

**Appendix H:
Toxicity Analysis.**

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12/6/20

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Shannon Town Centre, Shannon, Co.Clare, Ireland
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**CONFIDENTIAL REPORT
SHANNON AQUATIC TOXICITY LABORATORY**

Front Cover Report Sheet

Dept. Toxicity
Sheet no. 1 of 3 sheets

Tox F020 Ver. 2.2

Customer
Basta Parsons Ltd
Tubbercurry
Co. Sligo

Title
Toxicological analysis of a
sample

Attn: Mr. Mark Murphy

Report reference: 12T056

Order no.: 25453

Report by: Robert Hernan

Date received: 13.06.12

Approved by: Kathleen O' Rourke
Toxicologist

Copies to: R.6. Files

Date of issue: 19.06.12

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Test report relates only to the sample(s) tested


TOXICOLOGICAL ANALYSIS REPORT

Form No.: ToxF035-1 Ver 2.3

TEST RESULTS
Customer: Basta Parsons Ltd

Customer sample description: Basta, sample no.: 12-058, SW1,
12.06.12

Tox. Ref. No.: 12T056

Test Date: 13.06.12 - *Daphnia magna*
14.06.12 - *Vibrio fischeri*

Test Parameter	Test Results		95% Confidence Limits % vol./vol.	Method of Calculation
	Concentration % vol./vol.	Toxic Units		
48 h EC ₅₀ to <i>Daphnia magna</i>	49.8	2.0	42.9-58.0	Maximum Likelihood-Probit
30 min EC ₅₀ to <i>Vibrio fischeri</i>	>45	<2.2	n/a	n/a

Comments:
48 h EC₅₀ to *Daphnia magna*

100% mortality occurred at 100% vol./vol.
60% mortality occurred at 56% vol./vol.
10% mortality occurred at 32% vol./vol.
No mortality occurred at 18% vol./vol.

30 min EC₅₀ to *Vibrio fischeri*

Less than 34% light inhibition occurred at 45% vol./vol.
- compared to the control.

Test Method(s): (see Appendix on back of page 3)

Method 1: Freshwater crustacean, *Daphnia magna*

Method 2: Marine bacterium, *Vibrio fischeri*

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SHANNON
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TOXICOLOGICAL ANALYSIS REPORT

Form No.: ToxF035-2 Ver 2.4

SAMPLE INFORMATION

	SATL	Customer	Other
Sampled by:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Collected by:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Tox Ref. No.	12T056
Sampling procedure	n/a
Date of analysis	13.06.12
Storage conditions (°C)	3±3
Temperature (°C)	17.5
pH (at 17.4°C)	6.7
Dissolved oxygen (mg/l)	10.0
Dissolved oxygen (% saturation)	104
Conductivity (µS/cm at 25°C)	1089
Salinity (ppt at 20°C)	<1

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Appendix

Toxicity Test Methods and Procedures

1. Freshwater Crustacean

Method 6.1 based on ISO 6341:1996/Cor.1:1998: 'Water quality - Determination of the inhibition of the mobility of *Daphnia magna* Straus (Cladocera, Crustacea) - Acute toxicity test'

2. Marine Bacterium

Method 6.2 based on ISO 11348-3:2007: 'Water quality - Determination of the inhibitory effect of water samples on the light emission of *Vibrio fischeri* (Luminescent bacteria test) - Part 3: Method using freeze-dried bacteria'

3. Marine Copepod

Method 6.3 based on ISO 14669:1999: 'Water quality - Determination of acute lethal toxicity to marine copepods (*Copepoda*, Crustacea)'

4. Marine Algae

Method 6.4 based on ISO 10253:2006: 'Water quality - Marine algal growth inhibition test with *Skeletonema costatum* and *Phaeodactylum tricornutum*'

5. Freshwater Algae

Method 6.5 based on ISO 8692:2004 : 'Water quality - Freshwater algal growth inhibition test with unicellular green algae'

6. Freshwater Plant

Method 6.6 based on ISO 20079:2005: 'Water quality - Determination of the toxic effect of water constituents and waste water to duckweed (*Lemna minor*) - Duckweed growth inhibition test'

