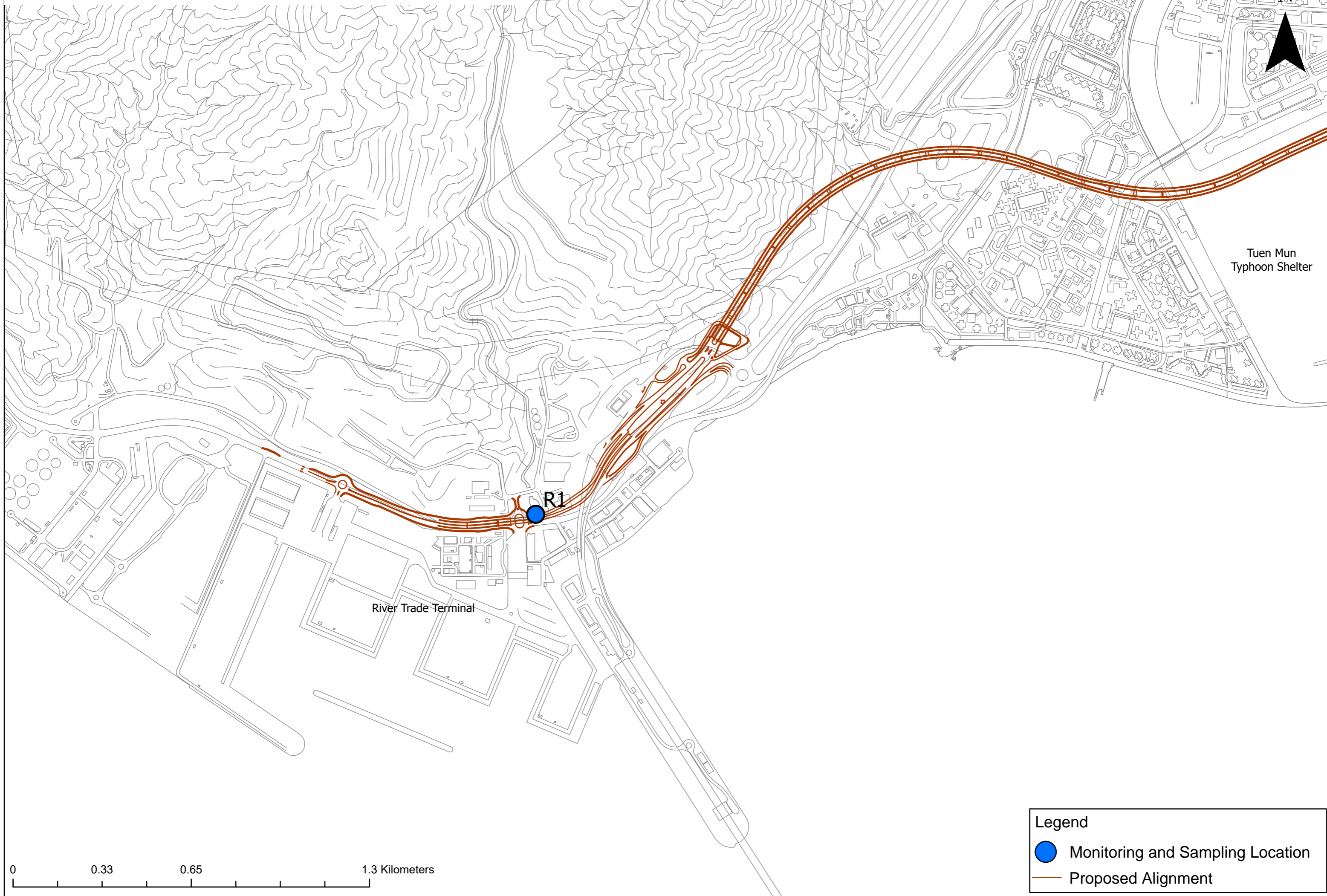


# Locations of Inland Water Quality Monitoring and Sampling



Tuen Mun  
Typhoon Shelter

R1

River Trade Terminal

**Legend**

- Monitoring and Sampling Location
- Proposed Alignment

0 0.33 0.65 1.3 Kilometers



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

## REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

<b>CONTACT:</b>	BEN TAM	<b>WORK ORDER:</b>	HK2237607
<b>CLIENT:</b>	ACTION-UNITED ENVIRONMENTAL SERVICES & CONSULTING	<b>SUB- BATCH:</b>	0
<b>ADDRESS:</b>	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T.	<b>LABORATORY:</b>	HONG KONG
		<b>DATE RECEIVED:</b>	22-Sep-2022
		<b>DATE OF ISSUE:</b>	28-Sep-2022

### SPECIFIC COMMENTS

Equipment information (Brand name, Model No., Serial No. and Equipment No.) is provided by client. 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 laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principle as practised by the laboratory or quoted from relevant international standards.

The validity of equipment/ meter performance only applies to the result(s) stated in the report.

Equipment Type:	Multifunctional Meter
Service Nature:	Performance Check
Scope:	Conductivity, Dissolved Oxygen, pH Value, Turbidity, Salinity and Temperature
Brand Name/ Model No.:	[YSI]/ [Professional DSS]
Serial No./ Equipment No.:	[17B102764/17B100758]/ [EQW019]
Date of Calibration:	27-September-2022

### GENERAL COMMENTS

This report superseded any previous report(s) with same work order number.

Ms. Lin Wai Yu, Iris  
Assistant Manager - Inorganics

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# REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



**WORK ORDER:** HK2237607  
**SUB- BATCH:** 0  
**DATE OF ISSUE:** 28-Sep-2022  
**CLIENT:** ACTION-UNITED ENVIRONMENTAL SERVICES & CONSULTING

**Equipment Type:** Multifunctional Meter  
**Brand Name/ Model No.:** [YSI]/ [Professional DSS]  
**Serial No./ Equipment No.:** [17B102764/17B100758]/ [EQW019]  
**Date of Calibration:** 27-September-2022      **Date of Next Calibration:** 27-December-2022

**PARAMETERS:**

**Conductivity**

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

Expected Reading (µS/cm)	Displayed Reading (µS/cm)	Tolerance (%)
146.9	154.1	+4.9
6667	7043	+5.6
12890	13282	+3.0
58670	60170	+2.6
Tolerance Limit (%)		±10.0

**Dissolved Oxygen**

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.90	3.86	-0.04
6.19	6.09	-0.10
7.76	7.78	+0.02
Tolerance Limit (mg/L)		±0.20

**pH Value**

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

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)
4.0	4.20	+0.20
7.0	7.20	+0.20
10.0	9.95	-0.05
Tolerance Limit (pH unit)		±0.20

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

Ms. Lin Wai Yu, Iris  
 Assistant Manager - Inorganics

# REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



WORK ORDER: HK2237607  
SUB-BATCH: 0  
DATE OF ISSUE: 28-Sep-2022  
CLIENT: ACTION-UNITED ENVIRONMENTAL SERVICES & CONSULTING

Equipment Type: Multifunctional Meter  
Brand Name/ Model No.: [YSI]/ [Professional DSS]  
Serial No./ Equipment No.: [17B102764/17B100758]/ [EQW019]  
Date of Calibration: 27-September-2022 Date of Next Calibration: 27-December-2022

## PARAMETERS:

### Turbidity

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

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	-0.12	--
4	3.86	-3.5
40	37.35	-6.6
80	77.12	-3.6
400	371.05	-7.2
800	728.04	-9.0
	Tolerance Limit (%)	±10.0

### Salinity

Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	10.67	+6.7
20	20.56	+2.8
30	31.12	+3.7
	Tolerance Limit (%)	±10.0

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

Ms. Lin Wai Yu, Iris  
Assistant Manager - Inorganics

## REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



**WORK ORDER:** HK2237607  
**SUB- BATCH:** 0  
**DATE OF ISSUE:** 28-Sep-2022  
**CLIENT:** ACTION-UNITED ENVIRONMENTAL SERVICES & CONSULTING

**Equipment Type:** Multifunctional Meter  
**Brand Name/ Model No.:** [YSI]/ [Professional DSS]  
**Serial No./ Equipment No.:** [17B102764/17B100758]/ [EQW019]  
**Date of Calibration:** 27-September-2022      **Date of Next Calibration:** 27-December-2022

### 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)
7.0	6.7	-0.3
23.0	22.4	-0.6
43.5	42.7	-0.8
	Tolerance Limit (°C)	±2.0

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

A handwritten signature in black ink, appearing to read 'Iris'.

Ms. Lin Wai Yu, Iris  
Assistant Manager - Inorganics

WATER

## Manufacturing Certificate

This product has been tested in accordance with procedures established through Global Water Instrumentation's Quality Management System. This product meets or exceeds its manufacturing acceptance criteria.

**ITEM DESCRIPTION:** Flow Probe, 5.5 - 14'  
**MODEL NAME/ NUMBER:** FP211  
**PART NUMBER:** BB1100  
**SERIAL NUMBER:** 22B106785  
**ACCURACY:** ± 0.1 FPS (0.03 MPS)  
**POWER REQUIRED:** Internal Lithium Coin Cell Battery  
**CABLE LENGTH:** N/A  
**CERTIFICATES:** CE Compliant  
**RANGE:** 0.3 - 19.9 FPS (0.1 - 6.1 MPS)  
**OUTPUT:** Flow Display, FPS/MPS  
**CALIBRATION FACTOR:** 318

Contact  
Global Water  
for all your  
instrumentation  
needs:

Water Level

Water Flow

Water Samplers

Water Quality

Weather

Remote Monitoring

Control

Technician Barnette, Melinda

Inspector Wineberg, Josh

Date 3/5/2022

NOTE: Global Water Instrumentation warrants that its products are free from defects in material & workmanship under normal use & service for a period of one year from date of original shipment from factory. Repaired components are warranted for a period of 90 days from shipment. Contact us for complete warranty details.



**Global Water**

a xylem brand

In the U.S. call toll free  
at 1-800-876-1172  
International: 1-979-690-5560  
Fax: 1-979-690-0440  
Email: [globalw@globalw.com](mailto:globalw@globalw.com)

Visit our online catalog at:  
[www.globalw.com](http://www.globalw.com)  
Our Service Address:  
151 Graham Rd  
College Station, TX 77845

**1. GENERAL**

Date	4-1-2023	Project No.	1278	Project Name		Time	
------	----------	-------------	------	--------------	--	------	--

**2. WEATHER**

	Monitoring Day
Temperature (°C)	18.4
Weather	Sunny / <u>Cloudy</u> / Rainy

**3. CALIBRATION**

Testing (DO Saturation %)	Check(✓)
Before Measurement ('Cal' mode can be adjusted to 100%)	✓
After Measurement ('Cal' mode can be adjusted to 100%)	✓

**4. RESULTS**

Start Time	Location ID	Depth (m)	Temperature (°C)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		Flow (m/s)	
			1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading
9:48	TMB-R1	0.28	16.3	16.3	9.9	9.20	93.9	94.0	1.73	1.71	0.39	0.39	8.18	8.18	0.1	0.1
9:48	TMB-R1 (Replicate)	0.28	16.3	16.3	9.18	9.16	93.8	93.6	1.74	1.72	0.38	0.38	8.11	8.11	0.1	0.1

**5. SITE OBSERVATION**

Sampled By	Date	Checked By	Date
G. ERIC	4-1-2023		

**1. GENERAL**

Date 6-1-23 Project No. 1278 Project Name \_\_\_\_\_ Time \_\_\_\_\_

**2. WEATHER**

	Monitoring Day
Temperature (°C)	<u>24.5</u>
Weather	<u>Sunny</u> / Cloudy / Rainy

**3. CALIBRATION**

Testing (DO Saturation %)	Check(✓)
Before Measurement ('Cal' mode can be adjusted to 100%)	✓
After Measurement ('Cal' mode can be adjusted to 100%)	✓

**4. RESULTS**

Start Time	Location ID	Depth (m)	Temperature (°C)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		Flow (m/s)	
			1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading
<u>10:50</u>	<u>TMB-R1</u>	<u>0.27</u>	<u>19.4</u>	<u>19.4</u>	<u>8.21</u>	<u>8.16</u>	<u>89.4</u>	<u>88.9</u>	<u>1.72</u>	<u>1.79</u>	<u>0.47</u>	<u>0.47</u>	<u>7.99</u>	<u>7.98</u>	<u>0.1</u>	<u>0.1</u>
<u>11:00</u>	<u>TMB-R1</u> <u>(Replicate)</u>	<u>0.27</u>	<u>19.3</u>	<u>19.4</u>	<u>8.14</u>	<u>8.16</u>	<u>88.5</u>	<u>88.9</u>	<u>1.98</u>	<u>1.79</u>	<u>0.47</u>	<u>0.47</u>	<u>7.97</u>	<u>7.98</u>	<u>0.1</u>	<u>0.1</u>

**5. SITE OBSERVATION**

Checked By \_\_\_\_\_ Date \_\_\_\_\_

Sampled By S. ZR.C Date 6-1-2023



**1. GENERAL**

Date: 9-1-23 Project No.: 1278 Project Name: Link Time: \_\_\_\_\_

**2. WEATHER**

	Monitoring Day
Temperature (°C)	<u>21.2</u>
Weather	Sunny <u>(Cloudy)</u> / Rainy

**3. CALIBRATION**

Testing (DO Saturation %)	Check(✓)
Before Measurement ('Cal' mode can be adjusted to 100%)	✓
After Measurement ('Cal' mode can be adjusted to 100%)	✓

**4. RESULTS**

Start Time	Location ID	Depth (m)	Temperature (°C)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		Flow (m/s)	
			1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading
<u>10:55</u>	<u>TMB-R1</u>	<u>0.29</u>	<u>18.5</u>	<u>18.5</u>	<u>9.19</u>	<u>9.24</u>	<u>98.3</u>	<u>98.8</u>	<u>2.24</u>	<u>2.25</u>	<u>0.42</u>	<u>0.44</u>	<u>8.34</u>	<u>8.33</u>	<u>0.1</u>	<u>0.1</u>
<u>11:10</u>	<u>TMB-R1</u> <u>(Replicate)</u>	<u>0.29</u>	<u>18.5</u>	<u>18.4</u>	<u>9.29</u>	<u>9.29</u>	<u>99.2</u>	<u>99.2</u>	<u>3.32</u>	<u>4.08</u>	<u>0.42</u>	<u>0.44</u>	<u>8.32</u>	<u>8.29</u>	<u>0.1</u>	<u>0.1</u>

**5. SITE OBSERVATION**

Sampled By: Sy. TRIC Date: 9-1-2023 Checked By: \_\_\_\_\_ Date: \_\_\_\_\_

**1. GENERAL**

Date	11-1-23	Project No.	1278	Project Name		Time	
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**2. WEATHER**

	Monitoring Day
Temperature (°C)	19.1
Weather	Sunny / <u>Cloudy</u> / Rainy

**3. CALIBRATION**

Testing (DO Saturation %)	Check(✓)
Before Measurement ('Cal' mode can be adjusted to 100%)	✓
After Measurement ('Cal' mode can be adjusted to 100%)	✓

**4. RESULTS**

Start Time	Location ID	Depth (m)	Temperature (°C)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		Flow (m/s)	
			1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading
11:05	TMB-R1	0.31	19.0	19.0	8.59	8.59	92.7	92.8	2.97	3.03	0.34	0.34	8.02	8.02	0.1	0.1
11:15	TMB-R1 (Replicate)	0.31	19.0	18.9	8.58	8.57	92.6	92.5	3.23	3.05	0.34	0.34	8.02	8.01	0.1	0.1

**5. SITE OBSERVATION**

Sampled By	Date	Checked By	Date
S. ERIC	11-1-2023		

**1. GENERAL**

Date 13-1-23 Project No. 1278 Project Name 在门水 Time

**2. WEATHER**

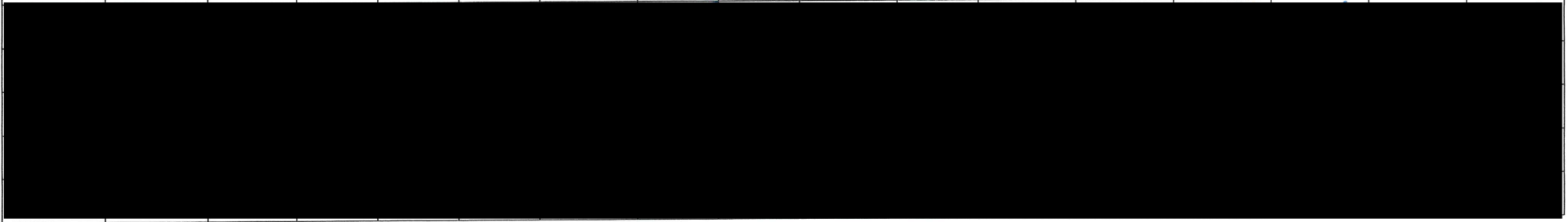
	Monitoring Day
Temperature (°C)	<u>21.2</u>
Weather	Sunny / <u>Cloudy</u> / Rainy

**3. CALIBRATION**

Testing (DO Saturation %)	Check(✓)
Before Measurement ('Cal' mode can be adjusted to 100%)	✓
After Measurement ('Cal' mode can be adjusted to 100%)	✓

**4. RESULTS**

Start Time	Location ID	Depth (m)	Temperature (°C)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		Flow (m/s)	
			1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading
<u>11:06</u>	<u>TMB-R1</u>	<u>0.31</u>	<u>20.9</u>	<u>20.9</u>	<u>8.26</u>	<u>8.27</u>	<u>92.6</u>	<u>92.6</u>	<u>2.87</u>	<u>2.76</u>	<u>0.40</u>	<u>0.40</u>	<u>8.18</u>	<u>8.18</u>	<u>&lt;0.1</u>	<u>&lt;0.1</u>
<u>11:16</u>	<u>TMB-R1</u> <u>(Replicate)</u>	<u>0.31</u>	<u>20.7</u>	<u>20.7</u>	<u>8.27</u>	<u>8.26</u>	<u>92.4</u>	<u>92.3</u>	<u>1.81</u>	<u>1.83</u>	<u>0.40</u>	<u>0.40</u>	<u>8.16</u>	<u>8.16</u>	<u>&lt;0.1</u>	<u>&lt;0.1</u>



