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SEDIMENT TOXICITY TESTS REPORT

10-day Amphipod Survival Test – *Leptocheirus plumulosus*

20-day Polychaete Growth and Survival Test – *Neanthes arenaceodentata*

48-60-hour Bivalve Larvae Survival and Normality Test – *Crassostrea gigas*

31-May-2021

Project: Ground Investigation and Utilities Survey for Tuen Ma Extension

Biological Testing Report

Prepared for

Tysan Foundation Limited

Rm 1219, 12/F, Leader Industrial Centre,
57-59 Au Pui Wan Street,
Fo Tan, Hong Kong

Prepared by

ALS Technichem (HK) Pty Ltd

ALS Work Order Number HK2115082

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31 May 21

Attention: Cheung Ka Ho Desmond

RE: Ground Investigation and Utilities Survey for Tuen Ma Extension

Dear Cheung Ka Ho Desmond,

Toxicity Test Result for Sediment Samples

We are pleased to provide the results of the toxicity testing performed on the sediment samples and reference sediment of the captioned project. The sediment samples were received within the period of 12 March 2021 to 14 April 2021. Each sample was assigned with an ALS identification (ID) code as stated in Table 1.2. The samples were tested with the three toxicity tests:

- 10-day Amphipod Survival Test – *Leptocheirus plumulosus*
- 20-day Polychaete Growth and Survival Test – *Neanthes arenaceodentata*
- 48-60-hour Bivalve Larvae Survival and Normality Test – *Crassostrea gigas*

The Amphipod testing was performed according to the United States Environmental Protection Agency (US EPA) Methods for Assessing the Toxicity of the Sediment-associated Contaminants with Estuarine and Marine Amphipods (EPA/600/R-94/025, 1994). The Polychaete Survival and Growth and the Bivalve Larval Development testing were performed according to the Puget Sound Estuary Program (PSEP, 1995) protocol.

A QA/QC review confirmed that the tests met all acceptability criteria for test validity as outlined in the respective protocols. Reference toxicant results for all three species were within warning limits (Mean \pm 2SD) based on historical laboratory performance, indicating that the relative health and sensitivity of the test organisms were consistent with previous batches of test organisms.

Should you have any questions or comments related to the report, please feel free to contact the undersigned.

Yours sincerely,



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TABLE OF CONTENTS

COVER		
PREFACE		
TABLE OF CONTENTS		
1.0	SAMPLE INFORMATION	
1.1	Sample Details	1
1.2	Sample Identification	2
1.3	Total Organic Carbon, Moisture Content and Porewater characteristics of Testing Sediments	3
1.4	Summary of Test Results	4
2.0	10-DAY AMPHIPOD SURVIVAL TEST – <i>Leptocheirus plumulosus</i>	
2.1	Methodology for the 10-day Amphipod Survival Test – <i>Leptocheirus plumulosus</i>	5
2.2	Results Summary of the 10-day Amphipod Survival Test – <i>Leptocheirus plumulosus</i>	7
2.3	Water Quality Summary of the 10-day Amphipod Survival Test – <i>Leptocheirus plumulosus</i>	8
2.4	Summary of quality control data of the 10-day Amphipod Survival Test– <i>Leptocheirus plumulosus</i>	8
3.0	20-DAY POLYCHAETE GROWTH AND SURVIVAL TEST – <i>Neanthes arenaceodentata</i>	
3.1	Methodology for the 20-day Polychaete Growth and Survival Test – <i>Neanthes arenaceodentata</i>	9
3.2	Results Summary of the 20-day Polychaete Growth and Survival Test – <i>Neanthes arenaceodentata</i>	11
3.3	Water Quality Summary of the 20-day Polychaete Growth and Survival Test – <i>Neanthes arenaceodentata</i>	12
3.4	Summary of quality control data of the 20-day Polychaete Growth and Survival Test – <i>Neanthes arenaceodentata</i>	12
4.0	48-60-HOUR BIVALVE LARVAE SURVIVAL AND NORMALITY TEST – <i>Crassostrea gigas</i>	
4.1	Methodology for the 48-60-hour Bivalve Larvae Survival and Normality Test – <i>Crassostrea gigas</i>	13
4.2	Results Summary of 48-60-hour Bivalve Larvae Survival and Normality Test – <i>Crassostrea gigas</i>	14
4.3	Water Quality Summary of the 48-60-hour Bivalve Larvae Survival and Normality Test – <i>Crassostrea gigas</i>	15
4.4	Summary of quality control data of the 48-60-hour Bivalve Larvae Survival and Normality Test – <i>Crassostrea gigas</i>	15
5.0	REFERENCES	16
APPENDIX A	Sediment Description	
APPENDIX B	Complete Data for the 10-day Amphipod Survival Test – <i>Leptocheirus plumulosus</i>	
APPENDIX C	Complete Data for the 20-day Polychaete Growth and Survival Test – <i>Neanthes arenaceodentata</i>	
APPENDIX D	Complete Data for the 48-60-hour Bivalve Larvae Survival and Normality Test – <i>Crassostrea gigas</i>	
APPENDIX E	Analytical Reports	

1 SAMPLE INFORMATION

Table 1.1 Sample Details

ALS work order number:	HK2115082
Number of sample(s) for Testing:	6 testing samples, 1 reference sample
Condition of sample(s) at receipt:	Temperature: CHILLED - Ice Present Container: Miscellaneous Plastic Bag and Vibrocore
Quantity of each sample(s) at receipt:	Various
Sample storage after receipt:	Stored in dark at 4°C

Table 1.2 Sample Identifications

Lab ID	Client ID	Lab ID (Ecotox. Section)	Date Sampled	Date Received	^b Category
HK2114755001	REFERENCE SEDIMENT	HK2115082002	14-Apr-21	14-Apr-21	L
HK2110995001	1530-TME-EDH507 17.10m- 17.60m, 17.60m-18.10m	HK2115082003	17-Mar-21	17-Mar-21	M
HK2110995004	1530-TME-EDH507 19.10m- 19.60m, 19.60m-20.10m	HK2115082004	17-Mar-21	17-Mar-21	M
HK2110604002	1530-TME-EDH505 11.00m- 11.50m, 11.50m-12.00m	HK2115082005	12-Mar-21	12-Mar-21	M
HK2111494001	1530-TME-MEDH614 0.50-0.95m	HK2115082006	20-Mar-21	20-Mar-21	M
HK2112655003	1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m	HK2115082007	30-Mar-21	30-Mar-21	M
HK2112950001	1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	HK2115082008	01-Apr-21	01-Apr-21	M

^b Sediments are categorized according to ETWB TCW No. 34/2002

Table 1.3 Total Organic Carbon (TOC), Moisture Content and Porewater characteristics (pH, Salinity and Ammonia) of Testing Sediments

Client ID	ALS ID (Ecotox. Section)	Total Organic Carbon (TOC) (%)	Moisture Content (%)	Grain Size (<63µm) (%)	pH	Porewater # Salinity (ppt)	*Ammonia (as mgN/L)
REFERENCE SEDIMENT	HK2115082002	0.94	52.4	54.1	7.9	31	2.22
1530-TME-EDH507 17.10m- 17.60m, 17.60m-18.10m	HK2115082003	0.36	24.1	39.0	7.9	33	34.6
1530-TME-EDH507 19.10m- 19.60m, 19.60m-20.10m	HK2115082004	0.32	20.7	37.5	7.8	32	38.4
1530-TME-EDH505 11.00m- 11.50m, 11.50m-12.00m	HK2115082005	0.48	22.9	47.6	7.9	31	31.9
1530-TME-MEDH614 0.50- 0.95m	HK2115082006	1.37	48.7	74.1	7.8	34	21.4
1530-TME-MEDH613 1.00- 1.45m, 1.50-1.95m	HK2115082007	0.24	35.3	77.6	8.2	34	67.5
1530-TME-EDH504 15.90- 16.40m, 16.40-16.90m	HK2115082008	0.65	24.2	41.3	7.8	33	16.0

NA is reported when no porewater could be extracted from sample.

* Ammonia is reported as mgN/L

Table 1.4 Summary of Test Results

ALS ID	Sample ID	Overall Result	10-Day Amphipod Survival Test		20-Day Polychaete Survival and Growth Test		48-60-hour Bivalve Survival and Normality Test	
			Survival (%) Mean SD	Pass / Fail	Total Dry Weight (mg) Mean SD	Pass / Fail	Normality Survival (%) Mean SD	Pass / Fail
HK2115082002	REFERENCE SEDIMENT	NA	85.0 5.0	NA	52.2 0.7	NA	87.7 1.5	NA
HK2115082003	1530-TME-EDH507 17.10m-17.60m, 17.60m-18.10m	Pass	82.0 5.7	Pass	*47.8 1.9	Pass	*74.5 2.6	Pass
HK2115082004	1530-TME-EDH507 19.10m-19.60m, 19.60m-20.10m	Pass	82.0 5.7	Pass	*48.8 1.5	Pass	*73.2 2.0	Pass
HK2115082005	1530-TME-EDH505 11.00m-11.50m, 11.50m-12.00m	Pass	82.0 5.7	Pass	*48.5 1.4	Pass	*75.0 2.8	Pass
HK2115082006	1530-TME-MEDH614 0.50-0.95m	Pass	82.0 5.7	Pass	*48.1 1.4	Pass	*76.2 1.6	Pass
HK2115082007	1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m	Pass	83.0 5.7	Pass	*48.5 1.1	Pass	*75.1 2.4	Pass
HK2115082008	1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	Pass	80.0 7.9	Pass	*48.6 1.4	Pass	*72.9 2.8	Pass

* Mean survival in test sediment is significantly different (p≤0.05) from that in reference sediment
 For Amphipod Survival Test, # Mean survival in test sediment is <80% of that in reference sediment
 For Polychaete Survival and Growth Test, # Mean total dry weight in test sediment is <90% of that in reference sediment
 For Bivalve Survival and Normality Test, # Mean normality survival in test sediment is <80% of that in reference sediment

2 10-DAY AMPHIPOD SURVIVAL TEST - *Leptocheirus plumulosus*

Table 2.1 Test Methodology for the 10-day Amphipod Survival Test
– *Leptocheirus plumulosus*

	Parameter	Conditions
1	Reference protocols:	USEPA (1994) & ALS (2000) (Ref. 3 & 4)
2	Organism source:	Collected from Aquatic Biosystem; body length 2-4 mm; no mature males or females
3	Testing periods:	30 Apr 2021 - 10 May 2021
4	Test type:	Sediment toxicity test, static, non-renewal
5	Test duration:	10 days
6	Temperature:	25 ± 1°C
7	Salinity:	20 ± 1 ppt
8	Light quality:	Wide-spectrum fluorescent lights
9	Illuminance:	500-1000 lux
10	Photoperiod:	24h : 0h (Light : Dark)
11	Test chamber:	1L glass jar with 10cm internal diameter; 175mL sediment; 800mL overlying seawater; position of test container randomized
12	Number of organisms per chamber:	20
13	Number of replicates:	5
14	Feeding regime:	None
15	Aeration:	Overlying water aerated overnight before the start of test and throughout the test at approximately 100 bubbles/min; maintains ≥60% dissolved oxygen saturation
16	Overlying water:	Reconstituted seawater made up from artificial sea salt (Brand: Red Sea®); filtered through a 0.5µm filter; sterilized by ultraviolet light
17	Overlying water quality monitoring:	Temperature, pH, salinity and dissolved oxygen measured daily; total ammonia and sulfide content taken at 0 d and 10 d
18	Control sediment:	Collected from Port Shelter at PS6 (E850234 N820057) on 19 November 2020 by grab sampler; expires on 18 May 2021; stored at -20°C after collection; sieved with 0.5mm sieve before testing; ALS Ref ID: HK2044770001
19	Endpoints:	Emergence ¹ (recorded daily); survival; reburial ²
20	Statistical analysis:	Data tested for normality and homogeneity of variance; Statistically significant differences between the mean survivals in testing sediments and reference sediment determined at a probability of p ≤ 0.05 using ToxCalc 5.0 (Ref 7)
21	Test acceptability criterion:	≥90% mean survival in control sediment

Reference Toxicant Test

22	Test type:	Water only test, static
23	Toxicant:	Cadmium
24	Test duration:	96 hours
25	Photoperiod:	0h : 24h (Light : Dark)
26	Test Chamber:	1L glass jar with 10cm internal diameter; 900 mL
27	Number of organisms per chamber:	10
28	Number of replicates:	2
29	Overlying seawater quality monitoring:	Temperature, pH, salinity and dissolved oxygen of the seawater measured at test initiation and termination
30	Endpoints:	Survival
31	Statistical analysis:	96-h LC50 for Cadmium determined by ToxCalc 5.0
32	Test acceptability criterion:	≥ 90% mean survival in control seawater
33	Other testing conditions are the same as in the sediment test	

¹ Number of amphipods appearing on the sediment surface or water column² Number of surviving amphipods that rebury within 1 h in a separate container containing a 2-cm layer of control sediment and overlying clean seawater

Table 2.2 Results Summary of the 10-day Amphipod Survival Test
–*Leptocheirus plumulosus*

Lab ID	Sample ID	Survival (%)		Avoidance (amphipod/jar/day)		Reburial (%)
		Mean	SD	Mean	SD	Mean
Control	Control	96.0	4.2	0.00	0.00	97.0
HK2115082002	REFERENCE SEDIMENT	85.0	5.0	0.00	0.00	94.0
HK2115082003	1530-TME-EDH507 17.10m- 17.60m, 17.60m-18.10m	82.0	5.7	0.00	0.00	93.0
HK2115082004	1530-TME-EDH507 19.10m- 19.60m, 19.60m-20.10m	82.0	5.7	0.00	0.00	93.0
HK2115082005	1530-TME-EDH505 11.00m- 11.50m, 11.50m-12.00m	82.0	5.7	0.00	0.00	94.0
HK2115082006	1530-TME-MEDH614 0.50-0.95m	82.0	5.7	0.00	0.00	95.0
HK2115082007	1530-TME-MEDH613 1.00- 1.45m, 1.50-1.95m	83.0	5.7	0.00	0.00	94.0
HK2115082008	1530-TME-EDH504 15.90- 16.40m, 16.40-16.90m	80.0	7.9	0.00	0.00	95.0

Table 2.3 Water Quality Summary of 10-day amphipod survival test – *Leptocheirus plumulosus*

Lab ID	Sample ID	Ammonia (Total, mg/L)		Sulfide (mg/L)		Temp(°C)		pH		Salinity (ppt)		DO (mg/L)	
		Day 0	Day 10	Day 0	Day 10	min	max	min	max	min	max	min	max
Control	CONTROL	<1.0	<1.0	<0.1	<0.1	25	25	7.8	8.1	20	20	6.8	72.0
HK2115082002	REFERENCE SEDIMENT	<1.0	<1.0	<0.1	<0.1	25	25	7.8	8.1	20	20	6.9	7.1
HK2115082003	1530-TME-EDH507 17.10m-17.60m, 17.60m-18.10m	3.0	2.9	<0.1	<0.1	25	25	7.9	8.1	20	20	6.9	7.1
HK2115082004	1530-TME-EDH507 19.10m-19.60m, 19.60m-20.10m	4.1	4.4	<0.1	<0.1	25	25	7.8	8.1	20	20	6.9	7.1
HK2115082005	1530-TME-EDH505 11.00m-11.50m, 11.50m-12.00m	5.7	5.8	<0.1	<0.1	25	25	7.8	8.1	20	20	6.9	7.1
HK2115082006	1530-TME-MEDH614 0.50-0.95m	<1.0	<1.0	<0.1	<0.1	25	25	7.8	8.1	20	20	6.9	7.1
HK2115082007	1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m	13.1	8.6	<0.1	<0.1	25	25	7.9	8.1	20	20	6.9	7.2
HK2115082008	1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	<1.0	<1.0	<0.1	<0.1	25	25	7.9	8.1	20	20	6.9	7.2

Table 2.4 Summary of Quality Control Data of the 10-day Amphipod Survival Test – *Leptocheirus plumulosus*

Date of Test	Sediment Test		Reference Toxicant Test	
	Mean survival (%) in control sediment	Acceptability	Mean survival (%) in 0 mg Cd/L	96-h ^a LC50 (mgCd / L)
30 Apr 2021 - 10 May 2021	96.0%	≥ 90%	100.0%	0.66 - 0.80

^aMedian Lethal Concentration, a concentration which kills 50% of the testing population

3 20-DAY POLYCHAETE GROWTH AND SURVIVAL TEST
– *Neanthes arenaceodentata*

Table 3.1 Test Methodology for the 20-day Polychaete Growth and Survival Test – *Neanthes arenaceodentata*

Parameter	Conditions
1 Reference protocols:	PSEP (1995) & ALS (2000) (Ref. 2 & 5)
2 Organism source:	Collected from Aquatic Toxicology Support; 2-3 weeks post emergence; dry weight 0.5-1.0 mg
3 Organism acclimation:	Polychaetes were acclimated in plastic container (20cm x 26cm x 8cm) at 20 ± 1°C with 28 ± 2ppt aerated seawater of 16h : 8h (light : dark) photoperiod Overlying seawater renewed; water quality (temperature, pH, salinity and dissolved oxygen) measured; organisms fed by grounded TetraMarin® in slurry form three times a week Temperature and salinity adjusted to testing condition at <3°C and <5ppt per day respectively
4 Testing periods:	30 Apr 2021 - 20 May 2021
5 Test type:	Sediment toxicity test; static; renewal
6 Test duration:	20 days
7 Temperature:	20 ± 1°C
8 Salinity:	28 ± 1 ppt
9 Light quality:	Wide-spectrum fluorescent lights
10 Illuminance:	500-1000 lux
11 Photoperiod:	24h : 0h (Light : Dark)
12 Test chamber:	1L glass jar with 10cm internal diameter; 175mL sediment; 800mL overlying seawater; position of test container randomized
13 Number of organisms per chamber:	5
14 Number of replicates:	5
15 Feeding regime:	Fed every second day (from day 0) with 40mg (dry weight) grounded TetraMarin® in slurry form in each testing chamber
16 Aeration:	Overlying water aerated overnight before the start of test and throughout the test at approximately 100 bubbles/min; maintains >60% dissolved oxygen saturation
17 Overlying water:	Reconstituted seawater made up from artificial sea salt (Brand: Red Sea®); filtered through a 0.5µm filter; sterilized by ultraviolet light
18 Overlying water quality monitoring:	Temperature monitored daily; pH, salinity and dissolved oxygen measured every third day before water renewal; total ammonia and sulfide taken at 0 d and 20 d
19 Control sediment:	Collected from Port Shelter at PS6 (E850234 N820057) on 19 November 2020 by grab sampler; expires on 18 May 2021; stored at -20°C after collection; sieved with 0.5mm sieve before testing; ALS Ref ID: HK2044770001

31-May-21

20	Endpoints:	Survival; total biomass ¹ ; average individual biomass ² ; average individual growth rate ³
21	Statistical analysis:	Data tested for normality and homogeneity of variance; Statistically significant differences between the mean total dry weight in testing sediments and reference sediment determined at a probability of $p \leq 0.05$ using ToxCalc 5.0 (Ref 7)
22	Test acceptability criterion:	$\geq 90\%$ mean survival and $\geq 0.38\text{mg/ind/day}$ individual growth rate in control sediment

Reference Toxicant Test

23	Test type:	Water only test, static
24	Toxicant:	Cadmium
25	Test duration:	96 hours
26	Photoperiod:	0h : 24h (Light : Dark)
27	Test Chamber:	1L glass jar with 10cm internal diameter; 900 mL seawater; position of test container randomized
28	Number of organisms per chamber:	10
29	Number of replicates:	2
30	Overlying seawater quality monitoring:	Temperature, pH, salinity and dissolved oxygen of the seawater measured at test initiation and termination
31	Endpoints:	Survival
32	Statistical analysis:	96-h LC50 for Cadmium determined by ToxCalc 5.0 (Ref 7)
33	Test acceptability criterion:	$\geq 90\%$ mean survival in control seawater
34	Other testing conditions are the same as in the sediment test	

¹ the total dry weight of the surviving worms.

² the total dry weight of the surviving worms, divided by the number of surviving worms.

³ the difference between the average initial and final dry weights, divided by the length of exposure (20 days).

