



PROJECT No.: TCS/00512/09

**DSD CONTRACT NO. DC/2009/13
CONSTRUCTION OF SEWAGE TREATMENT WORKS AT
YUNG SHUE WAN AND SOK KWU WAN**

**YUNG SHUE WAN PORTION AREA
QUARTERLY ENVIRONMENTAL MONITORING AND
AUDIT (EM&A) REPORT FOR POST
COMMISSIONING – NOVEMBER 2015 TO JANUARY
2016**

PREPARED FOR
LEADER CIVIL ENGINEERING CORPORATION LIMITED

Quality Index

| Date | Reference No. | Prepared By | Approved By |
|--------------|-------------------------|--|---|
| 3 March 2016 | TCS00512/09/600/R0941v2 |  |  |
| | | Nicola Hon Environmental Consultant | T.W. Tam Environmental Team Leader |

| Version | Date | Description |
|----------------|--------------|--|
| 1 | 1 March 2016 | First Submission |
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| | | |

AECOM CDM Joint Venture

Chief Engineer/Harbour Area Treatment Scheme
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Attention: Mr P.F. Ma

Your reference:

Our reference: 05117/6/16/449848

Date: 3 March 2016

BY FAX

Dear Sir,

Contract No. DC/2009/13

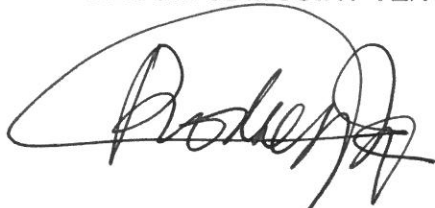
**Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan
Yung Shue Wan Portion Area**

Quarterly EM&A Report for Post Commissioning – November 2015 to January 2016

We refer to the Environmental Permit (EP-282/2007) and the email from the Environmental Team, Action-United Environmental Services and Consulting (AUES), with the revised report for the captioned project, dated 3 March 2016. We have no comment and have verified the captioned report.

Yours faithfully

AECOM CDM JOINT VENTURE



Rodney Ip
Independent Environmental Checker

ICWR/wwsc

| | | |
|----|--------------------------|----------------------------|
| cc | Leader Civil Engineering | (Attn: Mr Calvin Li) |
| | AUES | (Attn: Mr T.W. Tam) |
| | ER/LAMMA | (Attn: Mr K. K. Kam) |
| | CDM | (Attn: Mr John G Dryburgh) |

EXECUTIVE SUMMARY

- ES.01. The Leader Civil Engineering Corporation Limited (Leader) has been awarded the *Contract DC/2009/13 - Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan* (the Project) by the Drainage Services Department (DSD) on 4 May 2010. This Project is part of an overall plan approved under a statutory EIA for Outlying Islands Sewerage Stage 1 Phase 2 Package J – Sok Kwu Wan Sewage Collection and Treatment (Register No. AEIAR-075/2003) and Disposal Facilities and Outlying Islands Sewerage Stage 1 Phase 1 Package C – Yung Shue Wan Sewage Treatment Works and Outfall (Register No. EIA-124/BC). The Environmental Permit (No. EP-281/2007/A and EP-282/2007) for the Project have been obtained by the DSD on 29 June 2007 for the relevant works.
- ES.02. For ease of reporting, the EM&A report under the Project is separated two stand-alone parts:
(a) Sok Kwu Wan (under EP No. 281/2007/A);
(b) Yung Shue Wan (under EP No. 282/2007).
- ES.03. According to the EM&A Manual Section 4.9 of Yung Shue Wan, Operation Phase Monitoring shall be conducted during Sewage Treatment Work (STW) commissioning for a year period. Upon completion of the construction phase of the project, commissioning of the STW of Yung Shue Wan was commenced on 1 February 2015.
- ES.04. The main objective of the post-commissioning monitoring work is to ensure that the water quality in Yung Shue Wan due to outfall discharge is more or less in line with the EIA prediction (i.e. no deterioration in local water quality).
- ES.05. According to the EM&A Manual Section 12.5.1, a total of four quarterly summary reports for the post-commissioning monitoring should be prepared with appropriate statistical analyses to show the water quality changes before and after the commissioning the outfall.
- ES.06. This is the 4th Quarterly Post- Commissioning Monitoring Report prepared for Operation Phase of Yung Shue Wan Sewage Treatment Plant for the period of 1 November 2015 to 31 January 2016 (Reporting Period).
- ES.07. In the Reporting Period, marine water quality monitoring was conducted on 3 and 19 November 2015, 1 and 17 December 2015, 7 and 19 January 2016 at the designated monitoring locations. Statistical analysis for the monitoring result was made to compare to the baseline monitoring data. Overall, all the monitoring result obtained during operation phase is similar to the baseline data.
- ES.08. In order to minimize the odour nuisance, all proposed MBR feed pump station and sludge dewatering room would be enclosed and the outlet air from these facilities would be properly treated by deodorization facility. The performance test for the deodorization facility was conducted upon installation and the test report shown that the deodorization facility at YSWSTP could achieve 99.5% odour removal which in line with the EIA prediction.
- ES.09. In the Reporting Period, a total of two (2) Action Level exceedances of parameters of E.coli were recorded at WY2 and WY3 in the Reporting Period. In view of the measurement result, high values of E.coli were also at control station on the same day. It is considered that exceedances were due to natural variation. No deterioration in local water quality related to the project was found which in line with the prediction to the EIA prediction.

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1 INTRODUCTION

PROJECT BACKGROUND

- 1.01 The *Contract DC/2009/13 - Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan* (the Project) is part of an overall plan approved under a statutory EIA for Outlying Islands Sewerage Stage 1 Phase 2 Package J – Sok Kwu Wan Sewerage Collection and Treatment (Register No. AEIAR-075/2003) and Disposal Facilities and Outlying Islands Sewerage Stage 1 Phase 1 Package C – Yung Shue Wan Sewerage Treatment Works and Outfall (Register No. EIA-124/BC). The Environmental Permit (EP) No. EP-281/2007A and EP-282/2007 for the Project have been obtained by the DSD for the relevant works. The site layout plan for the captioned work under the Project is showing in *Appendix A*.
- 1.02 Action-United Environmental Services and Consulting (AUES) has been commissioned by Leader as the ET to implement the relevant EM&A programme including Construction (Impact and Post- Construction Monitoring) and Operation (Post- Commissioning Monitoring) Phases.
- 1.03 For ease of reporting, the EM&A report under the Project is separated two stand-alone parts:
(a) Sok Kwu Wan (under EP No. 281/2007/A);
(b) Yung Shue Wan (under EP No. 282/2007).
- 1.04 The construction of Sok Kwu Wan and Yung Shue Wan were respectively commenced on **27 July 2010** and **14 September 2010**. Moreover, all the construction works at Yung Shue Wan and Sok Kwu Wan were completed on **31 December 2014** and **31 May 2015** respectively.
- 1.05 According to the EM&A Manual Section 4.9 of Yung Shue Wan, Operation Phase Monitoring shall be conducted during Sewage Treatment Work (STW) commissioning for a year period. Upon completion of the construction phase of the project, commissioning of the STW of Yung Shue Wan was commenced on 1 February 2015.
- 1.06 The main objective of the post-commissioning monitoring work is to ensure that the water quality in Yung Shue Wan due to outfall discharge is more or less in line with the EIA prediction (i.e. no deterioration in local water quality)
- 1.07 This is the 4th Quarterly Post- Commissioning Monitoring Report prepared for Operation Phase of Yung Shue Wan Sewerage Treatment Plant for the period of 1 November 2015 to 31 January 2016 (Reporting Period).

REPORT STRUCTURE

- 1.08 The Post- Commissioning Environmental Monitoring and Audit (EM&A) Report – Yung Shue Wan structures into the following sections:-
- | | |
|------------------|--|
| SECTION 1 | INTRODUCTION |
| SECTION 2 | POST- COMMISSIONING MONITORING REQUIREMENTS |
| SECTION 3 | WATER QUALITY MONITORING RESULTS |
| SECTION 4 | ODOUR MONITORING RESULTS |
| SECTION 5 | CONCLUSIONS |

2 POST- COMMISSIONING MONITORING REQUIREMENTS

ENVIRONMENTAL ASPECT

2.01 The post-commissioning EM&A programme only included the marine water quality monitoring. The detailed monitoring requirement is presented in the following sub-sections.

2.02 A summary of the Marine Water monitoring parameters is listed in *Table 2-1*:

Table 2-1 Summary of the Marine Water monitoring parameters of EM&A Requirements

| Measurement | Parameters |
|---------------------|--|
| In-situ | <ul style="list-style-type: none"> • Dissolved Oxygen Concentration (mg/L); • Dissolved Oxygen Saturation (%); • Turbidity (NTU); • pH unit; • Salinity (ppt); • Water depth (m); and • Temperature (°C). |
| Laboratory Analysis | <ul style="list-style-type: none"> • Suspended Solids (mg/L) • Ammonia-Nitrogen (mg/L) • Total Inorganic Nitrogen as N (mg/L) • E Coli (cfu/100mL) |

MONITORING LOCATIONS

2.03 The marine water quality monitoring stations were adopted as recommended in the *EM&A Manual Section 4.5.1*. Two control stations (CY1 and CY2) were identified at locations representative of the project site in its undisturbed condition. Three impact stations (WY1, WY2 and WY3) were identified in the vicinity of sensitive receivers (the coral colonies in the vicinity of Yung Shue Wan, and secondary contact recreation subzone). Details of the marine water monitoring stations are described in *Table 2-2*. The graphical of marine water quality monitoring stations is shown in *Appendix B*.

Table 2-2 Location of the Marine Water Quality Monitoring Station

| Monitoring Station | Description | Coordinates | |
|--------------------|---|-------------|----------|
| | | Easting | Northing |
| WY1 | Coral Station on seawall at STW Site | 829 170 | 809 550 |
| WY2 | Coral colonies at Shek Kok Tsui | 829 000 | 810 400 |
| WY3 | Coral colonies at O Tsai (headland N of YSW ferry pier) | 829 200 | 809 850 |
| CY1 (flood) | Control Station | 828 400 | 810 800 |
| CY2 (ebb) | Control Station | 828 000 | 808 800 |

MONITORING FREQUENCY AND PERIOD

2.04 The post-commissioning monitoring was basically carried out in accordance with the requirements in the EM&A Manual Sections 4.9. The marine water quality monitoring requirements are listed as follows:

Parameters: Duplicate in-situ measurements: water depth, temperature, Dissolved Oxygen, pH, turbidity and salinity;

HOKLAS-accredited laboratory analysis: Suspended Solids, Ammonia as N (NH₃-N), Total Inorganic Nitrogen (TIN) and *E-coli*.

Frequency: 2 occasions per month (mid-ebb and mid-flood tides)

Sampling Depth Two depths: 1m below water surface and 1m above sea bottom

Duration: One year monitoring upon the STW commissioning

MONITORING EQUIPMENT

2.05 The monitoring equipments adopted for the EM&A program was proposed by ET. The equipments used for monitoring is listed in *Table 2-3* as below.

Table 2-3 Monitoring Equipments Used in EM&A Program

| <i>Marine Water quality</i> | |
|---|--|
| A Digital Global Positioning System | GPS12 Garmin |
| Water Depth Detector | Eagle Sonar |
| Water Sampler | A 2-litre transparent PVC cylinder with latex cups at both ends |
| Thermometer & DO meter | YSI Model 6820 Multifunctional Meter or YSI Professional DSS Multifunctional Meter |
| pH meter | YSI Model 6820 Multifunctional Meter or YSI Professional DSS Multifunctional Meter |
| Turbidimeter | YSI Model 6820 Multifunctional Meter or YSI Professional DSS Multifunctional Meter |
| Salinometer | YSI Model 6820 Multifunctional Meter or YSI Professional DSS Multifunctional Meter |
| Sample Container | High density polythene bottles (provided by laboratory) |
| Storage Container | 'Willow' 33-litter plastic cool box with Ice pad |
| Suspended Solids; Ammonia as N (NH ₃ -N), Total Inorganic Nitrogen (TIN) and <i>E-coli</i> | HOKLAS-accredited laboratory (ALS Technichem (HK) Pty Ltd) |

- i. **Dissolved Oxygen and Temperature Measuring Equipment** – The instrument should be a portable and weatherproof dissolved oxygen (DO) measuring instrument complete with cable, sensor and a DC power source. The equipment should be capable of measuring as a DO level in the range of 0 – 20mg L⁻¹ and 0 – 200% saturation; and a temperature of 0 – 45 degree Celsius.
- ii. **pH Meter** – The instrument should consist of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It should be readable to 0.1 pH in arrange of 0 to 14.
- iii. **Turbidity (NTU) Measuring Equipment** – The instrument should be a portable and weatherproof turbidity measuring instrument using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU.
- iv. **Water Sampling Equipment** – A water sampler should comprise a transparent PVC cylinder with a capacity not less than 2 litres, which can be effectively sealed with latex cups at both ends. The sampler should have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth.
- v. **Water Depth Detector** – A portable, battery-operated echo sounder should be used for the determination of water depth at each designated monitoring station. This unit can either be hand held or affixed to the bottom of the work boat.
- vi. **Salinity Measuring Equipment** – A portable salinometer capable of measuring salinity in the range of 0 - 40 parts per thousand (ppt) should be provided for measuring salinity of the water at each monitoring location.
- vii. **Sample Containers and Storage** – Water samples for Suspended Solids should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen).
- viii. **Monitoring Position Equipment** - A hand-held or boat-fixed type digital Differential Global Positioning System (DGPS) with way point bearing indication and Radio Technical Commission for maritime (RTCM) Type 16 error message 'screen pop-up' facilities (for real-time auto-display of error messages and DGPS corrections from the Hong Kong Hydrographic Office), or other equipment instrument of similar accuracy, should be provided and used during marine water monitoring to ensure the monitoring vessel is at the correct location before taking measurements.

- ix. **Suspended Solids, Ammonia-Nitrogen, Total Inorganic Nitrogen and E.Coli Analysis** – Analysis of those parameters shall be carried out in a HOKLAS or other international accredited laboratory following the analytical methods listed in *Table 2-4*.