**5. SITE OBSERVATION**

Sampled By Sy. ZRC Date 13-1-2023 Checked By  Date

**1. GENERAL**

Date 16-1-23 Project No. 1278 Project Name \_\_\_\_\_ Time \_\_\_\_\_

**2. WEATHER**

	Monitoring Day
Temperature (°C)	<u>13.0</u>
Weather	Sunny <input checked="" type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/>

**3. CALIBRATION**

Testing (DO Saturation %)	Check(✓)
Before Measurement ('Cal' mode can be adjusted to 100%)	✓
After Measurement ('Cal' mode can be adjusted to 100%)	✓

**4. RESULTS**

Start Time	Location ID	Depth (m)	Temperature (°C)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		Flow (m/s)	
			1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading
<u>10:51</u>	<u>TMB-R1</u>	<u>0.28</u>	<u>14.4</u>	<u>14.4</u>	<u>9.34</u>	<u>9.25</u>	<u>91.7</u>	<u>90.8</u>	<u>5.66</u>	<u>5.80</u>	<u>0.45</u>	<u>0.45</u>	<u>8.40</u>	<u>8.40</u>	<u>&lt;0.1</u>	<u>&lt;0.1</u>
<u>11:11</u>	<u>TMB-R1</u> <u>(Replicate)</u>	<u>0.28</u>	<u>14.4</u>	<u>14.4</u>	<u>9.16</u>	<u>9.14</u>	<u>89.9</u>	<u>89.7</u>	<u>6.74</u>	<u>6.73</u>	<u>0.40</u>	<u>0.40</u>	<u>8.40</u>	<u>8.40</u>	<u>&lt;0.1</u>	<u>&lt;0.1</u>

**5. SITE OBSERVATION**

Sampled By J. ERIC Date 16-1-2023 Checked By \_\_\_\_\_ Date \_\_\_\_\_

**1. GENERAL**

Date	17-10-2022	Project No.		Project Name		Time	09:35
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<b>2. WEATHER</b>		<b>3. CALIBRATION</b>	
	Monitoring Day	Testing (DO Saturation %)	Check(✓)
Temperature (°C)	29.0	Before Measurement ('Cal' mode can be adjusted to 100%)	✓
Weather	Sunny / <u>Cloudy</u> / Rainy	After Measurement ('Cal' mode can be adjusted to 100%)	✓

**4. RESULTS**

Start Time	Location ID	Depth (m)	Temperature (°C)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		Flow (m/s)	
			1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading
09:35	TMB-K1	0.24	23.5	23.5	9.13	9.12	107.5	107.4	0.32	0.35	0.12	0.13	9.1	9.2	0.1	0.1
09:40	TMB-K1	0.24	23.5	23.5	9.11	9.10	107.3	107.3	0.31	0.32	0.12	0.12	8.8	8.9	0.1	0.1
	(Replicate)															

**5. SITE OBSERVATION**

Sampled By	Date	Checked By	Date
Fai Sa	17-10-2022		

**1. GENERAL**

Date: 19-10-22 Project No. Project Name Time

**2. WEATHER**

	Monitoring Day
Temperature (°C)	24.8
Weather	Sunny / <u>Cloudy</u> / Rainy

**3. CALIBRATION**

Testing (DO Saturation %)	Check(✓)
Before Measurement ('Cal' mode can be adjusted to 100%)	✓
After Measurement ('Cal' mode can be adjusted to 100%)	✓

**4. RESULTS**

Start Time	Location ID	Depth (m)	Temperature (°C)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		Flow (m/s)	
			1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading
11:21	TMB-R1	0.25	23.5	23.5	9.58	9.59	112.7	112.8	0.43	0.44	0.10	0.10	9.23	9.23	0.1	0.1
11:27	TMB-R1	0.25	23.7	23.7	9.57	9.39	110.5	110.8	0.48	0.47	0.10	0.10	9.43	9.43	0.1	0.1
	(Replicate)															

**5. SITE OBSERVATION**

Sampled By: Cg. BAC Date: 19-10-2022

Checked By: Date:



**1. GENERAL**

Date	24-10-22	Project No.	1278	Project Name		Time	
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**2. WEATHER**

	Monitoring Day
Temperature (°C)	27.3
Weather	Sunny / Cloudy / Rainy

**3. CALIBRATION**

Testing (DO Saturation %)	Check(✓)
Before Measurement ('Cal' mode can be adjusted to 100%)	✓
After Measurement ('Cal' mode can be adjusted to 100%)	✓

**4. RESULTS**

Start Time	Location ID	Depth (m)	Temperature (°C)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		Flow (m/s)	
			1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading
11:20	TMB-RI	0.25	27.4	27.4	9.78	9.83	123.8	124.8	0.89	0.88	0.16	0.16	9.52	9.52	0.1	0.1
11:30	TMB-RI (Replicate)	0.25	27.4	27.4	9.77	9.72	123.7	123.3	0.59	0.60	0.14	0.14	9.51	9.51	0.1	0.1

**5. SITE OBSERVATION**

Sampled By	Date	Checked By	Date
G. ZRIL	24-10-2022		



**1. GENERAL**

Date	26-10-22	Project No.	1278	Project Name		Time	
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**2. WEATHER**

	Monitoring Day
Temperature (°C)	26.6
Weather	Sunny / Cloudy / Rainy

**3. CALIBRATION**

Testing (DO Saturation %)	Check(✓)
Before Measurement ('Cal' mode can be adjusted to 100%)	✓
After Measurement ('Cal' mode can be adjusted to 100%)	✓

**4. RESULTS**

Start Time	Location ID	Depth (m)	Temperature (°C)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		Flow (m/s)	
			1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading
11:15	TMB-R1	0.25	27.0	27.0	9.22	9.24	115.6	115.9	0.88	0.87	0.16	0.16	9.44	9.44	0.1	0.1
11:25	TMB-R1 (Replicate)	0.25	26.9	26.9	9.81	9.83	123.1	123.3	0.19	0.18	0.15	0.15	9.46	9.46	0.1	0.1

**5. SITE OBSERVATION**

Sampled By	Date	Checked By	Date
J. Jelic	26-10-2022		

**1. GENERAL**

Date	28-10-22	Project No.	1278	Project Name		Time	
------	----------	-------------	------	--------------	--	------	--

**2. WEATHER**

	Monitoring Day
Temperature (°C)	29
Weather	<input checked="" type="radio"/> Sunny / <input type="radio"/> Cloudy / <input type="radio"/> Rainy

**3. CALIBRATION**

Testing (DO Saturation %)	Check(✓)
Before Measurement ('Cal' mode can be adjusted to 100%)	✓
After Measurement ('Cal' mode can be adjusted to 100%)	✓

**4. RESULTS**

Start Time	Location ID	Depth (m)	Temperature (°C)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		Flow (m/s)	
			1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading	1st reading	2nd reading
11:10	TMB-R1	0.25	26.6	26.6	9.70	9.74	121	121.6	0.09	0.08	0.16	0.16	9.69	9.69	0.1	0.1
11:20	TMB-R1 (Replicate)	0.25	26.6	26.6	9.60	9.61	119.8	119.9	0.56	0.55	0.16	0.16	9.61	9.61	0.1	0.1

**5. SITE OBSERVATION**

Sampled By	Date	Checked By	Date
S. RICE	28-10-2022		






### CERTIFICATE OF ANALYSIS

Client	: HIGHWAYS DEPARTMENT	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 6
Contact	: EDWARD LEE	Contact	: Richard Fung	Work Order	: HK2300347
Address	: RM 10-01 TO 10-03, PENINSULA TOWER 538 CASTLE PEAK ROAD, KOWLOON, HONG KONG HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong Kwai Tsing Hong Kong		
E-mail	: Edward.Lee@arup.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ---	Telephone	: +852 2610 1044		
Facsimile	: ---	Facsimile	: +852 2610 2021		
Project	: ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU) AND OTHER MAJOR ROAD PROJECTS - GROUND INVESTIGATION	Date Samples Received	: 04-Jan-2023		
Order number	: HY/2022/09/WQM/02	Quote number	: HKE/1667/2022_V3	Issue Date	: 18-Jan-2023
C-O-C number	: ---			No. of samples received	: 2
Site	: WATER QUALITY MONITORING AT 1 LOCATION			No. of samples analysed	: 2

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
		
Fung Lim Chee, Richard	Managing Director	Inorganics, Kwai Tsing
		
Fung Lim Chee, Richard	Managing Director	Metals_ENV, Kwai Tsing
		
Ng Sin Kou, May	Laboratory Manager	Microbiology_ENV, Kwai Tsing

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## General Comments

This report supersedes any previous report(s) with the same work order number. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Testing period is from 04-Jan-2023 to 18-Jan-2023.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### Specific Comments for Work Order: HK2300347

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified.

Microbiological sample(s) was/ were collected in 250mL sterile plastic bottles containing sodium thiosulfate. Sample(s) arrived at the laboratory at 15:30.

NOT DETECTED denotes result(s) is (are) less than the Limit of Report (LOR).

EK061P - Total Kjeldahl Nitrogen is the difference of Total Nitrogen and Total Oxidizable Nitrogen.

EK061P - The accredited LOR of Total Kjeldahl Nitrogen is 0.1mg/L. Results reported below 0.1mg/L and the decimal value of the results were for reference only.

EK062P - The accredited LOR of Total Nitrogen is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EK071K - The accredited LOR of Reactive Phosphorus is 0.01mg/L. Results reported below LOR and with decimal value of the results are for reference only.

EK085 - The accredited LOR of Total Sulphide is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EP020 - The accredited LOR of Oil and Grease is 2mg/L. Results reported below LOR and with decimal value are for reference only.

EP030 - The accredited LOR of Biochemical Oxygen Demand is 2mg/L. Results reported below LOR and with decimal value are for reference only.

Water sample(s) digested by in-house method E-3005 prior to the determination of total metals. The in-house method is developed based on USEPA method 3005.

EA025 - The accredited LOR of Total Suspended Solids is 0.5mg/L. Results below this LOR are for reference only.



### Analytical Results

Sub-Matrix: WATER

				Sample ID	TMB-R1	TMB-R1 (replicate)			
				Sampling date / time	04-Jan-2023	04-Jan-2023	---	---	---
Compound	CAS Number	LOR	Unit	HK2300347-001	HK2300347-002	-----	-----	-----	
<b>EA/ED: Physical and Aggregate Properties</b>									
EA025: Suspended Solids (SS)	----	0.5	mg/L	1.6	1.3	---	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters</b>									
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	40.0	37.0	---	---	---	
EK058A: Nitrate as N	14797-55-8	0.005	mg/L	4.07	4.16	---	---	---	
EK061P: Total Kjeldahl Nitrogen as N	----	0.05	mg/L	40.0	40.2	---	---	---	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.03	0.02	---	---	---	
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.010	0.010	---	---	---	
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	<0.05	---	---	---	
<b>EG: Metals and Major Cations</b>									
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	---	---	---	
EG020: Chromium	7440-47-3	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Copper	7440-50-8	1.0	µg/L	1.3	1.4	---	---	---	
EG020: Lead	7439-92-1	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Zinc	7440-66-6	10	µg/L	34	<10	---	---	---	
EG020: Aluminium	7429-90-5	10	µg/L	17	16	---	---	---	
<b>EP: Aggregate Organics</b>									
EP005: Total Organic Carbon	----	1	mg/L	9	9	---	---	---	
EP020: Oil & Grease	----	0.5	mg/L	0.9	0.9	---	---	---	
EP026: Chemical Oxygen Demand	----	2	mg/L	16	13	---	---	---	
EP030: Biochemical Oxygen Demand	----	0.1	mg/L	2.8	2.2	---	---	---	
<b>EM: Microbiological Testing</b>									
EM019: Escherichia coli	----	1	CFU/100mL	180	430	---	---	---	
EM022: Faecal Coliforms	----	1	CFU/100mL	2600	2400	---	---	---	



### Laboratory Duplicate (DUP) Report

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4801852)</b>								
HK2251751-001	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	<1.0	<1.0	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4803703)</b>								
HK2300347-002	TMB-R1 (replicate)	EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.010	0.012	20.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4803798)</b>								
HK2300377-001	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	0.13	0.11	14.3
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813686)</b>								
HK2300346-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.005	mg/L	0.085	0.085	0.0
<b>EG: Metals and Major Cations (QC Lot: 4802003)</b>								
HK2300346-002	Anonymous	EG020: Zinc	7440-66-6	1	µg/L	58	65	12.3
<b>EP: Aggregate Organics (QC Lot: 4809424)</b>								
HK2300232-001	Anonymous	EP026: Chemical Oxygen Demand	----	2	mg/L	806	815	1.2
<b>EP: Aggregate Organics (QC Lot: 4816727)</b>								
HK2251357-016	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	<1	<1	0.0
<b>EG: Metals and Major Cations - Total (QC Lot: 4802003)</b>								
HK2300346-002	Anonymous	EG020: Cadmium	7440-43-9	0.1	µg/L	0.4	0.5	0.0
		EG020: Chromium	7440-47-3	0.1	µg/L	1.3	1.5	13.2
		EG020: Lead	7439-92-1	0.1	µg/L	6.0	6.6	8.8
		EG020: Copper	7440-50-8	0.2	µg/L	4.2	4.8	11.6
		EG020: Aluminium	7429-90-5	5	µg/L	1040	1000	3.3

### Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4801852)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	10 mg/L	108	----	85.1	117	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4803703)</b>											
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.5 mg/L	99.7	----	85.0	115	----	----



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
Method: Compound	CAS Number					LCS	DCS	Low	High	Value	Control Limit
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4803798)</b>											
EK067P: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	97.7	----	94.9	102	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4809929)</b>											
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	----	----	----	----	----	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813686)</b>											
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.05 mg/L	103	----	85.0	110	----	----
<b>EG: Metals and Major Cations (QC Lot: 4802003)</b>											
EG020: Zinc	7440-66-6	1	µg/L	<1	5 µg/L	111	----	88.7	115	----	----
<b>EP: Aggregate Organics (QC Lot: 4801260)</b>											
EP030: Biochemical Oxygen Demand	----	----	mg/L	----	198 mg/L	100	----	81.0	115	----	----
<b>EP: Aggregate Organics (QC Lot: 4809424)</b>											
EP026: Chemical Oxygen Demand	----	----	mg/L	----	20 mg/L	101	----	88.4	109	----	----
					200 mg/L	98.3	----	91.0	109	----	----
<b>EP: Aggregate Organics (QC Lot: 4816727)</b>											
EP005: Total Organic Carbon	----	1	mg/L	<1	5 mg/L	93.8	----	83.4	124	----	----
				<1	100 mg/L	107	----	87.8	119	----	----
<b>EP: Aggregate Organics (QC Lot: 4816884)</b>											
EP020: Oil & Grease	----	1	mg/L	<0.1	20 mg/L	93.0	----	79.0	105	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4802003)</b>											
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	5 µg/L	97.7	----	85.0	115	----	----
EG020: Chromium	7440-47-3	0.1	µg/L	<0.1	5 µg/L	108	----	85.3	114	----	----
EG020: Copper	7440-50-8	0.2	µg/L	<0.2	5 µg/L	94.5	----	86.3	115	----	----
EG020: Lead	7439-92-1	0.1	µg/L	<0.1	5 µg/L	92.3	----	85.0	115	----	----
EG020: Aluminium	7429-90-5	5	µg/L	<5	5 µg/L	97.4	----	85.0	115	----	----



**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

Matrix: WATER					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4803703)</b>										
HK2300347-002	TMB-R1 (replicate)	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	94.2	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4803798)</b>										
HK2300377-001	Anonymous	EK067P: Total Phosphorus as P	----	0.5 mg/L	96.9	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813686)</b>										
HK2300346-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.5 mg/L	104	----	75.0	125	----	----
<b>EG: Metals and Major Cations (QC Lot: 4802003)</b>										
HK2300346-001	Anonymous	EG020: Zinc	7440-66-6	5 µg/L	# Not Determined	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4809424)</b>										
HK2301024-014	Anonymous	EP026: Chemical Oxygen Demand	----	400 mg/L	101	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4816727)</b>										
HK2251357-016	Anonymous	EP005: Total Organic Carbon	----	5 mg/L	106	----	75.0	125	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4802003)</b>										
HK2300346-001	Anonymous	EG020: Cadmium	7440-43-9	5 µg/L	101	----	75.0	125	----	----
		EG020: Chromium	7440-47-3	5 µg/L	109	----	75.0	125	----	----
		EG020: Copper	7440-50-8	5 µg/L	100.0	----	75.0	125	----	----
		EG020: Lead	7439-92-1	5 µg/L	85.7	----	75.0	125	----	----
		EG020: Aluminium	7429-90-5	5 µg/L	# Not Determined	----	75.0	125	----	----





### CERTIFICATE OF ANALYSIS

Client	: HIGHWAYS DEPARTMENT	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 6
Contact	: EDWARD LEE	Contact	: Richard Fung	Work Order	: HK2300992
Address	: RM 10-01 TO 10-03, PENINSULA TOWER 538 CASTLE PEAK ROAD, KOWLOON, HONG KONG HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong Kwai Tsing Hong Kong		
E-mail	: Edward.Lee@arup.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ---	Telephone	: +852 2610 1044		
Facsimile	: ---	Facsimile	: +852 2610 2021		
Project	: ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU) AND OTHER MAJOR ROAD PROJECTS - GROUND INVESTIGATION	Date Samples Received	: 06-Jan-2023		
Order number	: HY/2022/09/WQM/02	Quote number	: HKE/1667/2022_V3	Issue Date	: 20-Jan-2023
C-O-C number	: ---			No. of samples received	: 2
Site	: WATER QUALITY MONITORING AT 1 LOCATION			No. of samples analysed	: 2

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
Fung Lim Chee, Richard	Managing Director	Inorganics, Kwai Tsing
Fung Lim Chee, Richard	Managing Director	Metals_ENV, Kwai Tsing
Ng Sin Kou, May	Laboratory Manager	Microbiology_ENV, Kwai Tsing

**ALS Technichem (HK) Pty Ltd**  
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Tel: +852 2610 1044 Fax: +852 2610 2021 www.alsglobal.com



## General Comments

This report supersedes any previous report(s) with the same work order number. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Testing period is from 06-Jan-2023 to 20-Jan-2023.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### Specific Comments for Work Order: HK2300992

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified.