Table 3.2 Results Summary of the 20-day Polychaete Growth and Survival Test – *Neanthes arenaceodentata*

Lab ID	Sample ID	Survival (%)		Individual Dry Weight (mg)		Individual Growth Rate (mg/ind/day)		Total Dry Weight (mg)	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
Control	CONTROL	100.0	0.0	11.1	0.2	0.52	0.01	55.6	0.8
HK2115082002	REFERENCE SEDIMENT	100.0	0.0	10.4	0.1	0.49	0.01	52.2	0.7
HK2115082003	1530-TME-EDH507 17.10m-17.60m, 17.60m-18.10m	100.0	0.0	9.6	0.4	0.45	0.02	*47.8	1.9
HK2115082004	1530-TME-EDH507 19.10m-19.60m, 19.60m-20.10m	100.0	0.0	9.8	0.3	0.46	0.01	*48.8	1.5
HK2115082005	1530-TME-EDH505 11.00m-11.50m, 11.50m-12.00m	100.0	0.0	9.7	0.3	0.45	0.01	*48.5	1.4
HK2115082006	1530-TME-MEDH614 0.50-0.95m	100.0	0.0	9.6	0.3	0.45	0.01	*48.1	1.4
HK2115082007	1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m	100.0	0.0	9.7	0.2	0.45	0.01	*48.5	1.1
HK2115082008	1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	100.0	0.0	9.7	0.3	0.45	0.01	*48.6	1.4

*Mean total dry weight in test sediment is significantly different ($p \leq 0.05$) from that in reference sediment

Table 3.3 Water Quality Summary of 20-day Polychaete Growth and Survival Test – *Neanthes arenaceodentata*

Lab ID	Sample ID	Ammonia (Total, mg/L)		Sulfide (mg/L)		Temp(°C)		pH		Salinity (ppt)		DO (mg/L)	
		Day 0	Day 20	Day 0	Day 20	min	max	min	max	min	max	min	max
Control	CONTROL	<1.0	<1.0	<0.1	<0.1	20	20	7.9	8.1	28	28	6.8	7.1
HK2115082002	REFERENCE SEDIMENT	<1.0	4.9	<0.1	<0.1	20	20	7.9	8.1	28	28	6.9	7.2
HK2115082003	1530-TME-EDH507 17.10m-17.60m, 17.60m-18.10m	4.4	22.1	<0.1	<0.1	20	20	7.8	8.1	28	28	6.9	7.1
HK2115082004	1530-TME-EDH507 19.10m-19.60m, 19.60m-20.10m	4.2	16.3	<0.1	<0.1	20	20	7.8	8.1	28	28	6.9	7.1
HK2115082005	1530-TME-EDH505 11.00m-11.50m, 11.50m-12.00m	6.2	11.6	<0.1	<0.1	20	20	7.8	8.1	28	28	7.0	7.2
HK2115082006	1530-TME-MEDH614 0.50-0.95m	2.6	11.6	<0.1	<0.1	20	20	7.8	8.1	28	28	6.9	7.2
HK2115082007	1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m	11.7	27.5	<0.1	<0.1	20	20	7.9	8.1	28	28	6.9	7.2
HK2115082008	1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	1.8	19.5	<0.1	<0.1	20	20	7.9	8.1	28	28	6.9	7.2

Table 3.4 Summary of Quality Control Data of the 20-day Polychaete Growth and Survival test – *Neanthes arenaceodentata*

Date of Test	Sediment Test				Reference Toxicant Test					
	Initial dry weight (mg/ind)	Acceptability Criterion	Mean survival (%) in control sediment	Acceptability Criterion	Mean ind growth rate (mg/ind/day) in control sediment	Acceptability Criterion	Mean survival (%) in 0 mgCd / L seawater	Acceptability Criterion	96-h ^a LC50 (mgCd / L)	Acceptability Criterion
30 Apr 2021 - 20 May 2021	0.66	0.5-1.0 (mg/ind)	100.0	≥ 90%	0.52	> 0.38 (mg/ind/day)	100.0	≥ 90%	7.65	7.05 - 7.84

^a Median Lethal Concentration, a concentration which kills 50% of the testing population

4.0 48-60-HOUR BIVALVE LARVAE SURVIVAL AND NORMALITY TEST – Crassostrea gigas

Table 4.1 Test Methodology for the 48-60-hour Bivalve Larvae Survival and Normality Test – Crassostrea gigas

Parameter	Condition
1 Reference protocols:	PSEP (1995) and ALS (2009) (Ref 2 and 6)
2 Organism Source:	Collected from Guernsey Sea Farm
3 Organism acclimation:	Organisms are stored in individual chambers at 20°C with aerated clean seawater for a night prior to testing.
4 Initiation and termination dates:	04 May 2021 - 06 May 2021
5 Test type:	Static; non-renewal
6 Test duration:	48 hours
7 Temperature:	20 ± 1°C
8 Salinity:	28 ± 1 ppt
9 Light quality:	Wide-spectrum fluorescent lights
10 Illuminance:	500 – 1000 lux
11 Photoperiod:	14h : 10h (Light : Dark)
12 Test chamber:	1L glass jar with 10cm internal diameter; 18.0 ± 0.5 g of sediment; 900mL overlying seawater; sediment stirred for 10sec and allowed to settle for 4h prior to the inoculation of embryos; position of test container randomized
13 Method for obtaining gametes:	Organisms were dissected to obtain the gametes
14 Life stage of organism:	<2h post-fertilization
15 Number of organisms per	20,000 – 40,000 (around 30 embryos / mL)
16 Number of replicates:	6 (5 for testing, 1 for water quality measurement)
17 Feeding regime:	None
18 Aeration:	100 bubbles/minute if dissolved oxygen drops to <60% saturation
19 Overlying water:	Natural seawater collected from uncontaminated area in Sai Kung; Filtered through a 0.5µm; sterilized by ultraviolet light; salinity adjusted to 28ppt with fresh water or artificial sea salt (Brand: Red Sea®)
20 Overlying water quality monitoring:	Temperature, pH, salinity and dissolved oxygen were recorded daily
21 Negative control:	Seawater without sediment
22 Endpoints:	Survival, normal development, and normality survival ¹
23 Statistical analysis:	Data tested for normality and homogeneity of variance; Statistically significant differences between the mean normality survival in testing sediments and reference sediment determined at a probability of p≤0.05 using ToxCalc 5.0 (Ref 7)
24 Test acceptability criterion:	>70% mean normal survival in seawater control
Reference Toxicant Test	
25 Toxicant:	Copper
26 Test chamber:	1L glass jar with 10cm internal diameter; 900mL seawater; position of test container randomized
27 Number of replicates:	4 (3 for testing; 1 for water quality measurement)
28 Endpoints:	Normal Survival
29 Statistical analysis:	48-60-h EC50 (and 95% confidence interval) for Cu calculated using ToxCalc 5.0 (Ref. 7)
30 Other testing conditions are the same as in the sediment samples test	

¹ Normality survival integrates the normality and survival end points, and measures survival of only the normal larvae relative to the starting number

Table 4.2 Results Summary of the 48-60-hour Bivalve Larvae Survival and Normality Test – *Crassostrea gigas*

Lab ID	Sample ID	Survival (%)		Normality (%)		Normality Survival (%)	
		Mean	SD	Mean	SD	Mean	SD
Control	CONTROL	94.9	3.0	94.4	1.5	89.6	3.1
HK2115082002	REFERENCE SEDIMENT	94.3	2.0	93.0	1.6	87.7	1.5
HK2115082003	1530-TME-EDH507 17.10m-17.60m, 17.60m-18.10m	82.5	3.1	90.4	1.6	*74.5	2.6
HK2115082004	1530-TME-EDH507 19.10m-19.60m, 19.60m-20.10m	81.0	2.1	90.4	1.5	*73.2	2.0
HK2115082005	1530-TME-EDH505 11.00m-11.50m, 11.50m-12.00m	82.4	3.0	91.1	1.1	*75.0	2.8
HK2115082006	1530-TME-MEDH614 0.50-0.95m	85.2	2.7	89.4	1.5	*76.2	1.6
HK2115082007	1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m	84.4	3.2	89.0	0.7	*75.1	2.4
HK2115082008	1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	81.3	3.1	89.6	1.4	*72.9	2.8

* Mean percentage in test sediment is significantly different ($p \leq 0.05$) from that in reference sediment

Table 4.3 Water Quality Summary of 48-60-h bivalve Survival and Normality Test – Crassostrea gigas

Lab ID	Sample ID	Ammonia (Total, mg/L)		Sulfide (mg/L)		Temp(°C)		pH		Salinity (ppt)		DO (mg/L)	
		Day 0	Day 2	Day 0	Day 2	min	max	min	max	min	max	min	max
Control	CONTROL	<1.0	<1.0	<0.1	<0.1	20	20	7.9	8.0	28	28	7.2	7.3
HK2115082002	REFERENCE SEDIMENT	<1.0	<1.0	<0.1	<0.1	20	20	7.9	8.0	28	28	7.1	7.2
HK2115082003	1530-TME-EDH507 17.10m-17.60m, 17.60m-18.10m	2.7	2.7	<0.1	<0.1	20	20	7.9	8.0	28	28	7.0	7.2
HK2115082004	1530-TME-EDH507 19.10m-19.60m, 19.60m-20.10m	3.2	2.8	<0.1	<0.1	20	20	7.8	8.1	28	28	7.0	7.1
HK2115082005	1530-TME-EDH505 11.00m-11.50m, 11.50m-12.00m	2.5	1.9	<0.1	<0.1	20	20	7.9	8.0	28	28	6.9	7.0
HK2115082006	1530-TME-MEDH614 0.50-0.95m	<1.0	<1.0	<0.1	<0.1	20	20	8.0	8.1	28	28	6.9	7.0
HK2115082007	1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m	2.8	1.4	<0.1	<0.1	20	20	7.9	8.1	28	28	6.9	7.1
HK2115082008	1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	<1.0	<1.0	<0.1	<0.1	20	20	7.9	8.0	28	28	7.0	7.1

Table 4.4 Summary of Quality Control Data of the 48-60-hour Bivalve Larvae Survival and Normality test – Crassostrea gigas

Date of Test	Water Control		Reference Toxicant Test	
	Mean Normality survival (%) in control		48-60-h EC50 (µgCu / L)	
	Result	Acceptability Criterion	Result	Acceptability Criterion
04 May 2021 - 06 May 2021	89.6%	≥70.0%	89.6%	≥70.0%
	89.6%	≥70.0%	5.41	4.90 - 5.61

5 References

- (1) APHA (American Public Health Association) 1995. Standard Methods for the Examination of Water and Wastewater. 19th edition. American Public Health Association, American Water Works Association and Water Environment Federation, Washington, DC.
- (2) PSEP (Puget Sound Estuary Program) 1995. Recommended guidelines for conducting laboratory bioassays on Puget Sound sediments. U.S. Environmental Protection Agency, Region 10, Office of Puget Sound, Seattle WA.
- (3) USEPA (U.S. Environmental Protection Agency) 1994. Methods for assessing the toxicity of sediment-associated contaminants with estuarine and marine amphipods. Office of Research and Development. U.S. Environmental Protection Agency, Cincinnati, OH. EPA/600/R94/025.
- (4) ALS 2000. 10-Day Amphipod Survival Test – *Leptocheirus plumulosus*. QWI-HK/ET001. In: Ecotoxicology Work Instruction. ALS Technichem (HK) Pty Ltd, Hong Kong.
- (5) ALS 2000. 20-Day Polychaete Growth and Survival Test – *Neanthes arenaceodentata*. QWI-HK/ET002. In: Ecotoxicology Work Instruction. ALS Technichem (HK) Pty Ltd, Hong Kong.
- (6) ALS 2009. 48 Hour Bivalve Larvae Survival and Normality Test – *Crassostrea gigas*. QWI-HK/ET012. In: Ecotoxicology Work Instruction. ALS Technichem (HK) Pty Ltd, Hong Kong.
- (7) TOXCALC™-Toxicity Data Analysis Software (v5.0.32) User's Guide. 1994-2008. Tidepool Scientific Software, McKinleyville, CA 95519.

APPENDIX A

Sediment Description

Table A.1: Sample Identification

^a Lot ID	Lab ID	Client ID	Lab ID (Ecotox. Section)
Z 1	HK2044770001	Control	Control
Z 2	HK2114755001	REFERENCE SEDIMENT	HK2115082002
Z 3	HK2110995001	1530-TME-EDH507 17.10m-17.60m, 17.60m-18.10m	HK2115082003
Z 4	HK2110995004	1530-TME-EDH507 19.10m-19.60m, 19.60m-20.10m	HK2115082004
Z 5	HK2110604002	1530-TME-EDH505 11.00m-11.50m, 11.50m-12.00m	HK2115082005
Z 6	HK2111494001	1530-TME-MEDH614 0.50-0.95m	HK2115082006
Z 7	HK2112655003	1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m	HK2115082007
Z 8	HK2112950001	1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	HK2115082008

^a Lot ID is identification used during testing




CERTIFICATE OF ANALYSIS

Client : TYSAN FOUNDATION LTD	Laboratory : ALS Technichem (HK) Pty Ltd	Page : 1 of 5
Contact : DESMOND CHEUNG	Contact : Richard Fung	Work Order : HK2117076
Address : UNIT 19, 12/F LEADER INDUSTRIAL CENTRE, NOS. 57-59 AU PUI WAN STREET, SHATIN, N.T. HONG KONG	Address : 11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong	
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Telephone : ---	Telephone : +852 2610 1044	
Facsimile : ---	Facsimile : +852 2610 2021	
Project : GROUND INVESTIGATION AND UTILITIES SURVEY FOR TUEN MA EXTENSION		Date received : 30-Apr-2021
Order number : J2009SF23	Quote number : HKE/2221/2020_V2	Date of issue : 10-May-2021
C-O-C number : ---		No. of samples - Received : 14
Site : TUEN MUN SOUTH		- Analysed : 14

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

<i>Signatory</i>	<i>Position</i>	<i>Authorised results for:</i>
 Fung Lim Chee, Richard	Managing Director	Inorganics

ALS Technichem (HK) Pty Ltd
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Page Number : 2 of 5
Client : TYSAN FOUNDATION LTD
Work Order : HK2117076



General Comments

This report supersedes any previous report(s) with this reference. 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 30-Apr-2021 to 10-May-2021.

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 HK2117076 :

Sample(s) was/were picked up from client by ALS staff. Sample(s) arrived laboratory in ambient 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.



Analytical Results

Sub-Matrix: SEAWATER			Compound	EA055: Moisture Content (dried @ 103°C) 0.1 %	EK055K: Ammonia as NH3 0.1 mg/L	EP005: Total Organic Carbon 0.05 %	---	---
			LOR Unit	EA/ED: Physical and Aggregate Properties	ED/EK: Inorganic Nonmetallic Parameters	EP: Aggregate Organics	---	---
Sample ID	Sampling date / time	Laboratory sample ID						
REFERENCE SEDIMENT Porewater	30-Apr-2021	HK2117076-008		---	2.7	---	---	---
1530-TME-EDH507 17.10m-17.60m, 17.60m-18.10m Porewater	30-Apr-2021	HK2117076-009		---	42.0	---	---	---
1530-TME-EDH507 18.10m-19.60m, 19.60m-20.10m Porewater	30-Apr-2021	HK2117076-010		---	46.6	---	---	---
1530-TME-EDH505 11.00m-11.50m, 11.50m-12.00m Porewater	30-Apr-2021	HK2117076-011		---	38.7	---	---	---
1530-TME-MEDH814 0.50-0.95m Porewater	30-Apr-2021	HK2117076-012		---	26.0	---	---	---
1530-TME-MEDH813 1.00-1.45m, 1.50-1.95m Porewater	30-Apr-2021	HK2117076-013		---	82.0	---	---	---
1530-TME-EDH504 15.90-16.40m, 16.40-16.90m Porewater	30-Apr-2021	HK2117076-014		---	19.4	---	---	---



Sub-Matrix: SEDIMENT			Compound	EA055: Moisture Content (dried @ 103°C) 0.1 %	EK055K: Ammonia as NH3 0.1 mg/L	EP005: Total Organic Carbon 0.05 %	---	---
			LOR Unit	EA/ED: Physical and Aggregate Properties	ED/EK: Inorganic Nonmetallic Parameters	EP: Aggregate Organics	---	---
Sample ID	Sampling date / time	Laboratory sample ID						
REFERENCE SEDIMENT	30-Apr-2021	HK2117076-001		52.4	---	0.94	---	---
1530-TME-EDH507 17.10m-17.60m, 17.60m-18.10m	30-Apr-2021	HK2117076-002		24.1	---	0.36	---	---
1530-TME-EDH507 18.10m-19.60m, 19.60m-20.10m	30-Apr-2021	HK2117076-003		20.7	---	0.32	---	---
1530-TME-EDH505 11.00m-11.50m, 11.50m-12.00m	30-Apr-2021	HK2117076-004		22.9	---	0.48	---	---
1530-TME-MEDH814 0.50-0.95m, 1530-TME-MEDH813 1.00-1.45m, 1.50-1.95m	30-Apr-2021	HK2117076-005		48.7	---	1.37	---	---
	30-Apr-2021	HK2117076-006		35.3	---	0.24	---	---
1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	30-Apr-2021	HK2117076-007		24.2	---	0.65	---	---



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EATED: Physical and Aggregate Properties (QC Lot: 3654853)								
HK2117199-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	---	0.1	%	<0.1	<0.1	0.00
HK2117223-002	Anonymous	EA055: Moisture Content (dried @ 103°C)	---	0.1	%	3.9	4.0	3.20
EP: Aggregate Organics (QC Lot: 3659642)								
HK2117076-001	REFERENCE SEDIMENT	EP005: Total Organic Carbon	---	0.05	%	0.94	0.94	0.00

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

Matrix: SOIL			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 (%)	DCS	Recovery Limits (%)		RPDs (%)	Control Limit
EP: Aggregate Organics (QC Lot: 3659542)											
EP005: Total Organic Carbon	---	0.05	%	<0.05	40 %	103	---	89.8	107	---	---
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 (%)	DCS	Recovery Limits (%)		RPDs (%)	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3654822)											
EK055K: Ammonia as NH3	---	0.1	mg/L	<0.1	---	---	---	---	---	---	---

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

Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Spike Concentration	MS	MSD	Recovery Limits (%)		RPDs (%)	Control Limit
EP: Aggregate Organics (QC Lot: 3659542)										
HK2117076-001	REFERENCE SEDIMENT	EP005: Total Organic Carbon	---	0.80677 %	102	---	75.0	125	---	---

APPENDIX B

Complete Data for the 10-day Amphipod Survival Test
– *Leptocheirus plumulosus*

Client: Tysan Foundation Limited
 Batch No.: HK2115082
 Initiation Date: 30-Apr-21

ID	Rep	Group	Cinet ID	Initial no.	Final no.	Avoidance	No. Not Reburying	Duration (Days)	Survival (%)			Avoidance (%)			Reburial (%)		
									S %	S Mean	S SD	A %	A Mean	A SD	R %	R Mean	
-	1	A	Control	CONTROL	20	19	0	1	10	95	96.0	4.2	0.00	0.00	0.00	94.7	97.0
-	2	B	Control	CONTROL	20	20	0	0	10	100			0.00			100.0	
-	3	C	Control	CONTROL	20	20	0	0	10	100			0.00			100.0	
-	4	D	Control	CONTROL	20	18	0	1	10	90			0.00			94.4	
-	5	E	Control	CONTROL	20	19	0	1	10	95			0.00			94.7	
1	1	A	HK2115082002	REFERENCE SEDIMENT	20	16	0	1	10	80	85.0	5.0	0.00	0.00	0.00	93.8	94.0
2	2	B	HK2115082002	REFERENCE SEDIMENT	20	18	0	1	10	90			0.00			94.4	
3	3	C	HK2115082002	REFERENCE SEDIMENT	20	17	0	2	10	85			0.00			88.2	
4	4	D	HK2115082002	REFERENCE SEDIMENT	20	16	0	0	10	80			0.00			100.0	
5	5	E	HK2115082002	REFERENCE SEDIMENT	20	18	0	1	10	90			0.00			94.4	
6	1	A	HK2115082003	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	15	0	2	10	75	82.0	5.7	0.00	0.00	0.00	86.7	93.0
7	2	B	HK2115082003	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	18	0	1	10	90			0.00			94.4	
8	3	C	HK2115082003	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	16	0	1	10	80			0.00			93.8	
9	4	D	HK2115082003	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	16	0	0	10	80			0.00			100.0	
10	5	E	HK2115082003	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	17	0	2	10	85			0.00			88.2	
11	1	A	HK2115082004	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	16	0	1	10	80	82.0	5.7	0.00	0.00	0.00	93.8	93.0
12	2	B	HK2115082004	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	16	0	1	10	80			0.00			93.8	
13	3	C	HK2115082004	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	18	0	2	10	90			0.00			88.9	
14	4	D	HK2115082004	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	17	0	2	10	85			0.00			88.2	
15	5	E	HK2115082004	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	15	0	0	10	75			0.00			100.0	
16	1	A	HK2115082005	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	15	0	0	10	75	82.0	5.7	0.00	0.00	0.00	100.0	94.0
17	2	B	HK2115082005	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	18	0	2	10	90			0.00			88.9	
18	3	C	HK2115082005	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	16	0	1	10	80			0.00			93.8	
19	4	D	HK2115082005	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	16	0	1	10	80			0.00			93.8	
20	5	E	HK2115082005	1530-TME-ED9847-13-00-15-00m; 13-00-15-00m	20	17	0	1	10	85			0.00			94.1	
21	1	A	HK2115082006	1530-TME-MEDH614-0.50-0.95m	20	16	0	2	10	80	82.0	5.7	0.00	0.00	0.00	87.5	95.0
22	2	B	HK2115082006	1530-TME-MEDH614-0.50-0.95m	20	18	0	1	10	90			0.00			94.4	
23	3	C	HK2115082006	1530-TME-MEDH614-0.50-0.95m	20	17	0	1	10	85			0.00			94.1	
24	4	D	HK2115082006	1530-TME-MEDH614-0.50-0.95m	20	16	0	0	10	80			0.00			100.0	
25	5	E	HK2115082006	1530-TME-MEDH614-0.50-0.95m	20	15	0	0	10	75			0.00			100.0	
26	1	A	HK2115082007	1530-TME-MEDH613-1.00-1.45m; 1.50-1.95m	20	16	0	1	10	80	83.0	5.7	0.00	0.00	0.00	93.8	94.0
27	2	B	HK2115082007	1530-TME-MEDH613-1.00-1.45m; 1.50-1.95m	20	17	0	1	10	85			0.00			94.1	
28	3	C	HK2115082007	1530-TME-MEDH613-1.00-1.45m; 1.50-1.95m	20	17	0	0	10	85			0.00			100.0	
29	4	D	HK2115082007	1530-TME-MEDH613-1.00-1.45m; 1.50-1.95m	20	15	0	1	10	75			0.00			93.3	
30	5	E	HK2115082007	1530-TME-MEDH613-1.00-1.45m; 1.50-1.95m	20	18	0	2	10	90			0.00			88.9	
31	1	A	HK2115082008	1530-TME-ED9848-15-00-15-00m; 15-00-15-00m	20	15	0	2	10	75	80.0	7.9	0.00	0.00	0.00	86.7	95.0
32	2	B	HK2115082008	1530-TME-ED9848-15-00-15-00m; 15-00-15-00m	20	16	0	1	10	80			0.00			93.8	
33	3	C	HK2115082008	1530-TME-ED9848-15-00-15-00m; 15-00-15-00m	20	18	0	0	10	90			0.00			100.0	
34	4	D	HK2115082008	1530-TME-ED9848-15-00-15-00m; 15-00-15-00m	20	17	0	0	10	85			0.00			100.0	
35	5	E	HK2115082008	1530-TME-ED9848-15-00-15-00m; 15-00-15-00m	20	14	0	1	10	70			0.00			92.9	

Test: AP Test ID: HK2115082a
 Species: LP Protocol: EPA 94
 Sample ID: VA Sample Type: MSE
 Start Date: 4/30/2021 End Date: 5/10/2021 Lab ID: ALS

Pos	ID	Rep	Group	Initial no.	Final no.	Avoidance	Reburying	T. Duration (Days)	Notes
	1	1	REFERENCE	20	16	0	1	10	
	2	2	REFERENCE	20	18	0	1	10	
	3	3	REFERENCE	20	17	0	2	10	
	4	4	REFERENCE	20	16	0	0	10	
	5	5	REFERENCE	20	18	0	1	10	
	6	1	2115082-03	20	15	0	2	10	
	7	2	2115082-03	20	18	0	1	10	
	8	3	2115082-03	20	16	0	1	10	
	9	4	2115082-03	20	16	0	0	10	
	10	5	2115082-03	20	17	0	2	10	
	11	1	2115082-04	20	16	0	1	10	
	12	2	2115082-04	20	16	0	1	10	
	13	3	2115082-04	20	18	0	2	10	
	14	4	2115082-04	20	17	0	2	10	
	15	5	2115082-04	20	15	0	0	10	
	16	1	2115082-05	20	15	0	0	10	
	17	2	2115082-05	20	18	0	2	10	
	18	3	2115082-05	20	16	0	1	10	
	19	4	2115082-05	20	16	0	1	10	
	20	5	2115082-05	20	17	0	1	10	
	21	1	2115082-06	20	16	0	2	10	
	22	2	2115082-06	20	18	0	1	10	
	23	3	2115082-06	20	17	0	1	10	
	24	4	2115082-06	20	16	0	0	10	
	25	5	2115082-06	20	15	0	0	10	
	26	1	2115082-07	20	16	0	1	10	
	27	2	2115082-07	20	17	0	1	10	
	28	3	2115082-07	20	17	0	0	10	
	29	4	2115082-07	20	15	0	1	10	
	30	5	2115082-07	20	18	0	2	10	
	31	1	2115082-08	20	15	0	2	10	
	32	2	2115082-08	20	16	0	1	10	
	33	3	2115082-08	20	18	0	0	10	
	34	4	2115082-08	20	17	0	0	10	
	35	5	2115082-08	20	14	0	1	10	