Table 2-4 Analytical Methods to be applied to Marine Water Quality Samples.

| Determinant | Standard | Detection Limit |
|--------------|--|-----------------|
| SS (mg/L) | APHA 2540D | 0.5mg/L |
| NH3-N (mg/L) | ASTM D3590-89 B(FIA) | 0.005mg/L |
| E-Coli | In-house method, membrane filtration with CHRIMagar Liquid E.coli-coliform culture | 1cfu/100mL |

MONITORING PROCEDURES

- 2.06 The marine water quality monitoring was conducted at the five designated locations at Yung Shue Wan. The sampling procedure including the in-situ monitoring are presented as below:
- 2.07 A Digital Global Positioning System (GPS) was used to identify the designated monitoring stations prior water sampling. A portable, battery-operated echo sounder was used for the determination of water depth at each station. At each station, marine water samples were collected at two depths: 1m below water surface and 1m above sea bottom.
- 2.08 The marine water sampler was lowered into the water body at the predetermined depth. The trigger system of the sampler was activated with a messenger. The opening ends of the sampler then were closed accordingly and water samples were collected.
- 2.09 The sample container was rinsed with a portion of the water sample. The water sample then was transferred to the high-density polythene bottles as provided by the laboratory, labeled with a unique sample number and sealed with a screw cap.
- 2.10 Before commencement of the sampling, general information such as the date and time of sampling, weather condition and tidal condition as well as the personnel responsible for the monitoring were be recorded on the monitoring field data sheet.
- 2.11 A ‘Willow’ 33-liter plastic cool box packed with ice was used to preserve the collected water samples prior to arrival at the laboratory for chemical determination. The water temperature of the cool box was maintained at a temperature as close to 40C as possible without being frozen. Samples collected were delivered to the laboratory upon collection.

In-situ Measurement

Positioning of Monitoring Locations

- 2.12 A digital Global Positioning System (GPS) was used during marine water monitoring to ensure the monitoring vessel is at the correct location when taking measurement and samples.

Depth, Dissolved Oxygen (DO), Temperature, Turbidity, Salinity and pH value

- 2.13 The YSI Model 6820 Multifunctional Meter or YSI Professional DSS Multifunctional Meter was used for marine water in-situ measurement, which automates the measurements and data logging of depth, temperature, dissolved oxygen, dissolved oxygen saturation, turbidity, pH and salinity simultaneously. Before each round of monitoring, the dissolved oxygen probe was calibrated by the wet bulb method and the turbidity and salinity probes checked with distilled water.
- 2.14 The laboratory has be comprehensive quality assurance and quality control programme. For QA/QC procedures, one duplicate samples of every batch of 20 samples is analyzed as followed the HOKLAS accredited requirement.

EQUIPMENT CALIBRATION

- 2.15 The Multi-parameter Water Quality Monitoring System will be calibrated by HOKLAS accredited laboratory of three month intervals. The available calibration certificate will be issued to ensure the performance of Multi-parameter Water Quality Monitoring System to use for in-situ measurement.
- 2.16 Valid calibration certificates of the monitoring equipment used for EM&A program in the Reporting Period would be attached in *Appendix C*.

DATA MANAGEMENT AND DATA QA/QC CONTROL

- 2.17 The monitoring data are handled by the ET's systematic data recording and management, which complies with in-house Quality Management System. Standard Field Data Sheets (FDS) are used in the monitoring programme.
- 2.18 The monitoring data recorded in Multi-parameter Water Quality Monitoring System, are downloaded directly from the equipments at the end of each monitoring day. The downloaded monitoring data are input into a computerized database properly maintained by the ET. The laboratory results are input directly into the computerized database and QA/QC checked by personnel other than those who input the data. For monitoring activities require laboratory analysis, the local laboratory follows the QA/QC requirements as set out under the HOKLAS scheme for all laboratory testing.

DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

- 2.19 The baseline marine water quality monitoring was carried out from 29 July 2010 to 28 December 2010 for consecutive six months. Based on the baseline monitoring data, the proposed Action and Limit Levels for water quality was determined and they are shown in *Table 2-5*.

Table 2-5 Action and Limit Levels of Water Quality Monitoring during Operation Stage of the STP

| Parameter | Performance Criteria | Impact Station | | |
|---|----------------------|----------------|-------|-------|
| | | WY1 | WY2 | WY3 |
| DO Concentration (Surface and Middle) (mg/L) | Action Level | 3.63 | 3.53 | 3.61 |
| | Limit Level | 3.32 | 3.47 | 3.42 |
| DO Concentration (Bottom) (mg/L) | Action Level | 3.33 | 2.92 | 3.36 |
| | Limit Level | 3.23 | 2.63 | 3.14 |
| Turbidity (Depth-Average) (NTU) | Action Level | 10.94 | 14.16 | 14.99 |
| | Limit Level | 17.35 | 15.20 | 16.21 |
| Suspended Solids (Depth-Average) (mg/L) | Action Level | 17.52 | 14.23 | 14.52 |
| | Limit Level | 25.62 | 16.51 | 16.88 |
| Ammonia as N (Depth – Average) (mg/L) | Action Level | 0.098 | 0.090 | 0.095 |
| | Limit Level | 0.104 | 0.095 | 0.099 |
| Total Inorganic Nitrogen as N (Depth-Average) (mg/L) | Action Level | 0.603 | 0.578 | 0.605 |
| | Limit Level | 0.673 | 0.659 | 0.683 |
| <i>E. coli</i> Depth-Average (1cfu/100ml) | Action Level | 28 | 31 | 44 |
| | Limit Level | 610 | 610 | 610 |

Notes:

- The proposed Action/Limit Levels of DO are adopted to be used 5%-ile/1%-ile of baseline data;
- The proposed Action/Limit Levels of Turbidity, SS, Ammonia and TIN are adopted to be used 95%-ile/99%-ile of baseline data;
- *E-coli* performance criteria of Action and Limit Levels are respectively proposed to use 95%-ile baseline data and 610 cfu/100mL geometric mean; and
- All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered necessary.

3 POST-COMMISSIONING WATER QUALITY MONITORING RESULTS

3.01 The Operation Phase EM&A Programme was commenced on 1 February 2015. In this reporting period, 6 monitoring events have been carried out at the designated locations. The monitoring results including in-situ measurements and laboratory testing results are provided in *Appendix D* and the graphical plots of monitoring results are shown in *Appendix E*.

Monitoring Result

3.02 In the Reporting Period, water Monitoring was carried out on 3 and 19 November 2015, 1 and 17 December 2015, 7 and 19 January 2016. Monitoring results of key parameters: dissolved oxygen (DO), turbidity, suspended solids, Ammonia-N, TIN and E.coli are summarized in *Tables 3-1 to 3-8*.

Table 3-1 Summary of Water Quality Results – Mid-ebb Tides (Dissolved Oxygen)

| Sampling date | DO conc. of Depth Ave. of Surf. and Mid Layer (mg/L) | | | | | DO conc. of Depth Ave. of Bottom Layer (mg/L) | | | | |
|---------------|--|------|------|------|------|---|------|------|------|------|
| | WY1 | WY2 | WY3 | CY1 | CY2 | WY1 | WY2 | WY3 | CY1 | CY2 |
| 3-Nov-15 | 6.83 | 6.80 | 6.82 | 6.52 | 6.93 | 6.87 | 6.74 | 6.75 | 6.53 | 6.72 |
| 19-Nov-15 | 7.00 | 7.35 | 7.35 | 7.43 | 7.71 | 7.00 | 7.21 | 7.21 | 7.19 | 7.54 |
| 1-Dec-15 | 7.66 | 7.70 | 7.15 | 7.23 | 7.53 | 7.68 | 7.58 | 7.11 | 7.28 | 7.55 |
| 17-Dec-15 | 7.61 | 7.78 | 7.55 | 7.62 | 7.54 | 7.56 | 7.49 | 7.55 | 7.49 | 7.45 |
| 7-Jan-15 | 8.03 | 8.34 | 8.04 | 8.54 | 8.65 | 7.98 | 8.19 | 7.88 | 8.48 | 8.21 |
| 19-Jan-15 | 7.66 | 7.53 | 7.50 | 7.44 | 7.58 | 7.66 | 7.70 | 7.49 | 7.48 | 7.41 |

Table 3-2 Summary of Water Quality Results – Mid-ebb Tides (Turbidity & Suspended Solids)

| Sampling date | Turbidity Depth Ave. (NTU) | | | | | SS Depth Ave. (mg/L) | | | | |
|---------------|----------------------------|------|------|------|------|----------------------|-------|-------|-------|------|
| | WY1 | WY2 | WY3 | CY1 | CY2 | WY1 | WY2 | WY3 | CY1 | CY2 |
| 3-Nov-15 | 2.45 | 4.51 | 3.79 | 3.88 | 2.60 | 13.00 | 9.00 | 6.00 | 3.50 | 5.00 |
| 19-Nov-15 | 5.25 | 5.43 | 6.35 | 3.28 | 1.50 | 7.00 | 10.00 | 10.00 | 4.00 | 4.00 |
| 1-Dec-15 | 5.28 | 4.50 | 5.98 | 2.13 | 3.38 | 4.00 | 6.00 | 11.50 | 10.00 | 5.50 |
| 17-Dec-15 | 3.93 | 3.73 | 5.08 | 4.08 | 3.60 | 3.50 | 4.50 | 5.00 | 9.50 | 5.50 |
| 7-Jan-15 | 0.90 | 0.78 | 0.70 | 0.80 | 1.00 | 2.00 | 2.50 | 2.00 | 2.00 | 2.50 |
| 19-Jan-15 | 0.97 | 0.24 | 0.63 | 0.10 | 0.05 | 2.50 | 3.00 | 2.50 | 2.00 | <2 |

Table 3-3 Summary of Water Quality Results – Mid-ebb Tides (Ammonia –N and TIN)

| Sampling date | Ammonia-N(mg/L) | | | | | TIN (mg/L) | | | | |
|---------------|-----------------|-------|-------|-------|-------|------------|------|------|------|------|
| | WY1 | WY2 | WY3 | CY1 | CY2 | WY1 | WY2 | WY3 | CY1 | CY2 |
| 3-Nov-15 | 0.04 | 0.04 | 0.04 | 0.07 | <0.01 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| 19-Nov-15 | 0.02 | <0.01 | <0.01 | 0.02 | <0.01 | 0.25 | 0.09 | 0.18 | 0.29 | 0.13 |
| 1-Dec-15 | 0.06 | <0.01 | 0.01 | 0.03 | <0.01 | 0.21 | 0.11 | 0.13 | 0.14 | 0.08 |
| 17-Dec-15 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.08 | 0.08 | 0.09 | 0.08 | 0.11 |
| 7-Jan-15 | 0.02 | 0.01 | 0.02 | <0.01 | <0.01 | 0.26 | 0.22 | 0.25 | 0.21 | 0.22 |
| 19-Jan-15 | <0.01 | <0.01 | <0.01 | 0.06 | <0.01 | 0.12 | 0.11 | 0.11 | 0.18 | 0.11 |

Table 3-4 Summary of Water Quality Results – Mid-ebb Tides (E.coli)

| Sampling date | E.coli (CFU/100ml) | | | | |
|---------------|--------------------|--------------|-------|--------------|--------------|
| | WY1 | WY2 | WY3 | CY1 | CY2 |
| 3-Nov-15 | 4.00 | 2.00 | 14.00 | 5.50 | not detected |
| 19-Nov-15 | 6.00 | not detected | 7.50 | not detected | not detected |
| 1-Dec-15 | 3.00 | 2.00 | 4.00 | 3.50 | not detected |
| 17-Dec-15 | not detected | not detected | 1.00 | 1.50 | 5.50 |
| 7-Jan-15 | 12.00 | 4.00 | 9.50 | not detected | not detected |
| 19-Jan-15 | 4.00 | not detected | 10.00 | 6.00 | not detected |

Table 3-5 Summary of Water Quality Results – Mid-flood Tides (Dissolved Oxygen)

| Sampling date | DO conc. of Depth Ave. of Surf. and Mid Layer (mg/L) | | | | | DO conc. of Depth Ave. of Bottom Layer (mg/L) | | | | |
|---------------|--|------|------|------|------|---|------|------|------|------|
| | WY1 | WY2 | WY3 | CY1 | CY2 | WY1 | WY2 | WY3 | CY1 | CY2 |
| 3-Nov-15 | 6.83 | 7.01 | 6.89 | 6.98 | 6.89 | 6.75 | 6.70 | 6.76 | 6.62 | 6.71 |
| 19-Nov-15 | 7.17 | 7.43 | 7.61 | 7.43 | 7.32 | 7.08 | 7.36 | 7.60 | 7.59 | 7.37 |
| 1-Dec-15 | 7.60 | 7.27 | 7.47 | 7.54 | 8.34 | 7.51 | 7.16 | 7.34 | 7.43 | 8.15 |
| 17-Dec-15 | 7.49 | 7.52 | 7.50 | 7.50 | 7.59 | 7.45 | 7.45 | 7.46 | 7.41 | 7.48 |
| 7-Jan-15 | 7.82 | 8.10 | 8.05 | 8.31 | 7.76 | 7.70 | 8.09 | 8.07 | 8.19 | 7.51 |
| 19-Jan-15 | 7.69 | 7.58 | 7.64 | 7.65 | 7.57 | 7.58 | 7.85 | 7.64 | 7.63 | 7.40 |

Table 3-6 Summary of Water Quality Results – Mid- flood Tides (Turbidity & Suspended Solids)

| Sampling date | Turbidity Depth Ave. (NTU) | | | | | SS Depth Ave. (mg/L) | | | | |
|---------------|----------------------------|------|------|------|------|----------------------|-------|-------|------|-------|
| | WY1 | WY2 | WY3 | CY1 | CY2 | WY1 | WY2 | WY3 | CY1 | CY2 |
| 3-Nov-15 | 4.53 | 4.20 | 4.49 | 4.07 | 4.73 | 14.50 | 6.00 | 4.50 | 8.00 | 10.00 |
| 19-Nov-15 | 3.40 | 2.33 | 2.38 | 2.53 | 2.50 | 10.00 | 7.00 | 11.00 | 7.00 | 6.00 |
| 1-Dec-15 | 4.08 | 3.98 | 4.23 | 4.18 | 3.43 | 9.00 | 12.50 | 12.00 | 5.00 | 6.00 |
| 17-Dec-15 | 3.91 | 3.65 | 3.70 | 3.34 | 3.75 | 4.50 | 4.00 | 4.00 | 3.00 | 6.50 |
| 7-Jan-15 | 0.85 | 0.55 | 0.95 | 0.58 | 0.68 | 3.00 | 3.00 | 3.50 | 2.00 | 3.00 |
| 19-Jan-15 | 1.13 | 1.15 | 0.61 | 0.73 | 0.10 | 3.00 | 3.00 | 3.00 | 2.00 | <2 |