Microbiological sample(s) was/ were collected in 250mL sterile plastic bottles containing sodium thiosulfate. Sample(s) arrived at the laboratory at 15:05.

NOT DETECTED denotes result(s) is (are) less than the Limit of Report (LOR).

EK061P - Total Kjeldahl Nitrogen is the difference of Total Nitrogen and Total Oxidizable Nitrogen.

EK061P - The accredited LOR of Total Kjeldahl Nitrogen is 0.1mg/L. Results reported below 0.1mg/L and the decimal value of the results were for reference only.

EK062P - The accredited LOR of Total Nitrogen is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EK071K - The accredited LOR of Reactive Phosphorus is 0.01mg/L. Results reported below LOR and with decimal value of the results are for reference only.

EK085 - The accredited LOR of Total Sulphide is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EP020 - The accredited LOR of Oil and Grease is 2mg/L. Results reported below LOR and with decimal value are for reference only.

EP030 - The accredited LOR of Biochemical Oxygen Demand is 2mg/L. Results reported below LOR and with decimal value are for reference only.

Water sample(s) digested by in-house method E-3005 prior to the determination of total metals. The in-house method is developed based on USEPA method 3005.

EA025 - The accredited LOR of Total Suspended Solids is 0.5mg/L. Results below this LOR are for reference only.



### Analytical Results

Sub-Matrix: WATER

				Sample ID	TMB-R1	TMB-R1 (replicate)			
				Sampling date / time	06-Jan-2023	06-Jan-2023	---	---	---
Compound	CAS Number	LOR	Unit	HK2300992-001	HK2300992-002	-----	-----	-----	
<b>EA/ED: Physical and Aggregate Properties</b>									
EA025: Suspended Solids (SS)	----	0.5	mg/L	2.8	2.6	---	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters</b>									
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	48.4	50.5	---	---	---	
EK058A: Nitrate as N	14797-55-8	0.005	mg/L	3.96	4.10	---	---	---	
EK061P: Total Kjeldahl Nitrogen as N	----	0.05	mg/L	50.5	50.8	---	---	---	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.06	0.06	---	---	---	
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.009	0.010	---	---	---	
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	<0.05	---	---	---	
<b>EG: Metals and Major Cations</b>									
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	---	---	---	
EG020: Chromium	7440-47-3	1.0	µg/L	1.2	<1.0	---	---	---	
EG020: Copper	7440-50-8	1.0	µg/L	4.1	2.7	---	---	---	
EG020: Lead	7439-92-1	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Zinc	7440-66-6	10	µg/L	23	<10	---	---	---	
EG020: Aluminium	7429-90-5	10	µg/L	84	16	---	---	---	
<b>EP: Aggregate Organics</b>									
EP005: Total Organic Carbon	----	1	mg/L	12	12	---	---	---	
EP020: Oil & Grease	----	0.5	mg/L	0.6	0.5	---	---	---	
EP026: Chemical Oxygen Demand	----	2	mg/L	20	22	---	---	---	
EP030: Biochemical Oxygen Demand	----	0.1	mg/L	3.2	3.2	---	---	---	
<b>EM: Microbiological Testing</b>									
EM019: Escherichia coli	----	1	CFU/100mL	1400	2400	---	---	---	
EM022: Faecal Coliforms	----	1	CFU/100mL	3600	4700	---	---	---	



### Laboratory Duplicate (DUP) Report

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4807453)</b>								
HK2300992-001	TMB-R1	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.8	2.5	8.5
HK2301017-004	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	63.0	62.6	0.6
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4804923)</b>								
HK2300994-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.026	0.028	7.7
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4808526)</b>								
HK2300592-001	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	3.33	3.32	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813686)</b>								
HK2300346-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.005	mg/L	0.085	0.085	0.0
<b>EG: Metals and Major Cations (QC Lot: 4805848)</b>								
HK2300992-002	TMB-R1 (replicate)	EG020: Zinc	7440-66-6	1	µg/L	<10	<10	0.0
<b>EP: Aggregate Organics (QC Lot: 4821183)</b>								
HK2300992-002	TMB-R1 (replicate)	EP026: Chemical Oxygen Demand	----	2	mg/L	22	22	0.0
<b>EP: Aggregate Organics (QC Lot: 4823931)</b>								
HK2301062-002	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	137	138	0.0
<b>EG: Metals and Major Cations - Total (QC Lot: 4805848)</b>								
HK2300992-002	TMB-R1 (replicate)	EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	0.0
		EG020: Chromium	7440-47-3	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Lead	7439-92-1	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Copper	7440-50-8	0.2	µg/L	2.7	2.4	10.6
		EG020: Aluminium	7429-90-5	5	µg/L	16	18	11.0

### Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4807453)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	10 mg/L	104	----	85.1	117	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4804923)</b>											



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
Method: Compound	CAS Number					LCS	DCS	Low	High	Value	Control Limit
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4804923) - Continued</b>											
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.5 mg/L	98.8	---	85.0	115	---	---
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4808526)</b>											
EK067P: Total Phosphorus as P	---	0.01	mg/L	<0.01	0.5 mg/L	97.3	---	94.9	102	---	---
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4809929)</b>											
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	---	---	---	---	---	---	---
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813686)</b>											
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.05 mg/L	103	---	85.0	110	---	---
<b>EG: Metals and Major Cations (QC Lot: 4805848)</b>											
EG020: Zinc	7440-66-6	1	µg/L	<1	5 µg/L	112	---	88.7	115	---	---
<b>EP: Aggregate Organics (QC Lot: 4804799)</b>											
EP030: Biochemical Oxygen Demand	---	---	mg/L	---	198 mg/L	87.0	---	81.0	115	---	---
<b>EP: Aggregate Organics (QC Lot: 4821183)</b>											
EP026: Chemical Oxygen Demand	---	---	mg/L	---	20 mg/L	105	---	88.4	109	---	---
				---	200 mg/L	100	---	91.0	109	---	---
<b>EP: Aggregate Organics (QC Lot: 4822028)</b>											
EP020: Oil & Grease	---	1	mg/L	<0.1	20 mg/L	98.0	---	79.0	105	---	---
<b>EP: Aggregate Organics (QC Lot: 4823931)</b>											
EP005: Total Organic Carbon	---	1	mg/L	<1	5 mg/L	97.8	---	83.4	124	---	---
				<1	100 mg/L	102	---	87.8	119	---	---
<b>EG: Metals and Major Cations - Total (QC Lot: 4805848)</b>											
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	5 µg/L	108	---	85.0	115	---	---
EG020: Chromium	7440-47-3	0.1	µg/L	<0.1	5 µg/L	107	---	85.3	114	---	---
EG020: Copper	7440-50-8	0.2	µg/L	<0.2	5 µg/L	97.8	---	86.3	115	---	---
EG020: Lead	7439-92-1	0.1	µg/L	<0.1	5 µg/L	106	---	85.0	115	---	---
EG020: Aluminium	7429-90-5	5	µg/L	<5	5 µg/L	94.9	---	85.0	115	---	---



**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

Matrix: WATER

				<b>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</b>						
<i>Laboratory sample ID</i>	<i>Sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike Concentration</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPD (%)</i>	
					<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4804923)</b>										
HK2300994-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	99.6	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4808526)</b>										
HK2300592-001	Anonymous	EK067P: Total Phosphorus as P	----	5 mg/L	99.7	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813686)</b>										
HK2300346-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.5 mg/L	104	----	75.0	125	----	----
<b>EG: Metals and Major Cations (QC Lot: 4805848)</b>										
HK2300992-001	TMB-R1	EG020: Zinc	7440-66-6	5 µg/L	# Not Determined	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4821183)</b>										
HK2300992-001	TMB-R1	EP026: Chemical Oxygen Demand	----	20 mg/L	99.0	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4823931)</b>										
HK2301062-002	Anonymous	EP005: Total Organic Carbon	----	25 mg/L	# Not Determined	----	75.0	125	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4805848)</b>										
HK2300992-001	TMB-R1	EG020: Cadmium	7440-43-9	5 µg/L	104	----	75.0	125	----	----
		EG020: Chromium	7440-47-3	5 µg/L	99.4	----	75.0	125	----	----
		EG020: Copper	7440-50-8	5 µg/L	111	----	75.0	125	----	----
		EG020: Lead	7439-92-1	5 µg/L	107	----	75.0	125	----	----
		EG020: Aluminium	7429-90-5	5 µg/L	# Not Determined	----	75.0	125	----	----



### CERTIFICATE OF ANALYSIS

Client	: HIGHWAYS DEPARTMENT	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 7
Contact	: EDWARD LEE	Contact	: Richard Fung	Work Order	: HK2301222
Address	: RM 10-01 TO 10-03, PENINSULA TOWER 538 CASTLE PEAK ROAD, KOWLOON, HONG KONG HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong Kwai Tsing Hong Kong		
E-mail	: Edward.Lee@arup.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ---	Telephone	: +852 2610 1044		
Facsimile	: ---	Facsimile	: +852 2610 2021		
Project	: ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU) AND OTHER MAJOR ROAD PROJECTS - GROUND INVESTIGATION	Date Samples Received	: 09-Jan-2023		
Order number	: HY/2022/09/WQM/02	Quote number	: HKE/1667/2022_V3	Issue Date	: 26-Jan-2023
C-O-C number	: ---			No. of samples received	: 2
Site	: WATER QUALITY MONITORING AT 1 LOCATION			No. of samples analysed	: 2

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
		
Fung Lim Chee, Richard	Managing Director	Inorganics, Kwai Tsing
		
Fung Lim Chee, Richard	Managing Director	Metals_ENV, Kwai Tsing
		
Ng Sin Kou, May	Laboratory Manager	Microbiology_ENV, Kwai Tsing

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## General Comments

This report supersedes any previous report(s) with the same work order number. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Testing period is from 09-Jan-2023 to 26-Jan-2023.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### Specific Comments for Work Order: HK2301222

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified.

Microbiological sample(s) was/ were collected in 250mL sterile plastic bottles containing sodium thiosulfate. Sample(s) arrived at the laboratory at 15:40.

NOT DETECTED denotes result(s) is (are) less than the Limit of Report (LOR).

EK061P - Total Kjeldahl Nitrogen is the difference of Total Nitrogen and Total Oxidizable Nitrogen.

EK061P - The accredited LOR of Total Kjeldahl Nitrogen is 0.1mg/L. Results reported below 0.1mg/L and the decimal value of the results were for reference only.

EK062P - The accredited LOR of Total Nitrogen is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EK071K - The accredited LOR of Reactive Phosphorus is 0.01mg/L. Results reported below LOR and with decimal value of the results are for reference only.

EK085 - The accredited LOR of Total Sulphide is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EP020 - The accredited LOR of Oil and Grease is 2mg/L. Results reported below LOR and with decimal value are for reference only.

EP030 - The accredited LOR of Biochemical Oxygen Demand is 2mg/L. Results reported below LOR and with decimal value are for reference only.

Water sample(s) digested by in-house method E-3005 prior to the determination of total metals. The in-house method is developed based on USEPA method 3005.

EA025 - The accredited LOR of Total Suspended Solids is 0.5mg/L. Results below this LOR are for reference only.





### Analytical Results

Sub-Matrix: WATER

				Sample ID	TMB-R1	TMB-R1 (replicate)			
				Sampling date / time	09-Jan-2023	09-Jan-2023	---	---	---
Compound	CAS Number	LOR	Unit	HK2301222-001	HK2301222-002	-----	-----	-----	
<b>EA/ED: Physical and Aggregate Properties</b>									
EA025: Suspended Solids (SS)	----	0.5	mg/L	4.5	4.8	---	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters</b>									
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	41.8	41.3	---	---	---	
EK058A: Nitrate as N	14797-55-8	0.005	mg/L	4.10	3.82	---	---	---	
EK061P: Total Kjeldahl Nitrogen as N	----	0.05	mg/L	46.1	45.6	---	---	---	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.04	0.07	---	---	---	
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.008	0.008	---	---	---	
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	<0.05	---	---	---	
<b>EG: Metals and Major Cations</b>									
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	---	---	---	
EG020: Chromium	7440-47-3	1.0	µg/L	1.3	<1.0	---	---	---	
EG020: Copper	7440-50-8	1.0	µg/L	3.2	3.1	---	---	---	
EG020: Lead	7439-92-1	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Zinc	7440-66-6	10	µg/L	31	75	---	---	---	
EG020: Aluminium	7429-90-5	10	µg/L	65	27	---	---	---	
<b>EP: Aggregate Organics</b>									
EP005: Total Organic Carbon	----	1	mg/L	11	12	---	---	---	
EP020: Oil & Grease	----	0.5	mg/L	0.7	0.9	---	---	---	
EP026: Chemical Oxygen Demand	----	2	mg/L	20	21	---	---	---	
EP030: Biochemical Oxygen Demand	----	0.1	mg/L	2.8	3.2	---	---	---	
<b>EM: Microbiological Testing</b>									
EM019: Escherichia coli	----	1	CFU/100mL	1100	1100	---	---	---	
EM022: Faecal Coliforms	----	1	CFU/100mL	2500	3400	---	---	---	



### Laboratory Duplicate (DUP) Report

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4807453)</b>								
HK2300992-001	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.8	2.5	8.5
HK2301017-004	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	63.0	62.6	0.6
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4808528)</b>								
HK2301155-001	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	2.60	2.55	2.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4809575)</b>								
HK2301222-001	TMB-R1	EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.008	0.008	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813686)</b>								
HK2300346-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.005	mg/L	0.085	0.085	0.0
<b>EG: Metals and Major Cations (QC Lot: 4807557)</b>								
HK2301222-002	TMB-R1 (replicate)	EG020: Zinc	7440-66-6	1	µg/L	75	70	6.4
<b>EP: Aggregate Organics (QC Lot: 4822778)</b>								
HK2301222-002	TMB-R1 (replicate)	EP026: Chemical Oxygen Demand	----	2	mg/L	21	21	0.0
<b>EP: Aggregate Organics (QC Lot: 4823931)</b>								
HK2301062-002	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	137	138	0.0
<b>EP: Aggregate Organics (QC Lot: 4823932)</b>								
HK2302278-005	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	<1	<1	0.0
<b>EG: Metals and Major Cations - Total (QC Lot: 4807557)</b>								
HK2301222-002	TMB-R1 (replicate)	EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	0.0
		EG020: Chromium	7440-47-3	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Lead	7439-92-1	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Copper	7440-50-8	0.2	µg/L	3.1	2.9	5.7
		EG020: Aluminium	7429-90-5	5	µg/L	27	26	4.3

### Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER			Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4807453)</b>											



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
Method: Compound	CAS Number					LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4807453) - Continued</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	10 mg/L	104	----	85.1	117	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4808528)</b>											
EK067P: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	98.8	----	94.9	102	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4809575)</b>											
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.5 mg/L	96.3	----	85.0	115	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4809929)</b>											
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	----	----	----	----	----	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813686)</b>											
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.05 mg/L	103	----	85.0	110	----	----
<b>EG: Metals and Major Cations (QC Lot: 4807557)</b>											
EG020: Zinc	7440-66-6	1	µg/L	<1	5 µg/L	112	----	88.7	115	----	----
<b>EP: Aggregate Organics (QC Lot: 4806586)</b>											
EP030: Biochemical Oxygen Demand	----	----	mg/L	----	198 mg/L	87.3	----	81.0	115	----	----
<b>EP: Aggregate Organics (QC Lot: 4822028)</b>											
EP020: Oil & Grease	----	1	mg/L	<0.1	20 mg/L	98.0	----	79.0	105	----	----
<b>EP: Aggregate Organics (QC Lot: 4822778)</b>											
EP026: Chemical Oxygen Demand	----	----	mg/L	----	20 mg/L	100	----	88.4	109	----	----
				----	200 mg/L	100	----	91.0	109	----	----
<b>EP: Aggregate Organics (QC Lot: 4823931)</b>											
EP005: Total Organic Carbon	----	1	mg/L	<1	5 mg/L	97.8	----	83.4	124	----	----
				<1	100 mg/L	102	----	87.8	119	----	----
<b>EP: Aggregate Organics (QC Lot: 4823932)</b>											
EP005: Total Organic Carbon	----	1	mg/L	<1	5 mg/L	98.9	----	83.4	124	----	----
				<1	100 mg/L	99.9	----	87.8	119	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4807557)</b>											
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	5 µg/L	103	----	85.0	115	----	----
EG020: Chromium	7440-47-3	0.1	µg/L	<0.1	5 µg/L	107	----	85.3	114	----	----
EG020: Copper	7440-50-8	0.2	µg/L	<0.2	5 µg/L	105	----	86.3	115	----	----



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
<b>EG: Metals and Major Cations - Total (QC Lot: 4807557) - Continued</b>											
EG020: Lead	7439-92-1	0.1	µg/L	<0.1	5 µg/L	108	----	85.0	115	----	----
EG020: Aluminium	7429-90-5	5	µg/L	<5	5 µg/L	112	----	85.0	115	----	----



**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

Matrix: WATER

				<b>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</b>						
<i>Laboratory sample ID</i>	<i>Sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike Concentration</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPD (%)</i>	
					<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4808528)</b>										
HK2301155-001	Anonymous	EK067P: Total Phosphorus as P	----	5 mg/L	99.9	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4809575)</b>										
HK2301222-001	TMB-R1	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	93.9	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813686)</b>										
HK2300346-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.5 mg/L	104	----	75.0	125	----	----
<b>EG: Metals and Major Cations (QC Lot: 4807557)</b>										
HK2301222-001	TMB-R1	EG020: Zinc	7440-66-6	5 µg/L	# Not Determined	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4822778)</b>										
HK2301222-001	TMB-R1	EP026: Chemical Oxygen Demand	----	20 mg/L	98.5	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4823931)</b>										
HK2301062-002	Anonymous	EP005: Total Organic Carbon	----	25 mg/L	# Not Determined	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4823932)</b>										
HK2302278-005	Anonymous	EP005: Total Organic Carbon	----	5 mg/L	102	----	75.0	125	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4807557)</b>										
HK2301222-001	TMB-R1	EG020: Cadmium	7440-43-9	5 µg/L	103	----	75.0	125	----	----
		EG020: Chromium	7440-47-3	5 µg/L	97.3	----	75.0	125	----	----
		EG020: Copper	7440-50-8	5 µg/L	95.8	----	75.0	125	----	----
		EG020: Lead	7439-92-1	5 µg/L	106	----	75.0	125	----	----
		EG020: Aluminium	7429-90-5	5 µg/L	# Not Determined	----	75.0	125	----	----



### CERTIFICATE OF ANALYSIS

Client	: HIGHWAYS DEPARTMENT	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 6
Contact	: EDWARD LEE	Contact	: Richard Fung	Work Order	: HK2301759
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Telephone	: ---	Telephone	: +852 2610 1044		
Facsimile	: ---	Facsimile	: +852 2610 2021		
Project	: ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU) AND OTHER MAJOR ROAD PROJECTS - GROUND INVESTIGATION	Date Samples Received	: 11-Jan-2023		
Order number	: HY/2022/09/WQM/02	Quote number	: HKE/1667/2022_V3	Issue Date	: 30-Jan-2023
C-O-C number	: ---			No. of samples received	: 2
Site	: WATER QUALITY MONITORING AT 1 LOCATION			No. of samples analysed	: 2

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
		
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Fung Lim Chee, Richard	Managing Director	Metals_ENV, Kwai Tsing
		
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## General Comments

This report supersedes any previous report(s) with the same work order number. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Testing period is from 11-Jan-2023 to 30-Jan-2023.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### Specific Comments for Work Order: HK2301759

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified.