Comments:

-Survival

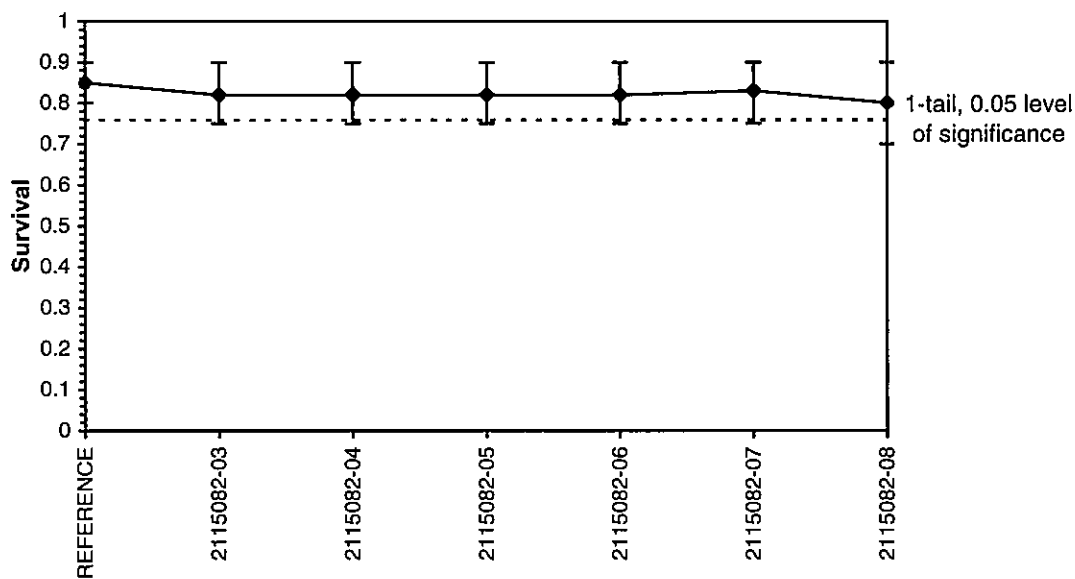
Start Date: 4/30/2021	Test ID: HK2115082a	Sample ID: VA
End Date: 5/10/2021	Lab ID: ALS	Sample Type: MSE
Sample Date:	Protocol: EPA 94	Test Species: LP

Conc-	1	2	3	4	5
REFERENCE	0.8000	0.9000	0.8500	0.8000	0.9000
2115082-03	0.7500	0.9000	0.8000	0.8000	0.8500
2115082-04	0.8000	0.8000	0.9000	0.8500	0.7500
2115082-05	0.7500	0.9000	0.8000	0.8000	0.8500
2115082-06	0.8000	0.9000	0.8500	0.8000	0.7500
2115082-07	0.8000	0.8500	0.8500	0.7500	0.9000
2115082-08	0.7500	0.8000	0.9000	0.8500	0.7000

Conc-	Mean	N-Mean	Transform: Untransformed					N	t-Stat	1-Tailed Critical	MSD
			Mean	Min	Max	CV%					
REFERENCE	0.8500	1.0000	0.8500	0.8000	0.9000	5.882	5				
2115082-03	0.8200	0.9647	0.8200	0.7500	0.9000	6.952	5	0.794	2.409	0.0910	
2115082-04	0.8200	0.9647	0.8200	0.7500	0.9000	6.952	5	0.794	2.409	0.0910	
2115082-05	0.8200	0.9647	0.8200	0.7500	0.9000	6.952	5	0.794	2.409	0.0910	
2115082-06	0.8200	0.9647	0.8200	0.7500	0.9000	6.952	5	0.794	2.409	0.0910	
2115082-07	0.8300	0.9765	0.8300	0.7500	0.9000	6.869	5	0.529	2.409	0.0910	
2115082-08	0.8000	0.9412	0.8000	0.7000	0.9000	9.882	5	1.323	2.409	0.0910	

Auxiliary Tests	Statistic	Critical	Skew	Kurt		
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)	0.94966	0.934	0.10561	-0.9798		
Bartlett's Test indicates equal variances ($p = 0.99$)	0.98102	16.8119				
Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test indicates no significant differences Treatments vs REFERENCE	0.09104	0.1071	0.00112	0.00357	0.9246	6, 28

Dose-Response Plot



Test: AP	Test ID: RTLPCD192
Species: LP	Protocol: EPA 94
Sample ID: REF	Sample Type: CDCL
Start Date: 4/30/2021	End Date: 5/4/2021
	Lab ID: ALS

Pos	ID	Rep	Group	Initial no.	Final no.	Avoidance	Reburying	T. Duration (Days)	Notes
	1	1	D-Control	10	10			4	
	2	2	D-Control	10	10			4	
	3	1	0.15	10	9			4	
	4	2	0.15	10	9			4	
	5	1	0.6	10	6			4	
	6	2	0.6	10	6			4	
	7	1	1.25	10	4			4	
	8	2	1.25	10	3			4	
	9	1	2.5	10	2			4	
	10	2	2.5	10	2			4	
	11	1	5	10	0			4	
	12	2	5	10	0			4	

Comments:

-Survival

Start Date: 4/30/2021	Test ID: RTLPCD192	Sample ID: REF
End Date: 5/4/2021	Lab ID: ALS	Sample Type: CDCL
Sample Date:	Protocol: EPA 94	Test Species: LP

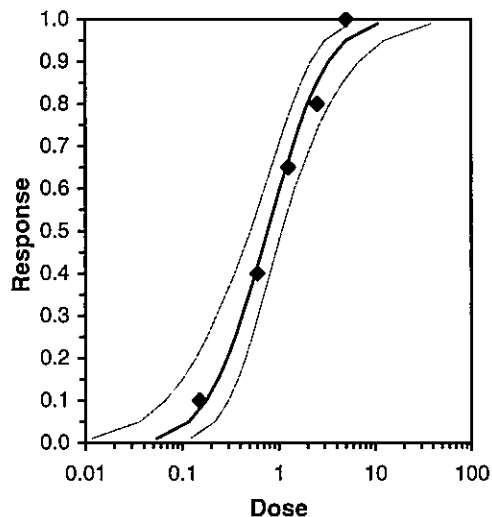
Conc-	1	2
D-Control	1.0000	1.0000
0.15	0.9000	0.9000
0.6	0.6000	0.6000
1.25	0.4000	0.3000
2.5	0.2000	0.2000
5	0.0000	0.0000

Conc-	Transform: Arcsin Square Root							Number Resp	Total Number
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
0.15	0.9000	0.9000	1.2490	1.2490	1.2490	0.000	2	2	20
0.6	0.6000	0.6000	0.8861	0.8861	0.8861	0.000	2	8	20
1.25	0.3500	0.3500	0.6322	0.5796	0.6847	11.753	2	13	20
2.5	0.2000	0.2000	0.4636	0.4636	0.4636	0.000	2	16	20
5	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	2	20	20

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Normality of the data set cannot be confirmed				
Equality of variance cannot be confirmed				

Parameter	Value	SE	95% Fiducial Limits		Maximum Likelihood-Probit						
					Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	2.02579	0.34919	1.34137	2.71021	0	1.66987	7.81473	0.64365	-0.1186	0.49363	3
Intercept	5.24022	0.15223	4.94184	5.5386							

Point	Probits	95% Fiducial Limits	
EC01	2.674	0.05408	0.11961
EC05	3.355	0.11735	0.21751
EC10	3.718	0.17734	0.30096
EC15	3.964	0.23432	0.37622
EC20	4.158	0.29239	0.45086
EC25	4.326	0.35357	0.52846
EC40	4.747	0.57064	0.8072
EC50	5.000	0.76106	1.06914
EC60	5.253	1.01504	1.45815
EC75	5.674	1.63822	2.62118
EC80	5.842	1.98095	3.37453
EC85	6.036	2.47195	4.57413
EC90	6.282	3.26617	6.77698
EC95	6.645	4.93602	12.3001
EC99	7.326	10.7099	38.4731



REFERENCE TOXICANT CONTROL CHART
Leptocheirus plumulosus - 96-h Survival LC50 Values (mg Cd / L)

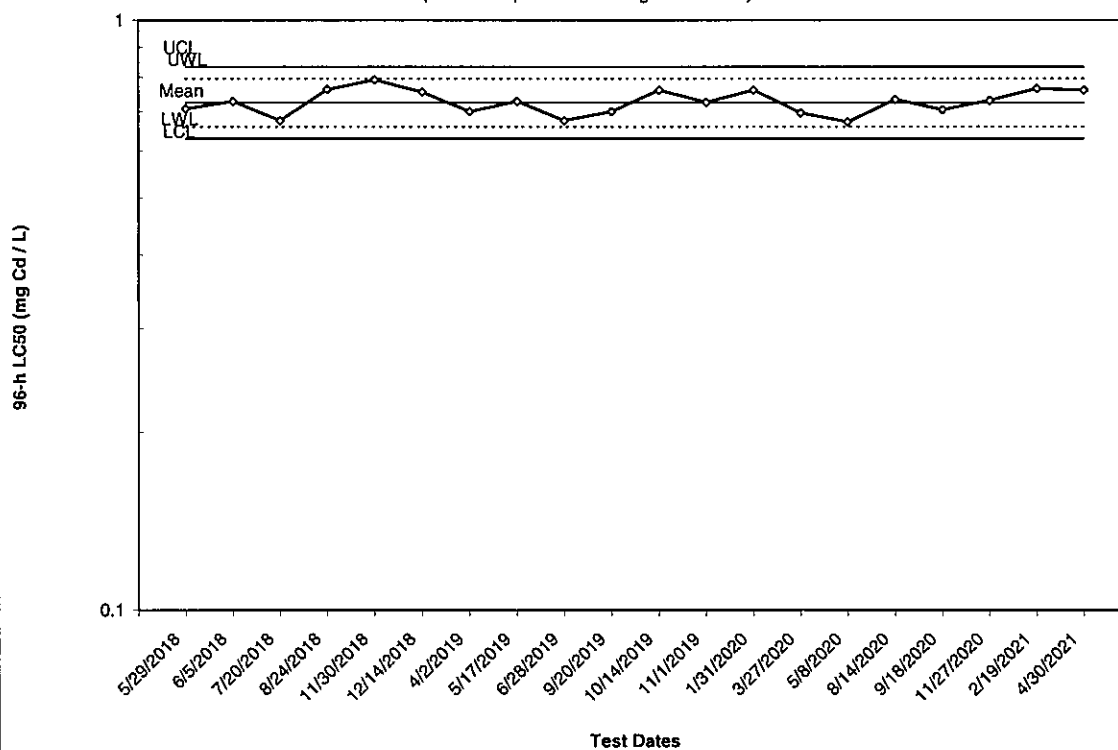
	Log	Antilog
Mean	-0.14	0.73
SD	0.02	1.05
2 x SD	0.04	1.10
UCL	-0.08	0.83
UWL	-0.10	0.80
LWL	-0.18	0.66
LCL	-0.20	0.63
CV(%)	-15	

WARNING / CONTROL LIMIT CALCULATIONS	
Mean: Mean is calculated for the last 20 logarithms of EC50, convert to antilogarithm to give Geomean	
SD: Standard deviation is calculated for the last 20 logarithms of EC50	
UCL: Upper Control Limit = Mean + 3 x SD, illustrated as antilogarithms in Control Chart	
UWL: Upper Warning Limit = Mean + 2 x SD, illustrated as antilogarithms in Control Chart	
LWL: Lower Warning Limit = Mean - 2 x SD, illustrated as antilogarithms in Control Chart	
LCL: Lower Control Limit = Mean - 3 x SD, illustrated as antilogarithms in Control Chart	

CONTROL CHART - DATA PLOT					
Point No.	Test Date	96-h LC50	Acceptable Result?	Calculation Method	
0	05/25/2018	0.74	-----	Maximum Likelihood-Probit	
1	05/29/2018	0.71	OK	Maximum Likelihood-Probit	
2	06/05/2018	0.73	OK	Maximum Likelihood-Probit	
3	07/20/2018	0.68	OK	Maximum Likelihood-Probit	
4	08/24/2018	0.76	OK	Maximum Likelihood-Probit	
5	11/30/2018	0.79	OK	Maximum Likelihood-Probit	
6	12/14/2018	0.76	OK	Maximum Likelihood-Probit	
7	04/02/2019	0.70	OK	Maximum Likelihood-Probit	
8	05/17/2019	0.73	OK	Maximum Likelihood-Probit	
9	06/28/2019	0.68	OK	Maximum Likelihood-Probit	
10	09/20/2019	0.70	OK	Maximum Likelihood-Probit	
11	10/14/2019	0.76	OK	Maximum Likelihood-Probit	
12	11/01/2019	0.73	OK	Maximum Likelihood-Probit	
13	01/31/2020	0.76	OK	Maximum Likelihood-Probit	
14	03/27/2020	0.70	OK	Maximum Likelihood-Probit	
15	05/08/2020	0.67	OK	Maximum Likelihood-Probit	
16	08/14/2020	0.73	OK	Maximum Likelihood-Probit	
17	09/18/2020	0.71	OK	Maximum Likelihood-Probit	
18	11/27/2020	0.73	OK	Maximum Likelihood-Probit	
19	02/19/2021	0.77	OK	Maximum Likelihood-Probit	
20	04/30/2021	0.76	OK	Maximum Likelihood-Probit	

Point No.	LC50	log LC50
0	0.74	-0.13
1	0.71	-0.15
2	0.73	-0.14
3	0.68	-0.17
4	0.76	-0.12
5	0.79	-0.10
6	0.76	-0.12
7	0.70	-0.15
8	0.73	-0.14
9	0.68	-0.17
10	0.70	-0.15
11	0.76	-0.12
12	0.73	-0.14
13	0.76	-0.12
14	0.70	-0.16
15	0.67	-0.17
16	0.73	-0.13
17	0.71	-0.15
18	0.73	-0.14
19	0.77	-0.12

REFERENCE TOXICANT CONTROL CHART
Leptocheirus plumulosus - 96-h LC50
 (Arithmetic plot based on log calculations)



10-d MARINE AMPHIPOD SEDIMENT TOXICITY TEST – DAILY WATER QUALITY

Client Tyson Foundation Ltd Test Initiation Date (Day 0) 30-Apr-21
 Batch No. HK 211508L Test Termination Date (Day 10) 10-May-21
 Sample ID 2-8 Test Species/Date Collected Leptocheirus plumulosus-26/Apr/21

Day	0	1	2	3	4	5	6	7	8	9	10
Sample ID	Salinity (ppt)										
Z 1	20	20	20	20	20	20	20	20	20	20	20
Initial	0	0	0	0	0	0	0	0	0	0	0
Sample ID	pH										
Z 1	7.9	8.0	8.0	7.9	7.8	7.9	8.0	8.1	8.1	8.0	7.9
Initial	0	0	0	0	0	0	0	0	0	0	0
Sample ID	Temperature (°C)										
Z 1	25	25	25	25	25	25	25	25	25	25	25
Initial	0	0	0	0	0	0	0	0	0	0	0
Sample ID	Dissolved Oxygen (mg/L)										
Z 1	6.8	6.8	7.1	7.1	7.2	7.1	7.0	6.9	7.0	7.0	7.1
Initial	0	0	0	0	0	0	0	0	0	0	0

WQ instrument pH HK1782 temp. HK890
 DO HK1187 Salinity HK1582

Comment _____

Test Set up By M Data verified by [Signature] Date Verified 31/5/21

10-d MARINE AMPHIPOD SEDIMENT TOXICITY TEST - DAILY WATER QUALITY

Client Tysan Foundation Limited
 Batch No. HK2115082
 Sample ID 2 - 8

Test Initiation Date (Day 0) _____
 Test Termination Date (Day 10) _____
 Test Species/Date Collected _____

30-Apr-21
10-May-21
Leptocheirus plumulosus-29/Apr/21

Day	0	1	2	3	4	5	6	7	8	9	10
Sample ID	Salinity (ppt)										
Z2	20	20	20	20	20	20	20	20	20	20	20
Z3	20	20	20	20	20	20	20	20	20	20	20
Z4	20	20	20	20	20	20	20	20	20	20	20
Z5	20	20	20	20	20	20	20	20	20	20	20
Z6	20	20	20	20	20	20	20	20	20	20	20
Z7	20	20	20	20	20	20	20	20	20	20	20
Z8	20	20	20	20	20	20	20	20	20	20	20
Initial	20	20	20	20	20	20	20	20	20	20	20
Sample ID	pH										
Z2	7.8	7.9	7.9	8.0	8.0	8.0	8.1	7.9	8.0	8.0	7.9
Z3	8.0	7.9	8.0	8.1	8.1	8.0	8.1	8.0	8.0	7.9	7.9
Z4	7.8	7.9	7.9	7.9	8.0	8.0	8.1	8.0	8.0	7.9	8.0
Z5	7.9	8.0	7.8	7.9	7.9	7.8	7.8	7.9	8.0	8.0	8.1
Z6	7.9	8.1	7.8	7.9	7.9	8.0	8.1	8.0	8.1	7.9	7.9
Z7	7.9	8.1	7.9	8.0	8.1	8.0	8.0	7.9	7.9	7.9	8.0
Z8	8.1	8.0	7.9	8.0	8.1	8.0	7.9	8.0	8.1	8.1	8.0
Initial	7.8	7.9	7.9	8.0	8.0	8.0	8.1	7.9	8.0	8.0	7.9
Sample ID	Temperature (°C)										
Z2	25	25	25	25	25	25	25	25	25	25	25
Z3	25	25	25	25	25	25	25	25	25	25	25
Z4	25	25	25	25	25	25	25	25	25	25	25
Z5	25	25	25	25	25	25	25	25	25	25	25
Z6	25	25	25	25	25	25	25	25	25	25	25
Z7	25	25	25	25	25	25	25	25	25	25	25
Z8	25	25	25	25	25	25	25	25	25	25	25
Initial	25	25	25	25	25	25	25	25	25	25	25
Sample ID	Dissolved Oxygen (mg/L)										
Z2	6.9	7.0	7.1	7.1	7.0	7.0	7.0	6.9	6.9	7.0	7.0
Z3	6.9	7.0	7.1	7.1	6.9	7.0	7.0	7.0	6.9	6.9	7.0
Z4	7.0	7.1	7.1	7.1	7.0	7.0	7.0	6.9	6.9	7.0	7.0
Z5	7.0	7.1	7.1	7.1	7.0	7.0	6.9	6.9	7.0	7.1	7.1
Z6	6.9	7.0	6.9	6.9	7.0	7.1	7.1	7.0	7.0	7.1	7.1
Z7	6.9	7.0	6.9	6.9	7.1	7.1	7.2	7.1	7.1	7.1	7.0
Z8	7.0	6.9	6.9	7.0	7.1	7.2	7.1	7.1	7.2	7.1	7.0
Initial	6.9	7.0	7.1	7.1	7.0	7.0	7.0	6.9	6.9	7.0	7.0

WQ instrument pH HK1782 temp. HK890
 DO HK1187 Salinity HK1582

Comment _____

Test Set up By HJ Data verified by [Signature] Date Verified 31/5/21

**10-d AMPHIPOD SEDIMENT TOXICITY TEST
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY**

Client
Batch No.