Table 3-7 Summary of Water Quality Results – Mid- flood Tides (Ammonia –N and TIN)

| Sampling date | Ammonia-N(mg/L) | | | | | TIN (mg/L) | | | | |
|---------------|-----------------|-------|-------|-------|-------|------------|------|------|------|------|
| | WY1 | WY2 | WY3 | CY1 | CY2 | WY1 | WY2 | WY3 | CY1 | CY2 |
| 3-Nov-15 | 0.04 | 0.02 | 0.02 | 0.04 | 0.01 | 0.08 | 0.08 | 0.10 | 0.08 | 0.04 |
| 19-Nov-15 | 0.02 | 0.03 | 0.01 | <0.01 | 0.02 | 0.33 | 0.30 | 0.27 | 0.36 | 0.19 |
| 1-Dec-15 | 0.02 | 0.05 | 0.03 | 0.04 | <0.01 | 0.15 | 0.21 | 0.20 | 0.23 | 0.09 |
| 17-Dec-15 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.09 | 0.08 | 0.10 | 0.07 | 0.11 |
| 7-Jan-15 | 0.02 | 0.01 | 0.01 | 0.02 | <0.01 | 0.24 | 0.22 | 0.24 | 0.23 | 0.22 |
| 19-Jan-15 | <0.01 | <0.01 | <0.01 | 0.04 | <0.01 | 0.12 | 0.11 | 0.11 | 0.15 | 0.11 |

Note: *Bolded and underlined indicated Limit Level exceedance.*

Table 3-8 Summary of Water Quality Results – Mid- flood Tides (E.coli)

| Sampling date | E.coli (CFU/100ml) | | | | |
|---------------|--------------------|--------------|--------------|--------------|--------------|
| | WY1 | WY2 | WY3 | CY1 | CY2 |
| 3-Nov-15 | 5.50 | 1.00 | 10.50 | 2.00 | 1.00 |
| 19-Nov-15 | 5.00 | 1.50 | 2.50 | 5.00 | not detected |
| 1-Dec-15 | 5.50 | 33.50 | 47.50 | 80.00 | not detected |
| 17-Dec-15 | 1.00 | not detected | not detected | not detected | 6.00 |
| 7-Jan-15 | 3.50 | 1.00 | 8.50 | not detected | 1.00 |
| 19-Jan-15 | 8.00 | 1.00 | 3.50 | 5.00 | not detected |

Note: *(1) Bolded and italic indicated Action Level exceedance.*

- 3.03 Statistical analysis for the monitoring result was made to compare to the baseline monitoring data. Overall, all the monitoring result obtained during operation phase is fall within and similar to the baseline data. The comparison of operation phase and baseline monitoring result is presented in **Tables 3-9**. Moreover, a summary of exceedances for the key parameters are shown in **Table 3-10**.

Table3-9 Fluctuation Ranges for the Monitored Operation Phase Water Quality Parameters

| Parameter | | WY1 | WY2 | WY3 | CY1 | CY2 |
|-----------------------|---------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| DO (mg/L) | Surface + Middle | 6.83 – 8.03 (2.65 – 6.99) | 6.80 – 8.34 (3.02 – 7.41) | 6.82 – 8.05 (3.27 – 7.77) | 6.52 – 8.54 (3.46 – 9.87) | 6.89 – 8.65 (3.40 – 9.36) |
| | Bottom | 6.75 – 7.98 (1.58 – 7.65) | 6.70 – 8.19 (1.79 – 6.71) | 6.75 – 8.07 (3.21 – 7.65) | 6.53 – 8.48 (2.55 – 7.47) | 6.71 – 8.21 (3.09 – 7.50) |
| Turbidity (NTU) | | 0.85 – 5.28 (2.00 – 10.83) | 0.24 – 5.43 (2.27 – 10.57) | 0.61 – 6.35 (2.28 – 19.18) | 0.10 – 4.18 (2.03 – 15.32) | 0.05 – 4.73 (2.38 – 16.30) |
| SS (mg/L) | | 2.00 – 14.50 (1.77 – 15.50) | 2.50 – 12.50 (2.13 – 10.77) | 2.00 – 12.00 (3.05 – 27.95) | 2.00 – 10.00 (2.13 – 17.17) | 2.50 – 10.00 (2.40 – 17.50) |
| Ammonia-N (mg/L) | | 0.02 – 0.06 (0.005 – 0.100) | 0.01 – 0.05 (0.005 – 0.090) | 0.01 – 0.04 (0.005 – 0.105) | 0.02 – 0.07 (0.005 – 0.095) | 0.01 – 0.02 (0.005 – 0.099) |
| TIN (mg/L) | | 0.08 – 0.33 (0.047 – 0.643) | 0.08 – 0.30 (0.018 – 0.653) | 0.09 – 0.27 (0.060 – 0.690) | 0.07 – 0.36 (0.060 – 0.680) | 0.04 – 0.22 (0.065 – 0.705) |
| E.coli (CFU/100ml) | | 1.00 – 12.00 (1 – 30) | 1.00 – 33.50 (1 – 42) | 1.00 – 47.50 (1 – 44) | 1.50 – 80.0 (1 – 43) | 1.00 – 6.00 (1 – 47) |

Note:

1. The numbers in brackets denote the range of baseline monitoring result.

Table 3-10 Summary of Exceedances of Marine Water Quality

| Station | DO (Ave of surf. & mid-depth) | | DO (Ave. of Bottom Layer) | | Turbidity (Depth Ave) | | SS (Depth Ave) | | Ammonia – N (Depth Ave) | | TIN (Depth Ave) | | E.coli (Depth Ave) | |
|---------------------------|-------------------------------------|---|---------------------------------|---|-----------------------------|---|----------------------|---|-------------------------------|---|-----------------------|---|--------------------------|---|
| | A | L | A | L | A | L | A | L | A | L | A | L | A | L |
| Mid-Ebb | | | | | | | | | | | | | | |
| WY1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WY2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WY3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mid-Flood | | | | | | | | | | | | | | |
| WY1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WY2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| WY3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| No. of exceed. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |

- 3.04 According to the monitoring result, a total of two (2) Action Level exceedances of parameters of E.coli were recorded at WY2 and WY3 in the Reporting Period. In view of the measurement result, high value of E.coli were also at control station on the same day. It is considered that exceedances were due to natural variation. No deterioration in local water quality related to the project was found which in line with the prediction to the EIA prediction.

4 ODOUR MONITORING RESULTS

- 4.01 As presented in the EIA Report and subsequent Review Report on EIA Study, it was predicted that air quality at the ASRs would satisfy the odour criteria with the proposed mitigation measures. Nevertheless, monitoring would be carried out during the operation phase to monitor the performance of the deodorization facilities.
- 4.02 In order to minimize the odour nuisance, all proposed MBR feed pump station and sludge dewatering room would be enclosed and the outlet air from these facilities would be properly treated by deodorization facility. The performance test for the deodorization facility was conducted upon installation and it aims to achieve 99.5% odour removal.

Methodology

- 4.03 The odour samples of air were collected at the inlet and outlet in accordance with ISC 3rd edition, Method 701 “Determination of Hydrogen Sulphide Content of the Atmosphere”.
- 4.04 Hydrogen sulfide (H₂S), as an odourous indicator gas in this odour removal efficiency test for the deodorizer, was generated by mixing sodium sulfide hydrates and concentrated sulfuric acid at the inlet of the deodorizer. The generation rate of gaseous of H₂S was kept constant by controlling the delivery rate of concentrated sulfuric acid from the dropping funnel. Gaseous sample containing H₂S was withdrawn from each sampling port (inlet and outlet) at a flow rate of 2 L/min., using a sampling pump. H₂S present in the gas stream was collected in the impinger which contained 10 – 15 mL absorbing solution. Sampling time was about 10 minutes to avoid overloading of the absorbing solution while ensuring a large enough sample was collected.
- 4.05 Colorimetric analytical method (ISC 3rd edition, Method 701 “Determination of Hydrogen Sulphide Content of the Atmosphere”) was used to determine the concentration of H₂S in the deodorizer odour removal test.
- 4.06 H₂S will be injected in the inlet as per following table, one sample of inlet H₂S concentration and one sample of outlet H₂S concentration will be measured and the removal efficiency of the deodorizer will be calculated as :-
- 4.07 Efficiency = (1-outlet concentration/inlet concentration) x 100%.

| Injection H2S concentration | Location |
|-----------------------------|----------|
| At least 7 ppm | YSWSTW |

Test Report

- 4.08 According to the test report provided by the laboratory, it shows that the deodorization facility at two DO tanks could achieve over 99.5% odour removal which in line with the EIA prediction. The test reports for performance of deodorization facility at YSWSTW are presented in **Appendix F**.

5 CONCLUSIONS

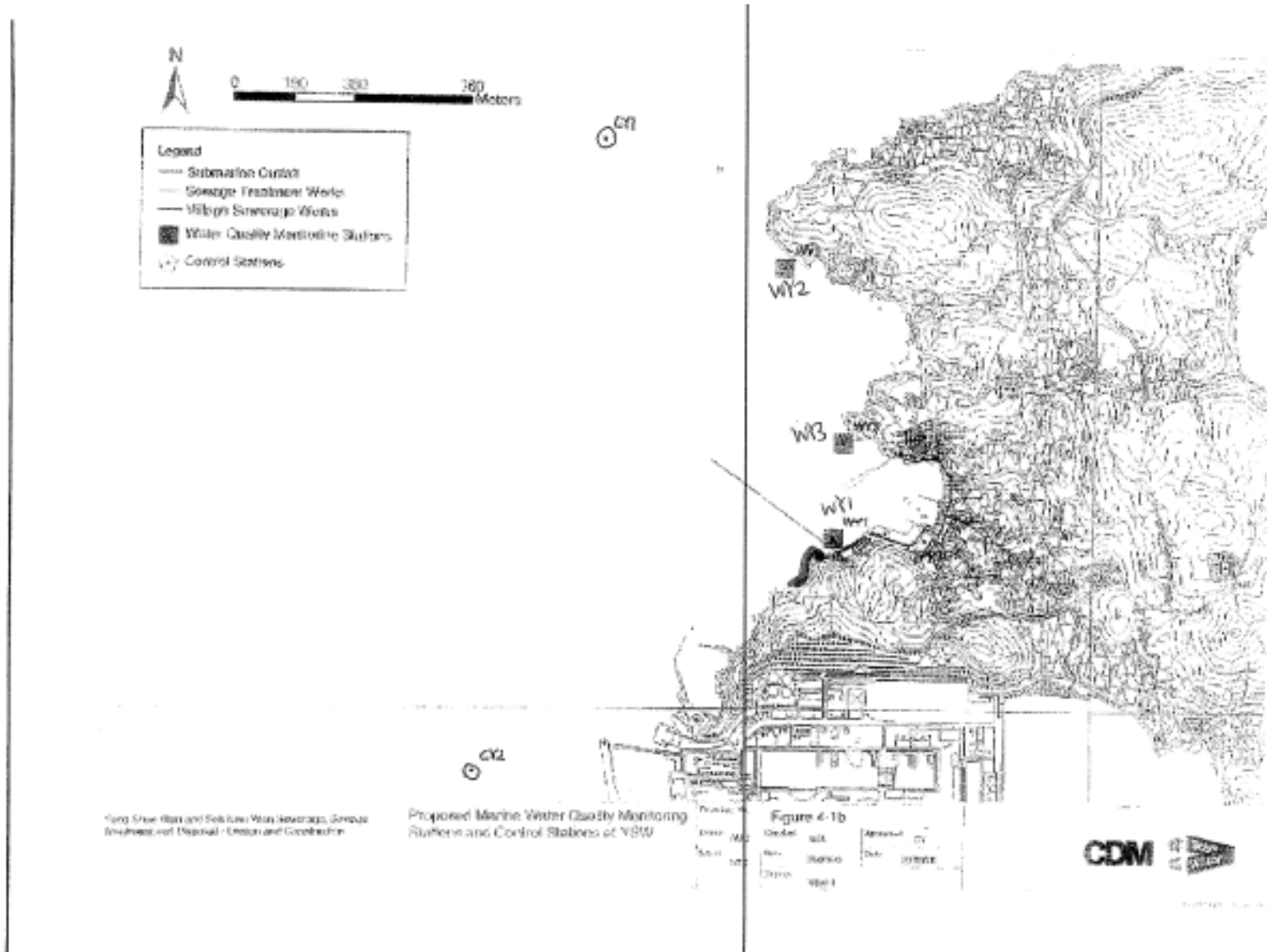
- 5.01 This is the 4th Quarterly Post- Commissioning Monitoring Report prepared for Operation Phase of Yung Shue Wan Sewage Treatment Plant for the period of 1 November 2015 to 31 January 2016.
- 5.02 In the Reporting Period, marine water quality monitoring was conducted on 3 and 19 November 2015, 1 and 17 December 2015, 7 and 19 January 2016 at the designated monitoring locations. Statistical analysis for the monitoring result was made to compare to the baseline monitoring data. Overall, all the monitoring result obtained during operation phase is similar to the baseline data.
- 5.03 In the Reporting Period, a total of two (2) Action Level exceedances of parameters of E.coli were recorded at WY2 and WY3 in the Reporting Period. In view of the measurement result, high values of E.coli were also at control station on the same day. It is considered that exceedances were due to natural variation. No deterioration in local water quality related to the project was found which in line with the prediction to the EIA prediction.
- 5.04 In order to minimize the odour nuisance, all proposed MBR feed pump station and sludge dewatering room would be enclosed and the outlet air from these facilities would be properly treated by deodorization facility. The performance test for the deodorization facility was conducted upon installation and the test report shown that the deodorization facility at YSWSTP could achieve 99.5% odour removal which in line with the EIA prediction.

Appendix A

Site Layout Plan – Yung Shue Wan Portion Area

Appendix B

**Location of Monitoring Stations
(Water Quality)**



Appendix C

Monitoring Equipments Calibration Certificate



ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T: +852 2610 1044
F: +852 2610 2021
www.alsglobal.com

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT: MR BEN TAM
CLIENT: ACTION UNITED ENVIRO SERVICES
ADDRESS: RM A 20/F., GOLD KING IND BLDG,
NO. 35-41 TAI LIN PAI ROAD,
KWAI CHUNG,
N.T., HONG KONG.

