New England Bioassay
A Division of GZA

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

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CHRONIC AQUATIC TOXICITY TEST REPORT

Barnhardt Manufacturing Company
Colrain, MA

Ceriodaphnia dubia Survival and Reproduction Test – EPA 1002.0

EPA 821-R-02-013, "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms", Fourth Edition

Test Start Date: 7/10/17

Test Period: July 2017

Report Prepared by:

New England Bioassay
A division of GZA GeoEnvironmental
77 Batson Drive
Manchester CT, 06042

NEB Project Number: 05.0044654.00

Report Date: August 3, 2017

Report Submitted to:

Barnhardt Manufacturing Company
247 Main Road
Colrain, MA 01340

Sample ID: Effluent

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NEW ENGLAND BIOASSAY, A DIVISION OF GZA EPA TEST SUMMARY SHEET

Facility Name: Barnhardt Manufacturing Company Test Start Date: 7/10/17
NPDES Permit Number: MA0003697 Outfall Number: 001

Test Type	Test Species	Sample Type	Sample Method
_ Acute	_ Fathead Minnow	_ Prechlorinated	_ Grab
X Chronic	X Ceriodaphnia Dubia	_ Dechlorinated	X Composite
_ Modified (Chronic reporting LC50 values)	_ Daphnia Pulex	_ Unchlorinated	_ Flow-thru
	_ Mysid Shrimp	_ Chlorinated	_ Other
_ 24-Hour Screening	_ Sheepshead		
	_ Menidia		
	_ Sea Urchin	TRC conc. <0.001 mg/L	
	_ Selenastrum		
	_Other_____		

Dilution Water

X Receiving water collected at a point immediately upstream of or away from the discharge; (Receiving water name and sampling location: North River -see COC)

_ Alternate Surface Water of known quality and a hardness to generally reflect the characteristics of the receiving water; (Surface water name:_____)

_ Synthetic water prepared using either Millipore Mill-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water;

_ Artificial sea salts mixed with deionized water;

_ Other_____

Effluent Sampling Date (s): 7/9-10/17 7/11-12/17 7/13-14/17

Effluent Concentrations Tested (in%): 0% 6.25% 5.0% 12.5% 25% 50% 100%
* (Permit Limit Concentration): 5.0% (C-NOEC)

Was effluent salinity adjusted? No If yes, to what value? N/A ppt

Reference Toxicant test date: 7/5/17 Reference Toxicant Test Acceptable: YesX No _

Age and Age Range of Test Organisms < 24 hours Source of Organisms NEB Lab

TEST RESULTS &PERMIT LIMITS

Test Acceptability Criteria

A. Synthetic Water Control
Mean Control Survival: 100% Mean Control Reproduction: 33.8 young/female

B. Receiving Water Control
Mean Control Survival: 100% Mean Control Reproduction: 32.7 young/female

C. Lab Culture Control Yes_ No X
Mean Control Survival: N/A Mean Control Reproduction: N/A

D. Thiosulfate Control Yes_ No X
Mean Control Survival: N/A Mean Control Reproduction: N/A

Test Variability

Test PMSD (growth) N/A Upper and Lower PMSD bound N/A low__ in-bounds__ high__
Test PMSD (reprod.)15.0% Upper and Lower PMSD bound 13-47% low__ in-bounds X high__

Permit Limits & Test Results

	Limits		Results
LC50	100%	LC50	>100%
		Upper Value	+∞
		Lower Value	100%
		Data Analysis Method Used	Graphical
A-NOEC	N/A	A-NOEC	100%
C-NOEC	5.0%	C-NOEC	6.25%
		LOEC	12.5%
IC25	N/A	IC25	8.6%
IC50	N/A	IC50	12.5%

PMSD Comparison Discussion (Test Variability/Sensitivity)

Reproduction

_ 1. PMSD exceeds upper bounds. Test results are highly variable and may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC).

_ 1a. Test results indicate the discharge is not toxic at the PLC. Test is not sufficiently sensitive and must be repeated within 30 days of the initial test completion date using fresh samples.

_ 1b. Test results indicate the discharge is toxic at the PLC. Test results are considered acceptable and the test does not have to be repeated.

X 2. The PMSD falls within the upper (47%) and lower (13%) bounds. Results are reportable.

_ 3. PMSD falls below the lower bound test variability criterion. The test is very sensitive. The relative percent difference (RPD) between the control and each treatment was calculated and compared to the lower PMSD boundary

_ 3a. The RPD values for each concentration fall below the lower bound. The differences observed in this test are considered statistically insignificant.

_ 3b. The RPDs for the following concentrations are above the lower bound_____. The results at these concentrations are considered statistically significantly lower than controls.

Concentration-Response Evaluation

Survival: The concentration-response relationship observed in this data set corresponds to the following item number in Chapter Four of "Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)" EPA 821-B-00-004, July 2000:#7 Significant effects only at highest concentration.

Reproduction: The concentration-response relationship observed in this data set corresponds to the following item number in Chapter Four of "Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136", EPA 821-B-00-004, July 2000: #1 Ideal concentration-response relationship.

The concentration-response relationship was reviewed according to the above guidance document and the following determination was made:

Survival	Reprod.	
X	X	1. Results are reliable and reportable.
_	_	2. Results are anomalous. An explanation is provided in the body of the report.
_	_	3. Results are inconclusive. A retest with fresh samples is required. An explanation is provided in the body of the report.

Whole Effluent Toxicity Testing Report Conclusions and Notes

Client Name/Project: Barnhardt Manufacturing Company Test Date: 7/10/17

Sample ID: Effluent

Your results were as follows:

☒ Passed all whole effluent toxicity permit limits

☐ Failed the following permit limit(s): ☐ LC50 ☐ C-NOEC
Please proceed according to the instructions in your permit.

☐ Original Test Invalid – **Valid retest performed. Both test and retest results are attached.**

☐ A retest using fresh samples must be performed within 30 days of the initial test completion date (____) due to the test condition described below. See next page for further explanation.
☐ Test Invalid due to: ☐ Diluent toxicity ☐ Synthetic control toxicity
☐ Test not sufficiently sensitive. PMSD exceeds upper bound.
☐ Results are inconclusive due to an unusual concentration-response relationship.

☐ Available information is insufficient to determine whether this test passed or failed. Please compare results to your permit limits. Please submit a current copy of your permit to the GZA Lab so that we can determine the status of future tests results and help ensure your compliance with permit requirements.