Tyhan Foundation Ltd
HK 2150 92

Test Initiation Date (Day 0) 30-Apr-21
Test Termination Date (Day 10) 10-May-21
Test Species Leptocheirus plumulosus
Source/Collection Date Aquatic Biosystem-26/Apr/21

SAMPLE ID Z 1

Rep.	NO. REMOVED/ REPLACED AT DAY 0	Number of Amphipods Emerged From Sediment at Days 1-10										NUMBER ALIVE AT DAY 10	initial	NO. NOT REBURYING AT DAY 10	Water Chemistry at Day 10			
		1	2	3	4	5	6	7	8	9	10				Temp. (°C)	pH	Sal. (ppt)	DO (mg/L)
A	0	0	0	0	0	0	0	0	0	0	0	19	7.9	1	25	7.9	20	7.0
B	0	0	0	0	0	0	0	0	0	0	0	20	7.9	0	25	8.0	20	7.0
C	0	0	0	0	0	0	0	0	0	0	0	20	7.9	0	25	8.0	20	7.1
D	0	0	0	0	0	0	0	0	0	0	0	18	7.9	1	25	7.9	20	7.0
E	0	0	0	0	0	0	0	0	0	0	0	19	7.9	1	25	7.9	20	6.9
Initial	7	7	7	7	7	7	7	7	7	7	7				7	7	7	7

(# dead: # missing) - A (0:1) B (0:0) C (0:0) D (0:2) E (0:1)

SAMPLE ID

Rep.	Number of Amphipods Emerged From Sediment at Days 1-10										NUMBER ALIVE AT DAY 10	initial	NO. NOT REBURYING AT DAY 10	Water Chemistry at Day 10				
	1	2	3	4	5	6	7	8	9	10				Temp. (°C)	pH	Sal. (ppt)	DO (mg/L)	
A																		
B																		
C																		
D																		
E																		
Initial																		

(# dead: # missing) - A (:) B (:) C (:) D (:) E (:)

SAMPLE ID

Rep.	Number of Amphipods Emerged From Sediment at Days 1-10										NUMBER ALIVE AT DAY 10	initial	NO. NOT REBURYING AT DAY 10	Water Chemistry at Day 10				
	1	2	3	4	5	6	7	8	9	10				Temp. (°C)	pH	Sal. (ppt)	DO (mg/L)	
A																		
B																		
C																		
D																		
E																		
Initial																		

(# dead: # missing) - A (:) B (:) C (:) D (:) E (:)

SAMPLE ID

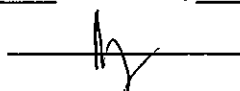
Rep.	Number of Amphipods Emerged From Sediment at Days 1-10										NUMBER ALIVE AT DAY 10	initial	NO. NOT REBURYING AT DAY 10	Water Chemistry at Day 10				
	1	2	3	4	5	6	7	8	9	10				Temp. (°C)	pH	Sal. (ppt)	DO (mg/L)	
A																		
B																		
C																		
D																		
E																		
Initial																		

(# dead: # missing) - A (:) B (:) C (:) D (:) E (:)

WQ Instruments Used:

Temp. HK890 Salinity HK1582 pH HK1782 DO HK1187

Data Verified By



Date Verified

31/5/21

**10-d AMPHIPOD SEDIMENT TOXICITY TEST
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY**

Client Tysan Foundation Limited
Batch No. HK2115082

Test Initiation Date (Day 0) 30-Apr-21
Test Termination Date (Day 10) 10-May-21
Test Species Leptocheirus plumulosus
Source/Collection Date Aquatic Biosystem-29/Apr/21

SAMPLE ID Z 2

Rep.	NO. REMOVED/ REPLACED AT DAY 0	Number of Amphipods Emerged From Sediment at Days 1-10										NUMBER ALIVE AT DAY 10	initial	NO. NOT REBURYING AT DAY 10	Water Chemistry at Day 10			
		1	2	3	4	5	6	7	8	9	10				Temp. (°C)	pH	Sal. (ppt)	DO (mg/L)
A	0	0	0	0	0	0	0	0	0	0	0	16	7	1	25	7.9	20	7.0
B	0	0	0	0	0	0	0	0	0	0	0	18	7	1	25	8.0	20	7.1
C	0	0	0	0	0	0	0	0	0	0	0	17	7	7	25	8.0	20	7.1
D	0	0	0	0	0	0	0	0	0	0	0	16	7	0	25	7.8	20	7.0
E	0	0	0	0	0	0	0	0	0	0	0	18	7	1	25	8.0	20	7.0
Initial	7	7	7	7	7	7	7	7	7	7	7				7	7	7	7

(# dead: # missing) - A (0:4) B (0:2) C (0:3) D (0:4) E (0:2)

SAMPLE ID Z 3

Rep.	NO. REMOVED/ REPLACED AT DAY 0	Number of Amphipods Emerged From Sediment at Days 1-10										NUMBER ALIVE AT DAY 10	initial	NO. NOT REBURYING AT DAY 10	Water Chemistry at Day 10			
		1	2	3	4	5	6	7	8	9	10				Temp. (°C)	pH	Sal. (ppt)	DO (mg/L)
A	0	0	0	0	0	0	0	0	0	0	0	15	7	2	25	8.0	20	7.1
B	0	0	0	0	0	0	0	0	0	0	0	18	7	1	25	8.1	20	7.1
C	0	0	0	0	0	0	0	0	0	0	0	16	7	1	25	8.0	20	7.0
D	0	0	0	0	0	0	0	0	0	0	0	16	7	0	25	8.1	20	7.1
E	0	0	0	0	0	0	0	0	0	0	0	17	7	2	25	8.0	20	7.1
Initial	7	7	7	7	7	7	7	7	7	7	7				7	7	7	7

(# dead: # missing) - A (0:5) B (0:2) C (0:4) D (0:4) E (0:3)

SAMPLE ID Z 4

Rep.	NO. REMOVED/ REPLACED AT DAY 0	Number of Amphipods Emerged From Sediment at Days 1-10										NUMBER ALIVE AT DAY 10	initial	NO. NOT REBURYING AT DAY 10	Water Chemistry at Day 10			
		1	2	3	4	5	6	7	8	9	10				Temp. (°C)	pH	Sal. (ppt)	DO (mg/L)
A	0	0	0	0	0	0	0	0	0	0	0	16	7	1	25	8.1	20	7.0
B	0	0	0	0	0	0	0	0	0	0	0	16	7	1	25	8.0	20	7.0
C	0	0	0	0	0	0	0	0	0	0	0	18	7	2	25	8.0	20	7.1
D	0	0	0	0	0	0	0	0	0	0	0	17	7	2	25	8.1	20	7.0
E	0	0	0	0	0	0	0	0	0	0	0	15	7	0	25	8.0	20	7.0
Initial	7	7	7	7	7	7	7	7	7	7	7				7	7	7	7

(# dead: # missing) - A (0:4) B (0:4) C (0:2) D (0:3) E (0:5)

SAMPLE ID Z 5

Rep.	NO. REMOVED/ REPLACED AT DAY 0	Number of Amphipods Emerged From Sediment at Days 1-10										NUMBER ALIVE AT DAY 10	initial	NO. NOT REBURYING AT DAY 10	Water Chemistry at Day 10			
		1	2	3	4	5	6	7	8	9	10				Temp. (°C)	pH	Sal. (ppt)	DO (mg/L)
A	0	0	0	0	0	0	0	0	0	0	0	15	7	0	25	8.0	20	7.1
B	0	0	0	0	0	0	0	0	0	0	0	18	7	2	25	8.1	20	7.1
C	0	0	0	0	0	0	0	0	0	0	0	16	7	1	25	8.1	20	7.0
D	0	0	0	0	0	0	0	0	0	0	0	16	7	1	25	8.0	20	7.1
E	0	0	0	0	0	0	0	0	0	0	0	17	7	1	25	8.0	20	7.0
Initial	7	7	7	7	7	7	7	7	7	7	7				7	7	7	7

(# dead: # missing) - A (0:5) B (0:2) C (0:4) D (0:4) E (0:3)

WQ Instruments Used:
Temp. HK890 Salinity HK1582 pH HK1782 DO HK1187

Data Verified By [Signature] Date Verified 31/5/21

**10-d AMPHIPOD SEDIMENT TOXICITY TEST
EMERGENCE, SURVIVAL AND DAY 10 WATER QUALITY**

Client Tysan Foundation Limited
Batch No. HK2115082

Test Initiation Date (Day 0) 30-Apr-21
Test Termination Date (Day 10) 10-May-21
Test Species Leptocheirus plumulosus
Source/Collection Date Aquatic Biosystem-29/Apr/21

SAMPLE ID Z 6

Rep.	NO. REMOVED/ REPLACED AT DAY 0	Number of Amphipods Emerged From Sediment at Days 1-10										NUMBER ALIVE AT DAY 10	initial	NO. NOT REBURYING AT DAY 10	Water Chemistry at Day 10			
		1	2	3	4	5	6	7	8	9	10				Temp. (°C)	pH	Sal. (ppt)	DO (mg/L)
A	0	0	0	0	0	0	0	0	0	0	0	16	7	2	25	7.9	20	7.0
B	0	0	0	0	0	0	0	0	0	0	0	18	0	1	25	7.9	20	7.1
C	0	0	0	0	0	0	0	0	0	0	0	17	0	1	25	8.0	20	7.1
D	0	0	0	0	0	0	0	0	0	0	0	16	0	0	25	8.0	20	7.1
E	0	0	0	0	0	0	0	0	0	0	0	15	0	0	25	7.9	20	7.1
Initial	7	7	7	7	7	7	7	7	7	7	7				7	7	7	7

(# dead: # missing) - A (0:4) B (0:2) C (0:3) D (0:4) E (0:5)

SAMPLE ID Z 7

Rep.	NO. REMOVED/ REPLACED AT DAY 0	Number of Amphipods Emerged From Sediment at Days 1-10										NUMBER ALIVE AT DAY 10	initial	NO. NOT REBURYING AT DAY 10	Water Chemistry at Day 10			
		1	2	3	4	5	6	7	8	9	10				Temp. (°C)	pH	Sal. (ppt)	DO (mg/L)
A	0	0	0	0	0	0	0	0	0	0	0	16	0	1	25	7.9	20	7.0
B	0	0	0	0	0	0	0	0	0	0	0	17	0	1	25	8.0	20	7.0
C	0	0	0	0	0	0	0	0	0	0	0	17	0	0	25	8.0	20	7.0
D	0	0	0	0	0	0	0	0	0	0	0	15	0	1	25	7.9	20	7.1
E	0	0	0	0	0	0	0	0	0	0	0	18	0	2	25	7.9	20	7.1
Initial	7	7	7	7	7	7	7	7	7	7	7				7	7	7	7

(# dead: # missing) - A (0:4) B (0:3) C (0:3) D (0:5) E (0:2)

SAMPLE ID Z 8

Rep.	NO. REMOVED/ REPLACED AT DAY 0	Number of Amphipods Emerged From Sediment at Days 1-10										NUMBER ALIVE AT DAY 10	initial	NO. NOT REBURYING AT DAY 10	Water Chemistry at Day 10			
		1	2	3	4	5	6	7	8	9	10				Temp. (°C)	pH	Sal. (ppt)	DO (mg/L)
A	0	0	0	0	0	0	0	0	0	0	0	15	0	2	25	8.0	20	7.0
B	0	0	0	0	0	0	0	0	0	0	0	16	0	1	25	8.0	20	7.0
C	0	0	0	0	0	0	0	0	0	0	0	18	0	0	25	7.9	20	7.0
D	0	0	0	0	0	0	0	0	0	0	0	17	0	0	25	7.9	20	7.1
E	0	0	0	0	0	0	0	0	0	0	0	14	0	1	25	7.9	20	7.1
Initial	7	7	7	7	7	7	7	7	7	7	7				7	7	7	7


(# dead: # missing) - A (0:5) B (0:4) C (0:2) D (0:3) E (0:6)

SAMPLE ID

Rep.	NO. REMOVED/ REPLACED AT DAY 0	Number of Amphipods Emerged From Sediment at Days 1-10										NUMBER ALIVE AT DAY 10	initial	NO. NOT REBURYING AT DAY 10	Water Chemistry at Day 10			
		1	2	3	4	5	6	7	8	9	10				Temp. (°C)	pH	Sal. (ppt)	DO (mg/L)
A																		
B																		
C																		
D																		
E																		
Initial																		

(# dead: # missing) - A (:) B (:) C (:) D (:) E (:)

WQ Instruments Used:
Temp. HK890 Salinity HK1582 pH HK1782 DO HK1187

Data Verified By  Date Verified 31/5/21

MARINE SPECIES REFERENCE TOXICANT TEST DATA

Test Species Leptocheirus plumulosus

Test Initiation Date (Time) 30-Apr-21 Client Ty/San Foundation Ltd Reference Toxicant Cd Source/Collection Date Aquatic Biosystem-26/Apr/21
 Test Termination Date (Time) 04-May-21 Batch No./Sample ID HK2115082 Stock ID HK211642-002 No. Organisms/Test Volume 10, 900ml

Rep	Ref. Toxicant Conc. (mg/L)	Number of Survivors (24 to 96 hours)				Dissolved Oxygen (mg/L)				Temperature (°C)				pH				Salinity (ppt)				
		24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96		
A	0.00				10	7.0				7.1	7.5				2.5	7.9				7.8	20	20
	0.15				9	7.0				7.0	7.5				2.5	8.0				7.9	20	20
	0.60				6	6.9				7.0	2.5				2.5	8.0				8.1	20	20
	1.25				4	7.0				6.9	2.5				2.5	8.1				8.1	20	20
	2.50				2	7.1				6.9	2.5				2.5	8.0				7.9	20	20
5.00				0	7.1				7.0	2.5				2.5	7.9				7.9	20	20	
B	0.00				10	6.9				7.0	2.5				2.5	7.9				7.8	20	20
	0.15				9	7.1				7.2	2.5				2.5	7.9				7.9	20	20
	0.60				6	7.0				7.1	2.5				2.5	8.0				7.9	20	20
	1.25				3	6.9				7.2	2.5				2.5	8.0				8.0	20	20
	2.50				2	6.9				6.9	2.5				2.5	7.9				8.0	20	20
5.00				0	7.0				6.9	2.5				2.5	7.9				8.0	20	20	
	Initials																					

Instruments Used:

- Auto Pipette HK903.HK338
- Temperature HK890
- pH HK1782
- DO HK1187
- Salinity HK1582
- Balance HK1571

Test Set Up By [Signature]

Data Verified By [Signature]

Date Verified 31/5/21



CERTIFICATE OF ANALYSIS

Client : TYSAN FOUNDATION LTD	Laboratory : ALS Technichem (HK) Pty Ltd	Page : 1 of 4
Contact : DESMOND CHEUNG	Contact : Richard Fung	Work Order : HK2117095
Address : UNIT 19, 12/F LEADER INDUSTRIAL CENTRE, NOS. 57-59 AU PUI WAN STREET, SHATIN, N.T. HONG KONG	Address : 11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong	
E-mail : Desmondcheung.si@tysan.com	E-mail : richard.fung@alsglobal.com	
Telephone : —	Telephone : +852 2610 1044	
Facsimile : —	Facsimile : +852 2610 2021	
Project : GROUND INVESTIGATION AND UTILITIES SURVEY FOR TUEN MA EXTENSION		Date received : 30-Apr-2021
Order number : J20098F23	Quote number : HKE/2221/2020_V2	Date of issue : 10-May-2021
C-O-C number : —		No. of samples - Received : 8
Site : TUEN MUN SOUTH		- Analysed : 8

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

<i>Signatory</i>	<i>Position</i>	<i>Authorised results for:</i>
 Fung Lim Chee, Richard	Managing Director	Inorganics

ALS Technichem (HK) Pty Ltd
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Page Number : 2 of 4
Client : TYSAN FOUNDATION LTD
Work Order : HK2117095



General Comments

This report supersedes any previous report(s) with this reference. 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 30-Apr-2021 to 10-May-2021.

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 HK2117095 :

Sample(s) was/ were picked up from client by ALS staff. Sample(s) arrived laboratory in ambient 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.



Analytical Results

Sub-Matrix: SEAWATER

Sample ID	Sampling date / time	Laboratory sample ID	Compound			---	---
			EK055K: Ammonia as NH3 0.1 mg/L	EK085: Sulphide as S2- 0.1 mg/L	EK055K: Unionized Ammonia (as N) 0.001 mg/L		
LOR Unit			ED/EK Inorganic Nonmetallic Parameters	ED/EK Inorganic Nonmetallic Parameters	ED/EK Inorganic Nonmetallic Parameters	---	---
Control AMPHIPOD 0 DAY	30-Apr-2021	HK2117095-001	0.2	<0.1	0.007	---	---
REFERENCE SEDIMENT	30-Apr-2021	HK2117095-002	0.1	<0.1	0.008	---	---
AMPHIPOD 0 DAY							
1530-TME-EDH507 17.10m-17.80m, 17.80m-18.10m AMPHIPOD 0 DAY	30-Apr-2021	HK2117095-003	3.0	<0.1	0.114	---	---
1530-TME-EDH507 19.10m-19.80m, 19.80m-20.10m AMPHIPOD 0 DAY	30-Apr-2021	HK2117095-004	4.1	<0.1	0.101	---	---
1530-TME-EDH505 11.00m-11.50m, 11.50m-12.00m AMPHIPOD 0 DAY	30-Apr-2021	HK2117095-005	5.7	<0.1	0.275	---	---
1530-TME-MEDH814 0.50-0.95m AMPHIPOD 0 DAY	30-Apr-2021	HK2117095-006	0.8	<0.1	0.047	---	---
1530-TME-MEDH813 1.00-1.45m, 1.50-1.95m AMPHIPOD 0 DAY	30-Apr-2021	HK2117095-007	13.1	<0.1	0.507	---	---
1530-TME-EDH504 15.90-16.40m, 16.40-16.90m AMPHIPOD 0 DAY	30-Apr-2021	HK2117095-008	0.7	<0.1	0.022	---	---



Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

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

Matrix: WATER

Method/Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)	Recovery Limits (%)		RPDs (%)		
						LCS	DCS	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QCLot: 3653151)											
EK055K: Ammonia as NH3		0.1	mg/L	<0.1	---	---	---	---	---	---	---
ED/EK: Inorganic Nonmetallic Parameters (QCLot: 3654891)											
EK085 Sulphide as S2-	18496-25-8	0.1	mg/L	<0.1	0.5 mg/L	105	---	85.0	115	---	---

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

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



CERTIFICATE OF ANALYSIS

Client : TYSAN FOUNDATION LTD	Laboratory : ALS Technichem (HK) Pty Ltd	Page : 1 of 4
Contact : DESMOND CHEUNG	Contact : Richard Fung	Work Order : HK2117110
Address : UNIT 19, 12/F LEADER INDUSTRIAL CENTRE, NOS. 57-59 AU PUI WAN STREET, SHATIN, N.T. HONG KONG	Address : 11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong	
E-mail : Desmondcheung.si@tysan.com	E-mail : richard.fung@alsglobal.com	
Telephone : —	Telephone : +852 2610 1044	
Facsimile : —	Facsimile : +852 2610 2021	
Project : GROUND INVESTIGATION AND UTILITIES SURVEY FOR TUEN MA EXTENSION		Date received : 10-May-2021
Order number : J2006SF23	Quote number : HKE/2221/2020_V2	Date of issue : 14-May-2021
C-O-C number : —		No. of samples - Received : 8
Site : TUEN MUN SOUTH		- Analysed : 8

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

Signatory	Position	Authorised results for:
	Managing Director	Inorganics
Fung Lim Chee, Richard		

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Page Number : 2 of 4
Client : TYSAN FOUNDATION LTD
Work Order : HK2117110



General Comments

This report supersedes any previous report(s) with this reference. 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 10-May-2021 to 13-May-2021.

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 HK2117110 :

Sample(s) was/were picked up from client by ALS staff. 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.



Analytical Results

Sub-Matrix: SEAWATER			Compound	EK055K: Ammonia as NH3 0.1 mg/L	EK085: Sulphide as S2- 0.1 mg/L	EK055K: Un-ionized Ammonia (as N) 0.001 mg/L	---	---
			LOR Unit	ED/EK: Inorganic Nonmetallic Parameters	ED/EK: Inorganic Nonmetallic Parameters	ED/EK: Inorganic Nonmetallic Parameters	---	---
Sample ID	Sampling date / time	Laboratory sample ID						
Control AMPHIPOD 10 DAY	10-May-2021	HK2117110-001		<0.1	<0.1	<0.001	---	---
REFERENCE SEDIMENT	10-May-2021	HK2117110-002		<0.1	<0.1	<0.001	---	---
AMPHIPOD 10 DAY								
1530-TME-EDH507 17.10m-17.80m,	10-May-2021	HK2117110-003		2.9	<0.1	0.142	---	---
17.80m-18.10m AMPHIPOD 10 DAY								
1530-TME-EDH507 18.10m-19.80m,	10-May-2021	HK2117110-004		4.4	<0.1	0.138	---	---
19.80m-20.10m AMPHIPOD 10 DAY								
1530-TME-EDH505 11.00m-11.50m,	10-May-2021	HK2117110-005		5.8	<0.1	0.145	---	---
11.50m-12.00m AMPHIPOD 10 DAY								
1530-TME-MEDH614 0.50-0.95m	10-May-2021	HK2117110-006		0.2	<0.1	0.005	---	---
AMPHIPOD 10 DAY								
1530-TME-MEDH613 1.00-1.45m,	10-May-2021	HK2117110-007		8.8	<0.1	0.213	---	---
1.50-1.95m AMPHIPOD 10 DAY								
1530-TME-EDH504 15.90-18.40m,	10-May-2021	HK2117110-008		<0.1	<0.1	<0.001	---	---
18.40-18.90m AMPHIPOD 10 DAY								



Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

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

Matrix: WATER

Method/Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					LCS	DCS	Low	High	Value	Control Limit		
ED/EK: Inorganic Nonmetallic Parameters (QCLot: 3670961)												
EK055K: Ammonia as NH3		0.1	mg/L	<0.1	---	---	---	---	---	---	---	---
ED/EK: Inorganic Nonmetallic Parameters (QCLot: 3675668)												
EK085: Sulphide as S2-	18496-25-8	0.1	mg/L	<0.1	0.5 mg/L	93.0	---	85.0	115	---	---	---

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

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

APPENDIX C

Complete Data for the 20-day Polychaete Growth and Survival Test
– *Neanthes arenaceodentata*

Client: Tysan Foundation Limited
 Batch No.: HK2115082
 Initiation Date: 30-Apr-21
 Termination Date: 20-May-21

Summary Results for the 20-d Polychaete Growth and Survival Test - *Neanthes arenaceodentata*