WORK ORDER: HK1539523
SUB-BATCH: 0
LABORATORY: HONG KONG
DATE RECEIVED: 14/10/2015
DATE OF ISSUE: 23/10/2015

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.: Sonde 6820 / 650 MDS
Serial No.: 02J0912 / 02K0788 AA
Equipment No.: --
Date of Calibration: 22 October, 2015

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: HK1539523
Sub-Batch: 0
Date of Issue: 23/10/2015
Client: ACTION UNITED ENVIRO SERVICES



Equipment Type: Multifunctional Meter
Brand Name: YSI
Model No.: Sonde 6820 / 650 MDS
Serial No.: 02J0912 / 02K0788 AA
Equipment No.: --
Date of Calibration: 22 October, 2015 **Date of next Calibration:** 22 January, 2016

Parameters:

Conductivity

Method Ref: APHA (21st edition), 2510B

| Expected Reading (uS/cm) | Displayed Reading (uS/cm) | Tolerance (%) |
|--------------------------|----------------------------|---------------|
| 146.9 | 140.9 | -4.1 |
| 6667 | 6281 | -5.8 |
| 12890 | 12580 | -2.4 |
| 58670 | 58650 | 0.0 |
| Tolerance Limit (%) | | ±10.0 |

Dissolved Oxygen

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

| Expected Reading (mg/L) | Displayed Reading (mg/L) | Tolerance (mg/L) |
|-------------------------|--------------------------|------------------|
| 2.53 | 2.66 | +0.13 |
| 5.26 | 5.42 | +0.16 |
| 7.97 | 8.07 | +0.10 |
| 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 | 4.03 | +0.03 |
| 7.0 | 7.02 | +0.02 |
| 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 | 0.00 | -- |
| 10 | 10.02 | +0.2 |
| 20 | 20.62 | +3.1 |
| 30 | 30.07 | +0.2 |
| 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: HK1539523
Sub-Batch: 0
Date of Issue: 23/10/2015
Client: ACTION UNITED ENVIRO SERVICES



Equipment Type: Multifunctional Meter
Brand Name: YSI
Model No.: Sonde 6820 / 650 MDS
Serial No.: 02J0912 / 02K0788 AA
Equipment No.: --
Date of Calibration: 22 October, 2015 Date of next Calibration: 22 January, 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 | 10.11 | +0.1 |
| 20 | 21.01 | +1.0 |
| 40 | 40.34 | +0.3 |
| | Tolerance Limit (°C) | ±2.0 |

Turbidity

Method Ref: APHA (21st edition), 2130B

| Expected Reading (NTU) | Displayed Reading (NTU) | Tolerance (%) |
|------------------------|-------------------------|---------------|
| 0 | 0.0 | -- |
| 4 | 4.1 | +2.5 |
| 40 | 42.0 | +5.0 |
| 80 | 86.1 | +7.6 |
| 400 | 414.1 | +3.5 |
| 800 | 838.1 | +4.8 |
| | Tolerance Limit (%) | ±10.0 |

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

A handwritten signature in blue ink, appearing to read 'Richard Fung Lim Chee'.

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

Appendix D

Monitoring Data Sheet

Contract No. DC/2009/13

**Construction of Sewage Treatment Works
at Yung Shue Wan and Sok Kwu Wan**



Yung Shue Wan

**Post-commissioning Martine Water Monitoring Programme
19-Nov-15**

| Date / Time | Location | Tide | Co-ordinates | | Water Depth m | Sampling Depth m | Temp °C | DO Conc mg/L | DO Saturation % | Turbidity NTU | Salinity ppt | pH unit | SS mg/l | Ammonia N mg/l | TIN mg/l | E.coli 1CFU/100ml |
|---------------------|----------|------|--------------|--------|------------------|---------------------|------------|-----------------|--------------------|------------------|-----------------|------------|------------|-------------------|-------------|----------------------|
| | | | East | North | | | | | | | | | | | | |
| 2015/11/19 17:03:00 | WY1 | ME | 829172 | 809572 | 3.8 | 1.00 | 26.59 | 6.99 | 104.8 | 4.9 | 32.98 | 8.17 | 8 | 0.02 | 0.33 | 6 |
| | | | | | | 1.00 | 26.6 | 7 | 105 | 4.9 | 33.01 | 8.16 | | | | |
| | | | | | | 2.80 | 26.45 | 6.99 | 104.9 | 5.5 | 33.66 | 8.16 | | | | |
| | | | | | | 2.80 | 26.38 | 7 | 105 | 5.7 | 33.72 | 8.16 | | | | |
| 2015/11/19 17:41:00 | WY2 | ME | 828993 | 810408 | 6.2 | 1.00 | 27.22 | 7.34 | 111.4 | 2.6 | 33.35 | 8.17 | 6 | <0.01 | 0.1 | not detected |
| | | | | | | 1.00 | 27.07 | 7.36 | 111.6 | 2.5 | 33.49 | 8.16 | | | | |
| | | | | | | 5.20 | 26.19 | 7.21 | 108.1 | 8.2 | 34.15 | 8.16 | | | | |
| | | | | | | 5.20 | 26.17 | 7.21 | 108.1 | 8.4 | 34.17 | 8.16 | | | | |
| 2015/11/19 17:31:00 | WY3 | ME | 829199 | 809873 | 3.9 | 1.00 | 26.55 | 7.37 | 110.5 | 5.5 | 33.13 | 8.18 | 12 | <0.01 | 0.21 | 13 |
| | | | | | | 1.00 | 26.48 | 7.33 | 110 | 5.6 | 33.33 | 8.17 | | | | |
| | | | | | | 2.90 | 26.53 | 7.21 | 108.3 | 7 | 33.54 | 8.16 | | | | |
| | | | | | | 2.90 | 26.34 | 7.21 | 108.2 | 7.3 | 33.87 | 8.16 | | | | |
| 2015/11/19 17:50:00 | CY1 | ME | 828401 | 810816 | 9.4 | 1.00 | 26.61 | 7.45 | 110 | 1.8 | 30.08 | 8.21 | 3 | 0.02 | 0.5 | not detected |
| | | | | | | 1.00 | 26.62 | 7.41 | 109.5 | 1.4 | 30.19 | 8.19 | | | | |
| | | | | | | 8.40 | 26 | 7.19 | 107.6 | 4.9 | 34.31 | 8.15 | | | | |
| | | | | | | 8.40 | 26 | 7.18 | 107.4 | 5 | 34.32 | 8.16 | | | | |
| 2015/11/19 17:15:00 | CY2 | ME | 828003 | 808809 | 15.2 | 1.00 | 27.61 | 7.73 | 117.9 | 0.5 | 33.08 | 8.15 | 3 | <0.01 | 0.17 | not detected |
| | | | | | | 1.00 | 27.74 | 7.69 | 117.5 | 0.5 | 33 | 8.15 | | | | |
| | | | | | | 14.20 | 25.84 | 7.55 | 112.7 | 2.4 | 34.32 | 8.17 | | | | |
| | | | | | | 14.20 | 25.84 | 7.53 | 112.3 | 2.6 | 34.32 | 8.17 | | | | |
| 2015/11/19 12:35:00 | WY1 | MF | 829166 | 809562 | 4.2 | 1.00 | 26.5 | 7.18 | 106.5 | 2.6 | 31.42 | 8.08 | 4 | 0.02 | 0.43 | 6 |
| | | | | | | 1.00 | 26.45 | 7.16 | 106.2 | 2.9 | 31.51 | 8.08 | | | | |
| | | | | | | 3.20 | 26.44 | 7.08 | 105.1 | 3.9 | 31.64 | 8.07 | | | | |
| | | | | | | 3.20 | 26.43 | 7.08 | 105.2 | 4.2 | 31.65 | 8.07 | | | | |
| 2015/11/19 12:17:00 | WY2 | MF | 828993 | 810403 | 6.4 | 1.00 | 26.53 | 7.44 | 110.1 | 1.3 | 30.68 | 8.04 | 3 | 0.03 | 0.45 | 1 |
| | | | | | | 1.00 | 26.53 | 7.41 | 109.6 | 1.1 | 30.69 | 8.04 | | | | |
| | | | | | | 5.40 | 26.81 | 7.35 | 111.1 | 3 | 33.75 | 8.07 | | | | |
| | | | | | | 5.40 | 26.71 | 7.37 | 111.2 | 3.9 | 33.85 | 8.07 | | | | |
| 2015/11/19 12:27:00 | WY3 | MF | 829190 | 809839 | 4 | 1.00 | 27.22 | 7.61 | 114.4 | 1.3 | 31.4 | 8.07 | 3 | 0.01 | 0.38 | 2 |
| | | | | | | 1.00 | 27.21 | 7.61 | 114.2 | 1.4 | 31.39 | 8.07 | | | | |
| | | | | | | 3.00 | 26.85 | 7.6 | 113.6 | 3.2 | 31.79 | 8.07 | | | | |
| | | | | | | 3.00 | 26.84 | 7.6 | 113.7 | 3.6 | 31.84 | 8.07 | | | | |
| 2015/11/19 12:06:00 | CY1 | MF | 828406 | 810813 | 9.8 | 1.00 | 26.46 | 7.42 | 108.7 | 0.2 | 29.12 | 8.05 | 9 | <0.01 | 0.38 | 8 |
| | | | | | | 1.00 | 26.35 | 7.43 | 108.8 | 0 | 29.39 | 8.04 | | | | |
| | | | | | | 8.80 | 26.05 | 7.59 | 113.6 | 4.9 | 34.34 | 8.04 | | | | |
| | | | | | | 8.80 | 26.05 | 7.59 | 113.6 | 5 | 34.38 | 8.05 | | | | |
| 2015/11/19 12:48:00 | CY2 | MF | 827998 | 808816 | 15.3 | 1.00 | 27.04 | 7.33 | 110.1 | 0.5 | 31.97 | 8.09 | <2 | 0.02 | 0.3 | not detected |
| | | | | | | 1.00 | 27 | 7.31 | 109.7 | 0.4 | 32.01 | 8.09 | | | | |
| | | | | | | 14.30 | 26.05 | 7.34 | 109.6 | 4.3 | 33.98 | 8.14 | | | | |
| | | | | | | 14.30 | 26.02 | 7.39 | 109.6 | 4.8 | 32.76 | 8.15 | | | | |

Remarks: MF - Middle Flood tide
ME - Middle Ebb tide

Contract No. DC/2009/13

Construction of Sewage Treatment Works
at Yung Shue Wan and Sok Kwu Wan



Yung Shue Wan

Post-commissioning Martine Water Monitoring Programme
1-Dec-15

| Date / Time | Location | Tide | Co-ordinates | | Water Depth m | Sampling Depth m | Temp °C | DO Conc mg/L | DO Saturation % | Turbidity NTU | Salinity ppt | pH | SS mg/l | Ammonia N mg/l | TIN mg/l | E.coli 1CFU/100ml |
|--------------------|----------|------|--------------|--------|------------------|---------------------|------------|-----------------|--------------------|------------------|-----------------|------|------------|-------------------|-------------|----------------------|
| | | | East | North | | | | | | | | | | | | |
| 2015/12/1 14:57:00 | WY1 | ME | 829173 | 809544 | 4.3 | 1.00 | 24.43 | 7.66 | 111.1 | 5.4 | 33.68 | 8.12 | 2 | 0.06 | 0.33 | 3 |
| | | | | | | 1.00 | 24.43 | 7.65 | 111 | 5 | 33.67 | 8.12 | | | | |
| | | | | | | 3.30 | 24.29 | 7.64 | 110.9 | 5.3 | 33.98 | 8.13 | | | | |
| | | | | | | 3.30 | 24.29 | 7.71 | 110.9 | 5.4 | 32.45 | 8.14 | | | | |
| 2015/12/1 15:32:00 | WY2 | ME | 829001 | 810402 | 6.6 | 1.00 | 24.54 | 7.68 | 111.5 | 2.4 | 33.45 | 8.18 | 6 | <0.01 | 0.11 | 2 |
| | | | | | | 1.00 | 24.53 | 7.72 | 111.3 | 2.3 | 32.24 | 8.18 | | | | |
| | | | | | | 5.60 | 24.22 | 7.59 | 109.5 | 6.6 | 33.3 | 8.18 | | | | |
| | | | | | | 5.60 | 24.22 | 7.57 | 109.3 | 6.7 | 33.37 | 8.18 | | | | |
| 2015/12/1 15:25:00 | WY3 | ME | 829193 | 809863 | 4.2 | 1.00 | 24.41 | 7.16 | 104 | 5.5 | 33.74 | 8.18 | 11 | 0.01 | 0.15 | 7 |
| | | | | | | 1.00 | 24.42 | 7.14 | 103.5 | 5.2 | 33.7 | 8.18 | | | | |
| | | | | | | 3.20 | 24.33 | 7.1 | 102.9 | 6.5 | 33.66 | 8.18 | | | | |
| | | | | | | 3.20 | 24.31 | 7.11 | 102.9 | 6.7 | 33.66 | 8.18 | | | | |
| 2015/12/1 15:41:00 | CY1 | ME | 828412 | 810818 | 9.7 | 1.00 | 24.34 | 7.25 | 103.8 | 1.3 | 31.52 | 8.17 | 8 | 0.02 | 0.15 | 5 |
| | | | | | | 1.00 | 24.33 | 7.2 | 103.5 | 1.2 | 32.25 | 8.17 | | | | |
| | | | | | | 8.70 | 24.14 | 7.27 | 105.2 | 3 | 34.09 | 8.16 | | | | |
| | | | | | | 8.70 | 24.13 | 7.28 | 105.2 | 3 | 33.84 | 8.16 | | | | |
| 2015/12/1 15:10:00 | CY2 | ME | 827982 | 808813 | 15.8 | 1.00 | 26.3 | 7.51 | 112.9 | 2.4 | 34.14 | 8.14 | 6 | <0.01 | 0.08 | not detected |
| | | | | | | 1.00 | 26.28 | 7.55 | 113.3 | 2.3 | 34.13 | 8.14 | | | | |
| | | | | | | 14.80 | 24.06 | 7.55 | 109.3 | 4.3 | 34.22 | 8.18 | | | | |
| | | | | | | 14.80 | 24.06 | 7.54 | 109.1 | 4.5 | 34.22 | 8.18 | | | | |
| 2015/12/1 11:18:00 | WY1 | MF | 829172 | 809539 | 4.2 | 1.00 | 24.14 | 7.61 | 109.3 | 3.6 | 32.7 | 8.12 | 8 | 0.02 | 0.17 | 8 |
| | | | | | | 1.00 | 24.15 | 7.59 | 109 | 3.6 | 32.65 | 8.12 | | | | |
| | | | | | | 3.20 | 24.27 | 7.5 | 108.6 | 4.5 | 33.85 | 8.12 | | | | |
| | | | | | | 3.20 | 24.33 | 7.51 | 108.9 | 4.6 | 33.8 | 8.12 | | | | |
| 2015/12/1 10:58:00 | WY2 | MF | 828996 | 810412 | 6.3 | 1.00 | 24.18 | 7.32 | 105.2 | 2.5 | 32.74 | 8.09 | 12 | 0.05 | 0.3 | 62 |
| | | | | | | 1.00 | 24.45 | 7.21 | 103.8 | 2.8 | 32.39 | 8.09 | | | | |
| | | | | | | 5.30 | 24.31 | 7.16 | 103.8 | 5.2 | 33.88 | 8.09 | | | | |
| | | | | | | 5.30 | 24.31 | 7.15 | 103.8 | 5.4 | 33.91 | 8.09 | | | | |
| 2015/12/1 11:08:00 | WY3 | MF | 829214 | 809863 | 4.3 | 1.00 | 24.15 | 7.49 | 107.7 | 3.4 | 32.74 | 8.11 | 11 | 0.04 | 0.26 | 87 |
| | | | | | | 1.00 | 24.16 | 7.45 | 107.1 | 3.4 | 32.75 | 8.11 | | | | |
| | | | | | | 3.30 | 24.47 | 7.34 | 106.5 | 5.2 | 33.6 | 8.11 | | | | |
| | | | | | | 3.30 | 24.49 | 7.34 | 106.6 | 4.9 | 33.62 | 8.12 | | | | |
| 2015/12/1 10:45:00 | CY1 | MF | 828407 | 810818 | 9.1 | 1.00 | 24.21 | 7.63 | 109.6 | 1.9 | 32.71 | 7.88 | 4 | 0.06 | 0.3 | 96 |
| | | | | | | 1.00 | 24.21 | 7.44 | 107 | 1.9 | 32.7 | 7.88 | | | | |
| | | | | | | 8.10 | 24.22 | 7.46 | 107.3 | 6.3 | 32.65 | 8.04 | | | | |
| | | | | | | 8.10 | 24.22 | 7.39 | 107.2 | 6.6 | 34.21 | 8.05 | | | | |
| 2015/12/1 11:31:00 | CY2 | MF | 828006 | 808809 | 16.2 | 1.00 | 24.56 | 8.35 | 121.7 | 1.4 | 34.08 | 8.15 | 5 | <0.01 | 0.1 | not detected |
| | | | | | | 1.00 | 24.55 | 8.33 | 121.4 | 1.5 | 34.08 | 8.15 | | | | |
| | | | | | | 15.20 | 24.09 | 8.15 | 118 | 5.2 | 34.2 | 8.18 | | | | |
| | | | | | | 15.20 | 24.08 | 8.15 | 118 | 5.6 | 34.2 | 8.18 | | | | |