☐ Additional testing for metals was required on the second and third effluent samples due to the following:
☐ Renewal sample(s) were of sufficient potency to cause lethality to 50% or more of the test organisms as follows: Effluent #: ☐ 2 ☐ 3 Concentration: ☐ 6.25% ☐ 12.5% ☐ 25% ☐ 50% ☐ 100% ☐ ____%
☐ The test failed to meet its permit limit for: ☐ LC50 ☐ C-NOEC

Diluent Toxicity:

☐ Testing ☐ will be or ☐ has been performed according to the Case 1 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water.

☐ Retesting ☐ will be or ☐ has been performed according to the Case 1 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water.

☐ This is your _____ case of dilution water toxicity. Please proceed according to the Case 2 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water. The alternate dilution water you select for future tests for this species should be described as follows: "synthetic laboratory water made up according to EPA's toxicity test protocols, by adding specified amounts of salts into deionized water in order to match the hardness of our receiving water." Writing this letter should help you to avoid retests in the future.

Sampling Requirements:
A minimum of 3 samples were collected. ☒ Yes. ☐ No. See explanation on next page.

Samples were first used within 36 hours of collection. ☒ Yes. ☐ No. See explanation on next page.

Dechlorination Procedures: Chlorine was measured using 4500 Cl.-G DPD Colorimetric Method.
☒ Dechlorination was not required.

☐ Sample was dechlorinated to _____ mg/L by adding sodium thiosulfate to the sample prior to test initiation. A dechlorinated control of diluent water spiked with sodium thiosulfate equal in proportion to the amount added to the effluent sample was included in the test series.

☐ Chlorine elevated due to interference. Chlorine was _____ mg/L after interference check.

☐ Total Residual Chlorine was re-measured following aeration, and was found to be ___ mg/L.

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Permittee)

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on _____ _____
[Date] [Authorized Signature]

_____
[Print or Type Name and Title]

_____
[Print or Type the Permittee's Name]

_____
[Print or Type the NPDES Permit No.]

Since the WET test and report check is complicated, the New England Bioassay, a division of GZA GeoEnvironmental, Inc. Aquatic Toxicity Laboratory has certified the validity of the WET test data in the section below. Please note that this does not relieve the permittee from its responsibility to sign and certify the report under 40 C.F.R. § 122.41(k).

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Bioassay Laboratory)

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on 8/3/17 _____ for Kim Wills
[Date] [Authorized Signature]

Kim Wills, Laboratory Manager
[Print or Type Name and Title]

New England Bioassay
[Print or Type Name of Bioassay Laboratory]

24. Telephone Contacts
If you have questions, please contact Joy Hilton, Water Technical Unit, at (617) 918-1877 or David McDonald, Ecosystem Assessment Unit, at (617) 918-8609.

NEW ENGLAND BIOASSAY TOXICITY DATA FORM
CHRONIC COVER SHEET

CLIENT: Barnhardt
ADDRESS: 247 Main Road
Colrain, MA 01340
SAMPLE TYPE: Barnhardt Industrial Effluent
DILUTION WATER: North River

C.dubia TEST ID # 17-1022
COC # C37-2648/49
PROJECT # 05.0044654.00

INVERTEBRATES

TEST SET UP (TECH INIT)	TBP
TEST SPECIES	*Ceriodaphnia dubia*
NEB LOT#	Cd17(RMH 120)
AGE	< 24 hours
TEST SOLUTION VOLUME (mls)	15
NO. ORGANISMS PER TEST CHAMBER	1
NO. ORGANISMS PER CONCENTRATION	10

Laboratory Control Water (CTRMH)

Batch Number	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$
CTR17-MH005	88	60

	DATE	TIME
TEST START:	7/10/17	1419
TEST END:	7/16/17	1341

Results of *Ceriodaphnia dubia* Chronic Test

		95% Confidence Limits
48 Hour LC50	>100%	100%±∞
7 Day LC50	84.1%	55.4%-127.6%
Survival NOEC	50%	
Survival LOEC	100%	
Reproduction NOEC	6.25%	
Reproduction LOEC	12.5%	
Reproduction IC_{25}	8.6%	

NOEC: NO OBSERVABLE EFFECT CONCENTRATIC LOEC: LOWEST OBSERVABLE EFFECT CONCENTRATION

Comments:

REVIEWD BY: DATE: 8/3/17

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Road, Colrain, MA 01340				
NEB PROJECT NUMBER:	05.0044654.00	NEB TEST NUMBER:	17-1022	COC #	C37-2648/49
TEST ORGANISM:	*Ceriodaphnia dubia*	AGE:	<24 hours	Lot #	Cd17(RMH 120)
START DATE:	7/10/17	TIME: 1419	END DATE: 7/16/17	TIME:	1341

Effluent Concentration	Culture Lot#	Cd17(RMH 120)										Total Live Young	# Live Adults	Analyst-Transfer	Analyst-Counts
	Cup #	A4	A5	A8	A10	A11	A12	A13	B3	B11	B12				
	Day Number	Replicate													
		A	B	C	D	E	F	G	H	I	J				
NEB Lab Synthetic Control	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10	TBP	
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10	TBP	
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	PD	
	3	4	7	6	2	4	3	4	4	5	5	44	10	KO	KO
	4	13	17	14	✓	12	✓	9	11	11	✓	87	10	PD	PD
	5	✓	✓	✓	12	✓	14	✓	✓	✓	12	38	10	PD	PD
	6	20	22	21	17	13	19	12	14	17	14	169	10	CB	CB
	7														
	totals	37	46	41	31	29	36	25	29	33	31	338	10		MG
North River Diluent		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	7	4	4	3	5	4	5	5	6	4	47	10		
	4	16	8	13	✓	9	✓	✓	✓	1	✓	47	10		
	5	✓	✓	✓	14	✓	12	9	11	14	12	72	10		
	6	16	10	19	16	16	15	14	19	19	17	161	10		
	7														
	totals	39	22	36	33	30	31	28	35	40	33	327	10		
5.0%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	3	3	1	4	3	5	4	7	3	4	37	10		
	4	12	13	14	✓	12	✓	8	✓	✓	✓	59	10		
	5	✓	✓	✓	11	✓	11	✓	12	14	9	57	10		
	6	22	17	19	16	16	15	13	14	20	17	169	10		
	7														
	totals	37	33	34	31	31	31	25	33	37	30	322	10		

Notes: _____

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Road, Colrain, MA 01340		
NEB PROJECT NUMBER:	05.0044654.00	ORGANISM: *Ceriodaphnia dubia*	START DATE: 7/10/17