ID	Rep	Group	Clinet ID	Duration (Days)	Initial no.	Final no.	No. weighed	Initial weight (mg)	pan weight (mg)	pan + worm weight (mg)	Survival (%)		Total Dry Weight (mg)		Ind. Dry Weight (mg)		Ind. Growth Rate (mg/d)				
											S (%)	SI Mean	SD	SI SD	TDW (mg)	TDW Mean	TDW SD	IGR (mg/d)	IGR Mean	IGR SD	
1	Control	Control	Control	20	5	5	0.66	1185.67	1241.03	1241.03	100.0	100.0	55.36	55.6	0.8	11.1	11.1	0.2	0.52	0.52	0.01
2	Control	Control	Control	20	5	5	0.66	1190.50	1246.47	1246.47	100.0	100.0	55.97	56.2	0.8	11.2	11.2	0.2	0.53	0.53	0.01
3	Control	Control	Control	20	5	5	0.66	1189.34	1243.59	1243.59	100.0	100.0	54.25	54.5	0.8	10.9	10.9	0.2	0.53	0.53	0.01
4	Control	Control	Control	20	5	5	0.66	1186.02	1242.15	1242.15	100.0	100.0	56.13	56.4	0.8	11.2	11.2	0.2	0.53	0.53	0.01
5	Control	Control	Control	20	5	5	0.66	1185.05	1232.10	1232.10	100.0	100.0	56.05	56.3	0.8	11.2	11.2	0.2	0.53	0.53	0.01
1	HK2115082002	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 17 00m, 17 00m-18 00m	20	5	5	0.66	1180.07	1232.87	1232.87	100.0	100.0	52.80	52.2	0.7	10.6	10.4	0.1	0.50	0.49	0.01
2	HK2115082002	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 17 00m, 17 00m-18 00m	20	5	5	0.66	1199.36	1252.02	1252.02	100.0	100.0	52.66	52.5	0.7	10.5	10.5	0.1	0.49	0.49	0.01
3	HK2115082002	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 17 00m, 17 00m-18 00m	20	5	5	0.66	1193.64	1236.16	1236.16	100.0	100.0	52.52	52.5	0.7	10.5	10.5	0.1	0.49	0.49	0.01
4	HK2115082002	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 17 00m, 17 00m-18 00m	20	5	5	0.66	1186.07	1237.30	1237.30	100.0	100.0	51.23	51.2	0.7	10.2	10.2	0.1	0.48	0.48	0.01
5	HK2115082002	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 17 00m, 17 00m-18 00m	20	5	5	0.66	1188.65	1240.44	1240.44	100.0	100.0	51.79	51.7	0.7	10.4	10.4	0.1	0.48	0.48	0.01
6	HK2115082003	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 17 00m, 17 00m-18 00m	20	5	5	0.66	1190.40	1236.91	1236.91	100.0	100.0	46.51	47.8	1.9	9.3	9.6	0.4	0.43	0.45	0.02
7	HK2115082003	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 17 00m, 17 00m-18 00m	20	5	5	0.66	1184.16	1233.50	1233.50	100.0	100.0	49.34	49.3	1.9	9.9	9.9	0.4	0.46	0.46	0.01
8	HK2115082003	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 17 00m, 17 00m-18 00m	20	5	5	0.66	1192.47	1238.78	1238.78	100.0	100.0	46.31	46.3	1.9	9.3	9.3	0.3	0.43	0.43	0.01
9	HK2115082003	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 17 00m, 17 00m-18 00m	20	5	5	0.66	1194.63	1245.14	1245.14	100.0	100.0	50.51	50.5	1.9	10.1	10.1	0.4	0.47	0.47	0.01
10	HK2115082003	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 17 00m, 17 00m-18 00m	20	5	5	0.66	1192.70	1239.28	1239.28	100.0	100.0	46.58	46.6	1.9	9.3	9.3	0.3	0.43	0.43	0.01
11	HK2115082004	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 18 00m, 18 00m-20 00m	20	5	5	0.66	1181.79	1231.50	1231.50	100.0	100.0	49.71	48.8	1.5	9.9	9.8	0.3	0.46	0.46	0.01
12	HK2115082004	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 18 00m, 18 00m-20 00m	20	5	5	0.66	1198.82	1245.39	1245.39	100.0	100.0	46.57	46.7	1.5	9.3	9.3	0.3	0.43	0.43	0.01
13	HK2115082004	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 18 00m, 18 00m-20 00m	20	5	5	0.66	1193.52	1243.34	1243.34	100.0	100.0	49.82	49.8	1.5	10.0	10.0	0.3	0.47	0.47	0.01
14	HK2115082004	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 18 00m, 18 00m-20 00m	20	5	5	0.66	1193.63	1243.63	1243.63	100.0	100.0	50.00	50.0	1.5	10.0	10.0	0.3	0.47	0.47	0.01
15	HK2115082004	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 18 00m, 18 00m-20 00m	20	5	5	0.66	1182.92	1230.98	1230.98	100.0	100.0	48.06	48.0	1.5	9.6	9.6	0.3	0.45	0.45	0.01
16	HK2115082005	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 11 00m, 11 00m-12 00m	20	5	5	0.66	1184.55	1233.94	1233.94	100.0	100.0	49.39	48.5	1.4	9.9	9.7	0.3	0.46	0.45	0.01
17	HK2115082005	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 11 00m, 11 00m-12 00m	20	5	5	0.66	1191.60	1237.71	1237.71	100.0	100.0	46.11	46.1	1.4	9.2	9.2	0.3	0.43	0.43	0.01
18	HK2115082005	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 11 00m, 11 00m-12 00m	20	5	5	0.66	1193.71	1242.29	1242.29	100.0	100.0	48.58	48.5	1.4	9.7	9.7	0.3	0.45	0.45	0.01
19	HK2115082005	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 11 00m, 11 00m-12 00m	20	5	5	0.66	1183.42	1232.66	1232.66	100.0	100.0	49.44	49.4	1.4	9.9	9.9	0.3	0.46	0.46	0.01
20	HK2115082005	REFERENCE SEDIMENT	1530-TIME-EDH0417 15 30 11 00m, 11 00m-12 00m	20	5	5	0.66	1196.56	1245.35	1245.35	100.0	100.0	48.79	48.7	1.4	9.8	9.8	0.3	0.45	0.45	0.01
21	HK2115082006	REFERENCE SEDIMENT	1530-TIME-MEDH614 0 50 0 095m	20	5	5	0.66	1192.95	1242.24	1242.24	100.0	100.0	49.29	48.1	1.4	9.9	9.6	0.3	0.45	0.45	0.01
22	HK2115082006	REFERENCE SEDIMENT	1530-TIME-MEDH614 0 50 0 095m	20	5	5	0.66	1193.59	1243.34	1243.34	100.0	100.0	49.75	49.7	1.4	10.0	10.0	0.3	0.46	0.46	0.01
23	HK2115082006	REFERENCE SEDIMENT	1530-TIME-MEDH614 0 50 0 095m	20	5	5	0.66	1187.79	1234.90	1234.90	100.0	100.0	47.11	47.1	1.4	9.4	9.4	0.3	0.44	0.44	0.01
24	HK2115082006	REFERENCE SEDIMENT	1530-TIME-MEDH614 0 50 0 095m	20	5	5	0.66	1181.71	1228.48	1228.48	100.0	100.0	46.77	46.7	1.4	9.4	9.4	0.3	0.43	0.43	0.01
25	HK2115082006	REFERENCE SEDIMENT	1530-TIME-MEDH614 0 50 0 095m	20	5	5	0.66	1189.54	1236.99	1236.99	100.0	100.0	47.45	47.4	1.4	9.5	9.5	0.3	0.44	0.44	0.01
26	HK2115082007	REFERENCE SEDIMENT	1530-TIME-MEDH613 1 00 1 155m, 1 50 1 155m	20	5	5	0.66	1187.88	1235.42	1235.42	100.0	100.0	47.54	48.5	1.1	9.5	9.7	0.2	0.44	0.45	0.01
27	HK2115082007	REFERENCE SEDIMENT	1530-TIME-MEDH613 1 00 1 155m, 1 50 1 155m	20	5	5	0.66	1195.80	1244.59	1244.59	100.0	100.0	48.79	48.7	1.1	9.8	9.8	0.2	0.45	0.45	0.01
28	HK2115082007	REFERENCE SEDIMENT	1530-TIME-MEDH613 1 00 1 155m, 1 50 1 155m	20	5	5	0.66	1199.63	1247.96	1247.96	100.0	100.0	48.33	48.3	1.1	9.7	9.7	0.2	0.45	0.45	0.01
29	HK2115082007	REFERENCE SEDIMENT	1530-TIME-MEDH613 1 00 1 155m, 1 50 1 155m	20	5	5	0.66	1184.53	1232.25	1232.25	100.0	100.0	47.72	47.7	1.1	9.5	9.5	0.2	0.44	0.44	0.01
30	HK2115082007	REFERENCE SEDIMENT	1530-TIME-MEDH613 1 00 1 155m, 1 50 1 155m	20	5	5	0.66	1191.32	1241.63	1241.63	100.0	100.0	50.31	50.3	1.1	10.1	10.1	0.2	0.47	0.47	0.01
31	HK2115082008	REFERENCE SEDIMENT	1530-TIME-EDH04 15 30 18 00m, 18 40 18 00m	20	5	5	0.66	1198.69	1245.83	1245.83	100.0	100.0	47.14	48.6	1.4	9.4	9.7	0.3	0.44	0.45	0.01
32	HK2115082008	REFERENCE SEDIMENT	1530-TIME-EDH04 15 30 18 00m, 18 40 18 00m	20	5	5	0.66	1189.61	1237.00	1237.00	100.0	100.0	47.39	47.3	1.4	9.5	9.5	0.3	0.44	0.44	0.01
33	HK2115082008	REFERENCE SEDIMENT	1530-TIME-EDH04 15 30 18 00m, 18 40 18 00m	20	5	5	0.66	1190.43	1239.27	1239.27	100.0	100.0	48.84	48.8	1.4	9.8	9.8	0.3	0.46	0.46	0.01
34	HK2115082008	REFERENCE SEDIMENT	1530-TIME-EDH04 15 30 18 00m, 18 40 18 00m	20	5	5	0.66	1195.83	1246.51	1246.51	100.0	100.0	50.68	50.6	1.4	10.1	10.1	0.3	0.47	0.47	0.01
35	HK2115082008	REFERENCE SEDIMENT	1530-TIME-EDH04 15 30 18 00m, 18 40 18 00m	20	5	5	0.66	1194.74	1243.81	1243.81	100.0	100.0	49.07	49.0	1.4	9.8	9.8	0.3	0.46	0.46	0.01

Reviewed by: My

Test ID: HK2115082b
 Protocol: PSEP 1995
 Sample Type: MS
 Lab ID: ALS

Test: NA
 Species: NA
 Sample ID: VA
 Start Date: 4/30/2021
 End Date: 5/20/2021

Pos ID	Rep	Group	T. Duration (Days)	Initial no.	Final no.	No. weighed	Initial weight	pan weight (mg)	pan + worm weight (mg)
1	1	REFERENCE	20	5	5	5	0.66	1180.07	1232.87
2	2	REFERENCE	20	5	5	5	0.66	1199.36	1252.02
3	3	REFERENCE	20	5	5	5	0.66	1183.64	1236.16
4	4	REFERENCE	20	5	5	5	0.66	1186.07	1237.3
5	5	REFERENCE	20	5	5	5	0.66	1188.65	1240.44
6	1	2115082-03	20	5	5	5	0.66	1190.4	1236.91
7	2	2115082-03	20	5	5	5	0.66	1184.16	1233.5
8	3	2115082-03	20	5	5	5	0.66	1192.47	1238.78
9	4	2115082-03	20	5	5	5	0.66	1194.63	1245.14
10	5	2115082-03	20	5	5	5	0.66	1192.7	1239.28
11	1	2115082-04	20	5	5	5	0.66	1181.79	1231.5
12	2	2115082-04	20	5	5	5	0.66	1198.82	1245.39
13	3	2115082-04	20	5	5	5	0.66	1193.52	1243.34
14	4	2115082-04	20	5	5	5	0.66	1193.63	1243.63
15	5	2115082-04	20	5	5	5	0.66	1182.92	1230.98
16	1	2115082-05	20	5	5	5	0.66	1184.55	1233.94
17	2	2115082-05	20	5	5	5	0.66	1191.6	1237.71
18	3	2115082-05	20	5	5	5	0.66	1193.71	1242.29
19	4	2115082-05	20	5	5	5	0.66	1183.42	1232.86
20	5	2115082-05	20	5	5	5	0.66	1196.56	1245.35
21	1	2115082-06	20	5	5	5	0.66	1192.95	1242.24
22	2	2115082-06	20	5	5	5	0.66	1193.59	1243.34
23	3	2115082-06	20	5	5	5	0.66	1187.79	1234.9
24	4	2115082-06	20	5	5	5	0.66	1181.71	1228.48
25	5	2115082-06	20	5	5	5	0.66	1189.54	1236.99
26	1	2115082-07	20	5	5	5	0.66	1187.88	1235.42
27	2	2115082-07	20	5	5	5	0.66	1195.8	1244.59
28	3	2115082-07	20	5	5	5	0.66	1199.63	1247.96
29	4	2115082-07	20	5	5	5	0.66	1184.53	1232.25
30	5	2115082-07	20	5	5	5	0.66	1191.32	1241.63
31	1	2115082-08	20	5	5	5	0.66	1198.69	1245.83
32	2	2115082-08	20	5	5	5	0.66	1189.61	1237
33	3	2115082-08	20	5	5	5	0.66	1190.43	1239.27
34	4	2115082-08	20	5	5	5	0.66	1195.83	1246.51
35	5	2115082-08	20	5	5	5	0.66	1194.74	1243.81

Comments:

-Total Dry Weight (mg)

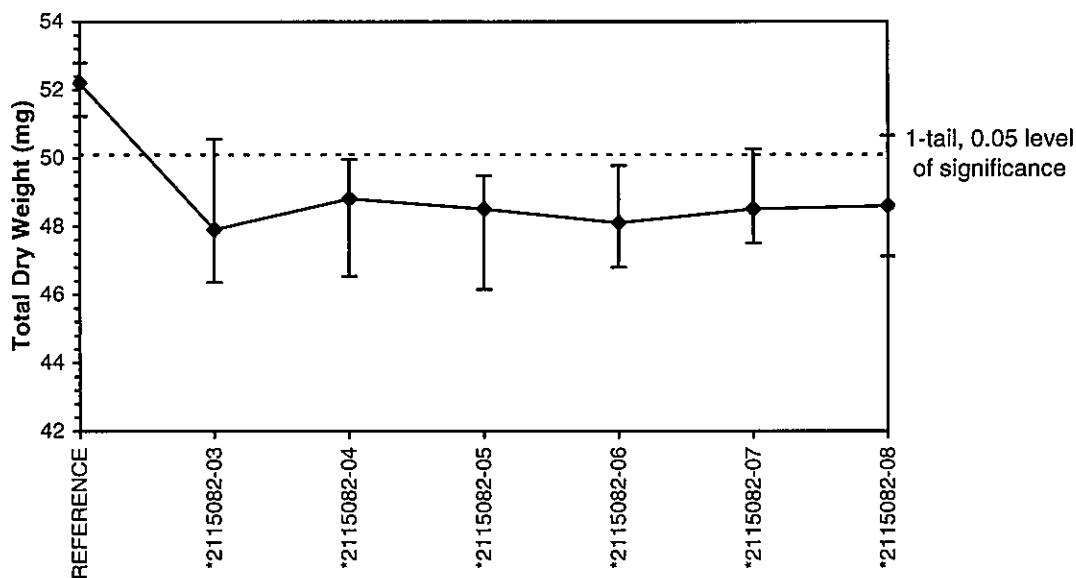
Start Date: 4/30/2021	Test ID: HK2115082b	Sample ID: VA
End Date: 5/20/2021	Lab ID: ALS	Sample Type: MS
Sample Date:	Protocol: PSEP 1995	Test Species: NA

Conc-	1	2	3	4	5
REFERENCE	52.800	52.660	52.520	51.230	51.790
2115082-03	46.510	49.340	46.310	50.510	46.580
2115082-04	49.710	46.570	49.820	50.000	48.060
2115082-05	49.390	46.110	48.580	49.440	48.790
2115082-06	49.290	49.750	47.110	46.770	47.450
2115082-07	47.540	48.790	48.330	47.720	50.310
2115082-08	47.140	47.390	48.840	50.680	49.070

Conc-	Mean	N-Mean	Transform: Untransformed					N	t-Stat	1-Tailed Critical	MSD
			Mean	Min	Max	CV%					
REFERENCE	52.200	1.0000	52.200	51.230	52.800	1.279	5				
*2115082-03	47.850	0.9167	47.850	46.310	50.510	4.057	5	4.973	2.409	2.107	
*2115082-04	48.832	0.9355	48.832	46.570	50.000	3.042	5	3.850	2.409	2.107	
*2115082-05	48.462	0.9284	48.462	46.110	49.440	2.820	5	4.273	2.409	2.107	
*2115082-06	48.074	0.9210	48.074	46.770	49.750	2.811	5	4.716	2.409	2.107	
*2115082-07	48.538	0.9298	48.538	47.540	50.310	2.283	5	4.186	2.409	2.107	
*2115082-08	48.624	0.9315	48.624	47.140	50.680	2.944	5	4.088	2.409	2.107	

Auxiliary Tests	Statistic	Critical	Skew	Kurt		
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)	0.97231	0.934	0.06577	-0.7378		
Bartlett's Test indicates equal variances ($p = 0.68$)	3.94934	16.8119				
Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test indicates significant differences Treatments vs REFERENCE	2.10703	0.04036	10.8894	1.91322	5.7E-04	6, 28

Dose-Response Plot



Test ID: RTNACD188 Species: NA Protocol: PSEP 1995 Sample ID: REF Sample Type: CDCL Start Date: 4/30/2021 End Date: 5/4/2021 Lab ID: ALS									
Pos ID	Rep	Group	T. Duration (Days)	Initial no.	Final no.	No. weighed	Initial weight	pan weight (mg)	pan + worm weight (mg)
1	1	D-Control	4	10	10				
2	2	D-Control	4	10	10				
3	1	2.4	4	10	9				
4	2	2.4	4	10	9				
5	1	6.9	4	10	6				
6	2	6.9	4	10	5				
7	1	9.8	4	10	4				
8	2	9.8	4	10	3				
9	1	14	4	10	2				
10	2	14	4	10	1				
11	1	20	4	10	0				
12	2	20	4	10	0				

Comments:

-Survival

Start Date: 4/30/2021 Test ID: RTNACD188 Sample ID: REF
 End Date: 5/4/2021 Lab ID: ALS Sample Type: CDCL
 Sample Date: Protocol: PSEP 1995 Test Species: NA
 Comments:

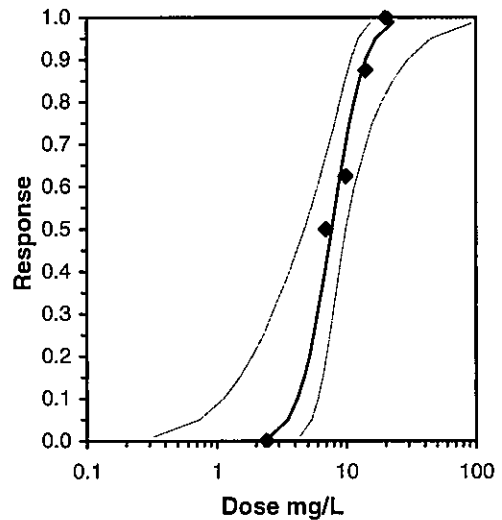
Conc-mg/L	1	2
D-Control	1.0000	1.0000
2.4	0.9000	0.9000
6.9	0.6000	0.5000
9.8	0.4000	0.3000
14	0.2000	0.1000
20	0.0000	0.0000

Conc-mg/L	Transform: Arcsin Square Root							Number Resp	Total Number
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	1.0000	1.0000	1.3181	1.3181	1.3181	0.000	2	0	8
2.4	0.9000	0.9000	1.2490	1.2490	1.2490	0.000	2	0	8
6.9	0.5500	0.5500	0.8357	0.7854	0.8861	8.518	2	4	8
9.8	0.3500	0.3500	0.6322	0.5796	0.6847	11.753	2	5	8
14	0.1500	0.1500	0.3927	0.3218	0.4636	25.550	2	7	8
20	0.0000	0.0000	0.2527	0.2527	0.2527	0.000	2	8	8

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Normality of the data set cannot be confirmed				
Equality of variance cannot be confirmed				

Parameter	Value	SE	95% Fiducial Limits		Maximum Likelihood-Probit						
			Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter		
Slope	4.86268	1.51096	1.9012	7.82417	0	0.73897	7.81473	0.864	0.88364	0.20565	5
Intercept	0.70313	1.4894	-2.2161	3.62237							
TSCR											

Point	Probits	mg/L	95% Fiducial Limits	
EC01	2.674	2.54233	0.32315	4.32186
EC05	3.355	3.51059	0.72869	5.34675
EC10	3.718	4.16958	1.11998	6.01098
EC15	3.964	4.68274	1.49299	6.5216
EC20	4.158	5.13527	1.8721	6.97349
EC25	4.326	5.55819	2.26819	7.40235
EC40	4.747	6.78485	3.62273	8.73683
EC50	5.000	7.64963	4.70951	9.84126
EC60	5.253	8.62464	5.9597	11.3878
EC75	5.674	10.528	8.08153	15.831
EC80	5.842	11.3951	8.85973	18.5717
EC85	6.036	12.4963	9.72181	22.693
EC90	6.282	14.0342	10.7696	29.6277
EC95	6.645	16.6687	12.3226	44.7423
EC99	7.326	23.017	15.4744	99.3951



REFERENCE TOXICANT CONTROL CHART

Neanthes arenaceodentata - 96-h Survival LC50 Values (mg Cd / L)

	Log	Antilog
Mean	0.87	7.43
SD	0.01	1.03
2 x SD	0.02	1.05
UCL	0.91	8.05
UWL	0.89	7.84
LWL	0.85	7.05
LCL	0.84	6.86
CV(%)	1.32	

WARNING / CONTROL LIMIT CALCULATIONS	
Mean:	Mean is calculated for the last 20 logarithms of EC50, convert to antilogarithm to give Geomean
SD:	Standard deviation is calculated for the last 20 logarithms of EC50
UCL:	Upper Control Limit = Mean + 3 x SD, illustrated as antilogarithms in Control Chart
UWL:	Upper Warning Limit = Mean + 2 x SD, illustrated as antilogarithms in Control Chart
LWL:	Lower Warning Limit = Mean - 2 x SD, illustrated as antilogarithms in Control Chart
LCL:	Lower Control Limit = Mean - 3 x SD, illustrated as antilogarithms in Control Chart

CONTROL CHART - DATA PLOT

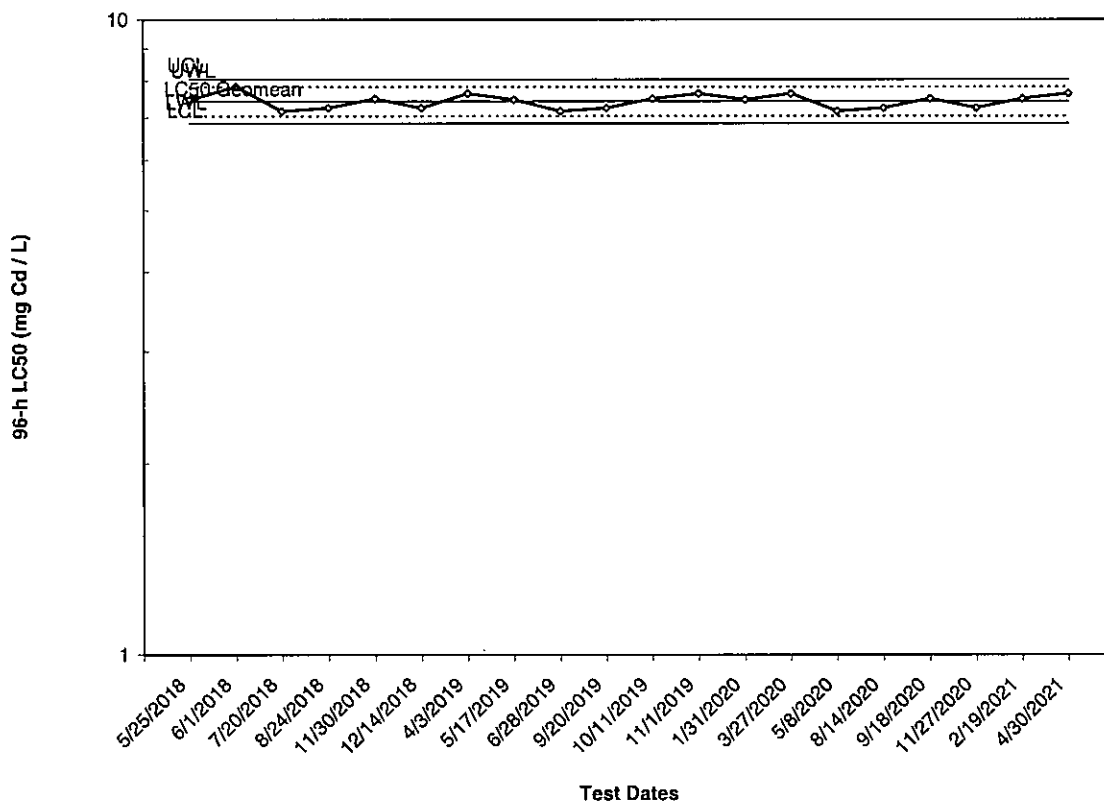
Point No.	LC50	log LC50
0	7.65	0.88
1	7.48	0.87
2	7.84	0.89
3	7.17	0.86
4	7.26	0.86
5	7.51	0.88
6	7.26	0.86
7	7.65	0.88
8	7.48	0.87
9	7.17	0.86
10	7.26	0.86
11	7.51	0.88
12	7.65	0.88
13	7.48	0.87
14	7.65	0.88
15	7.17	0.86
16	7.26	0.86
17	7.51	0.88
18	7.26	0.86
19	7.51	0.88