Remarks: MF - Middle Flood tide
ME - Middle Ebb tide

Contract No. DC/2009/13

Construction of Sewage Treatment Works
at Yung Shue Wan and Sok Kwu Wan



Yung Shue Wan

Post-commissioning Martine Water Monitoring Programme
17-Dec-15

| Date / Time | Location | Tide | Co-ordinates | | Water Depth m | Sampling Depth m | Temp °C | DO Conc mg/L | DO Saturation % | Turbidity NTU | Salinity ppt | pH unit | SS mg/l | Ammonia N mg/l | TIN mg/l | E.coli ICFU/100ml |
|---------------------|----------|------|--------------|--------|------------------|---------------------|------------|-----------------|--------------------|------------------|-----------------|------------|------------|-------------------|-------------|----------------------|
| | | | East | North | | | | | | | | | | | | |
| 2015/12/17 17:02:00 | WY1 | ME | 829173 | 809538 | 4.4 | 1.00 | 20.9 | 7.61 | 105.3 | 3.89 | 36.11 | 8.71 | 3 | <0.01 | 0.07 | not detected |
| | | | | | | 1.00 | 20.9 | 7.6 | 105.2 | 3.82 | 36.11 | 8.71 | | | | |
| | | | | | | 3.40 | 20.9 | 7.56 | 104.7 | 3.94 | 36.11 | 8.7 | | | | |
| 2015/12/17 17:40:00 | WY2 | ME | 828986 | 810391 | 6.6 | 1.00 | 20.9 | 7.55 | 104.5 | 4.07 | 36.11 | 8.7 | 4 | <0.01 | 0.08 | not detected |
| | | | | | | 1.00 | 20.9 | 7.8 | 107.7 | 3.46 | 36.07 | 8.68 | | | | |
| | | | | | | 1.00 | 20.9 | 7.76 | 107.2 | 3.65 | 36.07 | 8.68 | | | | |
| 2015/12/17 17:31:00 | WY3 | ME | 829192 | 809856 | 3.9 | 1.00 | 20.9 | 7.49 | 103.5 | 3.69 | 36.06 | 8.68 | 5 | <0.01 | 0.08 | not detected |
| | | | | | | 1.00 | 20.9 | 7.55 | 104.4 | 4.49 | 36.09 | 8.68 | | | | |
| | | | | | | 1.00 | 20.9 | 7.54 | 104.3 | 4.6 | 36.09 | 8.68 | | | | |
| 2015/12/17 17:50:00 | CY1 | ME | 828403 | 810813 | 10.3 | 1.00 | 20.9 | 7.55 | 104.4 | 4.49 | 36.09 | 8.68 | 9 | <0.01 | 0.08 | 1 |
| | | | | | | 1.00 | 21.2 | 7.62 | 105.8 | 2.75 | 36.04 | 8.7 | | | | |
| | | | | | | 2.90 | 20.8 | 7.54 | 104.1 | 5.78 | 36.18 | 8.67 | | | | |
| 2015/12/17 17:15:00 | CY2 | ME | 828003 | 808807 | 16.7 | 1.00 | 20.7 | 7.48 | 103 | 5.32 | 36.03 | 8.7 | 10 | <0.01 | 0.08 | 1 |
| | | | | | | 1.00 | 21.1 | 7.62 | 105.9 | 2.8 | 36.05 | 8.7 | | | | |
| | | | | | | 9.30 | 20.7 | 7.49 | 103.1 | 5.46 | 36.03 | 8.7 | | | | |
| 2015/12/17 17:15:00 | CY2 | ME | 828003 | 808807 | 16.7 | 1.00 | 20.7 | 7.55 | 104.1 | 3.4 | 35.99 | 8.71 | 5 | <0.01 | 0.11 | 3 |
| | | | | | | 1.00 | 20.7 | 7.52 | 103.7 | 3.39 | 35.99 | 8.71 | | | | |
| | | | | | | 15.70 | 20.7 | 7.45 | 102.6 | 3.83 | 36 | 8.7 | | | | |
| 2015/12/17 11:39:00 | WY1 | MF | 829163 | 809572 | 4.6 | 1.00 | 20.7 | 7.44 | 102.6 | 3.79 | 36 | 8.7 | 6 | <0.01 | 0.1 | 8 |
| | | | | | | 1.00 | 20.8 | 7.49 | 103.4 | 3.82 | 36.1 | 8.67 | | | | |
| | | | | | | 1.00 | 20.8 | 7.48 | 103.2 | 3.86 | 36.1 | 8.67 | | | | |
| 2015/12/17 11:24:00 | WY2 | MF | 829004 | 810408 | 6.9 | 3.60 | 20.7 | 7.45 | 102.8 | 3.93 | 36.1 | 8.68 | 4 | <0.01 | 0.08 | not detected |
| | | | | | | 3.60 | 20.7 | 7.45 | 102.7 | 4.02 | 36.1 | 8.67 | | | | |
| | | | | | | 1.00 | 21 | 7.52 | 104.2 | 3.3 | 36.08 | 8.68 | | | | |
| 2015/12/17 11:32:00 | WY3 | MF | 828990 | 809853 | 4.4 | 1.00 | 21 | 7.52 | 104.1 | 3.29 | 36.08 | 8.68 | 4 | <0.01 | 0.08 | not detected |
| | | | | | | 1.00 | 20.8 | 7.45 | 102.7 | 3.97 | 36.1 | 8.68 | | | | |
| | | | | | | 5.90 | 20.8 | 7.44 | 102.7 | 4.03 | 36.11 | 8.68 | | | | |
| 2015/12/17 11:12:00 | CY1 | MF | 828404 | 810816 | 10 | 1.00 | 20.9 | 7.5 | 103.7 | 3.53 | 36.1 | 8.68 | 4 | <0.01 | 0.09 | not detected |
| | | | | | | 1.00 | 20.9 | 7.49 | 103.7 | 3.52 | 36.1 | 8.68 | | | | |
| | | | | | | 3.40 | 20.9 | 7.46 | 103.2 | 3.87 | 36.1 | 8.67 | | | | |
| 2015/12/17 11:51:00 | CY2 | MF | 827992 | 808816 | 16.2 | 3.40 | 20.9 | 7.46 | 103.2 | 3.88 | 36.1 | 8.67 | 4 | <0.01 | 0.1 | not detected |
| | | | | | | 3.40 | 20.9 | 7.46 | 103.2 | 3.88 | 36.1 | 8.67 | | | | |
| | | | | | | 1.00 | 21.2 | 7.5 | 104.2 | 2.83 | 36.08 | 8.65 | | | | |
| 2015/12/17 11:12:00 | CY1 | MF | 828404 | 810816 | 10 | 1.00 | 21.2 | 7.5 | 104.2 | 2.85 | 36.09 | 8.65 | 3 | <0.01 | 0.06 | not detected |
| | | | | | | 9.00 | 20.8 | 7.41 | 102.3 | 3.78 | 36.07 | 8.65 | | | | |
| | | | | | | 9.00 | 20.7 | 7.41 | 102.1 | 3.89 | 36.07 | 8.65 | | | | |
| 2015/12/17 11:51:00 | CY2 | MF | 827992 | 808816 | 16.2 | 1.00 | 20.6 | 7.59 | 104.3 | 3.49 | 36.05 | 8.7 | 6 | <0.01 | 0.11 | 3 |
| | | | | | | 1.00 | 20.6 | 7.58 | 104.1 | 3.42 | 36.05 | 8.7 | | | | |
| | | | | | | 15.20 | 20.6 | 7.48 | 102.9 | 3.86 | 36.03 | 8.69 | | | | |
| 2015/12/17 11:51:00 | CY2 | MF | 827992 | 808816 | 16.2 | 15.20 | 20.6 | 7.48 | 102.9 | 3.86 | 36.03 | 8.69 | 7 | <0.01 | 0.11 | 9 |
| | | | | | | 15.20 | 20.6 | 7.48 | 102.9 | 4.21 | 36.04 | 8.69 | | | | |

Remarks: MF - Middle Flood tide
ME - Middle Ebb tide

Contract No. DC/2009/13

**Construction of Sewage Treatment Works
at Yung Shue Wan and Sok Kwu Wan**



Yung Shue Wan

Post-commissioning Martine Water Monitoring Programme

7-Jan-16

| Date / Time | Location | Tide | Co-ordinates | | Water Depth m | Sampling Depth m | Temp °C | DO Conc mg/L | DO Saturation % | Turbidity NTU | Salinity ppt | pH unit | SS mg/l | Ammonia N mg/l | TIN mg/l | E.coli 1CFU/100ml |
|-------------------|----------|------|--------------|--------|------------------|---------------------|------------|-----------------|--------------------|------------------|-----------------|------------|------------|-------------------|-------------|----------------------|
| | | | East | North | | | | | | | | | | | | |
| 2016/1/7 10:06:00 | WY1 | ME | 829162 | 809572 | 4.7 | 1.00 | 20.22 | 8.03 | 107.7 | 0.5 | 32.9 | 8.19 | 2 | 0.03 | 0.27 | 13 |
| | | | | | | 1.00 | 20.23 | 8.03 | 107.6 | 0.6 | 32.9 | 8.19 | | | | |
| | | | | | | 3.70 | 20.15 | 7.98 | 106.9 | 1.3 | 32.93 | 8.2 | | | | |
| | | | | | | 3.70 | 20.15 | 7.98 | 106.9 | 1.2 | 32.94 | 8.2 | | | | |
| 2016/1/7 09:46:00 | WY2 | ME | 829008 | 810403 | 7.2 | 1.00 | 20.07 | 8.36 | 111.7 | 0.7 | 32.87 | 8.12 | 2 | 0.01 | 0.24 | 4 |
| | | | | | | 1.00 | 20.12 | 8.32 | 111.3 | 0.6 | 32.84 | 8.12 | | | | |
| | | | | | | 6.20 | 19.9 | 8.19 | 109.3 | 0.9 | 33.1 | 8.14 | | | | |
| | | | | | | 6.20 | 19.9 | 8.19 | 109.3 | 0.9 | 33.1 | 8.15 | | | | |
| 2016/1/7 09:59:00 | WY3 | ME | 829214 | 809866 | 4.4 | 1.00 | 20.25 | 8.04 | 107.8 | 0.3 | 32.91 | 8.17 | 2 | 0.02 | 0.25 | 5 |
| | | | | | | 1.00 | 20.25 | 8.04 | 107.8 | 0.4 | 32.91 | 8.17 | | | | |
| | | | | | | 3.40 | 20.18 | 7.88 | 105.6 | 1.1 | 32.94 | 8.19 | | | | |
| | | | | | | 3.40 | 20.17 | 7.88 | 105.5 | 1 | 32.94 | 8.19 | | | | |
| 2016/1/7 09:32:00 | CY1 | ME | 828394 | 810792 | 10.6 | 1.00 | 20.4 | 8.55 | 115.1 | 0.5 | 32.99 | 7.94 | 2 | <0.01 | 0.21 | not detected |
| | | | | | | 1.00 | 20.39 | 8.53 | 114.8 | 0.6 | 33.01 | 7.95 | | | | |
| | | | | | | 9.60 | 20.14 | 8.48 | 113.6 | 0.9 | 32.97 | 8.05 | | | | |
| | | | | | | 9.60 | 20.12 | 8.48 | 113.5 | 1.2 | 32.93 | 8.06 | | | | |
| 2016/1/7 10:19:00 | CY2 | ME | 82008 | 808816 | 16.6 | 1.00 | 20.22 | 8.74 | 116.9 | 1 | 32.63 | 8.2 | 3 | <0.01 | 0.22 | not detected |
| | | | | | | 1.00 | 20.19 | 8.56 | 114.9 | 0.8 | 33.05 | 8.2 | | | | |
| | | | | | | 15.60 | 19.78 | 8.21 | 109.3 | 1 | 33.03 | 8.21 | | | | |
| | | | | | | 15.60 | 19.78 | 8.2 | 109.2 | 1.2 | 33.07 | 8.21 | | | | |
| 2016/1/7 15:38:00 | WY1 | MF | 829166 | 809568 | 4.5 | 1.00 | 20.34 | 7.82 | 105 | 0.6 | 32.92 | 8.29 | 3 | 0.02 | 0.25 | 5 |
| | | | | | | 1.00 | 20.35 | 7.81 | 105 | 0.4 | 32.91 | 8.29 | | | | |
| | | | | | | 3.50 | 20.19 | 7.7 | 103.2 | 1.1 | 32.92 | 8.27 | | | | |
| | | | | | | 3.50 | 20.2 | 7.7 | 103.3 | 1.3 | 32.94 | 8.27 | | | | |
| 2016/1/7 16:15:00 | WY2 | MF | 829002 | 810404 | 7 | 1.00 | 20.49 | 8.09 | 108.9 | 0.2 | 32.85 | 8.22 | <2 | 0.01 | 0.23 | 1 |
| | | | | | | 1.00 | 20.44 | 8.1 | 109 | 0.3 | 32.85 | 8.22 | | | | |
| | | | | | | 6.00 | 19.93 | 8.09 | 107.9 | 0.8 | 32.98 | 8.22 | | | | |
| | | | | | | 6.00 | 19.92 | 8.08 | 107.8 | 0.9 | 32.99 | 8.22 | | | | |
| 2016/1/7 16:08:00 | WY3 | MF | 828991 | 809868 | 4.8 | 1.00 | 20.34 | 8.05 | 108.1 | 0.9 | 32.86 | 8.22 | 4 | 0.01 | 0.25 | 4 |
| | | | | | | 1.00 | 20.32 | 8.04 | 108 | 0.8 | 32.87 | 8.22 | | | | |
| | | | | | | 3.80 | 20.18 | 8.07 | 108.2 | 1 | 32.96 | 8.22 | | | | |
| | | | | | | 3.80 | 20.22 | 8.07 | 108.3 | 1.1 | 32.95 | 8.22 | | | | |
| 2016/1/7 16:28:00 | CY1 | MF | 828406 | 810819 | 10.7 | 1.00 | 20.22 | 8.3 | 111.2 | 0.2 | 32.88 | 8.23 | 2 | 0.02 | 0.26 | not detected |
| | | | | | | 1.00 | 20.22 | 8.31 | 111.4 | 0.4 | 32.88 | 8.23 | | | | |
| | | | | | | 9.70 | 19.93 | 8.2 | 109.4 | 0.8 | 33.02 | 8.23 | | | | |
| | | | | | | 9.70 | 19.93 | 8.17 | 109.1 | 0.9 | 33.02 | 8.23 | | | | |
| 2016/1/7 15:51:00 | CY2 | MF | 828005 | 808807 | 16.6 | 1.00 | 20.45 | 7.75 | 104.4 | 0.2 | 32.98 | 8.25 | 3 | <0.01 | 0.21 | 1 |
| | | | | | | 1.00 | 20.51 | 7.76 | 104.6 | 0.4 | 32.98 | 8.24 | | | | |
| | | | | | | 15.60 | 19.77 | 7.52 | 100.1 | 1 | 33.1 | 8.23 | | | | |
| | | | | | | 15.60 | 19.77 | 7.5 | 99.9 | 1.1 | 33.08 | 8.23 | | | | |