Effluent Concentration	Day Number	Replicate A	B	C	D	E	F	G	H	I	J	Total Live Young	# Live Adults	Analyst Transfer	Analyst-Counts
6.25%	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	4	3	5	5	3	4	4	4	5	4	41	10		
	4	13	14	9	✓	11	✓	✓	13	2	10	72	10		
	5	✓	✓	✓	13	✓	11	9	✓	✓	✓	33	10		
	6	16	14	14	17	12	19	12	12	18	14	148	10		
	7														
	totals	33	31	28	35	26	34	25	29	25	28	294	10		
12.5%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	4	2	✓	4	5	5	3	2	4	3	32	10		
	4	14	5	✓	✓	10	✓	✓	10	7	✓	46	10		
	5	✓	✓	✓	9	✓	12	6	✓	✓	10	37	10		
	6	10	1	✓	✓	5	1	7	4	15	6	49	10		
	7														
	totals	28	8	0	13	20	18	16	16	26	19	164	10		
25%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	✓	✓	✓	✓	1	✓	✓	✓	✓	3	4	10		
	4	✓	✓	✓	✓	✓	✓	✓	x/✓	✓	✓	0	9		
	5	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	0	9		
	6	✓/x	✓	✓	✓	✓	✓	✓	X	✓/x	✓	0	7		
	7														
	totals	0	0	0	0	1	0	0	0	0	3	4	7		
50%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	5	✓	✓	x/✓	✓	✓	✓	✓	✓	✓	✓	0	9		
	6	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	0	9		
	7														
	totals	0	0	0	0	0	0	0	0	0	0	0	9		

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Road, Colrain, MA 01340		
NEB PROJECT NUMBER: 05.0044654.00	ORGANISM: *Ceriodaphnia dubia*	START DATE:	7/10/17

Effluent Concentration	Day Number	Replicate A	B	C	D	E	F	G	H	I	J	Total Live Young	# Live Adults	Analyst-Transfer	Analyst-Counts
100%	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	5	✓	x/✓	✓	✓	✓	✓	✓	x/✓	x/✓	✓	0	7		
	6	✓	X	✓	✓	✓/x	✓	✓/x	X	X	✓/x	0	4		
	7														
	totals	0	0	0	0	0	0	0	0	0	0	0	4		

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	07-9279-2687	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	18 Jul-17 11:16	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Batch ID:	16-3841-4401	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	10 Jul-17 14:19	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	16 Jul-17 13:41	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	5d 23h	**Source:**	In-House Culture	**Age:**	<24h

Sample ID:	12-3847-0744	**Code:**	49D19058	**Client:**	Barnhardt
Sample Date:	10 Jul-17 07:00	**Material:**	Industrial Effluent	**Project:**	
Receipt Date:	10 Jul-17 12:26	**Source:**	Barnhardt (BBA Fiberweb)		
Sample Age:	7h	**Station:**			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	926210	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	n/a	n/a	<1	n/a	n/a

2d Survival Rate Summary

			Calculated Variate(A/B)								
Conc-%	**Code**	**Count**	**Mean**	**Min**	**Max**	**Std Err**	**Std Dev**	**CV%**	**%Effect**	**A**	**B**
0	D	10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
5		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
6.25		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
12.5		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
25		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
50		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
100		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10

2d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

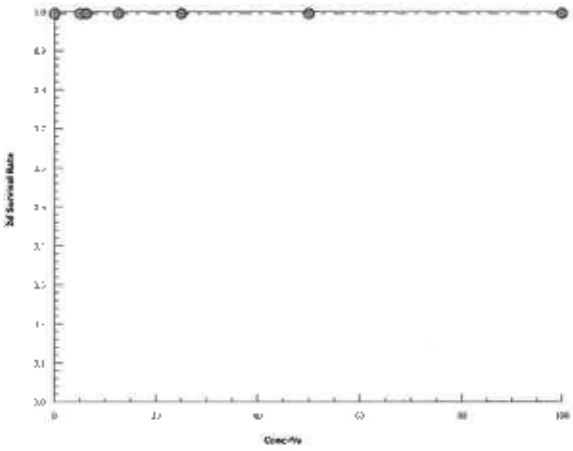
2d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	07-9279-2687	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	18 Jul-17 11:16	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — New England Bioassay

Analysis ID:	09-5683-1505	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.2
Analyzed:	18 Jul-17 11:17	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Batch ID:	16-3841-4401	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	10 Jul-17 14:19	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	16 Jul-17 13:41	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	5d 23h	**Source:**	In-House Culture	**Age:**	<24h

Sample ID:	12-3847-0744	**Code:**	49D19058	**Client:**	Barnhardt
Sample Date:	10 Jul-17 07:00	**Material:**	Industrial Effluent	**Project:**	
Receipt Date:	10 Jul-17 12:26	**Source:**	Barnhardt (BBA Fiberweb)		
Sample Age:	7h	**Station:**			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	208154	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits Lower	Upper	Overlap	Decision
Control Resp	32.7	15	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	8.594	7.138	9.949	11.64	10.05	14.01
IC50	12.54	10.56	15.34	7.975	6.52	9.469

Reproduction Summary

			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	32.7	22	40	1.687	5.334	16.31%	0.0%
5		10	32.2	25	37	1.114	3.521	10.94%	1.53%
6.25		10	29.4	25	35	1.166	3.688	12.54%	10.09%
12.5		10	16.4	0	28	2.583	8.168	49.80%	49.85%
25		10	0.4	0	3	0.3055	0.9661	241.50%	98.78%
50		10	0	0	0	0	0		100.0%
100		10	0	0	0	0	0		100.0%

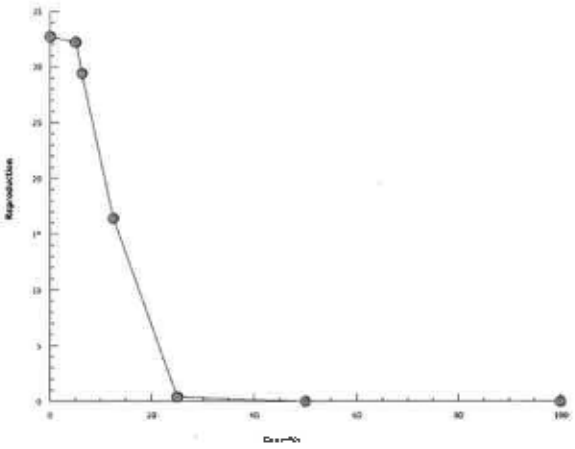
Reproduction Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	39	22	36	33	30	31	28	35	40	33
5		37	33	34	31	31	31	25	33	37	30
6.25		33	31	28	35	26	34	25	29	25	28
12.5		28	8	0	13	20	18	16	16	26	19
25		0	0	0	0	1	0	0	0	0	3
50		0	0	0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0	0	0