Point No.	Test Date	96-h LC50	Acceptable Result?	Calculation Method
0	18/05/2018	7.65	-----	Maximum Likelihood-Probit
1	25/05/2018	7.48	OK	Maximum Likelihood-Probit
2	01/06/2018	7.84	OUTSIDE 2SD	Maximum Likelihood-Probit
3	20/07/2018	7.17	OK	Maximum Likelihood-Probit
4	24/08/2018	7.26	OK	Maximum Likelihood-Probit
5	30/11/2018	7.51	OK	Maximum Likelihood-Probit
6	14/12/2018	7.26	OK	Maximum Likelihood-Probit
7	03/04/2019	7.65	OK	Maximum Likelihood-Probit
8	17/05/2019	7.48	OK	Maximum Likelihood-Probit
9	28/06/2019	7.17	OK	Maximum Likelihood-Probit
10	20/09/2019	7.26	OK	Maximum Likelihood-Probit
11	11/10/2019	7.51	OK	Maximum Likelihood-Probit
12	01/11/2019	7.65	OK	Maximum Likelihood-Probit
13	31/01/2020	7.48	OK	Maximum Likelihood-Probit
14	27/03/2020	7.65	OK	Maximum Likelihood-Probit
15	08/05/2020	7.17	OK	Maximum Likelihood-Probit
16	14/08/2020	7.26	OK	Maximum Likelihood-Probit
17	18/09/2020	7.51	OK	Maximum Likelihood-Probit
18	27/11/2020	7.26	OK	Maximum Likelihood-Probit
19	19/02/2021	7.51	OK	Maximum Likelihood-Probit
20	30/04/2021	7.65	OK	Maximum Likelihood-Probit

REFERENCE TOXICANT CONTROL CHART

Neanthes arenaceodentata - 96-h Survival LC50 Values (mg Cd / L)

(Arithmetic plot based on log calculations)



20-d Neanthes SEDIMENT TOXICITY TEST - DAILY WATER QUALITY MONITORING

Client Tyson Foundation Ltd
 Batch No. HK2115082
 Sample ID 2-8

Test Species
 Source/Date Received
 Test Initiation Date (Day 0)
 Test Termination Date (Day 20)

Neanthes arenaceodentata
 Aquatic Toxicology Support-26/Apr/21
30-Apr-21
20-May-21

Date	0	3	6	9	12	15	18	20
Sample ID	Salinity (ppt)							
Z1	28	28	28	28	28	28	28	28
Initial	OK	OK	OK	OK	OK	OK	OK	OK
Sample ID	pH							
Z1	8.0	7.9	7.9	8.0	8.1	8.1	8.0	7.9
Initial	OK	OK	OK	OK	OK	OK	OK	OK
Sample ID	DO (mg/L)							
Z1	6.8	6.9	6.9	7.1	7.1	7.0	7.0	6.9
Initial	OK	OK	OK	OK	OK	OK	OK	OK

WQ Instrument: pH HK1782 Sal. HK1582 DO HK1187

Comments _____

Test Set Up By H7 Data Verified By [Signature]

Date Verified 31/5/21

20-d Neanthes SEDIMENT TOXICITY TEST - DAILY WATER QUALITY MONITORING

Client Tysan Foundation Limited
 Batch No. HK2115082
 Sample ID 2 - 8

Test Species
 Source/Date Received
 Test Initiation Date (Day 0)
 Test Termination Date (Day 20)


Neanthes arenaceodentata
Aquatic Toxicology Support-29/Apr/21
30-Apr-21
20-May-21

Date	0	3	6	9	12	15	18	20
Sample ID	Salinity (ppt)							
Z 2	28	28	28	28	28	28	28	28
Z 3	28	28	28	28	28	28	28	28
Z 4	28	28	28	28	28	28	28	28
Z 5	28	28	28	28	28	28	28	28
Z 6	28	28	28	28	28	28	28	28
Z 7	28	28	28	28	28	28	28	28
Z 8	28	28	28	28	28	28	28	28
Initial	6	6	6	6	6	6	6	6
Sample ID	pH							
Z 2	7.9	8.0	7.9	7.9	8.0	8.1	8.1	8.0
Z 3	7.8	8.0	7.9	7.9	7.8	8.1	8.1	8.0
Z 4	7.9	7.9	7.9	7.8	8.0	8.1	8.0	8.0
Z 5	7.8	8.0	8.1	8.1	8.0	7.9	7.8	7.9
Z 6	7.8	7.9	8.0	8.1	8.1	7.9	8.0	8.0
Z 7	7.9	7.9	8.0	8.0	8.1	8.1	8.0	8.0
Z 8	7.9	8.0	7.9	7.9	8.0	8.1	7.9	7.9
Initial	6	6	6	6	6	6	6	6
Sample ID	DO (mg/L)							
Z 2	6.9	7.0	7.1	7.1	7.2	7.1	7.0	7.0
Z 3	6.9	6.9	6.9	7.0	7.1	7.1	7.1	7.1
Z 4	7.1	7.0	7.0	6.9	7.1	7.1	7.0	7.1
Z 5	7.1	7.0	7.1	7.1	7.2	7.1	7.1	7.0
Z 6	7.1	7.0	6.9	7.0	7.1	7.1	7.1	7.1
Z 7	7.0	7.0	6.9	7.0	7.1	7.2	7.1	6.9
Z 8	7.1	7.0	6.9	7.0	7.1	7.2	7.1	7.0
Initial	6	6	6	6	6	6	6	6

WQ Instrument: pH HK1782 Sal. HK1582 DO HK1187

Comments _____

Test Set Up By HJ

Data Verified By 

Date Verified 31/5/21

20-d *Neanthes* SEDIMENT TOXICITY TEST - DAILY WATER QUALITY MONITORING

Client Tyson Foundation Limited Test Species *Neanthes arenaceodentata*
 Batch No. HK 211 Log 2 Source/Date Received Aquatic Toxicology Support-26/Apr/21
 Sample ID 2-8 Test Initiation Date (Day 0) 30-Apr-21
 Test Termination Date (Day 20) 20-May-21

Sample ID	Temperature (°C)																					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Control	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
Technician Initials	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS

WQ Instruments Used: _____ Temp. HK890
 Comments _____
 Test Set Up By AT Date Verified By _____ Date Verified 31/5/21

20-d *Neanthes* SEDIMENT TOXICITY TEST - DAILY WATER QUALITY MONITORING

Client Tysan Foundation Limited

Test Species *Neanthes arenaceodentata*

Batch No. HK2115082

Source/Date Received Aquatic Toxicology Support-29/Apr/21

Sample ID 2 - 8

Test Initiation Date (Day 0) 30-Apr-21

Test Termination Date (Day 20) 20-May-21

Sample ID	Temperature (°C)																				
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Z2	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Z3	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Z4	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Z5	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Z6	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Z7	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Z8	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Technician Initials	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

WQ Instruments Used: _____ Temp. HK890

Comments _____

Test Set Up By (H)

Data Verified By _____

Date Verified 31/5/21

POLYCHAETE SEDIMENT TOXICITY TESTS - SURVIVAL, DRY WEIGHT AND FINAL WATER QUALITY DATA

Ensure that another technician carries out one of the tear down replicates

Client: Tyfon Foundation Ltd. Neanthes arenaceodentata / Static; Renewal
 Batch No.: HK211508Z Test Species/Test Type: 30-Apr-2021
 Sample ID: 2-8 Test Termination Date (Day 20): 20-May-2021

Sample ID	Rep.	Pan No.	Pan Weight (g)	Final Weight (g)	No. Alive	No. Dead	Total Recovered	No. Missing	Init.	Temp. (°C)	pH	Salinity (ppt)	DO (mg/L)
Z1	A	1	1.18567	1.24103	5	0	5	0	US	20	8.0	28	7.1
	B	2	1.19050	1.24647	5	0	5	0	6	20	8.0	28	7.0
	C	3	1.18934	1.24359	5	0	5	0	US	20	7.9	28	7.1
	D	4	1.18602	1.24215	5	0	5	0	6	20	7.9	28	7.0
	E	5	1.19605	1.25210	5	0	5	0	US	20	8.0	28	6.9
Initials										US	8	8	8

WQ Instruments Us Temp. HK890 Balance HK1571, HK658
 Data Verified By [Signature] DO HK1187
 Main technician performing tear down 6 Date Verified 31/5/21
 Second technician performing replicate tear down 6 [Signature]

POLYCHAETE SEDIMENT TOXICITY TESTS – SURVIVAL, DRY WEIGHT AND FINAL WATER QUALITY DATA

Ensure that another technician carries out one of the tear down replicates

Client Tysan Foundation Limited

Neanthes arenaceodentata / Static; Renewal

Batch No. HK2115082

Test Species/Test Type:

30-Apr-2021

Sample ID 2 - 8

Test Termination Date (Day 20):

20-May-2021

Sample ID	Rep.	Pan No.	Pan Weight (g)	Final Weight (g)	No. Alive	No. Dead	Total Recovered	No. Missing	Init.	Temp. (°C)	pH	Salinity (ppt)	DO (mg/L)
Z2	A	6Z	1.18007	1.23287	5	0	5	0	7	20	7.9	28	7.0
	B	7Z	1.19936	1.25202	5	0	5	0	CS	20	7.8	28	6.9
	C	8Z	1.18364	1.23616	5	0	5	0	7	20	7.9	28	7.1
	D	9Z	1.18607	1.23730	5	0	5	0	CS	20	8.1	28	7.1
	E	10Z	1.18865	1.24044	5	0	5	0	7	20	8.0	28	7.2
Z3	A	11Z	1.19040	1.23691	5	0	5	0	CS	20	8.0	28	7.1
	B	12Z	1.18416	1.23350	5	0	5	0	7	20	8.0	28	7.2
	C	13Z	1.19247	1.23878	5	0	5	0	CS	20	7.9	28	7.1
	D	14Z	1.19463	1.24514	5	0	5	0	7	20	7.8	28	7.0
	E	15Z	1.19270	1.23928	5	0	5	0	CS	20	8.1	28	6.9
Z4	A	16Z	1.18179	1.23150	5	0	5	0	7	20	7.9	28	7.0
	B	17Z	1.19882	1.24539	5	0	5	0	CS	20	7.8	28	6.9
	C	18Z	1.19352	1.24334	5	0	5	0	7	20	7.9	28	7.0
	D	19Z	1.19363	1.24363	5	0	5	0	CS	20	8.0	28	7.1
	E	20Z	1.18292	1.23098	5	0	5	0	7	20	8.1	28	7.1
										Initials			
										7			

WQ Instruments Us Temp. HK890 pH HK1782 Sal. HK1582 DO HK1187 Balance HK1571, HK658

Data Verified By 1 Date Verified 31/5/21
 Main technician performing tear down 1 Second technician performing replicate tear down CS

POLYCHAETE SEDIMENT TOXICITY TESTS – SURVIVAL, DRY WEIGHT AND FINAL WATER QUALITY DATA

Ensure that another technician carries out one of the tear down replicates

Client Tysan Foundation Limited

Neanthes arenaceodentata / Static; Renewal

Batch No. HK2115082

Test Species/Test Type:

30-Apr-2021

Sample ID 2 - 8

Test Initiation Date (Day 0):

20-May-2021

Sample ID	Rep.	Pan No.	Pan Weight (g)	Final Weight (g)	No. Alive	No. Dead	Total Recovered	No. Missing	Init.	Temp. (°C)	pH	Salinity (ppt)	DO (mg/L)
Z5	A	21Z	1.18455	1.23394	5	0	5	0	U	20	7.9	28	7.0
	B	22Z	1.19160	1.23771	5	0	5	0	U	20	7.8	28	7.0
	C	23Z	1.19371	1.24229	5	0	5	0	U	20	7.9	28	6.9
	D	24Z	1.18342	1.23286	5	0	5	0	U	20	8.0	28	7.1
	E	25Z	1.19656	1.24535	5	0	5	0	U	20	8.1	28	7.0
Z6	A	26Z	1.19295	1.24224	5	0	5	0	U	20	8.0	28	7.0
	B	27Z	1.19359	1.24334	5	0	5	0	U	20	7.9	28	7.0
	C	28Z	1.18779	1.23490	5	0	5	0	U	20	8.0	28	6.9
	D	29Z	1.18171	1.22848	5	0	5	0	U	20	8.0	28	7.0
	E	30Z	1.18954	1.23699	5	0	5	0	U	20	7.9	28	7.1
Z7	A	31Z	1.18788	1.23542	5	0	5	0	U	20	8.0	28	7.1
	B	32Z	1.19580	1.24459	5	0	5	0	U	20	8.0	28	7.0
	C	33Z	1.19963	1.24796	5	0	5	0	U	20	7.9	28	6.9
	D	34Z	1.18453	1.23225	5	0	5	0	U	20	7.9	28	7.0
	E	35Z	1.19132	1.24163	5	0	5	0	U	20	8.0	28	7.1
Initials										7	7	7	7

WQ Instruments Us Temp. HK890 pH HK1782 Sal. HK1582 DO HK1187 Balance HK1571, HK658

Data Verified By W Date Verified 31/5/21

Main technician performing tear down 7 Second technician performing replicate tear down U

POLYCHAETE SEDIMENT TOXICITY TESTS – SURVIVAL, DRY WEIGHT AND FINAL WATER QUALITY DATA

Ensure that another technician carries out one of the tear down replicates

Client Tysan Foundation Limited

Test Species/Test Type: *Neanthes arenaceodentata / Static; Renewal*

Batch No. HK2115082

Test Initiation Date (Day 0): 30-Apr-2021

Sample ID 2 - 8

Test Termination Date (Day 20): 20-May-2021

Sample ID	Rep.	Pan No.	Pan Weight (g)	Final Weight (g)	No. Alive	No. Dead	Total Recovered	No. Missing	Init.	Temp. (°C)	pH	Salinity (ppt)	DO (mg/L)
Z8	A	36Z	1.19869	1.24583	5	0	5	0	6	20	7.9	28	7.1
	B	37Z	1.18961	1.23700	5	0	5	0	9	20	8.0	28	7.0
	C	38Z	1.19043	1.23927	5	0	5	0	6	20	7.9	28	7.1
	D	39Z	1.19583	1.24651	5	0	5	0	8	20	8.1	28	7.0
	E	40Z	1.19474	1.24381	5	0	5	0	6	20	8.0	28	7.1
	A												
	B												
	C												
	D												
	E												
	A												
	B												
	C												
	D												
	E												
										6	7.6	26	6

WQ Instruments Us Temp. HK890 pH HK1782 Sal. HK1582 DO HK1187 Balance HK1571, HK658

Date Verified By Date Verified 31/5/21

Main technician performing tear down Second technician performing replicate tear down

MARINE SPECIES REFERENCE TOXICANT TEST DATA

Test Species Nematites arenacoedentata

Test Initiation Date (Time) 30-Apr-21 Client Tyasa Foundation Ltd

Reference Toxicant HK211642 Cd

Source/Collection Date

Aquatic Toxicology Support 26/Apr/21

Test Termination Date (Time) 04-May-21 Batch No./Sample ID HK2115082 Stock ID

No. Organisms/Test Volume 10, 900ml

Rep	Ref. Toxicant Conc. (mg/L)	Number of Survivors (24 to 96 hours)			Dissolved Oxygen (mg/L)			Temperature (°C)			pH			Salinity (ppt)			
		24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
A	0.0				10	7.1				7.0	7.0				8.0	8.0	28
	2.4				9	7.2				7.1	7.0				8.1	8.0	28
	6.9				6	7.1				7.0	7.0				8.1	8.0	28
	9.8				4	7.1				7.0	7.0				7.9	7.8	28
	14.0				2	6.8				6.9	7.0				7.9	8.0	28
	20.0				0	6.9				6.9	7.0				7.9	8.0	28
B	0.0				10	7.1				7.0	7.0				8.1	7.9	28
	2.4				9	7.0				7.1	7.0				7.9	7.9	28
	6.9				5	7.1				7.0	7.0				8.0	8.0	28
	9.8				3	6.9				7.1	7.0				8.0	7.9	28
	14.0				1	6.9				7.0	7.0				7.9	8.0	28
	20.0				0	7.0				7.1	7.0				8.0	8.1	28
	Initials																

Instruments Used:

- Auto Pipette HK903, HK338
- Temperature HK890
- pH HK1782
- DO HK1187
- Salinity HK1582
- Balance HK1571, HK658

Dry Weight (g) Determination of Organism

rep org. no.	wt pan	wt pan+org.	dry wt of pan + org.	dry wt of each org.	mean dry wt of each org.
1	1.19622	1.19956	1.19955	0.00067	0.00065
2	1.18434	1.18761	1.18760	0.00065	
3	1.19808	1.20124	1.20123	0.00063	

Test Set Up By 17
 Data Verified By [Signature]
 Date Verified 31/5/21




CERTIFICATE OF ANALYSIS

Client : TYSAN FOUNDATION LTD	Laboratory : ALS Technichem (HK) Pty Ltd	Page : 1 of 4
Contact : DESMOND CHEUNG	Contact : Richard Fung	Work Order : HK2117111
Address : UNIT 19, 12/F LEADER INDUSTRIAL CENTRE, NOS. 57-59 AU PUI WAN STREET, SHATIN, N.T. HONG KONG	Address : 11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong	
E-mail : Desmondcheung.si@tysan.com	E-mail : richard.fung@alsglobal.com	
Telephone : ---	Telephone : +852 2610 1044	
Facsimile : ---	Facsimile : +852 2610 2021	
Project : GROUND INVESTIGATION AND UTILITIES SURVEY FOR TUEN MA EXTENSION	Quote number : HKE/2221/2020_V2	Date received : 30-Apr-2021
Order number : J2009SF23		Date of issue : 10-May-2021
C-O-C number : ---		No. of samples - Received : 8
Site : TUEN MUN SOUTH		- Analysed : 8

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

<i>Signatory</i>	<i>Position</i>	<i>Authorised results for:</i>
 Fung Lim Chee, Richard	Managing Director	Inorganics

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

Page Number : 2 of 4
Client : TYSAN FOUNDATION LTD
Work Order : HK2117111



General Comments

This report supersedes any previous report(s) with this reference. 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 30-Apr-2021 to 10-May-2021.

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 HK2117111 :

Sample(s) was/were picked up from client by ALS staff. Sample(s) arrived laboratory in ambient 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.



Analytical Results

Sub-Matrix: SEAWATER			Compound	EK055K: Ammonia as NH3 0.1 mg/L	EK085: Sulphide as S2- 0.1 mg/L	EK055K: Unionized Ammonia (as N) 0.001 mg/L	---	---
			LOR Limit	ED/EK Inorganic Nonmetallic Parameters	ED/EK Inorganic Nonmetallic Parameters	ED/EK Inorganic Nonmetallic Parameters	---	---
Sample ID	Sampling date / time	Laboratory sample ID						
Control POLYCHATE 0 DAY	30-Apr-2021	HK2117111-001		0.3	<0.1	0.017	---	---
REFERENCE SEDIMENT POLYCHATE 0 DAY	30-Apr-2021	HK2117111-002		0.3	<0.1	0.013	---	---
1530-TME-EDH507 17.10m-17.80m, 17.80m-18.10m POLYCHATE 0 DAY	30-Apr-2021	HK2117111-003		4.4	<0.1	0.212	---	---
1530-TME-EDH507 19.10m-19.80m, 19.80m-20.10m POLYCHATE 0 DAY	30-Apr-2021	HK2117111-004		4.2	<0.1	0.129	---	---
1530-TME-EDH505 11.00m-11.50m, 11.50m-12.00m POLYCHATE 0 DAY	30-Apr-2021	HK2117111-005		6.2	<0.1	0.242	---	---
1530-TME-MEDH614 0.50-0.95m POLYCHATE 0 DAY	30-Apr-2021	HK2117111-006		2.6	<0.1	0.101	---	---
1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m POLYCHATE 0 DAY	30-Apr-2021	HK2117111-007		11.7	<0.1	0.565	---	---
1530-TME-EDH504 15.90-16.40m, 16.40-16.90m POLYCHATE 0 DAY	30-Apr-2021	HK2117111-008		1.3	<0.1	0.069	---	---



Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

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 (%)		RPDs (%)		
					LCS	DCS	Low	High	Value	Control Limit	
ED/EK: Inorganic Nonmetallic Parameters (QCLot: 3653161)											
EK055K: Ammonia as NH3		0.1	mg/L	<0.1	---	---	---	---	---	---	
ED/EK: Inorganic Nonmetallic Parameters (QCLot: 3664891)											
EK085: Sulphide as S2-	18496-25-8	0.1	mg/L	<0.1	0.5 mg/L	105	85.0	115	---	---	

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

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



CERTIFICATE OF ANALYSIS

Client	: TYSAN FOUNDATION LTD	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 5
Contact	: DESMOND CHEUNG	Contact	: Richard Fung	Work Order	: HK2117112
Address	: UNIT 18, 12/F LEADER INDUSTRIAL CENTRE, NOS. 57-59 AU PUI WAN STREET, SHATIN, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Desmondcheung.al@tysan.com	E-mail	: richard.fung@alaglobal.com		
Telephone	: —	Telephone	: +852 2810 1044		
Facsimile	: —	Facsimile	: +852 2810 2021		
Project	: GROUND INVESTIGATION AND UTILITIES SURVEY FOR TUEN MA EXTENSION	Date Samples Received	: 20-May-2021		
Order number	: J2009SF23	Quote number	: HKE/2221/2020_V2	Issue Date	: 27-May-2021
C-O-C number	: —	No. of samples received	: 8		
Site	: TUEN MUN SOUTH	No. of samples analysed	: 8		

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

<u>Signatories</u>	<u>Position</u>	<u>Authorised results for</u>
	Managing Director	Inorganics
Fung Lim Chee, Richard	Managing Director	Inorganics

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Page Number : 2 of 5
Client : TYSAN FOUNDATION LTD
Work Order : HK2117112



General Comments

This report supersedes any previous report(s) with this reference. 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 20-May-2021 to 27-May-2021.

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: HK2117112

Sample(s) was/were picked up from client by ALS staff. 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.