Microbiological sample(s) was/ were collected in 250mL sterile plastic bottles containing sodium thiosulfate. Sample(s) arrived at the laboratory at 15:35.

NOT DETECTED denotes result(s) is (are) less than the Limit of Report (LOR).

EK061P - Total Kjeldahl Nitrogen is the difference of Total Nitrogen and Total Oxidizable Nitrogen.

EK061P - The accredited LOR of Total Kjeldahl Nitrogen is 0.1mg/L. Results reported below 0.1mg/L and the decimal value of the results were for reference only.

EK062P - The accredited LOR of Total Nitrogen is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EK071K - The accredited LOR of Reactive Phosphorus is 0.01mg/L. Results reported below LOR and with decimal value of the results are for reference only.

EK085 - The accredited LOR of Total Sulphide is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EP020 - The accredited LOR of Oil and Grease is 2mg/L. Results reported below LOR and with decimal value are for reference only.

EP030 - The accredited LOR of Biochemical Oxygen Demand is 2mg/L. Results reported below LOR and with decimal value are for reference only.

Water sample(s) digested by in-house method E-3005 prior to the determination of total metals. The in-house method is developed based on USEPA method 3005.

EA025 - The accredited LOR of Total Suspended Solids is 0.5mg/L. Results below this LOR are for reference only.



### Analytical Results

Sub-Matrix: WATER

				Sample ID	TMB-R1	TMB-R1 (replicate)			
				Sampling date / time	11-Jan-2023	11-Jan-2023	---	---	---
Compound	CAS Number	LOR	Unit	HK2301759-001	HK2301759-002	-----	-----	-----	
<b>EA/ED: Physical and Aggregate Properties</b>									
EA025: Suspended Solids (SS)	----	0.5	mg/L	4.0	4.5	---	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters</b>									
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	34.2	33.2	---	---	---	
EK058A: Nitrate as N	14797-55-8	0.005	mg/L	3.64	3.59	---	---	---	
EK061P: Total Kjeldahl Nitrogen as N	----	0.05	mg/L	33.9	35.1	---	---	---	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.03	0.04	---	---	---	
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.008	0.010	---	---	---	
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	<0.05	---	---	---	
<b>EG: Metals and Major Cations</b>									
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	---	---	---	
EG020: Chromium	7440-47-3	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Copper	7440-50-8	1.0	µg/L	1.9	2.2	---	---	---	
EG020: Lead	7439-92-1	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Zinc	7440-66-6	10	µg/L	10	12	---	---	---	
EG020: Aluminium	7429-90-5	10	µg/L	30	38	---	---	---	
<b>EP: Aggregate Organics</b>									
EP005: Total Organic Carbon	----	1	mg/L	11	12	---	---	---	
EP020: Oil & Grease	----	0.5	mg/L	<0.5	<0.5	---	---	---	
EP026: Chemical Oxygen Demand	----	2	mg/L	16	17	---	---	---	
EP030: Biochemical Oxygen Demand	----	0.1	mg/L	2.4	2.6	---	---	---	
<b>EM: Microbiological Testing</b>									
EM019: Escherichia coli	----	1	CFU/100mL	680	700	---	---	---	
EM022: Faecal Coliforms	----	1	CFU/100mL	990	1200	---	---	---	





### Laboratory Duplicate (DUP) Report

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4813456)</b>								
HK2301296-001	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	118	123	3.9
HK2301759-001	TMB-R1	EA025: Suspended Solids (SS)	----	0.5	mg/L	4.0	4.3	7.3
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4812110)</b>								
HK2301763-001	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	0.21	0.22	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813682)</b>								
HK2301759-001	TMB-R1	EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.008	0.008	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813687)</b>								
HK2301759-001	TMB-R1	EK055A: Ammonia as N	7664-41-7	0.005	mg/L	34.2	33.7	1.6
<b>EG: Metals and Major Cations (QC Lot: 4811489)</b>								
HK2301759-002	TMB-R1 (replicate)	EG020: Zinc	7440-66-6	1	µg/L	12	11	0.0
<b>EP: Aggregate Organics (QC Lot: 4822778)</b>								
HK2301222-002	Anonymous	EP026: Chemical Oxygen Demand	----	2	mg/L	21	21	0.0
<b>EP: Aggregate Organics (QC Lot: 4825270)</b>								
HK2301763-003	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	<5	<5	0.0
<b>EG: Metals and Major Cations - Total (QC Lot: 4811489)</b>								
HK2301759-002	TMB-R1 (replicate)	EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	0.0
		EG020: Chromium	7440-47-3	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Lead	7439-92-1	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Copper	7440-50-8	0.2	µg/L	2.2	2.2	0.0
		EG020: Aluminium	7429-90-5	5	µg/L	38	32	17.6

### Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4813456)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	10 mg/L	108	----	85.1	117	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4812110)</b>											



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
Method: Compound	CAS Number					LCS	DCS	Low	High	Value	Control Limit
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4812110) - Continued</b>											
ED/EK: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	96.3	----	94.9	102	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813682)</b>											
ED/EK: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.5 mg/L	101	----	85.0	115	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813687)</b>											
ED/EK: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.05 mg/L	108	----	85.0	110	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4819423)</b>											
ED/EK: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	----	----	----	----	----	----	----
<b>EG: Metals and Major Cations (QC Lot: 4811489)</b>											
EG020: Zinc	7440-66-6	1	µg/L	<1	5 µg/L	97.9	----	88.7	115	----	----
<b>EP: Aggregate Organics (QC Lot: 4810285)</b>											
EP030: Biochemical Oxygen Demand	----	----	mg/L	----	198 mg/L	105	----	81.0	115	----	----
<b>EP: Aggregate Organics (QC Lot: 4822778)</b>											
EP026: Chemical Oxygen Demand	----	----	mg/L	----	20 mg/L	100	----	88.4	109	----	----
					200 mg/L	100		----	91.0		
<b>EP: Aggregate Organics (QC Lot: 4824841)</b>											
EP020: Oil & Grease	----	1	mg/L	<0.1	20 mg/L	90.9	----	79.0	105	----	----
<b>EP: Aggregate Organics (QC Lot: 4825270)</b>											
EP005: Total Organic Carbon	----	1	mg/L	<1	5 mg/L	93.2	----	83.4	124	----	----
					100 mg/L	113		----	87.8		
<b>EG: Metals and Major Cations - Total (QC Lot: 4811489)</b>											
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	5 µg/L	98.8	----	85.0	115	----	----
EG020: Chromium	7440-47-3	0.1	µg/L	<0.1	5 µg/L	96.0	----	85.3	114	----	----
EG020: Copper	7440-50-8	0.2	µg/L	<0.2	5 µg/L	97.4	----	86.3	115	----	----
EG020: Lead	7439-92-1	0.1	µg/L	<0.1	5 µg/L	92.6	----	85.0	115	----	----
EG020: Aluminium	7429-90-5	5	µg/L	<5	5 µg/L	103	----	85.0	115	----	----



**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

Matrix: WATER				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4812110)</b>										
HK2301763-001	Anonymous	EK067P: Total Phosphorus as P	----	0.5 mg/L	98.1	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813682)</b>										
HK2301759-001	TMB-R1	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	102	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4813687)</b>										
HK2301759-001	TMB-R1	EK055A: Ammonia as N	7664-41-7	50 mg/L	100	----	75.0	125	----	----
<b>EG: Metals and Major Cations (QC Lot: 4811489)</b>										
HK2301759-001	TMB-R1	EG020: Zinc	7440-66-6	5 µg/L	75.5	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4822778)</b>										
HK2301222-001	Anonymous	EP026: Chemical Oxygen Demand	----	20 mg/L	98.5	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4825270)</b>										
HK2301763-003	Anonymous	EP005: Total Organic Carbon	----	25 mg/L	99.3	----	75.0	125	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4811489)</b>										
HK2301759-001	TMB-R1	EG020: Cadmium	7440-43-9	5 µg/L	97.4	----	75.0	125	----	----
		EG020: Chromium	7440-47-3	5 µg/L	94.5	----	75.0	125	----	----
		EG020: Copper	7440-50-8	5 µg/L	105	----	75.0	125	----	----
		EG020: Lead	7439-92-1	5 µg/L	94.3	----	75.0	125	----	----
		EG020: Aluminium	7429-90-5	5 µg/L	# Not Determined	----	75.0	125	----	----






### CERTIFICATE OF ANALYSIS

Client	: HIGHWAYS DEPARTMENT	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 6
Contact	: EDWARD LEE	Contact	: Richard Fung	Work Order	: HK2302188
Address	: RM 10-01 TO 10-03, PENINSULA TOWER 538 CASTLE PEAK ROAD, KOWLOON, HONG KONG HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong Kwai Tsing Hong Kong		
E-mail	: Edward.Lee@arup.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ---	Telephone	: +852 2610 1044		
Facsimile	: ---	Facsimile	: +852 2610 2021		
Project	: ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU) AND OTHER MAJOR ROAD PROJECTS - GROUND INVESTIGATION	Date Samples Received	: 13-Jan-2023		
Order number	: HY/2022/09/WQM/02	Quote number	: HKE/1667/2022_V3	Issue Date	: 01-Feb-2023
C-O-C number	: ---			No. of samples received	: 2
Site	: WATER QUALITY MONITORING AT 1 LOCATION			No. of samples analysed	: 2

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
		
Fung Lim Chee, Richard	Managing Director	Inorganics, Kwai Tsing
		
Fung Lim Chee, Richard	Managing Director	Metals_ENV, Kwai Tsing
		
Ng Sin Kou, May	Laboratory Manager	Microbiology_ENV, Kwai Tsing

**ALS Technichem (HK) Pty Ltd**  
Part of the **ALS Laboratory Group**

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## General Comments

This report supersedes any previous report(s) with the same work order number. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Testing period is from 13-Jan-2023 to 31-Jan-2023.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### Specific Comments for Work Order: HK2302188

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified.

Microbiological sample(s) was/ were collected in 250mL sterile plastic bottles containing sodium thiosulfate. Sample(s) arrived at the laboratory at 15:35.

NOT DETECTED denotes result(s) is (are) less than the Limit of Report (LOR).

EK061P - Total Kjeldahl Nitrogen is the difference of Total Nitrogen and Total Oxidizable Nitrogen.

EK061P - The accredited LOR of Total Kjeldahl Nitrogen is 0.1mg/L. Results reported below 0.1mg/L and the decimal value of the results were for reference only.

EK062P - The accredited LOR of Total Nitrogen is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EK071K - The accredited LOR of Reactive Phosphorus is 0.01mg/L. Results reported below LOR and with decimal value of the results are for reference only.

EK085 - The accredited LOR of Total Sulphide is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EP020 - The accredited LOR of Oil and Grease is 2mg/L. Results reported below LOR and with decimal value are for reference only.

EP030 - The accredited LOR of Biochemical Oxygen Demand is 2mg/L. Results reported below LOR and with decimal value are for reference only.

Water sample(s) digested by in-house method E-3005 prior to the determination of total metals. The in-house method is developed based on USEPA method 3005.

EA025 - The accredited LOR of Total Suspended Solids is 0.5mg/L. Results below this LOR are for reference only.



### Analytical Results

Sub-Matrix: WATER

				Sample ID	TMB-R1	TMB-R1 (replicate)			
				Sampling date / time	13-Jan-2023	13-Jan-2023	---	---	---
Compound	CAS Number	LOR	Unit	HK2302188-001	HK2302188-002	-----	-----	-----	
<b>EA/ED: Physical and Aggregate Properties</b>									
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	5.2	---	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters</b>									
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	38.9	39.2	---	---	---	
EK058A: Nitrate as N	14797-55-8	0.005	mg/L	4.04	4.02	---	---	---	
EK061P: Total Kjeldahl Nitrogen as N	----	0.05	mg/L	39.3	39.3	---	---	---	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.01	0.01	---	---	---	
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.008	0.008	---	---	---	
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	<0.05	---	---	---	
<b>EG: Metals and Major Cations</b>									
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	---	---	---	
EG020: Chromium	7440-47-3	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Copper	7440-50-8	1.0	µg/L	1.9	2.4	---	---	---	
EG020: Lead	7439-92-1	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Zinc	7440-66-6	10	µg/L	<10	13	---	---	---	
EG020: Aluminium	7429-90-5	10	µg/L	19	16	---	---	---	
<b>EP: Aggregate Organics</b>									
EP005: Total Organic Carbon	----	1	mg/L	8	8	---	---	---	
EP020: Oil & Grease	----	0.5	mg/L	<0.5	<0.5	---	---	---	
EP026: Chemical Oxygen Demand	----	2	mg/L	16	18	---	---	---	
EP030: Biochemical Oxygen Demand	----	0.1	mg/L	2.6	2.9	---	---	---	
<b>EM: Microbiological Testing</b>									
EM019: Escherichia coli	----	1	CFU/100mL	270	380	---	---	---	
EM022: Faecal Coliforms	----	1	CFU/100mL	410	570	---	---	---	



### Laboratory Duplicate (DUP) Report

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4816312)</b>								
HK2302188-001	TMB-R1	EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	<0.5	0.0
HK2302219-005	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	2.8	3.2	14.1
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4816755)</b>								
HK2302188-001	TMB-R1	EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.008	0.007	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4822120)</b>								
HK2302224-001	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4842731)</b>								
HK2302188-002	TMB-R1 (replicate)	EK055A: Ammonia as N	7664-41-7	0.005	mg/L	39.2	38.7	1.2
<b>EG: Metals and Major Cations (QC Lot: 4816416)</b>								
HK2302188-002	TMB-R1 (replicate)	EG020: Zinc	7440-66-6	1	µg/L	13	13	0.0
<b>EP: Aggregate Organics (QC Lot: 4822779)</b>								
HK2302052-004	Anonymous	EP026: Chemical Oxygen Demand	----	2	mg/L	1030	1020	0.9
<b>EP: Aggregate Organics (QC Lot: 4825270)</b>								
HK2301763-003	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	<5	<5	0.0
<b>EG: Metals and Major Cations - Total (QC Lot: 4816416)</b>								
HK2302188-002	TMB-R1 (replicate)	EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	0.0
		EG020: Chromium	7440-47-3	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Lead	7439-92-1	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Copper	7440-50-8	0.2	µg/L	2.4	2.6	5.3
		EG020: Aluminium	7429-90-5	5	µg/L	16	16	0.0

### Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4816312)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	10 mg/L	92.0	----	85.1	117	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4816755)</b>											



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4816755) - Continued</b>											
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.5 mg/L	99.7	---	85.0	115	---	---
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4819423)</b>											
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	---	---	---	---	---	---	---
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4822120)</b>											
EK067P: Total Phosphorus as P	---	0.01	mg/L	<0.01	0.5 mg/L	95.6	---	94.9	102	---	---
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4842731)</b>											
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.05 mg/L	109	---	85.0	110	---	---
<b>EG: Metals and Major Cations (QC Lot: 4816416)</b>											
EG020: Zinc	7440-66-6	1	µg/L	<1	5 µg/L	100	---	88.7	115	---	---
<b>EP: Aggregate Organics (QC Lot: 4814851)</b>											
EP030: Biochemical Oxygen Demand	---	---	mg/L	---	198 mg/L	108	---	81.0	115	---	---
<b>EP: Aggregate Organics (QC Lot: 4822779)</b>											
EP026: Chemical Oxygen Demand	---	---	mg/L	---	20 mg/L	100	---	88.4	109	---	---
				---	200 mg/L	100	---	91.0	109	---	---
<b>EP: Aggregate Organics (QC Lot: 4825270)</b>											
EP005: Total Organic Carbon	---	1	mg/L	<1	5 mg/L	93.2	---	83.4	124	---	---
				<1	100 mg/L	113	---	87.8	119	---	---
<b>EP: Aggregate Organics (QC Lot: 4826412)</b>											
EP020: Oil & Grease	---	1	mg/L	<0.1	20 mg/L	93.4	---	79.0	105	---	---
<b>EG: Metals and Major Cations - Total (QC Lot: 4816416)</b>											
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	5 µg/L	97.8	---	85.0	115	---	---
EG020: Chromium	7440-47-3	0.1	µg/L	<0.1	5 µg/L	103	---	85.3	114	---	---
EG020: Copper	7440-50-8	0.2	µg/L	<0.2	5 µg/L	97.8	---	86.3	115	---	---
EG020: Lead	7439-92-1	0.1	µg/L	<0.1	5 µg/L	98.4	---	85.0	115	---	---
EG020: Aluminium	7429-90-5	5	µg/L	<5	5 µg/L	98.9	---	85.0	115	---	---