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	09-5683-1505	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.2
Analyzed:	18 Jul-17 11:17	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — New England Bioassay

Analysis ID:	16-7414-0117	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	18 Jul-17 11:17	**Analysis:**	Trimmed Spearman-Kärber	**Official Results:**	Yes

Batch ID:	16-3841-4401	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	10 Jul-17 14:19	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	16 Jul-17 13:41	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 23h	**Source:**	In-House Culture	**Age:**	<24h

Sample ID:	12-3847-0744	**Code:**	49D19058	**Client:**	Barnhardt
Sample Date:	10 Jul-17 07:00	**Material:**	Industrial Effluent	**Project:**	
Receipt Date:	10 Jul-17 12:25	**Source:**	Barnhardt (BBA Fiberweb)		
Sample Age:	7h	**Station:**			

Trimmed Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	LC50	95% LCL	95% UCL
Control Threshold	0	40.00%	1.925	0.09062	84.09	55.4	127.6

6d Survival Rate Summary

			Calculated Variate(A/B)								
Conc-%	**Code**	**Count**	**Mean**	**Min**	**Max**	**Std Err**	**Std Dev**	**CV%**	**%Effect**	**A**	**B**
0	D	10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
5		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
6.25		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
12.5		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
25		10	0.7000	0.0000	1.0000	0.1528	0.4830	69.01%	30.0%	7	10
50		10	0.9000	0.0000	1.0000	0.1000	0.3162	35.14%	10.0%	9	10
100		10	0.4000	0.0000	1.0000	0.1633	0.5164	129.10%	60.0%	4	10

6d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000
50		1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000

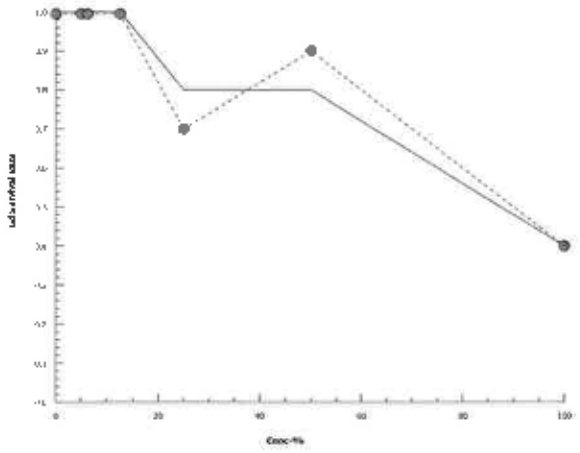
6d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	15-7414-0117	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	18 Jul-17 11:17	**Analysis:**	Trimmed Spearman-Kärber	**Official Results:**	Yes

Graphics



CETIS Analytical Report

Report Date: 18 Jul-17 11:17 (p 1 of 2)
Test Code: 17-1022 | 20-4469-5319

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	18-6967-5961	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	18 Jul-17 11:17	**Analysis:**	STP 2xK Contingency Tables	**Official Results:**	Yes

Batch ID:	16-3841-4401	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	10 Jul-17 14:19	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	16 Jul-17 13:41	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	5d 23h	**Source:**	In-House Culture	**Age:**	<24h

Sample ID:	12-3847-0744	**Code:**	49D19058	**Client:**	Barnhardt
Sample Date:	10 Jul-17 07:00	**Material:**	Industrial Effluent	**Project:**	
Receipt Date:	10 Jul-17 12:26	**Source:**	Barnhardt (BBA Fiberweb)		
Sample Age:	7h	**Station:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	50	100	70.71	2

Fisher Exact/Bonferroni-Holm Test

Control vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water	5	1.0000	Exact	1.0000	Non-Significant Effect
	6.25	1.0000	Exact	1.0000	Non-Significant Effect
	12.5	1.0000	Exact	1.0000	Non-Significant Effect
	25	0.1053	Exact	0.5263	Non-Significant Effect
	50	0.5000	Exact	1.0000	Non-Significant Effect
	100*	0.0054	Exact	0.0325	Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	D	10	0	10	1	0	0.0%
5		10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		7	3	10	0.7	0.3	30.0%
50		9	1	10	0.9	0.1	10.0%
100		4	6	10	0.4	0.6	60.0%

6d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000
50		1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000

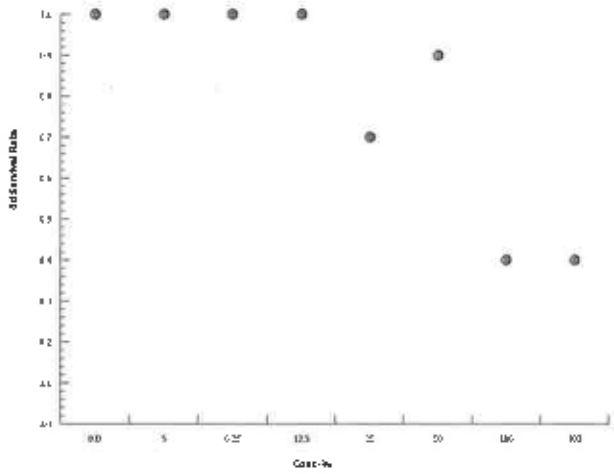
6d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		0/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	0/1	1/1
50		1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	0/1	1/1	1/1	0/1	1/1	0/1	0/1	0/1	0/1

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	18-6967-5961	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	18 Jul-17 11:17	**Analysis:**	STP 2xK Contingency Tables	**Official Results:**	Yes

Graphics



CETIS Analytical Report

Report Date:	18 Jul-17 11:17 (p 1 of 2)
Test Code:	17-1022 | 20-4469-5319

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	02-3916-5841	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.2
Analyzed:	18 Jul-17 11:17	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Batch ID:	16-3841-4401	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	10 Jul-17 14:19	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	16 Jul-17 13:41	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	5d 23h	**Source:**	In-House Culture	**Age:**	<24h

Sample ID:	12-3847-0744	**Code:**	49D19058	**Client:**	Barnhardt
Sample Date:	10 Jul-17 07:00	**Material:**	Industrial Effluent	**Project:**	
Receipt Date:	10 Jul-17 12:26	**Source:**	Barnhardt (BBA Fiberweb)		
Sample Age:	7h	**Station:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	6.25	12.5	8.839	16	15.02%