Analytical Results

Sub-Matrix: SEAWATER

				Sample ID	Control	REFERENCE	1530-TME-EDH507	1530-TME-EDH507	1530-TME-EDH505
					POLYCHATE 20	SEDIMENT	17.10m-17.80m,	19.10m-19.80m,	11.00m-11.50m,
					DAY	POLYCHATE 20	17.80m-18.10m	19.80m-20.10m	11.50m-12.00m
						DAY	POLYCHATE 20	POLYCHATE 20	POLYCHATE 20
				Sampling date / time	20-May-2021	20-May-2021	20-May-2021	20-May-2021	20-May-2021
Compound	CAS Number	LOR	Unit	HK2117112-001	HK2117112-002	HK2117112-003	HK2117112-004	HK2117112-005	HK2117112-005
EDEK: Inorganic Nonmetallic Parameters									
EK055K: Ammonia as NH3	---	0.1	mg/L	0.2	4.9	22.1	16.3	11.8	11.8
EK055K: Unionized Ammonia (as N)	---	0.001	mg/L	0.005	0.102	0.364	0.270	0.240	0.240
EK085: Sulphide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1



Sub-Matrix: SEAWATER

				Sample ID	1530-TME-MEDH6	1530-TME-MEDH6	1530-TME-EDH504	---	---
					14 0.50-0.95m	13 1.00-1.45m,	15.90-18.40m,		
					POLYCHATE 20	1.50-1.95m	18.40-18.80m		
					DAY	POLYCHATE 20	POLYCHATE 20		
				Sampling date / time	20-May-2021	20-May-2021	20-May-2021	---	---
Compound	CAS Number	LOR	Unit	HK2117112-006	HK2117112-007	HK2117112-008	---	---	---
EDEK: Inorganic Nonmetallic Parameters									
EK055K: Ammonia as NH3	---	0.1	mg/L	11.8	27.5	19.5	---	---	---
EK055K: Unionized Ammonia (as N)	---	0.001	mg/L	0.241	0.712	0.505	---	---	---
EK085: Sulphide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	<0.1	---	---	---



Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

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

Matrix: WATER

Method/Compound	CAS Number	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 (%)	
						LCS	DCS	Low	High	Value	Control Limit
EDYEC Inorganic Nonmetallic Parameters (QC Lot: 3688708)											
EK055K: Ammonia as NH3	---	0.1	mg/L	<0.1	---	---	---	---	---	---	---
EDYEC Inorganic Nonmetallic Parameters (QC Lot: 3688328)											
EK085: Sulphide as S2-	18496-25-8	0.1	mg/L	<0.1	0.5 mg/L	94.7	---	85.0	115	---	---

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

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

APPENDIX D

Complete Data for the 48-60-hour Bivalve Larvae Survival and Normality Test
– *Crassostrea gigas*

Client Tysan Foundation Limited
 Batch No. HK2115082
 Initiation Date: 4-May-21

Summary of Results for the 48-60-hr Bivalve Larval Survival and Development Test - Crassostrea gigas

P	I	Group	Client ID	Initial Density	Number Normal	Number Abnormal	Normality Survival %			Survival %			Normality %		
							NS (%)	NS Mean	NS SD	S (%)	S Mean	S SD	N (%)	N Mean	N SD
-	1	Control	Control	356	316	15	88.8	89.6	3.1	93.0	94.9	3.0	95.5	94.4	1.5
-	2	Control	Control	356	311	15	87.4			91.6			95.4		
-	3	Control	Control	356	313	27	87.9			95.5			92.1		
-	4	Control	Control	356	338	16	94.9			99.4			95.5		
-	5	Control	Control	356	317	21	89.0			94.9			93.8		
1	1	HK2115082002	REFERENCE SEDIMENT	356	314	26	88.2	87.7	1.5	95.5	94.3	2.0	92.4	93.0	1.6
2	2	HK2115082002	REFERENCE SEDIMENT	356	314	29	88.2			96.4			91.6		
3	3	HK2115082002	REFERENCE SEDIMENT	356	303	25	85.1			92.1			92.4		
4	4	HK2115082002	REFERENCE SEDIMENT	356	314	14	88.2			92.1			95.7		
5	5	HK2115082002	REFERENCE SEDIMENT	356	316	24	88.8			95.5			92.9		
6	1	HK2115082003	1530-TME-EDH507 17 10m-17.60m, 17.60m-18.10m	356	261	26	73.3	74.5	2.6	80.6	82.5	3.1	90.9	90.4	1.6
7	2	HK2115082003	1530-TME-EDH507 17 10m-17.60m, 17.60m-18.10m	356	272	34	76.4			86.0			88.9		
8	3	HK2115082003	1530-TME-EDH507 17 10m-17.60m, 17.60m-18.10m	356	271	21	76.1			82.0			92.8		
9	4	HK2115082003	1530-TME-EDH507 17 10m-17.60m, 17.60m-18.10m	356	251	29	70.5			78.7			89.6		
10	5	HK2115082003	1530-TME-EDH507 17 10m-17.60m, 17.60m-18.10m	356	272	32	76.4			85.4			89.5		
11	1	HK2115082004	1530-TME-EDH507 19 10m-19.60m, 19.60m-20.10m	356	270	22	75.8	73.2	2.0	82.0	81.0	2.1	92.5	90.4	1.5
12	2	HK2115082004	1530-TME-EDH507 19 10m-19.60m, 19.60m-20.10m	356	262	29	73.6			81.7			90.0		
13	3	HK2115082004	1530-TME-EDH507 19 10m-19.60m, 19.60m-20.10m	356	254	24	71.4			78.1			91.4		
14	4	HK2115082004	1530-TME-EDH507 19 10m-19.60m, 19.60m-20.10m	356	253	30	71.1			79.5			89.4		
15	5	HK2115082004	1530-TME-EDH507 19 10m-19.60m, 19.60m-20.10m	356	264	33	74.2			83.4			88.9		
16	1	HK2115082005	1530-TME-EDH505 11 00m-11.50m, 11.50m-12.00m	356	273	21	76.7	75.0	2.8	82.6	82.4	3.0	92.9	91.1	1.1
17	2	HK2115082005	1530-TME-EDH505 11 00m-11.50m, 11.50m-12.00m	356	252	25	70.8			77.8			91.0		
18	3	HK2115082005	1530-TME-EDH505 11 00m-11.50m, 11.50m-12.00m	356	266	30	74.7			83.2			89.9		
19	4	HK2115082005	1530-TME-EDH505 11 00m-11.50m, 11.50m-12.00m	356	265	27	74.4			82.0			90.8		
20	5	HK2115082005	1530-TME-EDH505 11 00m-11.50m, 11.50m-12.00m	356	279	28	78.4			86.2			90.9		
21	1	HK2115082006	1530-TME-MEDH614 0.50-0.95m	356	277	39	77.8	76.2	1.6	88.8	85.2	2.7	87.7	89.4	1.5
22	2	HK2115082006	1530-TME-MEDH614 0.50-0.95m	356	265	35	74.4			84.3			88.3		
23	3	HK2115082006	1530-TME-MEDH614 0.50-0.95m	356	274	29	77.0			85.1			90.4		
24	4	HK2115082006	1530-TME-MEDH614 0.50-0.95m	356	265	25	74.4			81.5			91.4		
25	5	HK2115082006	1530-TME-MEDH614 0.50-0.95m	356	275	33	77.3			86.5			89.3		
26	1	HK2115082007	1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m	356	258	32	72.5	75.1	2.4	81.5	84.4	3.2	89.0	89.0	0.7
27	2	HK2115082007	1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m	356	271	35	76.1			86.0			88.6		
28	3	HK2115082007	1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m	356	279	36	78.4			88.5			88.6		
29	4	HK2115082007	1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m	356	269	34	75.6			85.1			88.8		
30	5	HK2115082007	1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m	356	260	28	73.0			80.9			90.3		
31	1	HK2115082008	1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	356	277	30	77.8	72.9	2.8	86.2	81.3	3.1	90.2	89.6	1.4
32	2	HK2115082008	1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	356	257	26	72.2			79.5			90.8		
33	3	HK2115082008	1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	356	253	27	71.1			78.7			90.4		
34	4	HK2115082008	1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	356	256	37	71.9			82.3			87.4		
35	5	HK2115082008	1530-TME-EDH504 15.90-16.40m, 16.40-16.90m	356	254	31	71.4			80.1			89.1		

Test: BV-Bivalve Larval Survival and Development Test ID: HK2115082c
 Species: CG-Crassostrea gigas Protocol: CG
 Sample ID: VA Sample Type: MS
 Start Date: 5/4/2021 End Date: 5/6/2021 Lab ID: ALS

Pos	ID	Rep	Group	Initial Density	Normal Count	Abnormal Count	Notes
	1	1	2115082-02	356	314	26	
	2	2	2115082-02	356	314	29	
	3	3	2115082-02	356	303	25	
	4	4	2115082-02	356	314	14	
	5	5	2115082-02	356	316	24	
	6	1	2115082-03	356	261	26	
	7	2	2115082-03	356	272	34	
	8	3	2115082-03	356	271	21	
	9	4	2115082-03	356	251	29	
	10	5	2115082-03	356	272	32	
	11	1	2115082-04	356	270	22	
	12	2	2115082-04	356	262	29	
	13	3	2115082-04	356	254	24	
	14	4	2115082-04	356	253	30	
	15	5	2115082-04	356	264	33	
	16	1	2115082-05	356	273	21	
	17	2	2115082-05	356	252	25	
	18	3	2115082-05	356	266	30	
	19	4	2115082-05	356	265	27	
	20	5	2115082-05	356	279	28	
	21	1	2115082-06	356	277	39	
	22	2	2115082-06	356	265	35	
	23	3	2115082-06	356	274	29	
	24	4	2115082-06	356	265	25	
	25	5	2115082-06	356	275	33	
	26	1	2115082-07	356	258	32	
	27	2	2115082-07	356	271	35	
	28	3	2115082-07	356	279	36	
	29	4	2115082-07	356	269	34	
	30	5	2115082-07	356	260	28	
	31	1	2115082-08	356	277	30	
	32	2	2115082-08	356	257	26	
	33	3	2115082-08	356	253	27	
	34	4	2115082-08	356	256	37	
	35	5	2115082-08	356	254	31	

Comments:

Bivalve Larval Survival and Development Test-Normality Survival

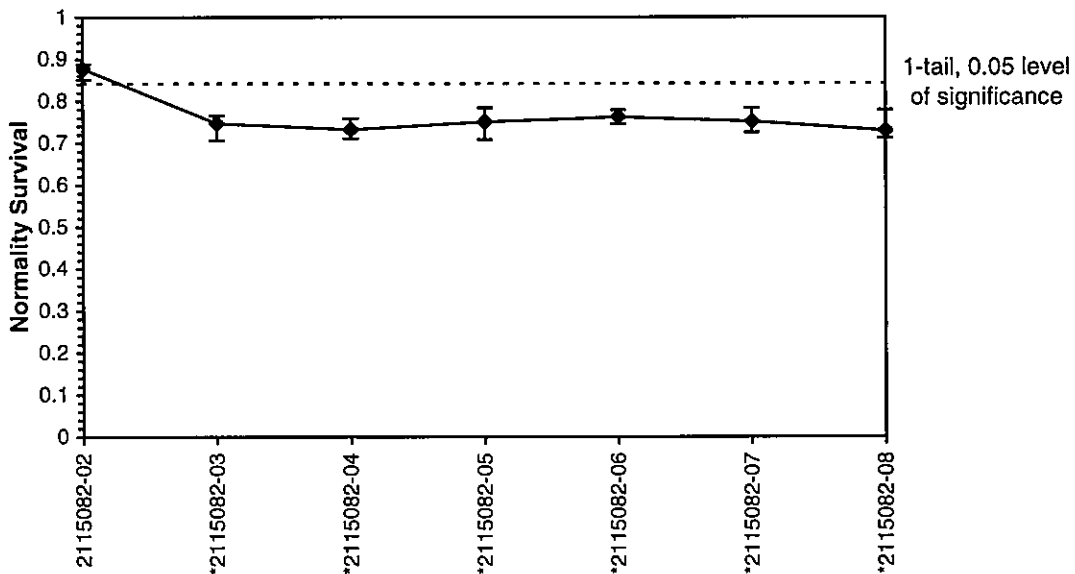
Start Date: 5/4/2021	Test ID: HK2115082c	Sample ID: VA
End Date: 5/6/2021	Lab ID: ALS	Sample Type: MS
Sample Date:	Protocol: CG	Test Species: CG-Crassostrea gigas

Conc-	1	2	3	4	5
2115082-02	0.8820	0.8820	0.8511	0.8820	0.8876
2115082-03	0.7331	0.7640	0.7612	0.7051	0.7640
2115082-04	0.7584	0.7360	0.7135	0.7107	0.7416
2115082-05	0.7669	0.7079	0.7472	0.7444	0.7837
2115082-06	0.7781	0.7444	0.7697	0.7444	0.7725
2115082-07	0.7247	0.7612	0.7837	0.7556	0.7303
2115082-08	0.7781	0.7219	0.7107	0.7191	0.7135

Conc-	Mean	N-Mean	Transform: Untransformed					N	t-Stat	1-Tailed Critical	MSD
			Mean	Min	Max	CV%					
2115082-02	0.8770	1.0000	0.8770	0.8511	0.8876	1.671	5				
*2115082-03	0.7455	0.8501	0.7455	0.7051	0.7640	3.500	5	9.006	2.409	0.0352	
*2115082-04	0.7320	0.8347	0.7320	0.7107	0.7584	2.735	5	9.929	2.409	0.0352	
*2115082-05	0.7500	0.8552	0.7500	0.7079	0.7837	3.792	5	8.698	2.409	0.0352	
*2115082-06	0.7618	0.8687	0.7618	0.7444	0.7781	2.125	5	7.890	2.409	0.0352	
*2115082-07	0.7511	0.8565	0.7511	0.7247	0.7837	3.202	5	8.621	2.409	0.0352	
*2115082-08	0.7287	0.8309	0.7287	0.7107	0.7781	3.842	5	10.160	2.409	0.0352	

Auxiliary Tests	Statistic	Critical	Skew	Kurt		
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)	0.97972	0.934	0.06241	-0.1793		
Bartlett's Test indicates equal variances ($p = 0.83$)	2.82062	16.8119				
Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test indicates significant differences Treatments vs 2115082-02	0.03516	0.04009	0.01312	0.00053	5.9E-10	6, 28

Dose-Response Plot



Test: BV-Bivalve Larval Survival and Development Test ID: RTCGCU118
 Species: CG-Crassostrea gigas Protocol: CG
 Sample ID: REF Sample Type: CUCL
 Start Date: 5/4/2021 End Date: 5/6/2021 Lab ID: ALS

Pos	ID	Rep	Group	Initial Density	Normal Count	Abnormal Count	Notes
	1	1	D-Control	355.6	362	6	
	2	2	D-Control	355.6	365	19	
	3	3	D-Control	355.6	353	12	
	4	4	D-Control	355.6	343	18	
	5	5	D-Control	355.6	355	15	
	6	1	1	355.6	347	14	
	7	2	1	355.6	340	25	
	8	3	1	355.6	339	20	
	9	1	5	355.6	184	40	
	10	2	5	355.6	187	35	
	11	3	5	355.6	188	37	
	12	1	10	355.6	84	67	
	13	2	10	355.6	83	65	
	14	3	10	355.6	84	61	
	15	1	20	355.6	50	89	
	16	2	20	355.6	32	83	
	17	3	20	355.6	44	84	
	18	1	50	355.6	3	114	
	19	2	50	355.6	6	114	
	20	3	50	355.6	6	111	

Comments:

Bivalve Larval Survival and Development Test-Normality Survival

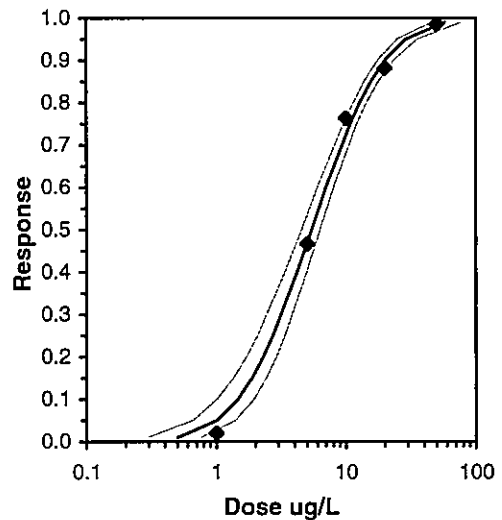
Start Date: 5/4/2021	Test ID: RTCGCU118	Sample ID: REF
End Date: 5/6/2021	Lab ID: ALS	Sample Type: CUCL
Sample Date:	Protocol: CG	Test Species: CG-Crassostrea gigas

Conc-ug/L	1	2	3	4	5
D-Control	1.0000	1.0000	0.9927	0.9646	0.9983
1	0.9758	0.9561	0.9533		
5	0.5174	0.5259	0.5287		
10	0.2362	0.2334	0.2362		
20	0.1406	0.0900	0.1237		
50	0.0084	0.0169	0.0169		

Conc-ug/L	Transform: Arcsin Square Root							Number Resp	Total Number
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	0.9911	1.0000	1.4435	1.3652	1.5297	4.812	5	1	70
1	0.9618	0.9704	1.3758	1.3530	1.4146	2.457	3	2	59
5	0.5240	0.5287	0.8094	0.8028	0.8141	0.724	3	53	112
10	0.2353	0.2374	0.5064	0.5042	0.5075	0.378	3	148	193
20	0.1181	0.1192	0.3495	0.3047	0.3844	11.665	3	226	256
50	0.0141	0.0142	0.1175	0.0920	0.1303	18.811	3	334	339

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.96166	0.905	-0.0221	1.07493
Bartlett's Test indicates unequal variances (p = 3.86E-03)	17.3604	15.0863		

Maximum Likelihood-Probit											
Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	2.25463	0.16356	1.93406	2.5752	0.01429	2.99462	7.81473	0.39246	0.73337	0.44353	5
Intercept	3.34653	0.18243	2.98896	3.7041							
TSCR	0.01097	0.01211	-0.0128	0.03472							
Point	Probits	ug/L	95% Fiducial Limits								
EC01	2.674	0.50299	0.29329	0.75707							
EC05	3.355	1.00884	0.65749	1.39813							
EC10	3.718	1.46204	1.01006	1.94092							
EC15	3.964	1.87791	1.34856	2.42328							
EC20	4.158	2.2913	1.69593	2.8923							
EC25	4.326	2.71775	2.06342	3.36805							
EC40	4.747	4.1783	3.37202	4.95866							
EC50	5.000	5.41211	4.51546	6.27949							
EC60	5.253	7.01026	6.01933	7.98822							
EC75	5.674	10.7776	9.54175	12.1243							
EC80	5.842	12.7836	11.362	14.426							
EC85	6.036	15.5976	13.8384	17.7783							
EC90	6.282	20.0343	17.5885	23.3169							
EC95	6.645	29.0343	24.805	35.2598							
EC99	7.326	58.2338	46.4251	77.9954							



REFERENCE TOXICANT CONTROL CHART

Crassostrea gigas - 48-60-h Survival EC50 Values (ug Cu / L)

	Log	Antilog
Mean	0.72	5.24
SD	0.01	1.03
2 x SD	0.03	1.07
UCL	0.76	5.80
UWL	0.75	5.61
LWL	0.69	4.90
LCL	0.68	4.74
CV(%)	2	

WARNING / CONTROL LIMIT CALCULATIONS	
Mean: Mean is calculated for the last 20 logarithms of EC50, convert to antilogarithm to give Geomean	
SD: Standard deviation is calculated for the last 20 logarithms of EC50	
UCL: Upper Control Limit = Mean + 3 x SD, illustrated as antilogarithms in Control Chart	
UWL: Upper Warning Limit = Mean + 2 x SD, illustrated as antilogarithms in Control Chart	
LWL: Lower Warning Limit = Mean - 2 x SD, illustrated as antilogarithms in Control Chart	
LCL: Lower Control Limit = Mean - 3 x SD, illustrated as antilogarithms in Control Chart	

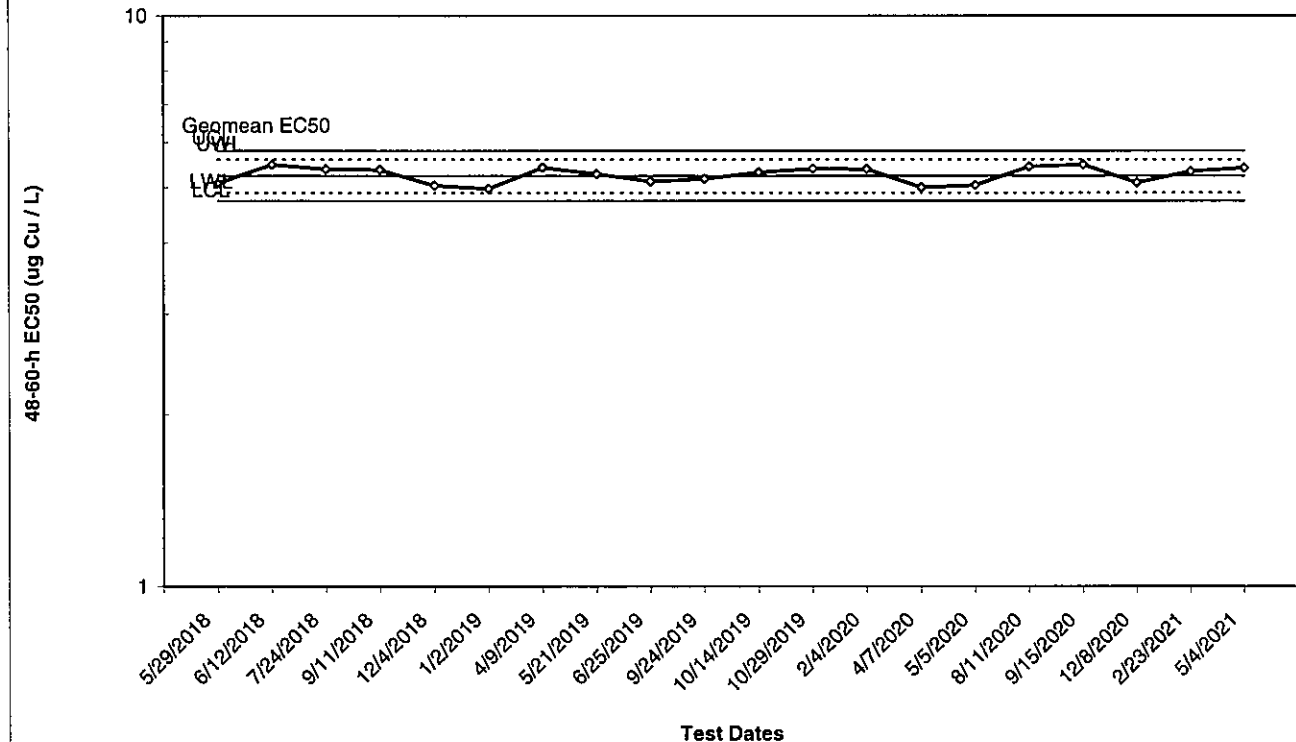
Point No.	EC50	log EC50
0	5.06	0.70
1	5.09	0.71
2	5.49	0.74
3	5.39	0.73
4	5.38	0.73
5	5.04	0.70
6	4.98	0.70
7	5.42	0.73
8	5.29	0.72
9	5.13	0.71
10	5.18	0.71
11	5.32	0.73
12	5.40	0.73
13	5.39	0.73
14	5.00	0.70
15	5.05	0.70
16	5.45	0.74
17	5.49	0.74
18	5.10	0.71
19	5.34	0.73

