded by more than one consecutive sampling days	1. Identify source(s) of impact; 2. Inform IEC, Contractor and EPD; 3. Check monitoring data, all work process and Contractor's working methods; 4. Discuss mitigation measures with IEC, Engineer and Contractor; 5. Ensure mitigation measures are implemented; 6. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days. (The above actions should be taken within 1 working day after the exceedance is identified)	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; 3. Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	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 marine work until no exceedance of Limit level. (The above actions should be taken within 1 working day after the exceedance is identified)	1. Inform the Engineer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all work process and methods; 4. Consider changes of working methods or slow down the work process; 5. Discuss with ET , IEC and Engineer and propose mitigation measures to IEC and Engineer within 3 working days; 6. Implement the agreed mitigation measures; 7. As directed by the Engineer, to slow down or to stop all or part of the marine work. (The above actions should be taken within 1 working day after the exceedance is identified)