Steel Many-One Rank Sum Test

Control vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water	5	101	76	3	18	Asymp	0.6869	Non-Significant Effect
	6.25	84	76	4	18	Asymp	0.1595	Non-Significant Effect
	12.5*	57.5	76	1	18	Asymp	6.4E-04	Significant Effect
	25*	55	76	0	18	Asymp	3.1E-04	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits Lower	Upper	Overlap	Decision
Control Resp	32.7	15	>>	Yes	Passes Criteria
PMSD	0.1502	0.13	0.47	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	7709.68	1927.42	4	78.93	<1.0E-37	Significant Effect
Error	1098.9	24.42	45			
Total	8808.58		49			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	29.04	13.28	7.7E-06	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9389	0.9367	0.0121	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	32.7	28.88	36.52	33	22	40	1.687	16.31%	0.00%
5		10	32.2	29.68	34.72	32	25	37	1.114	10.94%	1.53%
6.25		10	29.4	26.76	32.04	28.5	25	35	1.166	12.54%	10.09%
12.5		10	16.4	10.56	22.24	17	0	28	2.583	49.80%	49.85%
25		10	0.4	-0.2911	1.091	0	0	3	0.3055	241.52%	98.78%
50		10	0	0	0	0	0	0	0		100.00%

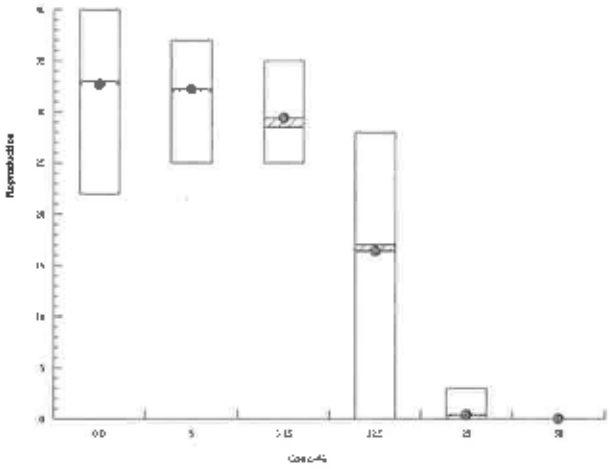
Reproduction Detail

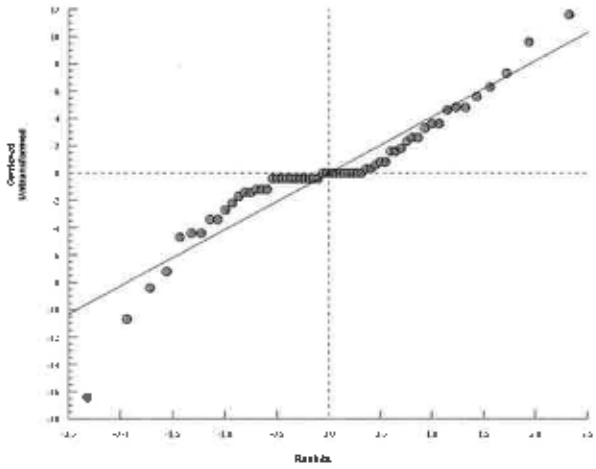
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	39	22	36	33	30	31	28	35	40	33
5		37	33	34	31	31	31	25	33	37	30
6.25		33	31	28	35	26	34	25	29	25	28
12.5		28	8	0	13	20	18	16	16	26	19
25		0	0	0	0	1	0	0	0	0	3
50		0	0	0	0	0	0	0	0	0	0

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	02-3916-5841	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.2
Analyzed:	18 Jul-17 11:17	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Road, Colrain, MA 01340							
NEB PROJECT NUMBER:	05.0044654.00			TEST ORGANISM			*Ceriodaphnia dubia*	
DILUTION WATER SOURCE:	North River			START DATE:			7/10/17	TIME: 1419
ANALYST	TBP	CB	PD	KO	CB	TBP		
NEB Lab Synthetic Control	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	25.1	25.5	24.9	25.1	24.8		
D.O. mg/L Initial	7.0	8.4	8.1	8.3	8.3	8.3		
pH s.u. Initial	7.6	7.8	7.5	7.5	7.8	7.3		
Conductivity µS Initial	358	355	355	356	331	333		
Temp °C Final	25.0	25.0	24.8	25.3	24.8	24.9		
D.O. mg/L Final	8.2	8.3	8.3	8.6	8.3	8.2		
pH s.u. Final	7.5	8.1	8.0	8.1	8.2	7.8		
Conductivity µS Final	379	367	370	372	346	353		
North River Diluent	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	25.4	25.5	25.1	24.4	24.6		
D.O. mg/L Initial	7.3	8.9	8.4	8.6	9.0	8.3		
pH s.u. Initial	7.7	7.8	7.3	7.4	7.6	7.5		
Conductivity µS Initial	107	110	104	105	106	107		
Temp °C Final	25.2	25.0	25.1	25.2	24.8	25.0		
D.O. mg/L Final	7.4	8.4	8.2	8.5	8.3	8.2		
pH s.u. Final	7.4	8.2	8.0	8.2	8.2	7.7		
Conductivity µS Final	133	132	119	121	133	140		
5.0%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	25.4	25.5	25.1	24.7	24.3		
D.O. mg/L Initial	7.4	8.9	8.4	8.9	8.8	8.8		
pH s.u. Initial	7.6	7.8	7.4	7.4	7.7	7.6		
Conductivity µS Initial	224	221	207	186	221	234		
Temp °C Final	25.4	25.0	25.1	25.3	24.6	25.0		
D.O. mg/L Final	7.5	8.4	8.2	8.6	8.4	8.2		
pH s.u. Final	7.5	8.1	8.0	8.2	8.2	7.9		
Conductivity µS Final	247	237	227	209	237	260		
6.25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	25.5	25.4	25.2	24.7	24.2		
D.O. mg/L Initial	7.5	9.0	8.4	8.9	8.9	8.8		
pH s.u. Initial	7.7	7.8	7.5	7.6	7.7	7.7		
Conductivity µS Initial	261	263	247	259	258	258		
Temp °C Final	25.3	25.0	25.3	25.8	24.7	24.8		
D.O. mg/L Final	7.7	8.4	8.2	8.7	8.4	8.2		
pH s.u. Final	7.7	8.1	8.1	8.4	8.3	8.1		
Conductivity µS Final	281	284	266	279	282	279		