CONTROL CHART - DATA PLOT				
Point No.	Test Date	48-60-h EC50	Acceptable Result?	Calculation Method
0	5/15/2018	5.06	-----	Maximum Likelihood-Probit
1	5/29/2018	5.09	OK	Maximum Likelihood-Probit
2	6/12/2018	5.49	OK	Maximum Likelihood-Probit
3	7/24/2018	5.39	OK	Maximum Likelihood-Probit
4	9/11/2018	5.38	OK	Maximum Likelihood-Probit
5	12/4/2018	5.04	OK	Maximum Likelihood-Probit
6	1/2/2019	4.98	OK	Maximum Likelihood-Probit
7	4/9/2019	5.42	OK	Maximum Likelihood-Probit
8	5/21/2019	5.29	OK	Maximum Likelihood-Probit
9	6/25/2019	5.13	OK	Maximum Likelihood-Probit
10	9/24/2019	5.18	OK	Maximum Likelihood-Probit
11	10/14/2019	5.32	OK	Maximum Likelihood-Probit
12	10/29/2019	5.40	OK	Maximum Likelihood-Probit
13	2/4/2020	5.39	OK	Maximum Likelihood-Probit
14	4/7/2020	5.00	OK	Maximum Likelihood-Probit
15	5/5/2020	5.05	OK	Maximum Likelihood-Probit
16	8/11/2020	5.45	OK	Maximum Likelihood-Probit
17	9/15/2020	5.49	OK	Maximum Likelihood-Probit
18	12/8/2020	5.10	OK	Maximum Likelihood-Probit
19	2/23/2021	5.34	OK	Maximum Likelihood-Probit
20	5/4/2021	5.41	OK	Maximum Likelihood-Probit

REFERENCE TOXICANT CONTROL CHART

Crassostrea gigas - 48-60-h EC50

(Arithmetic plot based on log calculation)



LARVAL DEVELOPMENT TOXICITY TEST - DAILY WATER QUALITY DATA

Client Tysan Foundation Limited
 Batch No. HK2115082
 Sample ID 2 - 8

Test Initiation Date/Time 04-May-21/14:00
 Test Termination Date 06-May-21/14:00
 Test Species / Date Collected Crassostrea gigas-04/May/21

Sample ID	Temperature (°C)			pH			Salinity (ppt)			Dissolved Oxygen (mg/L)		
	0	24	48	0	24	48	0	24	48	0	24	48
Z2	20	20	20	7.9	7.9	8.0	28	28	28	7.2	7.1	7.1
Z3	20	20	20	7.9	8.0	8.0	28	28	28	7.2	7.0	7.0
Z4	20	20	20	7.8	8.0	8.1	28	28	28	7.1	7.0	7.0
Z5	20	20	20	8.0	7.9	7.9	28	28	28	7.0	6.9	7.0
Z6	20	20	20	8.0	8.1	8.0	28	28	28	6.9	7.0	7.0
Z7	20	20	20	8.1	7.9	7.9	28	28	28	6.9	7.0	7.1
Z8	20	20	20	7.9	8.0	8.0	28	28	28	7.1	7.1	7.0
initials	b	b	b	b	b	b	b	b	b	b	b	b

WQ Instruments Used:
 Temp. HK890 pH HK1782 Salinity HK1582 DO HK1187

Comments _____

Test Set Up By lh Data Verified By lh Date Verified 31/5/21

LARVAL DEVELOPMENT TOXICITY TEST - SEDIMENT (SAMPLES)

Client TYSON Foundation Ltd
 Batch No. HK2115082

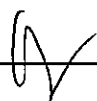
Test Initiation Date 04-May-21
 Test Termination Date 06-May-21
 Fertilization initiation time 12:00
 Inoculation time 14:00
 Test Species Crassostrea gigas
 Source/Date Received Guernsey Sea Farm-03/May/21

Initial Embryo Density 356
 Test Volume (mL) 900
 Aliquot Size (mL) 10

Sample ID	Rep.	Primary Count		Backup Count		Comments	Tech. Init.
		Normal Larvae	Abnormal Larvae	Normal Larvae	Abnormal Larvae		
Z 1	A	316	15				76
	B	311	15				68
	C	313	27				76
	D	338	16				68
	E	317	21				76

	Rep.	Count / 10 mL		Backup Count		Comments	Tech. Init.
		Fertilized Egg	Unfertilized Egg	Normal Larvae	Abnormal Larvae		
Day 0 Count	A	362	6				68
	B	365	19				76
	C	353	12				68
	D	343	18				76
	E	355	15				68

* Embryo must be inoculated within 2 hours after initiation of fertilization

Data Verified By 

Date Verified 3/5/21

LARVAL DEVELOPMENT TOXICITY TEST - SEDIMENT (SAMPLES)

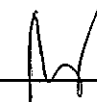
Client Tysan Foundation Limited
 Batch No. HK2115082

Test Initiation Date 04-May-21
 Test Termination Date 06-May-21
 Fertilization initiation time 12:00
 Inoculation time 14:00
 Test Species Crassostrea gigas
 Source/Date Received Guernsey Sea Farm-04/May/21

Initial Embryo Density 356
 Test Volume (mL) 900
 Aliquot Size (mL) 10

Sample ID	Rep.	Primary Count		Backup Count		Comments	Tech. Init.
		Normal Larvae	Abnormal Larvae	Normal Larvae	Abnormal Larvae		
HK2115082002 Z 2	A	314	26				7
	B	314	29				CS
	C	303	25				7
	D	314	14				CS
	E	316	24				7
HK2115082003 Z 3	A	261	26				CS
	B	272	34				7
	C	271	21				CS
	D	251	29				7
	E	272	32				CS
HK2115082004 Z 4	A	270	22				7
	B	262	29				CS
	C	254	24				7
	D	253	30				CS
	E	264	33				7
HK2115082005 Z 5	A	273	21				CS
	B	252	25				7
	C	266	30				CS
	D	265	27				7
	E	279	28				CS
HK2115082006 Z 6	A	277	39				7
	B	265	35				CS
	C	274	29				7
	D	265	25				CS
	E	275	33				7
HK2115082007 Z 7	A	258	32				CS
	B	271	35				7
	C	279	36				CS
	D	269	34				7
	E	260	28				CS
HK2115082008 Z 8	A	277	30				7
	B	257	26				CS
	C	253	27				7
	D	256	37				CS
	E	254	31				7

* Embryo must be inoculated within 2 hours after initiation of fertilization

Data Verified By 

Date Verified 31/5/21

LARVAL DEVELOPMENT TOXICITY TEST - REFERENCE TOXICANT TEST DATA

Client Tysan Foundation Limited
 Batch No. HK2115082
 Sample ID 2-8
 Initial Embryo Density 356

Test Initiation Date/Time 04-May-21/14:00
 Test Termination Date 06-May-21/14:00
 Test Species Crassostrea gigas
 Source/Date Received Guernsey Sea Farm / 04/May/21
 Test Volume (mL) 900
 Aliquot Size (mL) 10

Concentration (µg/L)	Dissolved Oxygen (mg/L)			Temperature (°C)			pH			Salinity (ppt)				
	0	24	48	60	0	24	48	60	0	48				
0.0	7.2		7.0		20		20		7.9		7.8		28	28
1.0	7.0		7.1		20		20		7.8		7.9		28	28
5.0	7.0		7.1		20		20		7.9		7.9		28	28
10.0	7.1		7.0		20		20		8.1		8.0		28	28
20.0	7.1		7.0		20		20		8.0		8.1		28	28
50.0	7.0		6.9		20		20		8.2		8.1		28	28
Technician	6		6		6		6		6		6		6	6

WQ Instruments Used:

Temp. HK890 pH HK1782 Salinity HK1582 DO HK1187

Comments _____

Test Set Up By (17)

Data Verified By (Signature)

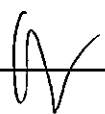
Date Verified 31/5/21

LARVAL DEVELOPMENT TOXICITY TEST - SEDIMENT (CONTROLS)

Client Tyson Foundation Ltd
 Batch No. HK 2115082
 Reference Toxicant Cu
 Stock ID HK2111642-001
 Initial Embryo Density 356
 Test Volume (mL) 900
 Aliquot Size (mL) 10

Test Initiation Date/Time 04-May-21/14:00
 Test Termination Date/Time 06-May-21/14:00
 Fertilization initiation Time 12:00
 Inoculation Time 14:00
 Test Species Crassostrea gigas
 Source/Date Received Guernsey Sea Farm-03/May/21

Concentration (µg/L)	Rep.	Primary Count		Backup Count		Comments	Tech. Init.
		Normal Larvae	Abnormal Larvae	Normal Larvae	Abnormal Larvae		
Reference Toxicant							
1.0	A	347	14				6
	B	340	25				CS
	C	339	20				6
5.0	A	184	40				CS
	B	187	35				6
	C	188	37				CS
10.0	A	84	67				6
	B	83	65				CS
	C	84	61				6
20.0	A	50	89				CS
	B	32	83				6
	C	44	84				CS
50.0	A	3	114				6
	B	6	114				CS
	C	6	111				6
Control Seawater							
0.0	A	362	6				CS
	B	365	19				6
	C	353	12				CS
	D	343	18				6
	E	355	15				CS

Data Verified By 

Date Verified 31/5/21



CERTIFICATE OF ANALYSIS

Client : TYSAN FOUNDATION LTD	Laboratory : ALS Technichem (HK) Pty Ltd	Page : 1 of 4
Contact : DESMOND CHEUNG	Contact : Richard Fung	Work Order : HK2117113
Address : UNIT 10, 12/F LEADER INDUSTRIAL CENTRE, NOS. 57-59 AU PUI WAN STREET, BHATIN, N.T. HONG KONG	Address : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong	
E-mail : Desmondcheung.sl@tysan.com	E-mail : richard.fung@alsglobal.com	
Telephone : ---	Telephone : +852 2610 1044	
Facsimile : ---	Facsimile : +852 2610 2021	
Project : GROUND INVESTIGATION AND UTILITIES SURVEY FOR TUEN MA EXTENSION		Date received : 04-May-2021
Order number : J2009SF23	Quote number : HKE/221/2020_V2	Date of issue : 10-May-2021
C-O-C number : ---		No. of samples - Received : 8
Site : TUEN MUN SOUTH		- Analysed : 8

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

<i>Signatory</i>	<i>Position</i>	<i>Authorised results for:</i>
	Managing Director	Inorganics
Fung Lim Chee, Richard		

ALS Technichem (HK) Pty Ltd
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11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong
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Page Number : 2 of 4
Client : TYSAN FOUNDATION LTD
Work Order : HK2117113



General Comments

This report supersedes any previous report(s) with this reference. 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-May-2021 to 10-May-2021.

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 HK2117113 :

Sample(s) was/were picked up from client by ALS staff. 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.



Analytical Results

Sub-Matrix: SEAWATER			Compound	EK055K: Ammonia as NH3 0.1 mg/L	EK085: Sulphide as S2- 0.1 mg/L	EK055K: Un-ionized Ammonia (as N) 0.001 mg/L	---	---
			LOR Unit					
Sample ID	Sampling date / time	Laboratory sample ID	ED/EK: Inorganic Nonmetallic Parameters	ED/EK: Inorganic Nonmetallic Parameters	ED/EK: Inorganic Nonmetallic Parameters			
Control BIVALVE 0 HOUR	04-May-2021	HK2117113-001	0.1	<0.1	0.002	---	---	---
REFERENCE SEDIMENT BIVALVE 0 HOUR	04-May-2021	HK2117113-002	<0.1	<0.1	<0.001	---	---	---
1530-TME-EDH507 17.10m-17.80m, 17.80m-18.10m BIVALVE 0 HOUR	04-May-2021	HK2117113-003	2.7	<0.1	0.045	---	---	---
1530-TME-EDH507 18.10m-19.80m, 19.80m-20.10m BIVALVE 0 HOUR	04-May-2021	HK2117113-004	3.2	<0.1	0.042	---	---	---
1530-TME-EDH505 11.00m-11.50m, 11.50m-12.00m BIVALVE 0 HOUR	04-May-2021	HK2117113-005	2.5	<0.1	0.041	---	---	---
1530-TME-MEDH614 0.50-0.95m BIVALVE 0 HOUR	04-May-2021	HK2117113-006	0.7	<0.1	0.014	---	---	---
1530-TME-MEDH613 1.00-1.45m, 1.50-1.95m BIVALVE 0 HOUR	04-May-2021	HK2117113-007	2.8	<0.1	0.046	---	---	---
1530-TME-EDH504 15.90-16.40m, 16.40-16.90m BIVALVE 0 HOUR	04-May-2021	HK2117113-008	0.6	<0.1	0.013	---	---	---



Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

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

Method/Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	LCS	DCS	Spike Recovery (%)		Recovery Limits (%)	
								Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QCLot: 3659810)											
EK055K: Ammonia as NH3		0.1	mg/L	<0.1							
ED/EK: Inorganic Nonmetallic Parameters (QCLot: 3665054)											
EK085: Sulphide as S2-	18496-25-8	0.1	mg/L	<0.1	0.483 mg/L	86.6		85.0	115		

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

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



CERTIFICATE OF ANALYSIS

Client : TYSAN FOUNDATION LTD	Laboratory : ALS Technichem (HK) Pty Ltd	Page : 1 of 4
Contact : DESMOND CHEUNG	Contact : Richard Fung	Work Order : HK2117114
Address : UNIT 10, 12/F LEADER INDUSTRIAL CENTRE, NOS. 57-59 AU PUI WAH STREET, SHATIN, N.T. HONG KONG	Address : 11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong	
E-mail : Desmondcheung.si@tysan.com	E-mail : richard.fung@alsglobal.com	
Telephone : —	Telephone : +852 2610 1044	
Facsimile : —	Facsimile : +852 2610 2021	
Project : GROUND INVESTIGATION AND UTILITIES SURVEY FOR TUEN MA EXTENSION	Quote number : HKE/2221/2020_V2	Date received : 06-May-2021
Order number : J2009SF23		Date of issue : 14-May-2021
C-O-C number : —		No. of samples - Received : 8
Site : TUEN MUN SOUTH		- Analysed : 8

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

Signatory	Position	Authorised results for:
 Fung Lim Chee, Richard	Managing Director	Inorganics

ALS Technichem (HK) Pty Ltd
Part of the ALS Laboratory Group
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Page Number : 2 of 4
Client : TYSAN FOUNDATION LTD
Work Order : HK2117114



General Comments

This report supersedes any previous report(s) with this reference. 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-May-2021 to 13-May-2021.

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 HK2117114 :

Sample(s) was/were picked up from client by ALS staff. 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.



Analytical Results

Sub-Matrix: SEAWATER			Compound	EK055K: Ammonia as NH3 0.1 mg/L	EK085: Sulphide as S2- 0.1 mg/L	EK055K: Unionized Ammonia (as N) 0.001 mg/L	---	---
			LOR Unit	ED/EK: Inorganic Nonmetallic Parameters	ED/EK: Inorganic Nonmetallic Parameters	ED/EK: Inorganic Nonmetallic Parameters	---	---
Sample ID	Sampling date / time	Laboratory sample ID						
Control BIVALVE 48 HOUR	06-May-2021	HK2117114-001		<0.1	<0.1	<0.001	---	---
REFERENCE SEDIMENT BIVALVE 48 HOUR	06-May-2021	HK2117114-002		<0.1	<0.1	<0.001	---	---
1530-TME-EDH507 17.10m-17.60m, 17.60m-18.10m BIVALVE 48 HOUR	06-May-2021	HK2117114-003		2.7	<0.1	0.056	---	---
1530-TME-EDH507 19.10m-19.60m, 19.60m-20.10m BIVALVE 48 HOUR	06-May-2021	HK2117114-004		2.8	<0.1	0.046	---	---
1530-TME-EDH505 11.00m-11.50m, 11.50m-12.00m BIVALVE 48 HOUR	06-May-2021	HK2117114-005		1.9	<0.1	0.049	---	---
1530-TME-MEDH614 0.50-0.95m BIVALVE 48 HOUR	06-May-2021	HK2117114-006		<0.1	<0.1	<0.001	---	---
1530-TME-MEDH613 1.00-1.45m, 1.50-1.85m BIVALVE 48 HOUR	06-May-2021	HK2117114-007		1.4	<0.1	0.030	---	---
1530-TME-EDH504 15.90-16.40m, 16.40-16.90m BIVALVE 48 HOUR	06-May-2021	HK2117114-008		<0.1	<0.1	0.001	---	---



Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

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 (%)		RPDs (%)	Control Limit
						LCS	DCS	Low	High	Value	
ED/EK: Inorganic Nonmetallic Parameters (QCLot: 3665043)											
EK055K: Ammonia as NH3		0.1	mg/L	<0.1	---	---	---	---	---	---	---
ED/EK: Inorganic Nonmetallic Parameters (QCLot: 3665054)											
EK085: Sulphide as S2-	18496-25-8	0.1	mg/L	<0.1	0.483 mg/L	86.6	---	85.0	115	---	---

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

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

APPENDIX E
Analytical Reports



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

CERTIFICATE OF ANALYSIS

CONTACT: CHEUNG KA HO DESMOND
CLIENT: TYSAN FOUNDATION LTD
ADDRESS: UNIT 19, 12/F LEADER INDUSTRIAL CENTRE,
NOS. 57- 59 AU PUI WAN STREET,
SHATIN, N.T. HONG KONG
PROJECT: GROUND INVESTIGATION AND UTILITIES SURVEY
FOR TUEN MA EXTENSION

WORK ORDER: HK2117076
SUB BATCH: 1
LABORATORY: HONG KONG
DATE RECEIVED: 30- Apr- 2021
DATE OF ISSUE: 10- May- 2021
SAMPLE TYPE: SEDIMENT
NO. OF SAMPLES: 7

SPECIFIC COMMENTS

Sample(s) was/ were sampled by ALS staff. Sample(s) arrived laboratory in ambient condition. The result(s) related only to the item(s) tested. Result(s) were reported on dry weight basis. Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client. The results of particle size distribution were shown on next page. Test method: In- house method reference as BS 1377 part 2: 1990

GENERAL COMMENTS

This is the Final Report and supersedes any preliminary report with this batch number.

Mr Chan Siu Ming, Vico
Manager - Inorganics

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Page 1 of 3

CERTIFICATE OF ANALYSIS



Work Order: HK2117076
Sub-Batch: 1
Date of Issue: 10-May-2021
Client: TYSAN FOUNDATION LTD
Client Reference: GROUND INVESTIGATION AND UTILITIES SURVEY FOR TUEN MA EXTENSION

Particle Size Distribution

Sample	Lab no.	Total dry weight (gram)	Sieve Size							
			+2mm	+710µm	+300µm	+150µm	+106µm	+75µm	+63µm	-63µm
REFERENCE SEDIMENT	HK2117076-001	47.8	< 0.1	6.9	4.6	3.3	2.3	3.6	1.2	25.9
1530-TME-EDH507 17.10M-17.60M, 17.60M-18.10M	HK2117076-002	76.2	10.6	11.0	8.8	7.4	4.4	3.3	0.9	29.7
1530-TME-EDH507 19.10M-19.60M, 19.60M-20.10M	HK2117076-003	79.7	21.1	16.5	5.3	3.6	1.5	1.3	0.6	29.9

Percent Retained

Sample	Lab no.	Total dry weight (%)	Sieve Size							
			+2mm	+710µm	+300µm	+150µm	+106µm	+75µm	+63µm	-63µm
REFERENCE SEDIMENT	HK2117076-001	100.0	< 1	14.5	9.6	6.8	4.9	7.6	2.5	54.1
1530-TME-EDH507 17.10M-17.60M, 17.60M-18.10M	HK2117076-002	100.0	13.9	14.5	11.6	9.7	5.7	4.3	1.2	39.0
1530-TME-EDH507 19.10M-19.60M, 19.60M-20.10M	HK2117076-003	100.0	26.4	20.7	6.6	4.5	1.9	1.6	< 1	37.5

Cumulative Percentage Retained

Sample	Lab no.	Total dry weight (%)	Sieve Size							
			+2mm	+710µm	+300µm	+150µm	+106µm	+75µm	+63µm	-63µm
REFERENCE SEDIMENT	HK2117076-001	--	< 1	14.5	24.1	30.9	35.8	43.4	45.9	100.0
1530-TME-EDH507 17.10M-17.60M, 17.60M-18.10M	HK2117076-002	--	13.9	28.4	40.0	49.7	55.5	59.8	61.0	100.0
1530-TME-EDH507 19.10M-19.60M, 19.60M-20.10M	HK2117076-003	--	26.4	47.1	53.8	58.3	60.1	61.8	62.5	100.0

CERTIFICATE OF ANALYSIS



Work Order: HK2117076
 Sub-Batch: 1
 Date of Issue: 10-May-2021
 Client: TYSAN FOUNDATION LTD
 Client Reference: GROUND INVESTIGATION AND UTILITIES SURVEY FOR TUEN MA EXTENSION

Particle Size Distribution

Sample	Lab no.	Total dry weight (gram)	Sieve Size							
			+2mm	+710µm	+300µm	+150µm	+106µm	+75µm	+63µm	-63µm
1530-TME-EDH505 11.00M-11.50M, 11.50M-12.00M	HK2117076-004	77.5	6.0	12.7	9.0	7.2	3.1	1.9	0.6	36.9
1530-TME-MEDH614 0.50-0.95M	HK2117076-005	51.5	0.8	4.1	3.5	2.4	1.1	1.1	0.4	38.2
1530-TME-MEDH613 1.00-1.45M, 1.50-1.95M	HK2117076-006	64.8	4.4	5.4	2.2	0.8	0.6	0.8	0.4	50.3
1530-TME-EDH504 15.90-16.40M, 16.40-16.90M	HK2117076-007	76.0	8.1	10.6	9.9	8.8	3.7	2.6	0.9	31.4

Percent Retained

Sample	Lab no.	Total dry weight (%)	Sieve Size							
			+2mm	+710µm	+300µm	+150µm	+106µm	+75µm	+63µm	-63µm
1530-TME-EDH505 11.00M-11.50M, 11.50M-12.00M	HK2117076-004	100.0	7.8	16.4	11.6	9.3	4.0	2.5	< 1	47.6
1530-TME-MEDH614 0.50-0.95M	HK2117076-005	100.0	1.5	8.0	6.8	4.7	2.1	2.1	< 1	74.1
1530-TME-MEDH613 1.00-1.45M, 1.50-1.95M	HK2117076-006	100.0	6.7	8.4	3.3	1.2	< 1	1.2	< 1	77.6
1530-TME-EDH504 15.90-16.40M, 16.40-16.90M	HK2117076-007	100.0	10.6	13.9	13.0	11.6	4.9	3.4	1.1	41.3

Cumulative Percentage Retained

Sample	Lab no.	Total dry weight (%)	Sieve Size							
			+2mm	+710µm	+300µm	+150µm	+106µm	+75µm	+63µm	-63µm
1530-TME-EDH505 11.00M-11.50M, 11.50M-12.00M	HK2117076-004	--	7.8	24.2	35.8	45.1	49.1	51.6	52.4	100.0
1530-TME-MEDH614 0.50-0.95M	HK2117076-005	--	1.5	9.5	16.3	21.0	23.1	25.2	25.9	100.0
1530-TME-MEDH613 1.00-1.45M, 1.50-1.95M	HK2117076-006	--	6.7	15.1	18.5	19.7	20.6	21.8	22.4	100.0
1530-TME-EDH504 15.90-16.40M, 16.40-16.90M	HK2117076-007	--	10.6	24.5	37.6	49.2	54.1	57.5	58.7	100.0