Remarks: MF - Middle Flood tide
ME - Middle Ebb tide

Contract No. DC/2009/13

Construction of Sewage Treatment Works
at Yung Shue Wan and Sok Kwu Wan



Yung Shue Wan

Post-commissioning Martine Water Monitoring Programme
19-Jan-16

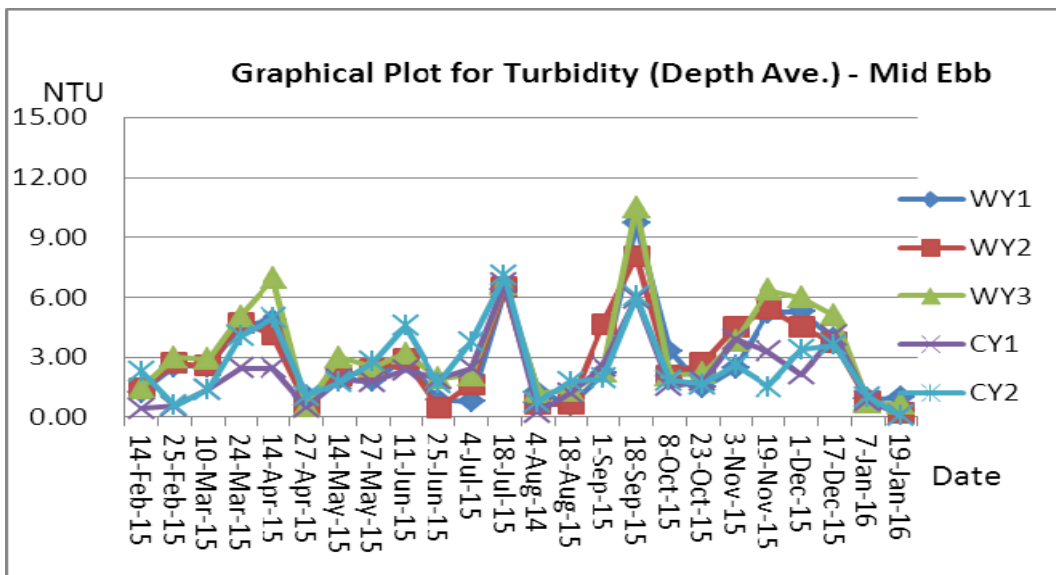
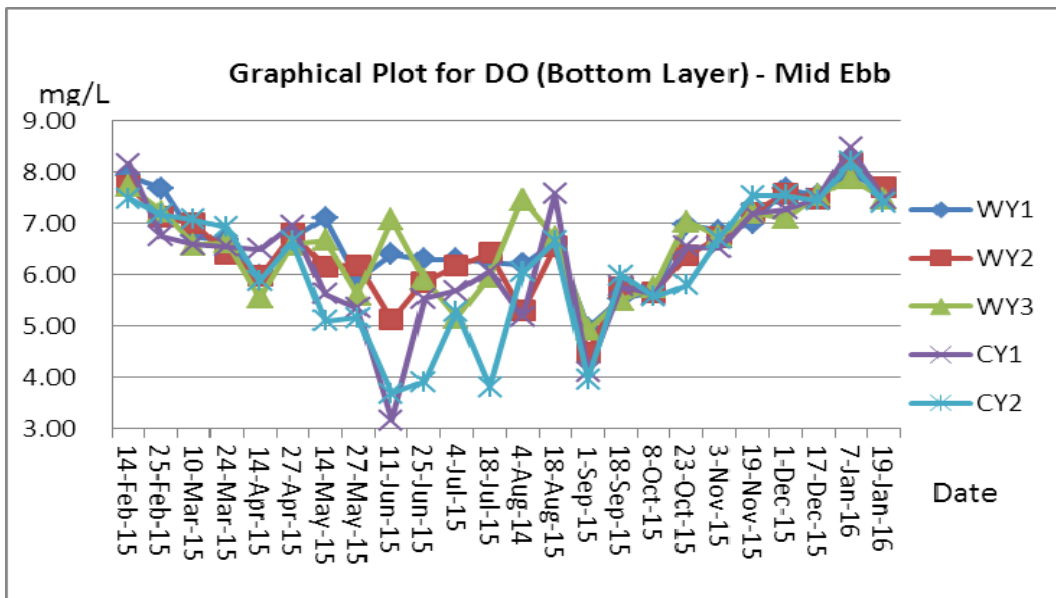
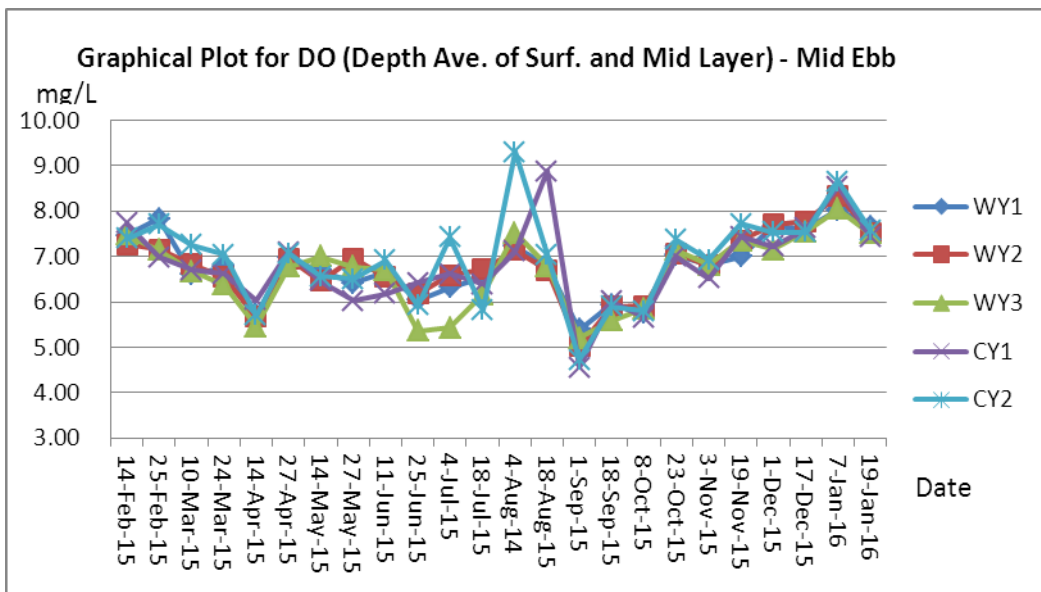
| Date / Time | Location | Tide | Co-ordinates | | Water Depth m | Sampling Depth m | Temp °C | DO Conc mg/L | DO Saturation % | Turbidity NTU | Salinity ppt | pH | SS mg/l | Ammonia N mg/l | TIN mg/l | E.coli ICFU/100ml |
|--------------------|----------|------|--------------|--------|------------------|---------------------|------------|-----------------|--------------------|------------------|-----------------|------|------------|-------------------|-------------|----------------------|
| | | | East | North | | | | | | | | | | | | |
| 2016/1/19 08:56:00 | WY1 | ME | 829178 | 809571 | 4.6 | 1.00 | 18.8 | 7.66 | 101 | 0.62 | 34.56 | 8.15 | 2 | <0.01 | 0.12 | 4 |
| | | | | | | 1.00 | 18.8 | 7.66 | 101.1 | 0.54 | 34.56 | 8.16 | | | | |
| | | | | | | 3.60 | 18.8 | 7.65 | 101 | 1.39 | 34.58 | 8.16 | 3 | <0.01 | 0.11 | not detected |
| | | | | | | 3.60 | 18.8 | 7.66 | 101.1 | 1.34 | 34.57 | 8.16 | | | | |
| 2016/1/19 08:37:00 | WY2 | ME | 829006 | 810408 | 7.5 | 1.00 | 18.8 | 7.52 | 99.2 | 0.22 | 34.57 | 8.11 | <2 | <0.01 | 0.11 | not detected |
| | | | | | | 1.00 | 18.8 | 7.53 | 99.4 | 0.1 | 34.57 | 8.12 | | | | |
| | | | | | | 6.50 | 18.8 | 7.69 | 101.4 | 0.29 | 34.6 | 8.15 | 3 | <0.01 | 0.1 | not detected |
| | | | | | | 6.50 | 18.8 | 7.71 | 101.7 | 0.34 | 34.6 | 8.15 | | | | |
| 2016/1/19 08:49:00 | WY3 | ME | 829208 | 809870 | 4.5 | 1.00 | 18.8 | 7.51 | 99 | 0.68 | 34.53 | 8.13 | 2 | <0.01 | 0.11 | 7 |
| | | | | | | 1.00 | 18.8 | 7.49 | 98.7 | 0.66 | 34.54 | 8.14 | | | | |
| | | | | | | 3.50 | 18.8 | 7.48 | 98.7 | 0.57 | 34.56 | 8.14 | 3 | <0.01 | 0.11 | 13 |
| | | | | | | 3.50 | 18.8 | 7.49 | 98.7 | 0.59 | 34.56 | 8.14 | | | | |
| 2016/1/19 08:23:00 | CY1 | ME | 828401 | 810809 | 10.4 | 1.00 | 18.7 | 7.44 | 97.7 | 0.02 | 34.08 | 8.06 | <2 | 0.06 | 0.22 | 5 |
| | | | | | | 1.00 | 18.7 | 7.44 | 97.7 | 0.03 | 34.08 | 8.06 | | | | |
| | | | | | | 9.40 | 18.8 | 7.48 | 98.7 | 0.15 | 34.55 | 8.1 | 2 | <0.01 | 0.13 | 7 |
| | | | | | | 9.40 | 18.8 | 7.48 | 98.6 | 0.19 | 34.55 | 8.1 | | | | |
| 2016/1/19 09:11:00 | CY2 | ME | 828003 | 808818 | 16.4 | 1.00 | 18.9 | 7.57 | 100 | 0.01 | 34.56 | 8.16 | <2 | <0.01 | 0.11 | not detected |
| | | | | | | 1.00 | 18.9 | 7.58 | 100.1 | 0.04 | 34.56 | 8.15 | | | | |
| | | | | | | 15.40 | 18.6 | 7.41 | 97.4 | 0.06 | 34.55 | 8.14 | <2 | <0.01 | 0.11 | not detected |
| | | | | | | 15.40 | 18.6 | 7.41 | 97.3 | 0.09 | 34.55 | 8.14 | | | | |
| 2016/1/19 13:26:00 | WY1 | MF | 829172 | 809563 | 4.5 | 1.00 | 18.9 | 7.69 | 101.6 | 0.71 | 34.52 | 8.17 | 2 | <0.01 | 0.12 | 8 |
| | | | | | | 1.00 | 18.9 | 7.68 | 101.5 | 0.68 | 34.52 | 8.17 | | | | |
| | | | | | | 3.50 | 18.8 | 7.58 | 100 | 1.61 | 34.57 | 8.16 | 4 | <0.01 | 0.11 | not detected |
| | | | | | | 3.50 | 18.8 | 7.58 | 100 | 1.5 | 34.57 | 8.16 | | | | |
| 2016/1/19 13:44:00 | WY2 | MF | 829005 | 810393 | 7.8 | 1.00 | 19.3 | 7.58 | 100.8 | 1.25 | 34.57 | 8.16 | 2 | <0.01 | 0.11 | 1 |
| | | | | | | 1.00 | 19.3 | 7.58 | 100.8 | 1.27 | 34.57 | 8.16 | | | | |
| | | | | | | 6.80 | 18.8 | 7.84 | 103.5 | 1.03 | 34.58 | 8.17 | 4 | <0.01 | 0.11 | not detected |
| | | | | | | 6.80 | 18.9 | 7.85 | 103.6 | 1.06 | 34.58 | 8.17 | | | | |
| 2016/1/19 13:35:00 | WY3 | MF | 829208 | 809862 | 4.2 | 1.00 | 18.9 | 7.64 | 100.9 | 0.75 | 34.55 | 8.16 | <2 | <0.01 | 0.11 | 4 |
| | | | | | | 1.00 | 18.9 | 7.64 | 100.9 | 0.58 | 34.55 | 8.16 | | | | |
| | | | | | | 3.20 | 18.9 | 7.64 | 100.9 | 0.56 | 34.54 | 8.16 | 3 | <0.01 | 0.11 | 3 |
| | | | | | | 3.20 | 18.9 | 7.64 | 100.9 | 0.54 | 34.55 | 8.16 | | | | |
| 2016/1/19 13:54:00 | CY1 | MF | 828404 | 810811 | 11.7 | 1.00 | 19.1 | 7.64 | 101 | 0.08 | 34.19 | 8.14 | <2 | 0.04 | 0.19 | 5 |
| | | | | | | 1.00 | 19.1 | 7.65 | 101.3 | 0.05 | 34.27 | 8.14 | | | | |
| | | | | | | 10.70 | 18.8 | 7.63 | 100.6 | 1.38 | 34.57 | 8.15 | 2 | <0.01 | 0.1 | not detected |
| | | | | | | 10.70 | 18.8 | 7.62 | 100.5 | 1.42 | 34.57 | 8.15 | | | | |
| 2016/1/19 13:11:00 | CY2 | MF | 828007 | 808806 | 16.6 | 1.00 | 18.9 | 7.57 | 100 | 0.09 | 34.56 | 8.14 | <2 | <0.01 | 0.11 | not detected |
| | | | | | | 1.00 | 18.9 | 7.57 | 100 | 0.1 | 34.56 | 8.14 | | | | |
| | | | | | | 15.60 | 18.6 | 7.4 | 97.2 | 0.09 | 34.55 | 8.14 | <2 | <0.01 | 0.11 | not detected |
| | | | | | | 15.60 | 18.6 | 7.39 | 97.1 | 0.12 | 34.55 | 8.14 | | | | |