**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

Matrix: WATER					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4816755)</b>										
HK2302188-001	TMB-R1	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	96.0	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4822120)</b>										
HK2302224-001	Anonymous	EK067P: Total Phosphorus as P	----	0.5 mg/L	96.7	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4842731)</b>										
HK2302188-001	TMB-R1	EK055A: Ammonia as N	7664-41-7	0.05 mg/L	# Not Determined	----	75.0	125	----	----
<b>EG: Metals and Major Cations (QC Lot: 4816416)</b>										
HK2302188-001	TMB-R1	EG020: Zinc	7440-66-6	5 µg/L	83.2	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4822779)</b>										
HK2302188-001	TMB-R1	EP026: Chemical Oxygen Demand	----	20 mg/L	102	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4825270)</b>										
HK2301763-003	Anonymous	EP005: Total Organic Carbon	----	25 mg/L	99.3	----	75.0	125	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4816416)</b>										
HK2302188-001	TMB-R1	EG020: Cadmium	7440-43-9	5 µg/L	92.1	----	75.0	125	----	----
		EG020: Chromium	7440-47-3	5 µg/L	103	----	75.0	125	----	----
		EG020: Copper	7440-50-8	5 µg/L	91.1	----	75.0	125	----	----
		EG020: Lead	7439-92-1	5 µg/L	96.2	----	75.0	125	----	----
		EG020: Aluminium	7429-90-5	5 µg/L	87.6	----	75.0	125	----	----



### CERTIFICATE OF ANALYSIS

Client	: HIGHWAYS DEPARTMENT	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 6
Contact	: EDWARD LEE	Contact	: Richard Fung	Work Order	: HK2302462
Address	: RM 10-01 TO 10-03, PENINSULA TOWER 538 CASTLE PEAK ROAD, KOWLOON, HONG KONG HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong Kwai Tsing Hong Kong		
E-mail	: Edward.Lee@arup.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ---	Telephone	: +852 2610 1044		
Facsimile	: ---	Facsimile	: +852 2610 2021		
Project	: ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU) AND OTHER MAJOR ROAD PROJECTS - GROUND INVESTIGATION	Date Samples Received	: 16-Jan-2023		
Order number	: HY/2022/09/WQM/02	Quote number	: HKE/1667/2022_V3	Issue Date	: 02-Feb-2023
C-O-C number	: ---			No. of samples received	: 2
Site	: WATER QUALITY MONITORING AT 1 LOCATION			No. of samples analysed	: 2

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
		
Fung Lim Chee, Richard	Managing Director	Inorganics, Kwai Tsing
		
Fung Lim Chee, Richard	Managing Director	Metals_ENV, Kwai Tsing
		
Ng Sin Kou, May	Laboratory Manager	Microbiology_ENV, Kwai Tsing

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## General Comments

This report supersedes any previous report(s) with the same work order number. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Testing period is from 16-Jan-2023 to 02-Feb-2023.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### Specific Comments for Work Order: HK2302462

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified.

Microbiological sample(s) was/ were collected in 250mL sterile plastic bottles containing sodium thiosulfate. Sample(s) arrived at the laboratory at 15:30.

NOT DETECTED denotes result(s) is (are) less than the Limit of Report (LOR).

EK061P - Total Kjeldahl Nitrogen is the difference of Total Nitrogen and Total Oxidizable Nitrogen.

EK061P - The accredited LOR of Total Kjeldahl Nitrogen is 0.1mg/L. Results reported below 0.1mg/L and the decimal value of the results were for reference only.

EK062P - The accredited LOR of Total Nitrogen is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EK071K - The accredited LOR of Reactive Phosphorus is 0.01mg/L. Results reported below LOR and with decimal value of the results are for reference only.

EK085 - The accredited LOR of Total Sulphide is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EP020 - The accredited LOR of Oil and Grease is 2mg/L. Results reported below LOR and with decimal value are for reference only.

EP030 - The accredited LOR of Biochemical Oxygen Demand is 2mg/L. Results reported below LOR and with decimal value are for reference only.

Water sample(s) digested by in-house method E-3005 prior to the determination of total metals. The in-house method is developed based on USEPA method 3005.

EA025 - The accredited LOR of Total Suspended Solids is 0.5mg/L. Results below this LOR are for reference only.



### Analytical Results

Sub-Matrix: WATER

				Sample ID	TMB-R1	TMB-R1 (replicate)			
				Sampling date / time	16-Jan-2023	16-Jan-2023	---	---	---
Compound	CAS Number	LOR	Unit	HK2302462-001	HK2302462-002	-----	-----	-----	
<b>EA/ED: Physical and Aggregate Properties</b>									
EA025: Suspended Solids (SS)	----	0.5	mg/L	6.2	6.6	---	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters</b>									
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	38.6	37.8	---	---	---	
EK058A: Nitrate as N	14797-55-8	0.005	mg/L	4.00	3.95	---	---	---	
EK061P: Total Kjeldahl Nitrogen as N	----	0.05	mg/L	43.8	41.0	---	---	---	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.07	0.07	---	---	---	
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.004	0.005	---	---	---	
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	<0.05	---	---	---	
<b>EG: Metals and Major Cations</b>									
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	---	---	---	
EG020: Chromium	7440-47-3	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Copper	7440-50-8	1.0	µg/L	2.3	2.9	---	---	---	
EG020: Lead	7439-92-1	1.0	µg/L	<1.0	1.1	---	---	---	
EG020: Zinc	7440-66-6	10	µg/L	19	1330	---	---	---	
EG020: Aluminium	7429-90-5	10	µg/L	64	94	---	---	---	
<b>EP: Aggregate Organics</b>									
EP005: Total Organic Carbon	----	1	mg/L	9	8	---	---	---	
EP020: Oil & Grease	----	0.5	mg/L	<0.5	<0.5	---	---	---	
EP026: Chemical Oxygen Demand	----	2	mg/L	21	21	---	---	---	
EP030: Biochemical Oxygen Demand	----	0.1	mg/L	3.4	3.3	---	---	---	
<b>EM: Microbiological Testing</b>									
EM019: Escherichia coli	----	1	CFU/100mL	540	360	---	---	---	
EM022: Faecal Coliforms	----	1	CFU/100mL	960	740	---	---	---	



**Laboratory Duplicate (DUP) Report**

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4817885)</b>								
HK2302462-001	TMB-R1	EA025: Suspended Solids (SS)	----	0.5	mg/L	6.2	6.5	4.7
HK2302468-001	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	<1.0	<1.0	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4818979)</b>								
HK2302462-001	TMB-R1	EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.004	0.004	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4822122)</b>								
HK2302588-001	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	3.36	3.42	1.6
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4842731)</b>								
HK2302188-002	Anonymous	EK055A: Ammonia as N	7664-41-7	0.005	mg/L	39.2	38.7	1.2
<b>EG: Metals and Major Cations (QC Lot: 4819027)</b>								
HK2302462-002	TMB-R1 (replicate)	EG020: Zinc	7440-66-6	1	µg/L	1330	1040	24.8
<b>EP: Aggregate Organics (QC Lot: 4825271)</b>								
HK2302278-006	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	<1	<1	0.0
<b>EP: Aggregate Organics (QC Lot: 4847927)</b>								
HK2302462-002	TMB-R1 (replicate)	EP026: Chemical Oxygen Demand	----	2	mg/L	21	21	0.0
<b>EG: Metals and Major Cations - Total (QC Lot: 4819027)</b>								
HK2302462-002	TMB-R1 (replicate)	EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	0.0
		EG020: Chromium	7440-47-3	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Lead	7439-92-1	0.1	µg/L	1.1	1.1	0.0
		EG020: Copper	7440-50-8	0.2	µg/L	2.9	2.9	0.0
		EG020: Aluminium	7429-90-5	5	µg/L	94	85	10.4

**Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report**

Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4817885)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	10 mg/L	104	----	85.1	117	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4818979)</b>											



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)		
Method: Compound	CAS Number					LCS	DCS	Low	High	Value	Control Limit	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4818979) - Continued</b>												
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.5 mg/L	99.6	---	85.0	115	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4819423)</b>												
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	---	---	---	---	---	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4822122)</b>												
EK067P: Total Phosphorus as P	---	0.01	mg/L	<0.01	0.5 mg/L	97.7	---	94.9	102	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4842731)</b>												
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.05 mg/L	109	---	85.0	110	---	---	
<b>EG: Metals and Major Cations (QC Lot: 4819027)</b>												
EG020: Zinc	7440-66-6	1	µg/L	<1	5 µg/L	101	---	88.7	115	---	---	
<b>EP: Aggregate Organics (QC Lot: 4817781)</b>												
EP030: Biochemical Oxygen Demand	---	---	mg/L	---	198 mg/L	105	---	81.0	115	---	---	
<b>EP: Aggregate Organics (QC Lot: 4825271)</b>												
EP005: Total Organic Carbon	---	1	mg/L	<1	5 mg/L	93.4	---	83.4	124	---	---	
				<1	100 mg/L	98.4	---	87.8	119	---	---	
<b>EP: Aggregate Organics (QC Lot: 4842605)</b>												
EP020: Oil & Grease	---	1	mg/L	<0.1	20 mg/L	88.0	---	79.0	105	---	---	
<b>EP: Aggregate Organics (QC Lot: 4847927)</b>												
EP026: Chemical Oxygen Demand	---	---	mg/L	---	20 mg/L	102	---	91.6	111	---	---	
				---	200 mg/L	101	---	94.0	106	---	---	
<b>EG: Metals and Major Cations - Total (QC Lot: 4819027)</b>												
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	5 µg/L	96.0	---	85.0	115	---	---	
EG020: Chromium	7440-47-3	0.1	µg/L	<0.1	5 µg/L	98.2	---	85.3	114	---	---	
EG020: Copper	7440-50-8	0.2	µg/L	<0.2	5 µg/L	104	---	86.3	115	---	---	
EG020: Lead	7439-92-1	0.1	µg/L	<0.1	5 µg/L	97.7	---	85.0	115	---	---	
EG020: Aluminium	7429-90-5	5	µg/L	<5	5 µg/L	95.1	---	85.0	115	---	---	



**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4818979)</b>										
HK2302462-001	TMB-R1	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	98.0	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4822122)</b>										
HK2302588-001	Anonymous	EK067P: Total Phosphorus as P	----	5 mg/L	96.9	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4842731)</b>										
HK2302188-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.05 mg/L	# Not Determined	----	75.0	125	----	----
<b>EG: Metals and Major Cations (QC Lot: 4819027)</b>										
HK2302462-001	TMB-R1	EG020: Zinc	7440-66-6	5 µg/L	89.2	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4825271)</b>										
HK2302278-006	Anonymous	EP005: Total Organic Carbon	----	5 mg/L	99.6	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4847927)</b>										
HK2302462-001	TMB-R1	EP026: Chemical Oxygen Demand	----	20 mg/L	102	----	75.0	125	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4819027)</b>										
HK2302462-001	TMB-R1	EG020: Cadmium	7440-43-9	5 µg/L	99.0	----	75.0	125	----	----
		EG020: Chromium	7440-47-3	5 µg/L	97.9	----	75.0	125	----	----
		EG020: Copper	7440-50-8	5 µg/L	96.1	----	75.0	125	----	----
		EG020: Lead	7439-92-1	5 µg/L	94.7	----	75.0	125	----	----
		EG020: Aluminium	7429-90-5	5 µg/L	# Not Determined	----	75.0	125	----	----



### CERTIFICATE OF ANALYSIS

Client	: HIGHWAYS DEPARTMENT	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 6
Contact	: EDWARD LEE	Contact	: Richard Fung	Work Order	: HK2241016
Address	: RM 10-01 TO 10-03, PENINSULA TOWER 538 CASTLE PEAK ROAD, KOWLOON, HONG KONG HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong Kwai Tsing Hong Kong		
E-mail	: Edward.Lee@arup.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ---	Telephone	: +852 2610 1044		
Facsimile	: ---	Facsimile	: +852 2610 2021		
Project	: ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU) AND OTHER MAJOR ROAD PROJECTS - GROUND INVESTIGATION	Date Samples Received	: 17-Oct-2022		
Order number	: HY/2022/09/WQM/02	Quote number	: HKE/1667/2022_V3	Issue Date	: 31-Oct-2022
C-O-C number	: ---			No. of samples received	: 2
Site	: WATER QUALITY MONITORING AT 1 LOCATION			No. of samples analysed	: 2

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
		
Fung Lim Chee, Richard	Managing Director	Inorganics, Kwai Tsing
		
Fung Lim Chee, Richard	Managing Director	Metals_ENV, Kwai Tsing
		
Ng Sin Kou, May	Laboratory Manager	Microbiology_ENV, Kwai Tsing

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## General Comments

This report supersedes any previous report(s) with the same work order number. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Testing period is from 17-Oct-2022 to 31-Oct-2022.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### Specific Comments for Work Order: HK2241016

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified.

Microbiological sample(s) was/ were collected in 250mL sterile plastic bottles containing sodium thiosulfate. Sample(s) arrived at the laboratory at 15:30.

NOT DETECTED denotes result(s) is (are) less than the Limit of Report (LOR).

EK061P - Total Kjeldahl Nitrogen is the difference of Total Nitrogen and Total Oxidizable Nitrogen.

EK061P - The accredited LOR of Total Kjeldahl Nitrogen is 0.1mg/L. Results reported below 0.1mg/L and the decimal value of the results were for reference only.

EK062P - The accredited LOR of Total Nitrogen is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EK071K - The accredited LOR of Reactive Phosphorus is 0.01mg/L. Results reported below LOR and with decimal value of the results are for reference only.

EK085 - The accredited LOR of Total Sulphide is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EP020 - The accredited LOR of Oil and Grease is 2mg/L. Results reported below LOR and with decimal value are for reference only.

EP030 - The accredited LOR of Biochemical Oxygen Demand is 2mg/L. Results reported below LOR and with decimal value are for reference only.

Water sample(s) digested by in-house method E-3005 prior to the determination of total metals. The in-house method is developed based on USEPA method 3005.



### Analytical Results

Sub-Matrix: WATER

				Sample ID	TMB-R1	TMB-R1 (replicate)			
				Sampling date / time	17-Oct-2022	17-Oct-2022	---	---	---
Compound	CAS Number	LOR	Unit	HK2241016-001	HK2241016-002	-----	-----	-----	
<b>EA/ED: Physical and Aggregate Properties</b>									
EA025: Suspended Solids (SS)	----	0.5	mg/L	2.7	2.3	---	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters</b>									
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	6.81	6.71	---	---	---	
EK058A: Nitrate as N	14797-55-8	0.005	mg/L	3.09	3.07	---	---	---	
EK061P: Total Kjeldahl Nitrogen as N	----	0.05	mg/L	9.48	12.3	---	---	---	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.02	0.03	---	---	---	
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	<0.001	---	---	---	
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	<0.05	---	---	---	
<b>EG: Metals and Major Cations</b>									
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	---	---	---	
EG020: Chromium	7440-47-3	1.0	µg/L	1.4	<1.0	---	---	---	
EG020: Copper	7440-50-8	1.0	µg/L	6.8	2.0	---	---	---	
EG020: Lead	7439-92-1	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Zinc	7440-66-6	10	µg/L	10	<10	---	---	---	
EG020: Aluminium	7429-90-5	10	µg/L	42	36	---	---	---	
<b>EP: Aggregate Organics</b>									
EP005: Total Organic Carbon	----	1	mg/L	2	2	---	---	---	
EP020: Oil & Grease	----	0.5	mg/L	<0.5	<0.5	---	---	---	
EP026: Chemical Oxygen Demand	----	2	mg/L	10	10	---	---	---	
EP030: Biochemical Oxygen Demand	----	0.1	mg/L	2.0	2.2	---	---	---	
<b>EM: Microbiological Testing</b>									
EM019: Escherichia coli	----	1	CFU/100mL	340	440	---	---	---	
EM022: Faecal Coliforms	----	1	CFU/100mL	1000	1000	---	---	---	



**Laboratory Duplicate (DUP) Report**

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4644359)</b>								
HK2239961-001	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	<1.0	<1.0	0.0
HK2240710-001	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	<1.0	<1.0	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4645914)</b>								
HK2240950-003	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	1.61	1.62	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4647191)</b>								
HK2241015-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.037	0.039	3.4
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4647203)</b>								
HK2241015-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.005	mg/L	2.58	2.43	6.1
<b>EG: Metals and Major Cations (QC Lot: 4644539)</b>								
HK2241015-002	Anonymous	EG020: Zinc	7440-66-6	1	µg/L	<10	<10	0.0
<b>EP: Aggregate Organics (QC Lot: 4656345)</b>								
HK2240745-002	Anonymous	EP026: Chemical Oxygen Demand	----	2	mg/L	18	18	0.0
<b>EP: Aggregate Organics (QC Lot: 4658743)</b>								
HK2241748-005	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	<1	<1	0.0
<b>EG: Metals and Major Cations - Total (QC Lot: 4644539)</b>								
HK2241015-002	Anonymous	EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	0.0
		EG020: Chromium	7440-47-3	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Lead	7439-92-1	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Copper	7440-50-8	0.2	µg/L	<1.0	<1.0	0.0
		EG020: Aluminium	7429-90-5	5	µg/L	95	91	4.8

**Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report**

Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4644359)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	10 mg/L	99.0	----	85.1	117	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4645914)</b>											



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)		
Method: Compound	CAS Number					LCS	DCS	Low	High	Value	Control Limit	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4645914) - Continued</b>												
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4645914) - Continued	---	0.01	mg/L	<0.01	0.5 mg/L	100	---	94.9	102	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4647191)</b>												
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4647191)	14265-44-2	0.001	mg/L	<0.001	0.5 mg/L	98.0	---	85.0	115	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4647203)</b>												
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4647203)	7664-41-7	0.005	mg/L	<0.005	0.5 mg/L	95.9	---	85.0	110	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4653683)</b>												
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4653683)	18496-25-8	0.05	mg/L	<0.05	---	---	---	---	---	---	---	
<b>EG: Metals and Major Cations (QC Lot: 4644539)</b>												
EG: Metals and Major Cations (QC Lot: 4644539)	7440-66-6	1	µg/L	<1	5 µg/L	90.6	---	88.7	115	---	---	
<b>EP: Aggregate Organics (QC Lot: 4643340)</b>												
EP: Aggregate Organics (QC Lot: 4643340)	---	---	mg/L	---	198 mg/L	107	---	81.0	115	---	---	
<b>EP: Aggregate Organics (QC Lot: 4656345)</b>												
EP: Aggregate Organics (QC Lot: 4656345)	---	---	mg/L	---	20 mg/L	99.5	---	88.4	109	---	---	
					200 mg/L	100	---	91.0	109	---	---	
<b>EP: Aggregate Organics (QC Lot: 4657165)</b>												
EP: Aggregate Organics (QC Lot: 4657165)	---	1	mg/L	<0.1	20 mg/L	99.5	---	79.0	105	---	---	
<b>EP: Aggregate Organics (QC Lot: 4658743)</b>												
EP: Aggregate Organics (QC Lot: 4658743)	---	1	mg/L	<1	5 mg/L	113	---	83.4	124	---	---	
					100 mg/L	88.0	---	87.8	119	---	---	
<b>EG: Metals and Major Cations - Total (QC Lot: 4644539)</b>												
EG: Metals and Major Cations - Total (QC Lot: 4644539)	7440-43-9	0.1	µg/L	<0.1	5 µg/L	102	---	85.0	115	---	---	
EG: Metals and Major Cations - Total (QC Lot: 4644539)	7440-47-3	0.1	µg/L	<0.1	5 µg/L	104	---	85.3	114	---	---	
EG: Metals and Major Cations - Total (QC Lot: 4644539)	7440-50-8	0.2	µg/L	<0.2	5 µg/L	90.7	---	86.3	115	---	---	
EG: Metals and Major Cations - Total (QC Lot: 4644539)	7439-92-1	0.1	µg/L	<0.1	5 µg/L	102	---	85.0	115	---	---	
EG: Metals and Major Cations - Total (QC Lot: 4644539)	7429-90-5	5	µg/L	<5	5 µg/L	91.8	---	85.0	115	---	---	



**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

Matrix: WATER

				<b>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</b>						
<i>Laboratory sample ID</i>	<i>Sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike Concentration</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPD (%)</i>	
					<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4645914)</b>										
HK2240950-003	Anonymous	EK067P: Total Phosphorus as P	----	0.5 mg/L	89.5	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4647191)</b>										
HK2241015-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	102	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4647203)</b>										
HK2241015-001	Anonymous	EK055A: Ammonia as N	7664-41-7	5 mg/L	92.3	----	75.0	125	----	----
<b>EG: Metals and Major Cations (QC Lot: 4644539)</b>										
HK2241015-001	Anonymous	EG020: Zinc	7440-66-6	5 µg/L	83.8	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4656345)</b>										
HK2240745-001	Anonymous	EP026: Chemical Oxygen Demand	----	20 mg/L	106	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4658743)</b>										
HK2241748-005	Anonymous	EP005: Total Organic Carbon	----	5 mg/L	107	----	75.0	125	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4644539)</b>										
HK2241015-001	Anonymous	EG020: Cadmium	7440-43-9	5 µg/L	105	----	75.0	125	----	----
		EG020: Chromium	7440-47-3	5 µg/L	113	----	75.0	125	----	----
		EG020: Copper	7440-50-8	5 µg/L	102	----	75.0	125	----	----
		EG020: Lead	7439-92-1	5 µg/L	102	----	75.0	125	----	----
		EG020: Aluminium	7429-90-5	5 µg/L	# Not Determined	----	75.0	125	----	----






### CERTIFICATE OF ANALYSIS

Client	: HIGHWAYS DEPARTMENT	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 6
Contact	: EDWARD LEE	Contact	: Richard Fung	Work Order	: HK2241332
Address	: RM 10-01 TO 10-03, PENINSULA TOWER 538 CASTLE PEAK ROAD, KOWLOON, HONG KONG HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong Kwai Tsing Hong Kong		
E-mail	: Edward.Lee@arup.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ---	Telephone	: +852 2610 1044		
Facsimile	: ---	Facsimile	: +852 2610 2021		
Project	: ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU) AND OTHER MAJOR ROAD PROJECTS - GROUND INVESTIGATION	Date Samples Received	: 19-Oct-2022		
Order number	: HY/2022/09/WQM/02	Quote number	: HKE/1667/2022_V3	Issue Date	: 02-Nov-2022
C-O-C number	: ---			No. of samples received	: 2
Site	: WATER QUALITY MONITORING AT 1 LOCATION			No. of samples analysed	: 2

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
		
Fung Lim Chee, Richard	Managing Director	Inorganics, Kwai Tsing
		
Fung Lim Chee, Richard	Managing Director	Metals_ENV, Kwai Tsing
		
Ng Sin Kou, May	Laboratory Manager	Microbiology_ENV, Kwai Tsing

**ALS Technichem (HK) Pty Ltd**  
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## General Comments

This report supersedes any previous report(s) with the same work order number. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Testing period is from 19-Oct-2022 to 02-Nov-2022.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### Specific Comments for Work Order: HK2241332

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified.

Microbiological sample(s) was/ were collected in 250mL sterile plastic bottles containing sodium thiosulfate. Sample(s) arrived at the laboratory at 15:30.

NOT DETECTED denotes result(s) is (are) less than the Limit of Report (LOR).

EK061P - Total Kjeldahl Nitrogen is the difference of Total Nitrogen and Total Oxidizable Nitrogen.

EK061P - The accredited LOR of Total Kjeldahl Nitrogen is 0.1mg/L. Results reported below 0.1mg/L and the decimal value of the results were for reference only.

EK062P - The accredited LOR of Total Nitrogen is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EK071K - The accredited LOR of Reactive Phosphorus is 0.01mg/L. Results reported below LOR and with decimal value of the results are for reference only.

EK085 - The accredited LOR of Total Sulphide is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EP020 - The accredited LOR of Oil and Grease is 2mg/L. Results reported below LOR and with decimal value are for reference only.

EP030 - The accredited LOR of Biochemical Oxygen Demand is 2mg/L. Results reported below LOR and with decimal value are for reference only.

Water sample(s) digested by in-house method E-3005 prior to the determination of total metals. The in-house method is developed based on USEPA method 3005.

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### Analytical Results

Sub-Matrix: WATER

				Sample ID	TMB-R1	TMB-R1 (replicate)			
				Sampling date / time	19-Oct-2022	19-Oct-2022	---	---	---
Compound	CAS Number	LOR	Unit	HK2241332-001	HK2241332-002	-----	-----	-----	
<b>EA/ED: Physical and Aggregate Properties</b>									
EA025: Suspended Solids (SS)	----	0.5	mg/L	1.3	1.5	---	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters</b>									
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	5.01	5.20	---	---	---	
EK058A: Nitrate as N	14797-55-8	0.005	mg/L	2.32	2.36	---	---	---	
EK061P: Total Kjeldahl Nitrogen as N	----	0.05	mg/L	5.26	5.32	---	---	---	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.02	0.03	---	---	---	
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.011	0.014	---	---	---	
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	<0.05	---	---	---	
<b>EG: Metals and Major Cations</b>									
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	---	---	---	
EG020: Chromium	7440-47-3	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Copper	7440-50-8	1.0	µg/L	1.0	1.2	---	---	---	
EG020: Lead	7439-92-1	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Zinc	7440-66-6	10	µg/L	12	15	---	---	---	
EG020: Aluminium	7429-90-5	10	µg/L	72	77	---	---	---	
<b>EP: Aggregate Organics</b>									
EP005: Total Organic Carbon	----	1	mg/L	3	3	---	---	---	
EP020: Oil & Grease	----	0.5	mg/L	<0.5	<0.5	---	---	---	
EP026: Chemical Oxygen Demand	----	2	mg/L	11	12	---	---	---	
EP030: Biochemical Oxygen Demand	----	0.1	mg/L	1.4	1.4	---	---	---	
<b>EM: Microbiological Testing</b>									
EM019: Escherichia coli	----	1	CFU/100mL	410	380	---	---	---	
EM022: Faecal Coliforms	----	1	CFU/100mL	1100	900	---	---	---	





**Laboratory Duplicate (DUP) Report**

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4652622)</b>								
HK2241267-001	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	6.4	6.3	1.6
HK2241327-003	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	1.8	1.7	7.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4651353)</b>								
HK2241304-003	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	1.72	1.72	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4652758)</b>								
HK2241332-002	TMB-R1 (replicate)	EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.014	0.012	15.6
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4661750)</b>								
HK2241327-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.005	mg/L	0.025	0.023	7.2
<b>EG: Metals and Major Cations (QC Lot: 4650136)</b>								
HK2241327-002	Anonymous	EG020: Zinc	7440-66-6	1	µg/L	13	13	0.0
<b>EP: Aggregate Organics (QC Lot: 4656353)</b>								
HK2241327-004	Anonymous	EP026: Chemical Oxygen Demand	----	2	mg/L	5	5	0.0
<b>EP: Aggregate Organics (QC Lot: 4658746)</b>								
HK2241748-006	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	<1	<1	0.0
<b>EG: Metals and Major Cations - Total (QC Lot: 4650136)</b>								
HK2241327-002	Anonymous	EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	0.0
		EG020: Chromium	7440-47-3	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Lead	7439-92-1	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Copper	7440-50-8	0.2	µg/L	1.2	1.0	17.1
		EG020: Aluminium	7429-90-5	5	µg/L	107	102	4.8

**Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report**

Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4652622)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	10 mg/L	91.5	----	85.1	117	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4651353)</b>											



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
Method: Compound	CAS Number					LCS	DCS	Low	High	Value	Control Limit
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4651353) - Continued</b>											
EK067P: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	97.2	----	94.9	102	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4652758)</b>											
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.5 mg/L	98.3	----	85.0	115	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4653683)</b>											
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	----	----	----	----	----	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4661750)</b>											
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.5 mg/L	102	----	85.0	110	----	----
<b>EG: Metals and Major Cations (QC Lot: 4650136)</b>											
EG020: Zinc	7440-66-6	1	µg/L	<1	5 µg/L	109	----	88.7	115	----	----
<b>EP: Aggregate Organics (QC Lot: 4651085)</b>											
EP030: Biochemical Oxygen Demand	----	----	mg/L	----	198 mg/L	100	----	81.0	115	----	----
<b>EP: Aggregate Organics (QC Lot: 4656353)</b>											
EP026: Chemical Oxygen Demand	----	----	mg/L	----	20 mg/L	99.5	----	88.4	109	----	----
				----	200 mg/L	100	----	91.0	109	----	----
<b>EP: Aggregate Organics (QC Lot: 4658746)</b>											
EP005: Total Organic Carbon	----	1	mg/L	<1	5 mg/L	113	----	83.4	124	----	----
				<1	100 mg/L	92.9	----	87.8	119	----	----
<b>EP: Aggregate Organics (QC Lot: 4659776)</b>											
EP020: Oil & Grease	----	1	mg/L	<0.1	20 mg/L	99.2	----	79.0	105	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4650136)</b>											
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	5 µg/L	98.7	----	85.0	115	----	----
EG020: Chromium	7440-47-3	0.1	µg/L	<0.1	5 µg/L	112	----	85.3	114	----	----
EG020: Copper	7440-50-8	0.2	µg/L	<0.2	5 µg/L	97.8	----	86.3	115	----	----
EG020: Lead	7439-92-1	0.1	µg/L	<0.1	5 µg/L	113	----	85.0	115	----	----
EG020: Aluminium	7429-90-5	5	µg/L	<5	5 µg/L	92.6	----	85.0	115	----	----



**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

Matrix: WATER

				<b>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</b>						
<i>Laboratory sample ID</i>	<i>Sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike Concentration</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPD (%)</i>	
					<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4651353)</b>										
HK2241304-003	Anonymous	EK067P: Total Phosphorus as P	----	0.5 mg/L	75.9	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4652758)</b>										
HK2241332-002	TMB-R1 (replicate)	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	106	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4661750)</b>										
HK2241327-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.5 mg/L	108	----	75.0	125	----	----
<b>EG: Metals and Major Cations (QC Lot: 4650136)</b>										
HK2241327-001	Anonymous	EG020: Zinc	7440-66-6	5 µg/L	# Not Determined	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4656353)</b>										
HK2241332-001	TMB-R1	EP026: Chemical Oxygen Demand	----	20 mg/L	102	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4658746)</b>										
HK2241748-006	Anonymous	EP005: Total Organic Carbon	----	5 mg/L	106	----	75.0	125	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4650136)</b>										
HK2241327-001	Anonymous	EG020: Cadmium	7440-43-9	5 µg/L	107	----	75.0	125	----	----
		EG020: Chromium	7440-47-3	5 µg/L	103	----	75.0	125	----	----
		EG020: Copper	7440-50-8	5 µg/L	103	----	75.0	125	----	----
		EG020: Lead	7439-92-1	5 µg/L	99.9	----	75.0	125	----	----
		EG020: Aluminium	7429-90-5	5 µg/L	# Not Determined	----	75.0	125	----	----



### CERTIFICATE OF ANALYSIS

Client	: HIGHWAYS DEPARTMENT	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 6
Contact	: EDWARD LEE	Contact	: Richard Fung	Work Order	: HK2241696
Address	: RM 10-01 TO 10-03, PENINSULA TOWER 538 CASTLE PEAK ROAD, KOWLOON, HONG KONG HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong Kwai Tsing Hong Kong		
E-mail	: Edward.Lee@arup.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ---	Telephone	: +852 2610 1044		
Facsimile	: ---	Facsimile	: +852 2610 2021		
Project	: ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU) AND OTHER MAJOR ROAD PROJECTS - GROUND INVESTIGATION	Date Samples Received	: 21-Oct-2022		
Order number	: HY/2022/09/WQM/02	Quote number	: HKE/1667/2022_V3	Issue Date	: 04-Nov-2022
C-O-C number	: ---			No. of samples received	: 2
Site	: WATER QUALITY MONITORING AT 1 LOCATION			No. of samples analysed	: 2

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
		
Fung Lim Chee, Richard	Managing Director	Inorganics, Kwai Tsing
		
Fung Lim Chee, Richard	Managing Director	Metals_ENV, Kwai Tsing
		
Ng Sin Kou, May	Laboratory Manager	Microbiology_ENV, Kwai Tsing

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## General Comments

This report supersedes any previous report(s) with the same work order number. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Testing period is from 21-Oct-2022 to 04-Nov-2022.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### Specific Comments for Work Order: HK2241696

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified.

Microbiological sample(s) was/ were collected in 250mL sterile plastic bottles containing sodium thiosulfate. Sample(s) arrived at the laboratory at 15:30.

NOT DETECTED denotes result(s) is (are) less than the Limit of Report (LOR).

EK061P - Total Kjeldahl Nitrogen is the difference of Total Nitrogen and Total Oxidizable Nitrogen.

EK061P - The accredited LOR of Total Kjeldahl Nitrogen is 0.1mg/L. Results reported below 0.1mg/L and the decimal value of the results were for reference only.

EK062P - The accredited LOR of Total Nitrogen is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EK071K - The accredited LOR of Reactive Phosphorus is 0.01mg/L. Results reported below LOR and with decimal value of the results are for reference only.

EK085 - The accredited LOR of Total Sulphide is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EP020 - The accredited LOR of Oil and Grease is 2mg/L. Results reported below LOR and with decimal value are for reference only.

EP030 - The accredited LOR of Biochemical Oxygen Demand is 2mg/L. Results reported below LOR and with decimal value are for reference only.

Water sample(s) digested by in-house method E-3005 prior to the determination of total metals. The in-house method is developed based on USEPA method 3005.