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Road, Colrain, MA 01340							
NEB PROJECT NUMBER:	05.0044654.00			TEST ORGANISM			*Ceriodaphnia dubia*	
DILUTION WATER SOURCE:	North River			START DATE:			7/10/17 TIME:	1419
12.5%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	25.5	25.4	25.1	24.7	24.2		
D.O. mg/L Initial	7.4	8.9	8.4	8.9	8.9	8.8		
pH s.u. Initial	7.8	7.9	7.9	7.8	7.9	7.8		
Conductivity µS Initial	432	419	429	383	407	430		
Temp °C Final	25.4	25.0	25.4	25.9	24.7	24.9		
D.O. mg/L Final	7.8	8.5	8.3	8.8	8.4	8.3		
pH s.u. Final	8.0	8.3	8.3	8.5	8.5	8.4		
Conductivity µS Final	454	432	444	397	425	446		
25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	25.5	25.3	25.1	24.7	24.3		
D.O. mg/L Initial	7.5	8.9	8.3	8.8	8.9	8.8		
pH s.u. Initial	8.2	8.3	8.2	8.3	8.3	8.2		
Conductivity µS Initial	768	714	707	715	781	752		
Temp °C Final	25.4	25.0	25.5	26.0	24.7	24.8		
D.O. mg/L Final	7.8	8.4	8.4	8.8	8.4	8.4		
pH s.u. Final	8.2	8.4	8.6	8.7	8.8	8.7		
Conductivity µS Final	796	720	733	743	794	787		
50%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	25.5	25.2	25.1	25.0	24.3		
D.O. mg/L Initial	7.4	8.8	8.3	8.8	8.8	8.8		
pH s.u. Initial	8.4	8.5	8.3	8.5	8.5	8.5		
Conductivity µS Initial	1,304	1,317	1,302	1,302	1,350	1,374		
Temp °C Final	25.5	25.0	25.5	26.0	24.7	24.8		
D.O. mg/L Final	7.8	8.5	8.3	8.8	8.4	8.4		
pH s.u. Final	8.7	8.7	8.9	8.9	9.0	8.9		
Conductivity µS Final	1,294	1,354	1,314	1,304	1,416	1,375		
100%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	25.5	24.9	25.1	25.3	25.0		
D.O. mg/L Initial	7.3	8.8	8.0	8.8	8.8	8.7		
pH s.u. Initial	8.5	8.5	8.4	8.5	8.5	8.6		
Conductivity µS Initial	2,531	2,521	2,454	2,457	2,617	2,623		
Temp °C Final	25.5	25.2	25.5	26.0	24.7	24.8		
D.O. mg/L Final	7.7	8.2	8.2	8.7	8.3	8.4		
pH s.u. Final	9.0	9.0	9.1	9.1	9.1	9.1		
Conductivity µS Final	2,559	2,523	2,497	2,547	2,619	2,684		

Table of Random Permutations of 16 **C.dubia Test ID#** 17-1022

7	12	15	15	1	2	7	16	10	2	14	15	7	13	13	10	6	1	8	10
13	3	8	16	7	10	11	10	13	5	11	7	13	16	7	7	5	13	2	14
3	1	4	5	14	13	3	14	9	13	13	2	9	15	6	2	8	4	5	8
11	8	16	14	15	6	2	6	2	16	8	5	12	3	9	13	4	3	10	4
14	9	1	6	3	9	14	13	8	6	5	8	14	7	3	15	13	11	4	7
2	16	10	13	5	5	13	2	11	7	3	12	5	14	12	16	2	2	9	15
4	6	13	7	2	15	1	9	1	4	7	10	6	9	11	9	7	6	16	11
6	14	6	10	4	14	4	15	3	3	4	16	2	6	5	1	12	10	6	9
10	15	2	1	13	12	16	3	4	8	10	1	15	5	14	12	14	12	3	2
12	10	7	12	9	11	9	8	12	14	15	4	11	8	16	8	9	14	14	1
15	7	5	2	10	7	8	12	6	15	6	13	16	12	15	4	11	8	12	6
16	2	11	8	8	8	15	5	16	1	1	9	8	1	8	14	16	5	13	5
9	13	14	3	6	4	10	11	5	12	9	3	10	4	4	3	10	9	1	3
8	11	9	4	11	3	12	7	7	10	12	14	3	10	1	6	15	16	15	12
1	5	12	11	16	16	5	4	14	9	16	11	1	2	10	5	1	15	7	13
5	4	3	9	12	1	6	1	15	11	2	6	4	11	2	11	3	7	11	16
conc.																			
11	8	16	5	5	13	1	13	2	16	14	12	9	8	7	5	13	3	13	3
2	2	8	8	14	16	4	3	8	11	10	14	15	1	2	11	4	5	15	9
6	13	2	13	6	5	9	15	11	10	12	6	16	15	16	9	10	12	16	15
14	12	4	16	16	11	14	10	5	12	3	3	12	14	15	13	6	4	1	16
8	6	3	9	4	10	6	4	16	2	2	9	8	16	4	6	5	15	7	8
9	15	12	10	3	2	12	6	1	15	4	13	7	7	9	12	14	8	8	11
3	10	11	12	13	12	5	11	7	8	9	5	14	11	10	1	3	13	3	5
16	1	13	14	8	14	15	5	3	7	11	15	6	12	5	7	11	1	14	4
1	14	14	2	9	15	16	14	6	14	7	8	3	13	11	8	7	7	12	7
4	4	6	4	12	3	11	8	15	9	8	1	13	6	3	3	15	9	9	12
15	5	1	11	10	6	3	7	10	5	5	11	10	10	12	15	16	14	5	2
5	3	5	6	7	7	13	2	14	3	16	4	5	5	13	4	9	16	2	6
12	7	15	15	15	9	8	12	12	13	15	10	1	4	6	16	2	6	11	1
10	11	10	3	2	4	2	1	4	6	6	7	11	9	14	10	8	11	4	13
7	9	7	7	11	1	7	16	13	1	13	2	4	2	1	2	12	2	10	14
13	16	9	1	1	8	10	9	9	4	1	16	2	3	8	14	1	10	6	10
1	6	7	4	8	6	5	2	8	15	4	6	6	1	4	5	7	13	2	10
9	15	11	3	11	15	9	10	1	3	8	2	15	7	9	8	16	1	14	3
10	16	4	5	12	9	16	11	7	1	7	16	11	8	3	3	12	2	3	4
4	14	1	9	5	5	4	13	6	8	15	5	12	5	7	16	5	11	8	1
7	3	13	14	15	2	1	14	16	5	14	9	2	16	1	12	6	14	4	13
16	11	2	1	14	16	6	9	3	4	16	14	3	15	11	11	3	9	12	5
3	10	16	16	13	7	13	1	11	14	9	10	16	2	10	2	10	7	10	16
11	13	9	13	4	13	8	3	5	13	10	12	5	12	5	14	13	16	5	6
15	2	3	12	9	12	2	4	13	10	3	13	14	4	2	1	14	8	6	12
14	1	14	6	10	1	3	12	4	2	2	4	13	3	16	9	9	3	7	14
13	12	5	11	3	11	15	8	2	7	11	7	8	14	6	4	4	4	15	11
12	5	10	7	2	14	7	15	14	16	13	1	9	10	12	10	11	10	9	8
8	9	8	10	6	4	11	7	10	11	6	8	4	9	8	15	8	6	11	9
2	7	6	2	1	8	10	6	15	12	1	11	7	11	13	6	1	15	13	15
6	4	15	8	16	10	14	16	9	6	12	3	10	6	14	7	2	12	16	7
5	8	12	15	7	3	12	5	12	9	5	15	1	13	15	13	15	5	1	2
reps																			
13	4	10	4	16	13	16	13	5	3	6	14	1	16	8	7	2	3	3	12
5	14	4	6	8	2	15	1	13	14	16	4	15	4	3	12	12	1	4	7
2	2	2	15	14	16	9	12	16	6	10	15	14	9	10	1	14	8	8	16
7	12	15	8	12	3	5	14	7	12	5	13	16	1	7	5	11	2	9	3
6	9	7	14	9	14	10	11	15	11	12	1	12	12	14	16	3	11	11	8
14	5	16	7	10	8	11	8	14	13	7	11	6	3	11	4	4	6	6	9
15	11	8	9	7	12	8	7	1	15	9	3	3	7	13	11	10	4	5	1
11	6	6	1	4	1	3	16	12	5	4	9	13	13	6	8	15	9	1	14
4	10	3	16	2	11	7	9	6	9	1	8	4	11	5	2	16	10	12	4
1	8	1	13	1	15	4	4	11	4	2	16	5	8	1	9	5	12	16	6
9	7	14	2	6	4	14	10	9	8	15	10	7	10	9	10	6	14	10	11
12	1	9	10	15	5	2	15	10	2	14	2	8	2	4	13	8	5	15	5
3	3	12	11	5	9	6	6	3	10	13	12	9	6	2	15	7	15	7	13
10	15	11	5	13	7	12	5	2	7	11	5	10	15	12	3	1	13	13	10
8	13	13	3	3	10	13	2	4	1	8	6	11	14	15	6	9	16	2	2
16	16	5	12	11	6	1	3	8	16	3	7	2	5	16	14	13	7	14	15