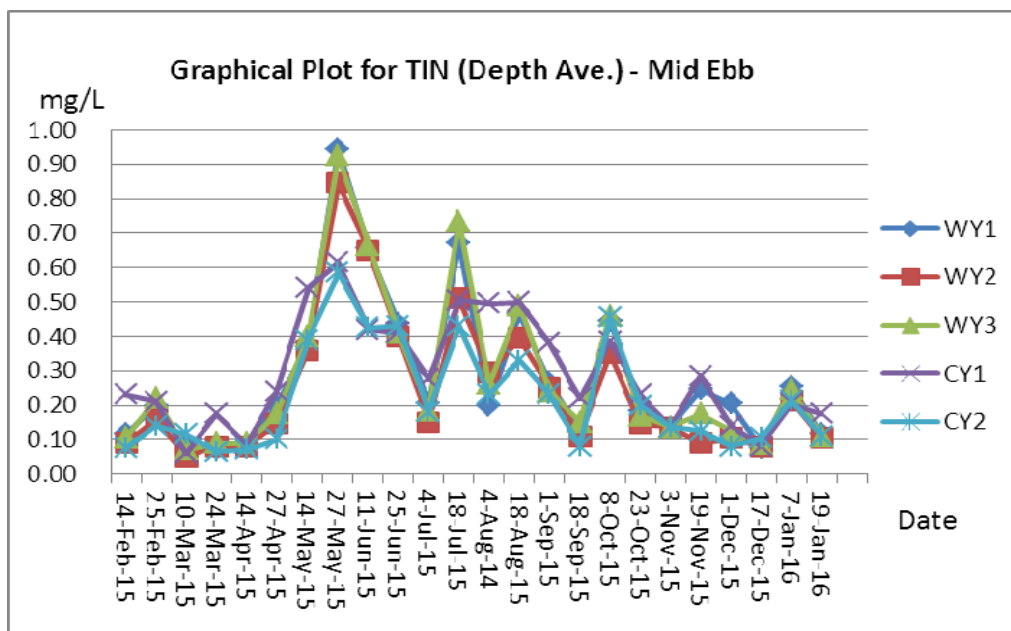
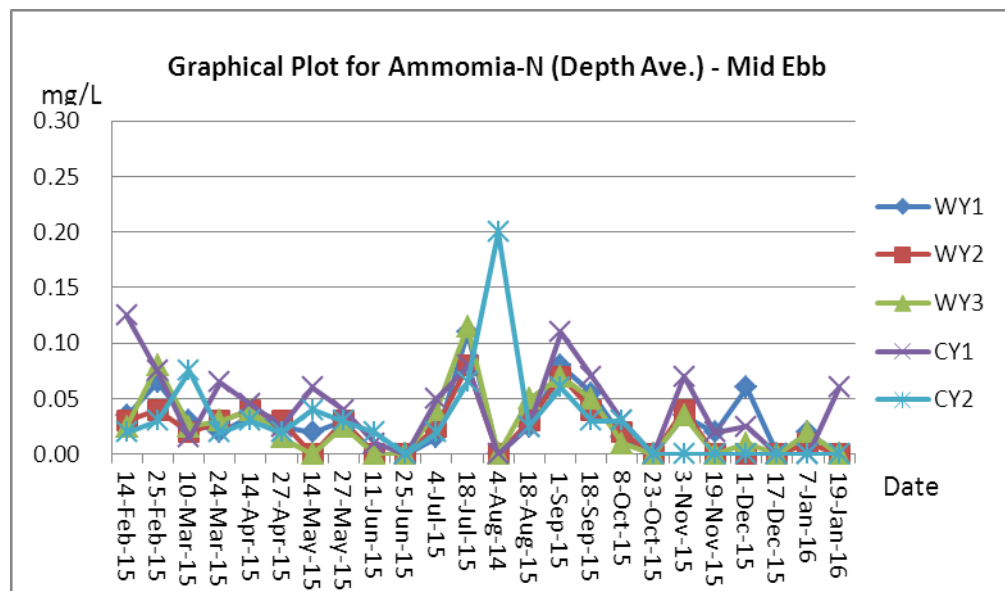
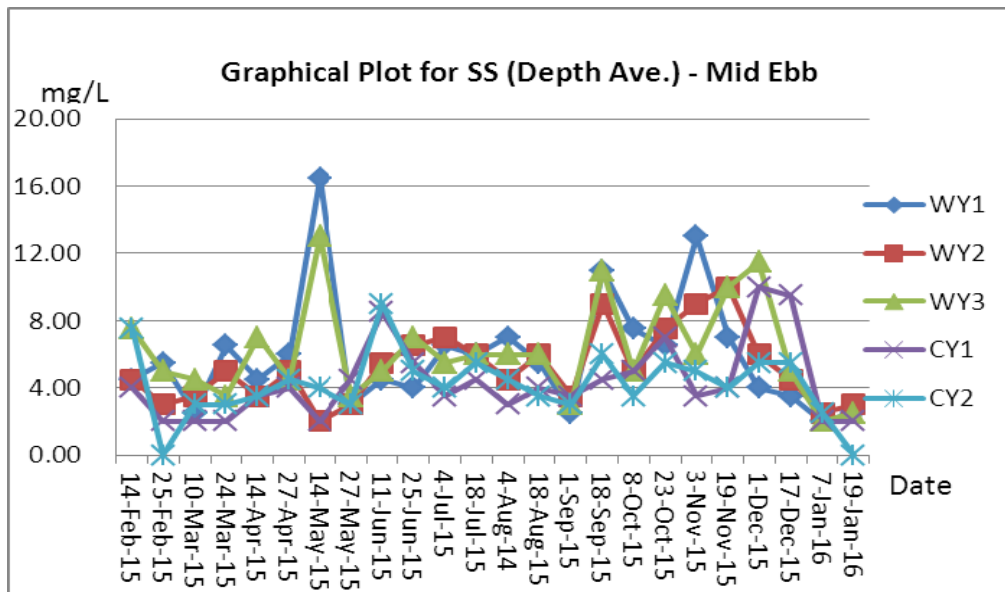
Remarks: MF - Middle Flood tide
ME - Middle Ebb tide

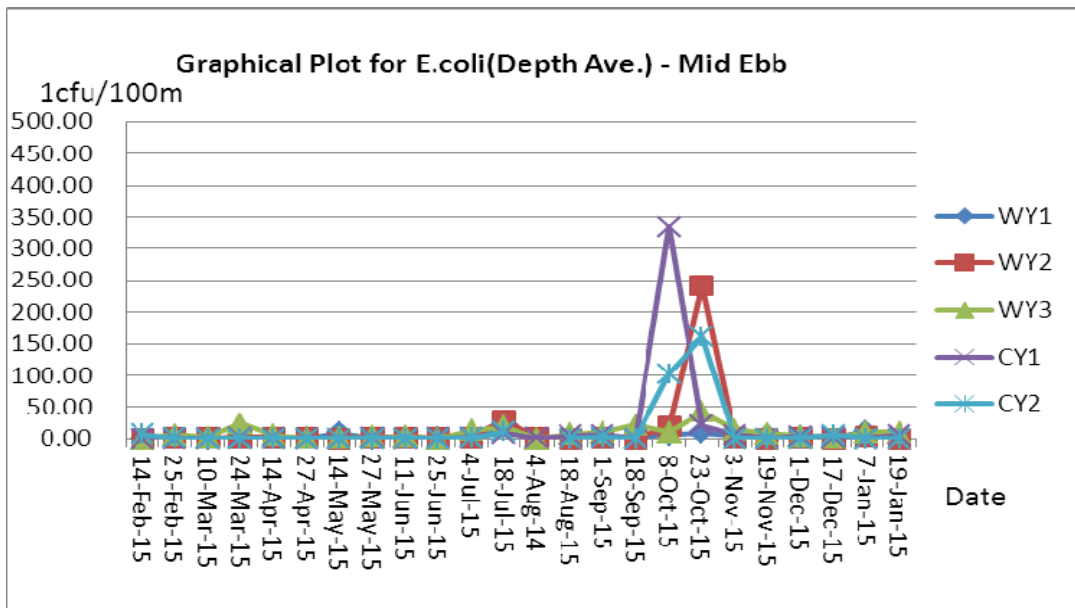
Appendix E

Graphical Plots of Monitoring Results

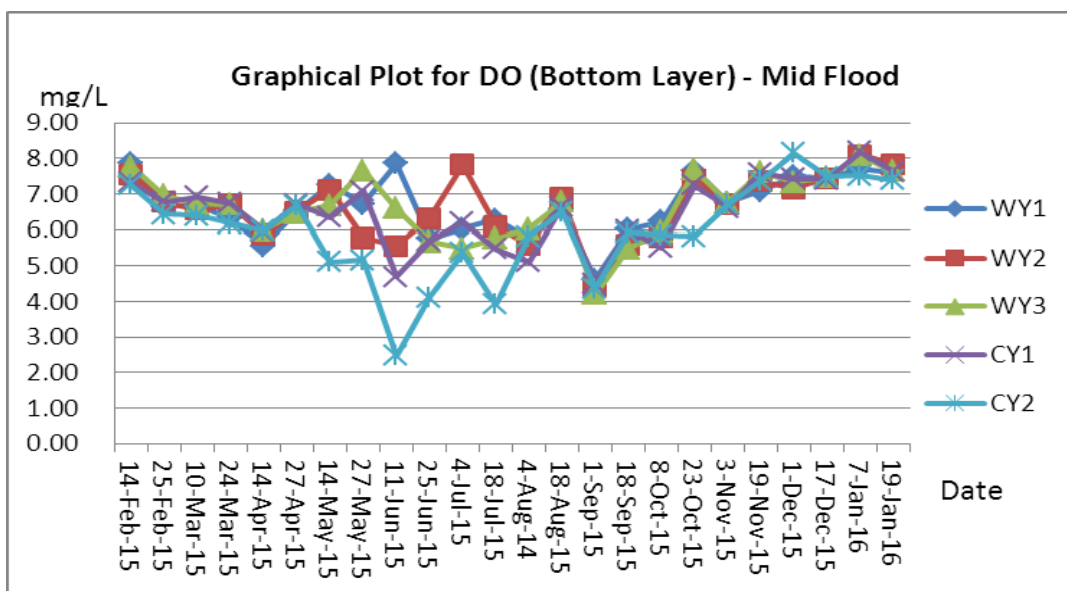
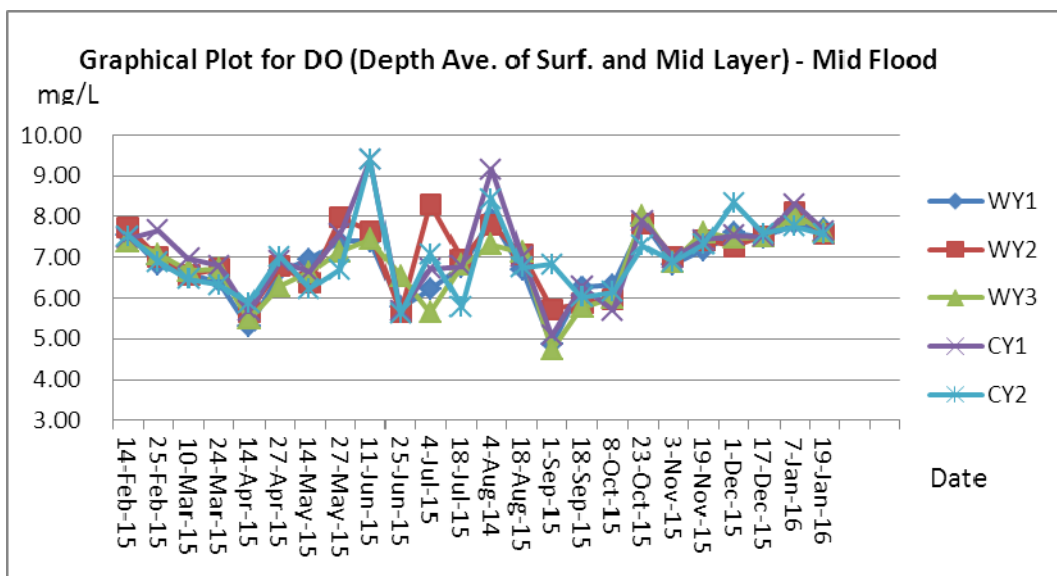
Water Quality Monitoring Result – Mid Ebb