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### Analytical Results

Sub-Matrix: WATER

				Sample ID	TMB-R1	TMB-R1 (replicate)			
				Sampling date / time	21-Oct-2022	21-Oct-2022	---	---	---
Compound	CAS Number	LOR	Unit	HK2241696-001	HK2241696-002	-----	-----	-----	
<b>EA/ED: Physical and Aggregate Properties</b>									
EA025: Suspended Solids (SS)	----	0.5	mg/L	2.2	2.7	---	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters</b>									
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	6.78	6.64	---	---	---	
EK058A: Nitrate as N	14797-55-8	0.005	mg/L	2.73	2.75	---	---	---	
EK061P: Total Kjeldahl Nitrogen as N	----	0.05	mg/L	6.61	6.59	---	---	---	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.03	0.03	---	---	---	
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.013	0.004	---	---	---	
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	<0.05	---	---	---	
<b>EG: Metals and Major Cations</b>									
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	---	---	---	
EG020: Chromium	7440-47-3	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Copper	7440-50-8	1.0	µg/L	1.5	2.0	---	---	---	
EG020: Lead	7439-92-1	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Zinc	7440-66-6	10	µg/L	140	<10	---	---	---	
EG020: Aluminium	7429-90-5	10	µg/L	46	57	---	---	---	
<b>EP: Aggregate Organics</b>									
EP005: Total Organic Carbon	----	1	mg/L	3	3	---	---	---	
EP020: Oil & Grease	----	0.5	mg/L	<0.5	<0.5	---	---	---	
EP026: Chemical Oxygen Demand	----	2	mg/L	6	8	---	---	---	
EP030: Biochemical Oxygen Demand	----	0.1	mg/L	1.6	1.4	---	---	---	
<b>EM: Microbiological Testing</b>									
EM019: Escherichia coli	----	1	CFU/100mL	800	1200	---	---	---	
EM022: Faecal Coliforms	----	1	CFU/100mL	6200	8800	---	---	---	



**Laboratory Duplicate (DUP) Report**

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4656291)</b>								
HK2241643-001	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	12.6	12.1	4.1
HK2241703-002	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	0.6	0.5	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4656342)</b>								
HK2241703-004	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.047	0.051	6.7
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4657483)</b>								
HK2241652-003	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	1.59	1.57	1.4
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4661750)</b>								
HK2241327-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.005	mg/L	0.025	0.023	7.2
<b>EG: Metals and Major Cations (QC Lot: 4656395)</b>								
HK2241696-002	TMB-R1 (replicate)	EG020: Zinc	7440-66-6	1	µg/L	<10	11	0.0
<b>EP: Aggregate Organics (QC Lot: 4664576)</b>								
HK2241703-003	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	<5	<5	0.0
<b>EP: Aggregate Organics (QC Lot: 4667075)</b>								
HK2241696-001	TMB-R1	EP026: Chemical Oxygen Demand	----	2	mg/L	6	7	0.0
<b>EG: Metals and Major Cations - Total (QC Lot: 4656395)</b>								
HK2241696-002	TMB-R1 (replicate)	EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	0.0
		EG020: Chromium	7440-47-3	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Lead	7439-92-1	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Copper	7440-50-8	0.2	µg/L	2.0	1.9	0.0
		EG020: Aluminium	7429-90-5	5	µg/L	57	56	0.0

**Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report**

Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4656291)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	10 mg/L	102	----	85.1	117	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4656342)</b>											



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)		
Method: Compound	CAS Number					LCS	DCS	Low	High	Value	Control Limit	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4656342) - Continued</b>												
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.5 mg/L	99.6	---	85.0	115	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4657483)</b>												
EK067P: Total Phosphorus as P	---	0.01	mg/L	<0.01	0.5 mg/L	98.1	---	94.9	102	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4661750)</b>												
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.5 mg/L	102	---	85.0	110	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4667187)</b>												
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	---	---	---	---	---	---	---	
<b>EG: Metals and Major Cations (QC Lot: 4656395)</b>												
EG020: Zinc	7440-66-6	1	µg/L	<1	5 µg/L	101	---	88.7	115	---	---	
<b>EP: Aggregate Organics (QC Lot: 4654630)</b>												
EP030: Biochemical Oxygen Demand	---	---	mg/L	---	198 mg/L	112	---	81.0	115	---	---	
<b>EP: Aggregate Organics (QC Lot: 4662588)</b>												
EP020: Oil & Grease	---	1	mg/L	<0.1	20 mg/L	99.6	---	79.0	105	---	---	
<b>EP: Aggregate Organics (QC Lot: 4664576)</b>												
EP005: Total Organic Carbon	---	1	mg/L	<1	5 mg/L	104	---	83.4	124	---	---	
				<1	100 mg/L	105	---	87.8	119	---	---	
<b>EP: Aggregate Organics (QC Lot: 4667075)</b>												
EP026: Chemical Oxygen Demand	---	---	mg/L	---	20 mg/L	99.0	---	88.4	109	---	---	
				---	200 mg/L	100	---	91.0	109	---	---	
<b>EG: Metals and Major Cations - Total (QC Lot: 4656395)</b>												
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	5 µg/L	102	---	85.0	115	---	---	
EG020: Chromium	7440-47-3	0.1	µg/L	<0.1	5 µg/L	108	---	85.3	114	---	---	
EG020: Copper	7440-50-8	0.2	µg/L	<0.2	5 µg/L	103	---	86.3	115	---	---	
EG020: Lead	7439-92-1	0.1	µg/L	<0.1	5 µg/L	110	---	85.0	115	---	---	
EG020: Aluminium	7429-90-5	5	µg/L	<5	5 µg/L	101	---	85.0	115	---	---	





**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

Matrix: WATER

					<b>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</b>					
<i>Laboratory sample ID</i>	<i>Sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike Concentration</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPD (%)</i>	
					<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4656342)</b>										
HK2241703-004	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	101	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4657483)</b>										
HK2241652-003	Anonymous	EK067P: Total Phosphorus as P	----	0.5 mg/L	86.6	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4661750)</b>										
HK2241327-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.5 mg/L	108	----	75.0	125	----	----
<b>EG: Metals and Major Cations (QC Lot: 4656395)</b>										
HK2241696-001	TMB-R1	EG020: Zinc	7440-66-6	5 µg/L	# Not Determined	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4664576)</b>										
HK2241703-003	Anonymous	EP005: Total Organic Carbon	----	25 mg/L	83.8	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4667075)</b>										
HK2241696-002	TMB-R1 (replicate)	EP026: Chemical Oxygen Demand	----	20 mg/L	102	----	75.0	125	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4656395)</b>										
HK2241696-001	TMB-R1	EG020: Cadmium	7440-43-9	5 µg/L	105	----	75.0	125	----	----
		EG020: Chromium	7440-47-3	5 µg/L	104	----	75.0	125	----	----
		EG020: Copper	7440-50-8	5 µg/L	103	----	75.0	125	----	----
		EG020: Lead	7439-92-1	5 µg/L	112	----	75.0	125	----	----
		EG020: Aluminium	7429-90-5	5 µg/L	# Not Determined	----	75.0	125	----	----



### CERTIFICATE OF ANALYSIS

Client	: HIGHWAYS DEPARTMENT	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 6
Contact	: EDWARD LEE	Contact	: Richard Fung	Work Order	: HK2241912
Address	: RM 10-01 TO 10-03, PENINSULA TOWER 538 CASTLE PEAK ROAD, KOWLOON, HONG KONG HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong Kwai Tsing Hong Kong		
E-mail	: Edward.Lee@arup.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ---	Telephone	: +852 2610 1044		
Facsimile	: ---	Facsimile	: +852 2610 2021		
Project	: ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU) AND OTHER MAJOR ROAD PROJECTS - GROUND INVESTIGATION	Date Samples Received	: 24-Oct-2022		
Order number	: HY/2022/09/WQM/02	Quote number	: HKE/1667/2022_V3	Issue Date	: 07-Nov-2022
C-O-C number	: ---			No. of samples received	: 2
Site	: WATER QUALITY MONITORING AT 1 LOCATION			No. of samples analysed	: 2

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
		
Fung Lim Chee, Richard	Managing Director	Inorganics, Kwai Tsing
		
Fung Lim Chee, Richard	Managing Director	Metals_ENV, Kwai Tsing
		
Ng Sin Kou, May	Laboratory Manager	Microbiology_ENV, Kwai Tsing

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## General Comments

This report supersedes any previous report(s) with the same work order number. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Testing period is from 24-Oct-2022 to 07-Nov-2022.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### Specific Comments for Work Order: HK2241912

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified.

Microbiological sample(s) was/ were collected in 250mL sterile plastic bottles containing sodium thiosulfate. Sample(s) arrived at the laboratory at 15:30.

NOT DETECTED denotes result(s) is (are) less than the Limit of Report (LOR).

EK061P - Total Kjeldahl Nitrogen is the difference of Total Nitrogen and Total Oxidizable Nitrogen.

EK061P - The accredited LOR of Total Kjeldahl Nitrogen is 0.1mg/L. Results reported below 0.1mg/L and the decimal value of the results were for reference only.

EK062P - The accredited LOR of Total Nitrogen is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EK071K - The accredited LOR of Reactive Phosphorus is 0.01mg/L. Results reported below LOR and with decimal value of the results are for reference only.

EK085 - The accredited LOR of Total Sulphide is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EP020 - The accredited LOR of Oil and Grease is 2mg/L. Results reported below LOR and with decimal value are for reference only.

EP030 - The accredited LOR of Biochemical Oxygen Demand is 2mg/L. Results reported below LOR and with decimal value are for reference only.

Water sample(s) digested by in-house method E-3005 prior to the determination of total metals. The in-house method is developed based on USEPA method 3005.



### Analytical Results

Sub-Matrix: WATER

				Sample ID	TMB-R1	TMB-R1 (replicate)			
				Sampling date / time	24-Oct-2022	24-Oct-2022	---	---	---
Compound	CAS Number	LOR	Unit	HK2241912-001	HK2241912-002	-----	-----	-----	
<b>EA/ED: Physical and Aggregate Properties</b>									
EA025: Suspended Solids (SS)	----	0.5	mg/L	1.2	1.1	---	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters</b>									
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	7.73	7.79	---	---	---	
EK058A: Nitrate as N	14797-55-8	0.005	mg/L	3.01	3.11	---	---	---	
EK061P: Total Kjeldahl Nitrogen as N	----	0.05	mg/L	7.01	6.92	---	---	---	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.02	0.02	---	---	---	
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.006	---	---	---	
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	<0.05	---	---	---	
<b>EG: Metals and Major Cations</b>									
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	---	---	---	
EG020: Chromium	7440-47-3	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Copper	7440-50-8	1.0	µg/L	<1.0	1.2	---	---	---	
EG020: Lead	7439-92-1	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Zinc	7440-66-6	10	µg/L	30	909	---	---	---	
EG020: Aluminium	7429-90-5	10	µg/L	33	34	---	---	---	
<b>EP: Aggregate Organics</b>									
EP005: Total Organic Carbon	----	1	mg/L	3	3	---	---	---	
EP020: Oil & Grease	----	0.5	mg/L	<0.5	<0.5	---	---	---	
EP026: Chemical Oxygen Demand	----	2	mg/L	15	14	---	---	---	
EP030: Biochemical Oxygen Demand	----	0.1	mg/L	<0.1	<0.1	---	---	---	
<b>EM: Microbiological Testing</b>									
EM019: Escherichia coli	----	1	CFU/100mL	900	800	---	---	---	
EM022: Faecal Coliforms	----	1	CFU/100mL	3500	2800	---	---	---	



**Laboratory Duplicate (DUP) Report**

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method/Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4661467)</b>								
HK2241728-001	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	7.5	8.4	11.3
HK2241728-017	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	12.7	12.9	1.8
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4659602)</b>								
HK2241917-004	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.014	0.013	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4661750)</b>								
HK2241327-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.005	mg/L	0.025	0.023	7.2
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4664866)</b>								
HK2241993-003	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	2.10	1.98	6.0
<b>EG: Metals and Major Cations (QC Lot: 4658747)</b>								
HK2241912-002	TMB-R1 (replicate)	EG020: Zinc	7440-66-6	1	µg/L	909	765	17.3
<b>EP: Aggregate Organics (QC Lot: 4664576)</b>								
HK2241703-003	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	<5	<5	0.0
<b>EP: Aggregate Organics (QC Lot: 4667075)</b>								
HK2241696-001	Anonymous	EP026: Chemical Oxygen Demand	----	2	mg/L	6	7	0.0
<b>EG: Metals and Major Cations - Total (QC Lot: 4658747)</b>								
HK2241912-002	TMB-R1 (replicate)	EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	0.0
		EG020: Chromium	7440-47-3	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Lead	7439-92-1	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Copper	7440-50-8	0.2	µg/L	1.2	1.2	0.0
		EG020: Aluminium	7429-90-5	5	µg/L	34	34	0.0

**Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report**

Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method/Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4661467)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	10 mg/L	89.5	----	85.1	117	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4659602)</b>											



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4659602) - Continued</b>											
ED071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.5 mg/L	99.5	---	85.0	115	---	---
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4661750)</b>											
ED055A: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.5 mg/L	102	---	85.0	110	---	---
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4664866)</b>											
ED067P: Total Phosphorus as P	---	0.01	mg/L	<0.01	0.5 mg/L	97.8	---	94.9	102	---	---
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4667187)</b>											
ED085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	---	---	---	---	---	---	---
<b>EG: Metals and Major Cations (QC Lot: 4658747)</b>											
EG020: Zinc	7440-66-6	1	µg/L	<1	5 µg/L	106	---	88.7	115	---	---
<b>EP: Aggregate Organics (QC Lot: 4657585)</b>											
EP030: Biochemical Oxygen Demand	---	---	mg/L	---	198 mg/L	103	---	81.0	115	---	---
<b>EP: Aggregate Organics (QC Lot: 4664576)</b>											
EP005: Total Organic Carbon	---	1	mg/L	<1	5 mg/L	104	---	83.4	124	---	---
				<1	100 mg/L	105	---	87.8	119	---	---
<b>EP: Aggregate Organics (QC Lot: 4665389)</b>											
EP020: Oil & Grease	---	1	mg/L	<0.1	20 mg/L	99.6	---	79.0	105	---	---
<b>EP: Aggregate Organics (QC Lot: 4667075)</b>											
EP026: Chemical Oxygen Demand	---	---	mg/L	---	20 mg/L	99.0	---	88.4	109	---	---
				---	200 mg/L	100	---	91.0	109	---	---
<b>EG: Metals and Major Cations - Total (QC Lot: 4658747)</b>											
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	5 µg/L	103	---	85.0	115	---	---
EG020: Chromium	7440-47-3	0.1	µg/L	<0.1	5 µg/L	109	---	85.3	114	---	---
EG020: Copper	7440-50-8	0.2	µg/L	<0.2	5 µg/L	90.8	---	86.3	115	---	---
EG020: Lead	7439-92-1	0.1	µg/L	<0.1	5 µg/L	108	---	85.0	115	---	---
EG020: Aluminium	7429-90-5	5	µg/L	<5	5 µg/L	101	---	85.0	115	---	---



**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

Matrix: WATER

					<b>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</b>					
<i>Laboratory sample ID</i>	<i>Sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike Concentration</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPD (%)</i>	
					<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4659602)</b>										
HK2241917-004	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	96.2	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4661750)</b>										
HK2241327-001	Anonymous	EK055A: Ammonia as N	7664-41-7	0.5 mg/L	108	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4664866)</b>										
HK2241993-003	Anonymous	EK067P: Total Phosphorus as P	----	5 mg/L	99.8	----	75.0	125	----	----
<b>EG: Metals and Major Cations (QC Lot: 4658747)</b>										
HK2241912-001	TMB-R1	EG020: Zinc	7440-66-6	5 µg/L	# Not Determined	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4664576)</b>										
HK2241703-003	Anonymous	EP005: Total Organic Carbon	----	25 mg/L	83.8	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4667075)</b>										
HK2241696-002	Anonymous	EP026: Chemical Oxygen Demand	----	20 mg/L	102	----	75.0	125	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4658747)</b>										
HK2241912-001	TMB-R1	EG020: Cadmium	7440-43-9	5 µg/L	98.4	----	75.0	125	----	----
		EG020: Chromium	7440-47-3	5 µg/L	97.3	----	75.0	125	----	----
		EG020: Copper	7440-50-8	5 µg/L	88.7	----	75.0	125	----	----
		EG020: Lead	7439-92-1	5 µg/L	112	----	75.0	125	----	----
		EG020: Aluminium	7429-90-5	5 µg/L	# Not Determined	----	75.0	125	----	----



### CERTIFICATE OF ANALYSIS

Client	: HIGHWAYS DEPARTMENT	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 6
Contact	: EDWARD LEE	Contact	: Richard Fung	Work Order	: HK2242250
Address	: RM 10-01 TO 10-03, PENINSULA TOWER 538 CASTLE PEAK ROAD, KOWLOON, HONG KONG HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong Kwai Tsing Hong Kong		
E-mail	: Edward.Lee@arup.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ---	Telephone	: +852 2610 1044		
Facsimile	: ---	Facsimile	: +852 2610 2021		
Project	: ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU) AND OTHER MAJOR ROAD PROJECTS - GROUND INVESTIGATION	Date Samples Received	: 26-Oct-2022		
Order number	: HY/2022/09/WQM/02	Quote number	: HKE/1667/2022_V3	Issue Date	: 09-Nov-2022
C-O-C number	: ---			No. of samples received	: 2
Site	: WATER QUALITY MONITORING AT 1 LOCATION			No. of samples analysed	: 2

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
		
Fung Lim Chee, Richard	Managing Director	Inorganics, Kwai Tsing
		
Fung Lim Chee, Richard	Managing Director	Metals_ENV, Kwai Tsing
		
Ng Sin Kou, May	Laboratory Manager	Microbiology_ENV, Kwai Tsing

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## General Comments

This report supersedes any previous report(s) with the same work order number. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Testing period is from 26-Oct-2022 to 09-Nov-2022.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### Specific Comments for Work Order: HK2242250

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified.

Microbiological sample(s) was/ were collected in 250mL sterile plastic bottles containing sodium thiosulfate. Sample(s) arrived at the laboratory at 15:30.

NOT DETECTED denotes result(s) is (are) less than the Limit of Report (LOR).

EK061P - Total Kjeldahl Nitrogen is the difference of Total Nitrogen and Total Oxidizable Nitrogen.

EK061P - The accredited LOR of Total Kjeldahl Nitrogen is 0.1mg/L. Results reported below 0.1mg/L and the decimal value of the results were for reference only.

EK062P - The accredited LOR of Total Nitrogen is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EK071K - The accredited LOR of Reactive Phosphorus is 0.01mg/L. Results reported below LOR and with decimal value of the results are for reference only.

EK085 - The accredited LOR of Total Sulphide is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EP020 - The accredited LOR of Oil and Grease is 2mg/L. Results reported below LOR and with decimal value are for reference only.

EP030 - The accredited LOR of Biochemical Oxygen Demand is 2mg/L. Results reported below LOR and with decimal value are for reference only.