7. Marine Fish

Method 6.7 based on OECD 1992: Guideline 203: - 'Fish, acute toxicity test'

8. Freshwater Fish

Method 6.8 based on OECD 1992: Guideline 203: - 'Fish, acute toxicity test'

9. Estuarine Crustacean

Method 6.9 based on MAFF SOP No. BEG/030:1996: 'Brown Shrimp (*Crangon crangon*) 96 h acute toxicity for liquid effluents and wastes'

10. Sampling

Method based on ISO 5667-16:1998: 'Water quality - Sampling - Part 16: Guidance on biotesting of samples'

11. Eluate Generation

Procedure 4.7.8. "Eluate Generation" based on DIN 38 414 part 4, 1984: - 'Sludge and Sediments (Group S) - Determination of leachability by water (S4)'

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**CONFIDENTIAL REPORT
SHANNON AQUATIC TOXICITY LABORATORY**

Front Cover Report Sheet

Dept. Toxicity
 Sheet no. 1 of 3 sheets

Tox F020 Ver. 2.2

Customer
 Basta Parsons Ltd
 Tubbercurry
 Sligo

Title
 Toxicological analysis of a
 sample

Attn: Mr. Mark Murphy

Report reference: 11T076

Order no.: 24766

Date received: 22.06.11

Report by: Kathleen O' Rourke *KORourke*
 Robert Hernan *RHernan*

Approved by: Ann Harte *Ann Harte*
 Quality Manager

Copies to: R.6. Files

Date of issue: 30.06.11

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Test report relates only to the sample(s) tested



TOXICOLOGICAL ANALYSIS REPORT

Form No.: ToxF035-1 Ver 2.3

TEST RESULTS

Customer: Basta Parsons Ltd

Customer sample description: Sample 11-113, 21.06.11

Tox. Ref. No.: 11T076

Test Date: 22.06.11

Test Parameter	Test Results		95% Confidence Limits % vol./vol.	Method of Calculation
	Concentration % vol./vol.	Toxic Units		
48 h EC ₅₀ to <i>Daphnia magna</i>	>100	<1	n/a	n/a
30 min EC ₅₀ to <i>Vibrio fischeri</i>	>45	<2.2	n/a	n/a

Comments:**48 h EC₅₀ to *Daphnia magna***No *Daphnia* were immobilized at 100% vol./vol.**30 min EC₅₀ to *Vibrio fischeri***Less than 8% light inhibition occurred at 45% vol./vol.
- compared to the control.**Test Method(s): (see Appendix on back of page 3)**Method 1: *Daphnia magna*Method 2: *Vibrio fischeri*


TOXICOLOGICAL ANALYSIS REPORT

Form No.: ToxF035-2 Ver 2.3

SAMPLE INFORMATION

	SATL	Customer	Other
Sampled by:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Collected by:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Tox Ref. No.	111076
Sampling procedure	n/a
Date of analysis	22.06.11
Storage conditions (°C)	3±3
Temperature (°C)	19.6
pH (at 19.5°C)	7.4
Dissolved oxygen (mg/l)	9.3
Dissolved oxygen (% saturation)	100
Conductivity (µS/cm at 25°C)	1728
Salinity (ppt at 20°C)	<1

Toxicity Test Methods and Procedures

1. Freshwater Crustacean

Method 6.1 based on ISO 6341:1996/Cor.1:1998: 'Water quality - Determination of the inhibition of the mobility of *Daphnia magna* Straus (Cladocera, Crustacea) - Acute toxicity test'

2. Marine Bacterium

Method 6.2 based on ISO 11348-3:2007: 'Water quality - Determination of the inhibitory effect of water samples on the light emission of *Vibrio fischeri* (Luminescent bacteria test) - Part 3: Method using freeze-dried bacteria'

3. Marine Copepod

Method 6.3 based on ISO 14669:1999: 'Water quality - Determination of acute lethal toxicity to marine copepods (*Copepoda*, *Crustacea*)'