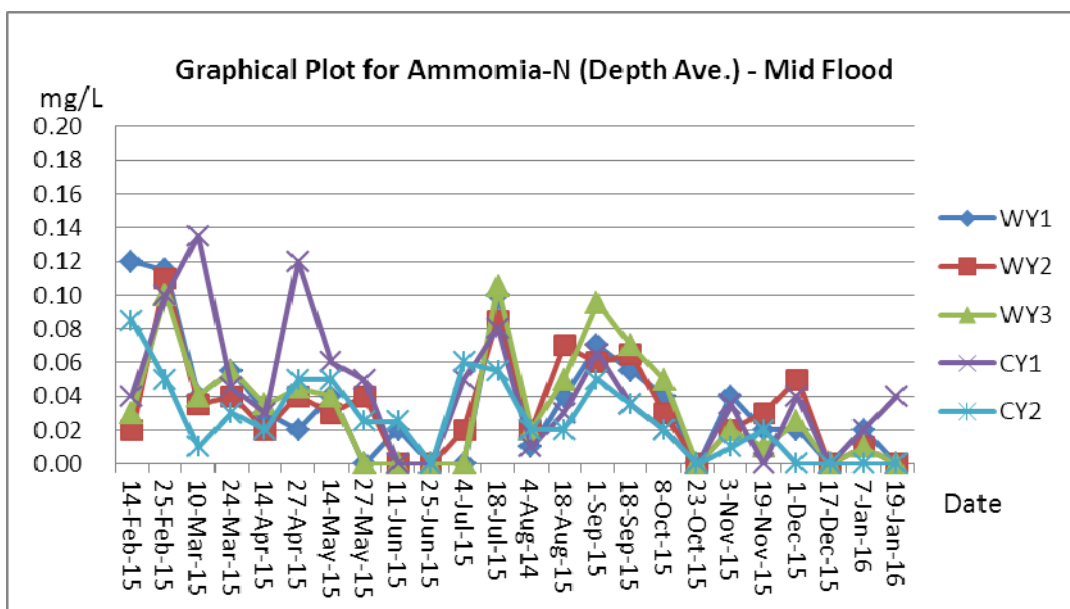
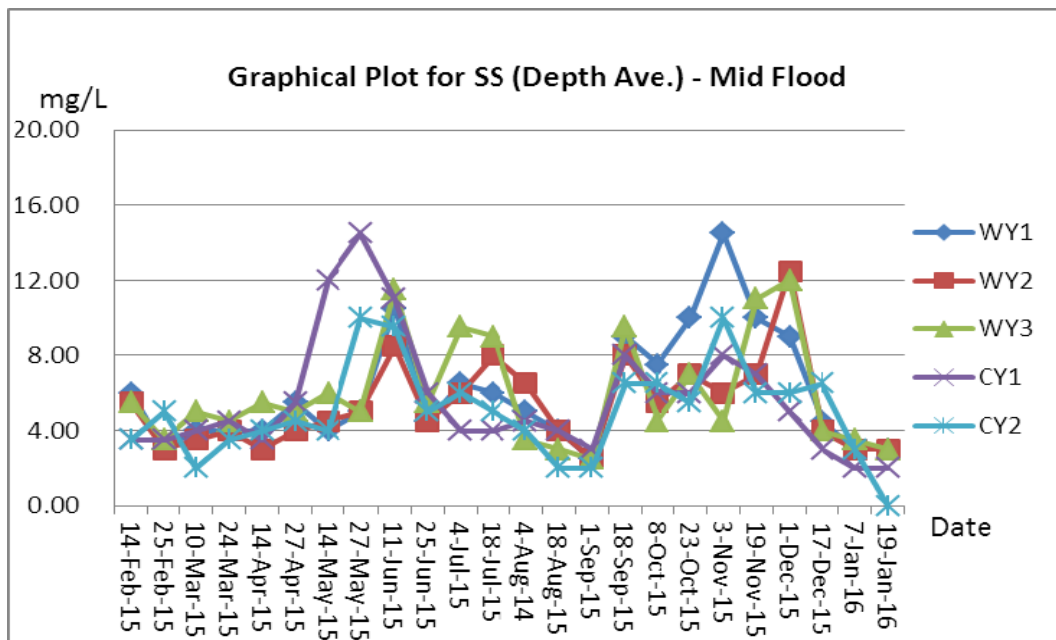
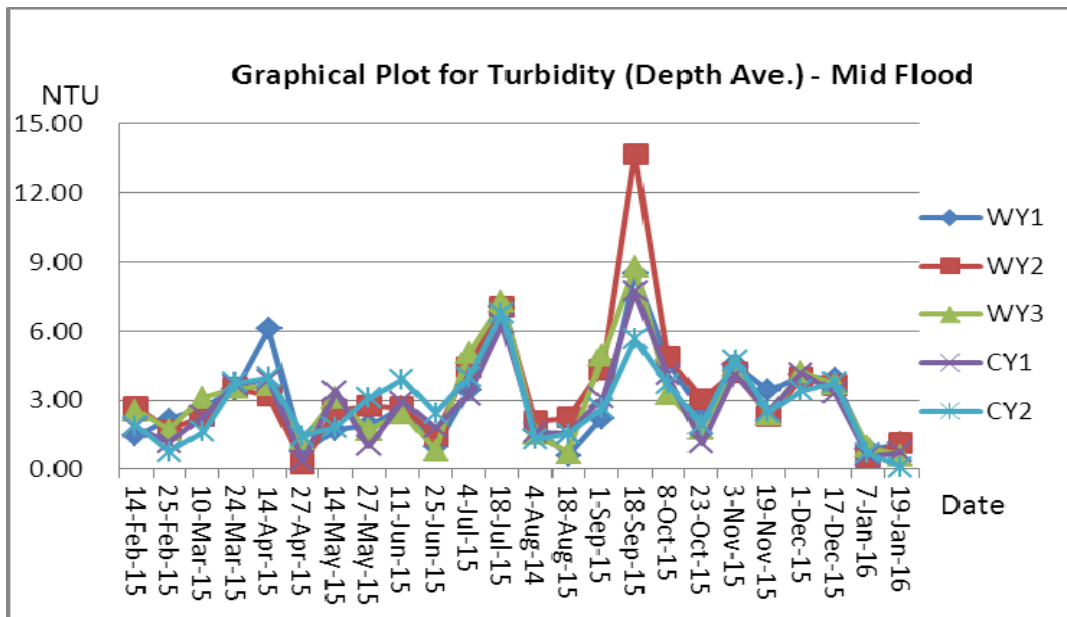


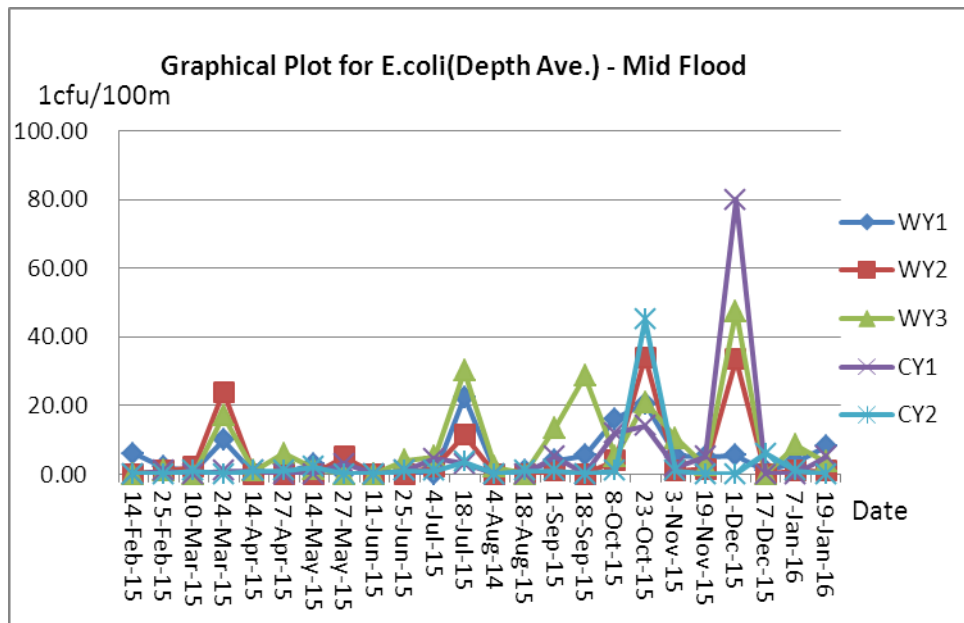
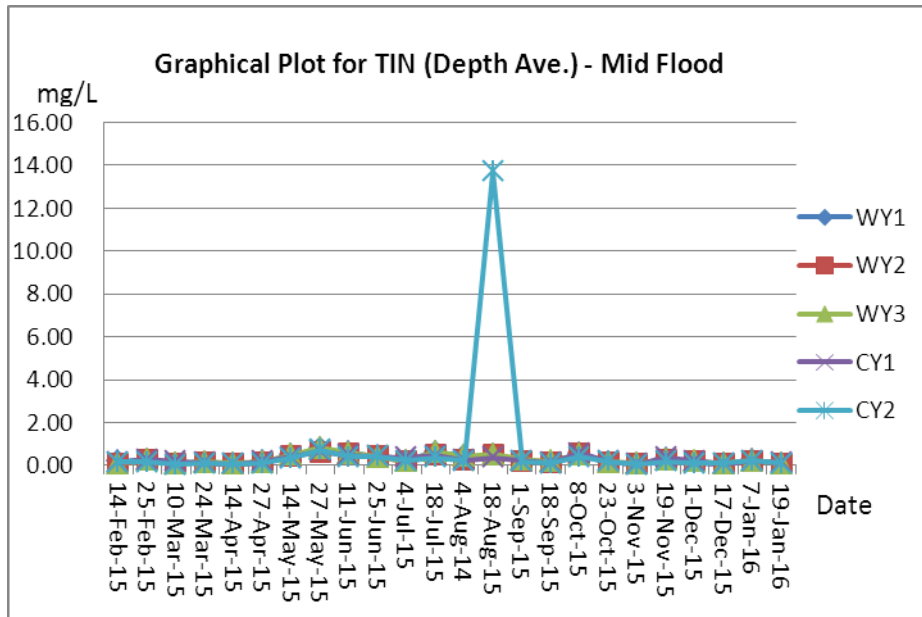




Water Quality Monitoring Result – Mid Flood







Appendix F

**Test Reports for Performance
of Deodorization Facility at YSWSTW**



PHARMTECH (HONG KONG) LIMITED

Unit 1C, 6/F., Cheung Fung Industrial Building,
23-39 Pak Tin Par Street, Tsuen Wan, Hong Kong.
Tel: (852) 2499 8886 Fax: (852) 2405 7005
Website: www.pharmtechhk.com E-mail: lab@pharmtech.com.hk

TEST REPORT

| | | | |
|-------------------------|--|-------------------------|------------|
| Name of Client : | Kai Mei Environmental Co. Ltd. No.18-20, 9/F Block A Hi-Tech Ind. Ctr. 5-21 Pak Tin Par St., Tsuen Wan Hong Kong | Report No. : | LR14/00352 |
| Contact Person : | Mr. Johnson Wong | Date of Issue : | 14-07-2014 |
| | | Date Received : | 11-07-2014 |
| | | Date Commenced : | 12-07-2014 |
| | | Date Completed : | 12-07-2014 |
| | | Page No. : | 1 of 1 |

Information of Sample(s):

| | |
|--------------------|--|
| Sample Description | 2 liquid absorbent samples as received |
| Sampling Date | 11-07-2014 |
| Sampling Location | Yung Shue Wan STW |
| Equipment Model | U13000 |
| Serial Number | 101205 |

Test Parameter(s) & Method Reference(s):

| Parameter(s) | Method Reference(s) | Limit of Reporting |
|---------------------------|--|--------------------|
| Hydrogen Sulphide Content | Refer to ISC 3 rd edition, Method 701 “Determination of Hydrogen Sulphide Content of the Atmosphere” | 0.02 ppm |

Test Result(s):

| | Inlet (sample 1) | Outlet (sample 2) |
|--------------------------------------|------------------|-------------------|
| Sample Code | LR14/00352/001 | LR14/00352/002 |
| Hydrogen Sulphide Content, ppm (v/v) | 8.3 | <0.02 |

***** END *****

PREPARED AND APPROVED BY:




T.C. Lee, Jeffrey
Date: 14-07-2014



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Unit 1C, 6/F., Cheung Fung Industrial Building,
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Website: www.pharmtechhk.com E-mail: lab@pharmtech.com.hk

TEST REPORT

| | | | |
|-------------------------|--|-------------------------|------------|
| Name of Client : | Kai Mei Environmental Co. Ltd. No.18-20, 9/F Block A Hi-Tech Ind. Ctr. 5-21 Pak Tin Par St., Tsuen Wan Hong Kong | Report No. : | LR14/00351 |
| Contact Person : | Mr. Johnson Wong | Date of Issue : | 14-07-2014 |
| | | Date Received : | 11-07-2014 |
| | | Date Commenced : | 12-07-2014 |
| | | Date Completed : | 12-07-2014 |
| | | Page No. : | 1 of 1 |

Information of Sample(s):

| | |
|--------------------|--|
| Sample Description | 2 liquid absorbent samples as received |
| Sampling Date | 11-07-2014 |
| Sampling Location | Yung Shue Wan STW |
| Equipment Model | U13000 |
| Serial Number | 101206 |

Test Parameter(s) & Method Reference(s):

| Parameter(s) | Method Reference(s) | Limit of Reporting |
|---------------------------|--|--------------------|
| Hydrogen Sulphide Content | Refer to ISC 3 rd edition, Method 701 "Determination of Hydrogen Sulphide Content of the Atmosphere" | 0.02 ppm |

Test Result(s):

| | Inlet (sample 1) | Outlet (sample 2) |
|--------------------------------------|------------------|-------------------|
| Sample Code | LR14/00351/001 | LR14/00351/002 |
| Hydrogen Sulphide Content, ppm (v/v) | 7.9 | <0.02 |

***** END *****

PREPARED AND APPROVED BY:

T.C. Lee, Jeffrey

Date: 14-07-2014