Water sample(s) digested by in-house method E-3005 prior to the determination of total metals. The in-house method is developed based on USEPA method 3005.



### Analytical Results

Sub-Matrix: WATER

				Sample ID	TMB-R1	TMB-R1 (replicate)			
				Sampling date / time	26-Oct-2022	26-Oct-2022	---	---	---
Compound	CAS Number	LOR	Unit	HK2242250-001	HK2242250-002	-----	-----	-----	
<b>EA/ED: Physical and Aggregate Properties</b>									
EA025: Suspended Solids (SS)	----	0.5	mg/L	1.2	2.3	---	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters</b>									
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	8.87	8.97	---	---	---	
EK058A: Nitrate as N	14797-55-8	0.005	mg/L	3.29	3.34	---	---	---	
EK061P: Total Kjeldahl Nitrogen as N	----	0.05	mg/L	8.90	9.00	---	---	---	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.02	0.02	---	---	---	
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	<0.001	---	---	---	
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	<0.05	---	---	---	
<b>EG: Metals and Major Cations</b>									
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	---	---	---	
EG020: Chromium	7440-47-3	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Copper	7440-50-8	1.0	µg/L	1.3	2.2	---	---	---	
EG020: Lead	7439-92-1	1.0	µg/L	<1.0	2.9	---	---	---	
EG020: Zinc	7440-66-6	10	µg/L	1240	98	---	---	---	
EG020: Aluminium	7429-90-5	10	µg/L	28	161	---	---	---	
<b>EP: Aggregate Organics</b>									
EP005: Total Organic Carbon	----	1	mg/L	3	4	---	---	---	
EP020: Oil & Grease	----	0.5	mg/L	<0.5	<0.5	---	---	---	
EP026: Chemical Oxygen Demand	----	2	mg/L	12	14	---	---	---	
EP030: Biochemical Oxygen Demand	----	0.1	mg/L	1.4	1.5	---	---	---	
<b>EM: Microbiological Testing</b>									
EM019: Escherichia coli	----	1	CFU/100mL	800	900	---	---	---	
EM022: Faecal Coliforms	----	1	CFU/100mL	2900	3300	---	---	---	



**Laboratory Duplicate (DUP) Report**

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4667069)</b>								
HK2242244-001	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	31.1	31.3	0.6
HK2242267-005	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	6.8	6.5	4.9
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4664868)</b>								
HK2242270-001	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	0.48	0.48	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4667113)</b>								
HK2242244-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.012	0.012	0.0
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4667305)</b>								
HK2242250-002	TMB-R1 (replicate)	EK055A: Ammonia as N	7664-41-7	0.005	mg/L	8.97	8.97	0.1
<b>EG: Metals and Major Cations (QC Lot: 4670964)</b>								
HK2242244-002	Anonymous	EG020: Zinc	7440-66-6	1	µg/L	<10	<10	0.0
<b>EP: Aggregate Organics (QC Lot: 4671564)</b>								
HK2242542-005	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	<1	<1	0.0
<b>EP: Aggregate Organics (QC Lot: 4687180)</b>								
HK2242244-002	Anonymous	EP026: Chemical Oxygen Demand	----	2	mg/L	7	7	0.0
<b>EG: Metals and Major Cations - Total (QC Lot: 4670964)</b>								
HK2242244-002	Anonymous	EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	0.0
		EG020: Chromium	7440-47-3	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Lead	7439-92-1	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Copper	7440-50-8	0.2	µg/L	1.2	1.2	0.0
		EG020: Aluminium	7429-90-5	5	µg/L	100	99	0.0

**Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report**

Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4667069)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	10 mg/L	92.0	----	85.1	117	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4664868)</b>											



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)		
Method: Compound	CAS Number					LCS	DCS	Low	High	Value	Control Limit	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4664868) - Continued</b>												
ED067P: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	97.8	----	94.9	102	----	----	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4667113)</b>												
ED071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.5 mg/L	104	----	85.0	115	----	----	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4667187)</b>												
ED085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	----	----	----	----	----	----	----	
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4667305)</b>												
ED055A: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.5 mg/L	100	----	85.0	110	----	----	
<b>EG: Metals and Major Cations (QC Lot: 4670964)</b>												
EG020: Zinc	7440-66-6	1	µg/L	<1	5 µg/L	106	----	88.7	115	----	----	
<b>EP: Aggregate Organics (QC Lot: 4662400)</b>												
EP030: Biochemical Oxygen Demand	----	----	mg/L	----	198 mg/L	104	----	81.0	115	----	----	
<b>EP: Aggregate Organics (QC Lot: 4671564)</b>												
EP005: Total Organic Carbon	----	1	mg/L	<1	5 mg/L	96.3	----	83.4	124	----	----	
				<1	100 mg/L	110	----	87.8	119	----	----	
<b>EP: Aggregate Organics (QC Lot: 4673992)</b>												
EP020: Oil & Grease	----	1	mg/L	<0.1	20 mg/L	99.0	----	79.0	105	----	----	
<b>EP: Aggregate Organics (QC Lot: 4687180)</b>												
EP026: Chemical Oxygen Demand	----	----	mg/L	----	20 mg/L	94.0	----	88.4	109	----	----	
				----	200 mg/L	104	----	91.0	109	----	----	
<b>EG: Metals and Major Cations - Total (QC Lot: 4670964)</b>												
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	5 µg/L	98.9	----	85.0	115	----	----	
EG020: Chromium	7440-47-3	0.1	µg/L	<0.1	5 µg/L	109	----	85.3	114	----	----	
EG020: Copper	7440-50-8	0.2	µg/L	<0.2	5 µg/L	99.8	----	86.3	115	----	----	
EG020: Lead	7439-92-1	0.1	µg/L	<0.1	5 µg/L	103	----	85.0	115	----	----	
EG020: Aluminium	7429-90-5	5	µg/L	<5	5 µg/L	102	----	85.0	115	----	----	



**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

Matrix: WATER

				<b>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</b>						
<i>Laboratory sample ID</i>	<i>Sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike Concentration</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPD (%)</i>	
					<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4664868)</b>										
HK2242270-001	Anonymous	EK067P: Total Phosphorus as P	----	0.5 mg/L	103	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4667113)</b>										
HK2242244-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	104	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4667305)</b>										
HK2242250-002	TMB-R1 (replicate)	EK055A: Ammonia as N	7664-41-7	5 mg/L	92.5	----	75.0	125	----	----
<b>EG: Metals and Major Cations (QC Lot: 4670964)</b>										
HK2242244-001	Anonymous	EG020: Zinc	7440-66-6	5 µg/L	87.0	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4671564)</b>										
HK2242542-005	Anonymous	EP005: Total Organic Carbon	----	5 mg/L	87.3	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4687180)</b>										
HK2242244-001	Anonymous	EP026: Chemical Oxygen Demand	----	20 mg/L	97.5	----	75.0	125	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4670964)</b>										
HK2242244-001	Anonymous	EG020: Cadmium	7440-43-9	5 µg/L	104	----	75.0	125	----	----
		EG020: Chromium	7440-47-3	5 µg/L	102	----	75.0	125	----	----
		EG020: Copper	7440-50-8	5 µg/L	97.1	----	75.0	125	----	----
		EG020: Lead	7439-92-1	5 µg/L	88.4	----	75.0	125	----	----
		EG020: Aluminium	7429-90-5	5 µg/L	# Not Determined	----	75.0	125	----	----



### CERTIFICATE OF ANALYSIS

Client	: HIGHWAYS DEPARTMENT	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 6
Contact	: EDWARD LEE	Contact	: Richard Fung	Work Order	: HK2242574
Address	: RM 10-01 TO 10-03, PENINSULA TOWER 538 CASTLE PEAK ROAD, KOWLOON, HONG KONG HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong Kwai Tsing Hong Kong		
E-mail	: Edward.Lee@arup.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ---	Telephone	: +852 2610 1044		
Facsimile	: ---	Facsimile	: +852 2610 2021		
Project	: ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU) AND OTHER MAJOR ROAD PROJECTS - GROUND INVESTIGATION	Date Samples Received	: 28-Oct-2022		
Order number	: HY/2022/09/WQM/02	Quote number	: HKE/1667/2022_V3	Issue Date	: 11-Nov-2022
C-O-C number	: ---			No. of samples received	: 2
Site	: WATER QUALITY MONITORING AT 1 LOCATION			No. of samples analysed	: 2

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
		
Fung Lim Chee, Richard	Managing Director	Inorganics, Kwai Tsing
		
Fung Lim Chee, Richard	Managing Director	Metals_ENV, Kwai Tsing
		
Ng Sin Kou, May	Laboratory Manager	Microbiology_ENV, Kwai Tsing

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## General Comments

This report supersedes any previous report(s) with the same work order number. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Testing period is from 28-Oct-2022 to 10-Nov-2022.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

### Specific Comments for Work Order: HK2242574

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in chilled condition. The result(s) related only to the item(s) tested.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified.

Microbiological sample(s) was/ were collected in 250mL sterile plastic bottles containing sodium thiosulfate. Sample(s) arrived at the laboratory at 15:40.

NOT DETECTED denotes result(s) is (are) less than the Limit of Report (LOR).

EK061P - Total Kjeldahl Nitrogen is the difference of Total Nitrogen and Total Oxidizable Nitrogen.

EK061P - The accredited LOR of Total Kjeldahl Nitrogen is 0.1mg/L. Results reported below 0.1mg/L and the decimal value of the results were for reference only.

EK062P - The accredited LOR of Total Nitrogen is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EK071K - The accredited LOR of Reactive Phosphorus is 0.01mg/L. Results reported below LOR and with decimal value of the results are for reference only.

EK085 - The accredited LOR of Total Sulphide is 0.1mg/L. Results reported below LOR and with decimal value are for reference only.

EP020 - The accredited LOR of Oil and Grease is 2mg/L. Results reported below LOR and with decimal value are for reference only.

EP030 - The accredited LOR of Biochemical Oxygen Demand is 2mg/L. Results reported below LOR and with decimal value are for reference only.

Water sample(s) digested by in-house method E-3005 prior to the determination of total metals. The in-house method is developed based on USEPA method 3005.



**Analytical Results**

Sub-Matrix: WATER

				Sample ID	TMB-R1	TMB-R1 (replicate)			
				Sampling date / time	28-Oct-2022	28-Oct-2022	---	---	---
Compound	CAS Number	LOR	Unit	HK2242574-001	HK2242574-002	-----	-----	-----	
<b>EA/ED: Physical and Aggregate Properties</b>									
EA025: Suspended Solids (SS)	----	0.5	mg/L	3.1	3.4	---	---	---	
<b>ED/EK: Inorganic Nonmetallic Parameters</b>									
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	9.50	9.52	---	---	---	
EK058A: Nitrate as N	14797-55-8	0.005	mg/L	3.41	3.38	---	---	---	
EK061P: Total Kjeldahl Nitrogen as N	----	0.05	mg/L	9.64	9.54	---	---	---	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.02	0.02	---	---	---	
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.009	0.007	---	---	---	
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	<0.05	---	---	---	
<b>EG: Metals and Major Cations</b>									
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	---	---	---	
EG020: Chromium	7440-47-3	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Copper	7440-50-8	1.0	µg/L	1.3	<1.0	---	---	---	
EG020: Lead	7439-92-1	1.0	µg/L	<1.0	<1.0	---	---	---	
EG020: Zinc	7440-66-6	10	µg/L	1220	<10	---	---	---	
EG020: Aluminium	7429-90-5	10	µg/L	32	28	---	---	---	
<b>EP: Aggregate Organics</b>									
EP005: Total Organic Carbon	----	1	mg/L	3	3	---	---	---	
EP020: Oil & Grease	----	0.5	mg/L	<0.5	<0.5	---	---	---	
EP026: Chemical Oxygen Demand	----	2	mg/L	14	14	---	---	---	
EP030: Biochemical Oxygen Demand	----	0.1	mg/L	1.7	1.6	---	---	---	
<b>EM: Microbiological Testing</b>									
EM019: Escherichia coli	----	1	CFU/100mL	900	1900	---	---	---	
EM022: Faecal Coliforms	----	1	CFU/100mL	2900	3400	---	---	---	





**Laboratory Duplicate (DUP) Report**

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4673206)</b>								
HK2242696-001	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	51.8	53.8	3.6
HK2242699-001	Anonymous	EA025: Suspended Solids (SS)	----	0.5	mg/L	73.2	80.2	9.1
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4670963)</b>								
HK2242563-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.028	0.027	3.7
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4670968)</b>								
HK2242574-002	TMB-R1 (replicate)	EK055A: Ammonia as N	7664-41-7	0.005	mg/L	9.52	9.50	0.2
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4672262)</b>								
HK2242660-003	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	1.78	1.83	2.5
<b>EG: Metals and Major Cations (QC Lot: 4670964)</b>								
HK2242244-002	Anonymous	EG020: Zinc	7440-66-6	1	µg/L	<10	<10	0.0
<b>EP: Aggregate Organics (QC Lot: 4678827)</b>								
HK2243125-001	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	2	1	0.0
<b>EP: Aggregate Organics (QC Lot: 4693036)</b>								
HK2242574-002	TMB-R1 (replicate)	EP026: Chemical Oxygen Demand	----	2	mg/L	14	14	0.0
<b>EG: Metals and Major Cations - Total (QC Lot: 4670964)</b>								
HK2242244-002	Anonymous	EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	<0.1	0.0
		EG020: Chromium	7440-47-3	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Lead	7439-92-1	0.1	µg/L	<1.0	<1.0	0.0
		EG020: Copper	7440-50-8	0.2	µg/L	1.2	1.2	0.0
		EG020: Aluminium	7429-90-5	5	µg/L	100	99	0.0

**Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report**

Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
<b>EA/ED: Physical and Aggregate Properties (QC Lot: 4673206)</b>											
EA025: Suspended Solids (SS)	----	0.5	mg/L	<0.5	10 mg/L	# 82.5	----	85.1	117	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4670963)</b>											



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
Method: Compound	CAS Number					LCS	DCS	Low	High	Value	Control Limit
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4670963) - Continued</b>											
EK071K: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.5 mg/L	95.8	---	85.0	115	---	---
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4670968)</b>											
EK055A: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.5 mg/L	92.1	---	85.0	110	---	---
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4672262)</b>											
EK067P: Total Phosphorus as P	---	0.01	mg/L	<0.01	0.5 mg/L	97.4	---	94.9	102	---	---
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4676435)</b>											
EK085: Sulphide as S2-	18496-25-8	0.05	mg/L	<0.05	---	---	---	---	---	---	---
<b>EG: Metals and Major Cations (QC Lot: 4670964)</b>											
EG020: Zinc	7440-66-6	1	µg/L	<1	5 µg/L	106	---	88.7	115	---	---
<b>EP: Aggregate Organics (QC Lot: 4668942)</b>											
EP030: Biochemical Oxygen Demand	---	---	mg/L	---	198 mg/L	92.7	---	81.0	115	---	---
<b>EP: Aggregate Organics (QC Lot: 4678827)</b>											
EP005: Total Organic Carbon	---	1	mg/L	<1	5 mg/L	100	---	83.4	124	---	---
				<1	100 mg/L	92.1	---	87.8	119	---	---
<b>EP: Aggregate Organics (QC Lot: 4682264)</b>											
EP020: Oil & Grease	---	1	mg/L	<0.1	20 mg/L	99.5	---	79.0	105	---	---
<b>EP: Aggregate Organics (QC Lot: 4693036)</b>											
EP026: Chemical Oxygen Demand	---	---	mg/L	---	20 mg/L	95.0	---	88.4	109	---	---
				---	200 mg/L	100	---	91.0	109	---	---
<b>EG: Metals and Major Cations - Total (QC Lot: 4670964)</b>											
EG020: Cadmium	7440-43-9	0.1	µg/L	<0.1	5 µg/L	98.9	---	85.0	115	---	---
EG020: Chromium	7440-47-3	0.1	µg/L	<0.1	5 µg/L	109	---	85.3	114	---	---
EG020: Copper	7440-50-8	0.2	µg/L	<0.2	5 µg/L	99.8	---	86.3	115	---	---
EG020: Lead	7439-92-1	0.1	µg/L	<0.1	5 µg/L	103	---	85.0	115	---	---
EG020: Aluminium	7429-90-5	5	µg/L	<5	5 µg/L	102	---	85.0	115	---	---



**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

Matrix: WATER

				<b>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</b>						
<i>Laboratory sample ID</i>	<i>Sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike Concentration</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPD (%)</i>	
					<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4670963)</b>										
HK2242563-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	93.0	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4670968)</b>										
HK2242574-002	TMB-R1 (replicate)	EK055A: Ammonia as N	7664-41-7	5 mg/L	98.4	----	75.0	125	----	----
<b>ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 4672262)</b>										
HK2242660-003	Anonymous	EK067P: Total Phosphorus as P	----	0.5 mg/L	85.4	----	75.0	125	----	----
<b>EG: Metals and Major Cations (QC Lot: 4670964)</b>										
HK2242244-001	Anonymous	EG020: Zinc	7440-66-6	5 µg/L	87.0	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4678827)</b>										
HK2243125-001	Anonymous	EP005: Total Organic Carbon	----	5 mg/L	119	----	75.0	125	----	----
<b>EP: Aggregate Organics (QC Lot: 4693036)</b>										
HK2242574-001	TMB-R1	EP026: Chemical Oxygen Demand	----	20 mg/L	95.0	----	75.0	125	----	----
<b>EG: Metals and Major Cations - Total (QC Lot: 4670964)</b>										
HK2242244-001	Anonymous	EG020: Cadmium	7440-43-9	5 µg/L	104	----	75.0	125	----	----
		EG020: Chromium	7440-47-3	5 µg/L	102	----	75.0	125	----	----
		EG020: Copper	7440-50-8	5 µg/L	97.1	----	75.0	125	----	----
		EG020: Lead	7439-92-1	5 µg/L	88.4	----	75.0	125	----	----
		EG020: Aluminium	7429-90-5	5 µg/L	# Not Determined	----	75.0	125	----	----