NEW ENGLAND BIOASSAY
INITIAL CHEMISTRY DATA

CLIENT: Barnhardt
NEB JOB # 05.0044654.00
TEST ID # C.dubia 17-1022

DATE RECEIVED	7/10/17		7/12/17		7/14/17	
SAMPLE TYPE:	EFF #1	RIVER #1	EFF #2	RIVER #2	EFF #3	RIVER #3
COC #	C37-2648	C37-2649	C37-2696	C37-697	C37-2756	C37-2757
pH (SU)	8.3	7.8	8.5	7.5	8.5	7.5
Temperature (^{0}C)	4.2	4.7	7.6	5.2	4.7	4.3
Dissolved Oxygen (mg/L)	8.8	9.4	8.0	8.5	8.9	8.9
Conductivity (µmhos)	2,549	105	2,486	97	2,687	108
Salinity (ppt)	1	<1	1	<1	1	<1
TRC - DPD (mg/L)	<0.001	0.009	<0.001	0.004	<0.001	0.006
TRC - Amperometric (mg/L)	<0.05	NA	<0.05	NA	<0.05	NA
Hardness (mg/L as $CaCO_3$)	68	30	64	30	66	30
Alkalinity (mg/l as $CaCO_3$)	1,075	25	1,070	25	1,155	25
Tech Initials	CB	CB	TBP	TBP	TBP	TBP

NOTE: NA = NOT APPLICABLE

Data Reviewed By: [signature] Date Reviewed: 8/3/17

Ceriodaphnia dubia Culture Chart Lot # Cd 17 (BMH 120) A

Brood mother source: BMH 111 A10 Source's brood size: 25 (Qty.)

Barnhardt 7-10-17

Tech	AT	AT		AH	AT	SP	AH	AH		MG		SP	AH			
Date	6-29	6-30		7-2	7-3	7-4	7-5	7-6		7-7		7-9	7-10			
Day acc.	0	1	2	3	4	5	6	7		8	9	10	11	12	13	14
Cup # 1	N	N		N	5	10	N	Y	1	Y		Y	T1 Y 18			
2	N	N		N	5	9	N	Y	2	Y		Y	T2 Y 22			
3	N	N		N	5	9	N	Y	3	Y		Y	T3 Y 21			
4	N	N		N	5	9	N	Y	4	Y		Y	T1 Y 19			
5	N	N		N	4	10	N	Y	5	Y		Y	T2 Y 20			
6	N	N		N	6	11	N	Y	6	Y		Y	N			
7	N	N		N	5	12	N	Y	7	Y		Y	T4 Y 18			
8	N	N		N	5	9	N	Y	8	Y		Y	T3 Y 19			
9	N	N		N	4	9	N	Y	9	Y		Y	T5 Y 16			
10	N	N		N	6	9	N	Y	10	Y		Y	T4 Y 17			
11	N	N		N	4	8	N	Y	11	Y		Y	T5 Y 18			
12	N	N		N	5	10	N	Y	12	Y		Y	T6 Y 16			
13	N	N		N	5	10	N	Y	13	Y		Y	T7 Y 18			

Y = neonates present, and *criterion has been met:* ≥ 20 neonates produced in total by 3rd brood. **N** = no neonates

2B = two broods present. **2Y** = two broods and criterion met: ≥ 20 neos. by 3rd brood. **X** = brood mother dead **ae** = aborted eggs

✓ or **P** = neonates present after renewal on previous day (see time in log). **A→** = acceptable for acute testing only

T# = neonates used in test, replicate number of test noted (and brood counted) **acc.** = *if acclimated*, H_2O type used w/ renewal this day.

Test organism collection:

Project #	Symbols (✓ / P)	Tray diagram used? (Y/N)	Time period, neonates released	Collection date / time
00447203	T	Y	7-9-17/1530 → 7-9-17/1950	7-10-17/1050
00446654	T	Y	7-9-17/1630 → 7-9-17/1950	7-10-17/1120
	T			
	T			
	T			
	T			

Ceriodaphnia dubia Culture Chart Lot # Cd 17 (RMH 20) B

Brood mother source: RMH 111 B12 Source's brood size: 23 (qty.)