4. Marine Algae

Method 6.4 based on ISO 10253:2006: 'Water quality - Marine algal growth inhibition test with *Skeletonema costatum* and *Phaeodactylum tricornutum*'

5. Freshwater Algae

Method 6.5 based on ISO 8692:2004: 'Water quality - Freshwater algal growth inhibition test with unicellular green algae' [*Pseudokirchneriella subcapitata*]

6. Freshwater Plant

Method 6.6 based on ISO 20079:2005: 'Water quality - Determination of the toxic effect of water constituents and waste water to duckweed (*Lemna minor*) - Duckweed growth inhibition test'

7. Marine Fish

Method 6.7 based on OECD 1992: Guideline 203: - 'Fish, acute toxicity test'

8. Freshwater Fish

Method 6.8 based on OECD 1992: Guideline 203: - 'Fish, acute toxicity test'

9. Estuarine Crustacean

Method 6.9 based on MAFF SOP No. BEG/030:1996: 'Brown Shrimp (*Crangon crangon*) 96 h acute toxicity for liquid effluents and wastes'

10. Marine Amphipod

Method 6.10 based on ICES, No. 28, 2001: 'Biological effects of contaminants: *Corophium* sp. sediment bioassay and toxicity test'

11. Eluate Generation

Procedure 4.7.8. "Eluate Generation" based on DIN 38 414 part 4, 1984: - 'Sludge and Sediments (Group S) - Determination of leachability by water (S4)'



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Front Cover Report Sheet

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Sheet no. 1 of 3 sheets

Tox F020 Ver. 2.2

Customer
Basta Parsons Ltd
Tubbercurry
Co. Sligo

Title
Toxicological analysis of a
sample

Attn: Mr. Mark Murphy

Report reference: 10T064

Order no.: 24045

Report by: Kathleen O' Rourke

K O'Rourke

Date received: 16.06.10

Approved by: Robert Hernan
Toxicologist

R Hernan

Copies to: R.6. Files

Date of issue: 30.06.10

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TOXICOLOGICAL ANALYSIS REPORT

Form No.: ToxF035-1 Ver 2.1

TEST RESULTS**Customer:** Basta Parsons Ltd**Customer sample description:** Basta sample, 10-113, 15.06.10**Tox. Ref. No.:** 10T064**Test Date:** 16.06.10 - *Daphnia magna*
21.06.10 - *Vibrio fischeri*

Test Parameter	Test Results		95% Confidence Limits % vol./vol.	Method of Calculation
	Concentration % vol./vol.	Toxic Units		
48 h EC ₅₀ to <i>Daphnia magna</i>	80.5	1.2	74.2-87.2	Trimmed Spearman-Kärber
5 min EC ₅₀ to <i>Vibrio fischeri</i>	>45	<2.2	n/a	n/a
15 min EC ₅₀ to <i>Vibrio fischeri</i>	>45	<2.2	n/a	n/a

Comments:**48 h EC₅₀ to *Daphnia magna***80% of the *Daphnia magna* were immobilized at 100% vol./vol.**5,15 min EC₅₀ to *Vibrio fischeri***No light inhibition occurred at 45% vol./vol.
- compared to the control.**Test Method(s): (see Appendix on back of page 3)**Method 1: *Daphnia magna*Method 2: *Vibrio fischeri*

TOXICOLOGICAL ANALYSIS REPORT	Form No.: ToxF035-2 Ver 2.2
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SAMPLE INFORMATION

Sampled by:	SATL <input type="checkbox"/>	Customer <input checked="" type="checkbox"/>	Other <input type="checkbox"/>
Collected by:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Tox Ref. No.	10T064
Sampling procedure	n/a
Date of analysis	16.06.10
Storage conditions (°C)	3±3 - <i>D. magna</i> ≤ 20 - <i>V. fischeri</i>
Temperature (°C)	18.3
pH (at 18.5°C)	7.3
Dissolved oxygen (mg/l)	10.1
Dissolved oxygen (% saturation)	109
Conductivity (µS/cm at 25°C)	679
Salinity (ppt at 20°C)	<1

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