Bernhardt 7-10-17

Tech	AT	AT		AW	AT	SP	AW	AW		MG		SP	AW			
Date	6-29	6-30		7-2	7-3	7-4	7-5	7-6		7-7		7-9	7-10			
Day acc.	0	1	2	3	4	5	6	7		8	9	10	11	12	13	14
Cup # 1	N	N		N	6	9	N	Y	1	T1 4 14		Y	Y			
2	N	N		N	5	8	N	Y	2	T2 4 15		Y	T6 Y 17			
3	N	N		N	5	8	N	Y	3	T3 4 19		Y	(T8) Y 16			
4	N	N		N	5	8	Y	N	4	T4 4 18		Y	T7 Y 23			
5	N	N		N	6	9	Y	N	5	T5 4 20		Y	T8 Y 20			
6	N	N		N	6	10	N	Y	6	T6 4 18		Y	T9 Y 20			
7	N	N		N	4	9	N	Y	7	T7 4 15		Y	T10 Y 20			
8	N	N		N	5	10	Y	N	8	T8 4 17		Y	Y			
9	N	N		N	4	10	N	Y	9	4		Y	Y			
10	N	N		N	6	11	Y	N	10	T9 4 19		Y	Y			
11	N	N		N	6	9	N	Y	11	T10 4 15		Y	(T9) Y 19			
12	N	N		N	5	10	N	Y	12	4		Y	(T10) Y 18			
13	N	N		N	4	10	N	Y	13	4		Y	Y			

Y = neonates present, and *criterion has been met:* ≥ 20 neonates produced in total by 3rd brood. **N** = no neonates

2B = two broods present. **2Y** = two broods and criterion met: ≥ 20 neos. by 3rd brood. **X** = brood mother dead **ae** = aborted eggs

✓ or **P** = neonates present after renewal on previous day (see time in log). **A→** = acceptable for acute testing only

T# = neonates used in test, replicate number of test noted (and brood counted). **acc.** = *if acclimated*, H_2O type used w/ renewal **this** day.

Test organism collection:

Project #	Symbols (✓ / P)	Tray diagram used? (Y/N)	Time period, neonates released	Collection date / time
0045743	T	Y	7-7-17 0600-0830	7-7-17 / 1100
0044703	T	Y	7-9-17/1530 → 7-9-17/1950	7-10-17/1050
0044654	T	Y	7-9-17/1630 → 7-9-17/1950	7-10-17/1120
	T			
	T			
	T			

PHOENIX
Environmental Laboratories, Inc.

Wednesday, August 02, 2017

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: BARNHARDT MFG
Sample ID#s: BY55608 - BY55610

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Telephone (860) 645-1102 Fax (860) 645-0823

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

August 02, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		07/10/17	7:00
Location Code:	NEB	Received by:	LB	07/10/17	16:19
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22019				

Laboratory Data

SDG ID: GBY55608
Phoenix ID: BY55608

Project ID: BARNHARDT MFG
Client ID: EFFLUENT 1 C37-2648

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.063	0.005	mg/L	1	07/12/17	LK	E200.7
Calcium	14.8	0.005	mg/L	1	07/12/17	LK	E200.7
Cadmium	0.0005	0.0001	mg/L	1	07/12/17	RS	SM3113B
Chromium	0.003	0.001	mg/L	1	07/12/17	LK	E200.7
Copper	0.032	0.001	mg/L	1	07/12/17	LK	E200.7
Hardness (CaCO3)	74.3	0.1	mg/L	1	07/13/17		E200.7
Magnesium	9.07	0.005	mg/L	1	07/12/17	LK	E200.7
Nickel	0.006	0.001	mg/L	1	07/12/17	LK	E200.7
Lead	0.0003	0.0003	mg/L	1	07/13/17	RS	SM3113B
Zinc	0.059	0.001	mg/L	1	07/12/17	LK	E200.7
Alkalinity-CaCO3	1140	5.00	mg/L	1	07/11/17	BS/EG	SM2320B-97
Conductivity	2520	5.00	umhos/cm	1	07/11/17	BS/EG	SM2510B-97,-11
Ammonia as Nitrogen	0.24	0.05	mg/L	1	07/14/17	WHM	E350.1
Tot. Diss. Solids	1700	10	mg/L	1	07/11/17	CR/SD	SM2540C-97,-11
Tot. Org. Carbon	36.0	0.50	mg/L	1	07/12/17	EG	SM5310C/E415.1-co
Total Solids	1800	40	mg/L	4	07/11/17	CR/SD	SM2540B-97,-11
Total Metals Digestion	Completed				07/11/17	AG	

Project ID: BARNHARDT MFG
Client ID: EFFLUENT 1 C37-2648

Phoenix I.D.: BY55608

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
August 02, 2017
Reviewed and Released by: Deb Lawria, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

August 02, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		07/10/17	6:30
Location Code:	NEB	Received by:	LB	07/10/17	16:19
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22019				

Laboratory Data

SDG ID: GBY55608
Phoenix ID: BY55609

Project ID: BARNHARDT MFG
Client ID: RECEIVING WATER 1 C37-2649

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.024	0.005	mg/L	1	07/12/17	LK	E200.7
Cadmium	< 0.0001	0.0001	mg/L	1	07/12/17	RS	SM3113B
Copper	0.001	0.001	mg/L	1	07/12/17	LK	E200.7
Hardness (CaCO3)	26.5	0.1	mg/L	1	07/14/17		E200.7
Nickel	< 0.001	0.001	mg/L	1	07/12/17	LK	E200.7
Lead	< 0.0003	0.0003	mg/L	1	07/13/17	RS	SM3113B
Zinc	0.002	0.001	mg/L	1	07/13/17	LK	E200.7
Alkalinity-CaCO3	38.8	5.00	mg/L	1	07/11/17	BS/EG	SM2320B-97
Conductivity	108	5.00	umhos/cm	1	07/11/17	BS/EG	SM2510B-97,-11
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	07/14/17	WHM	E350.1
pH	7.31	1.00	pH Units	1	07/11/17 08:27	BS/EG	SM4500-H B-00
Tot. Org. Carbon	2.48	0.50	mg/L	1	07/12/17	EG	SM5310C/E415.1-00
Total Metals Digestion	Completed				07/11/17	AG	

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
August 02, 2017
Reviewed and Released by: Deb Lawrie, Project Manager

Ver 1

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

August 02, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		07/10/17	7:00
Location Code:	NEB	Received by:	LB	07/10/17	16:19
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22019				

Laboratory Data

SDG ID: GBY55608
Phoenix ID: BY55610

Project ID: BARNHARDT MFG
Client ID: EFFLUENT GRAB 1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	< 0.02	0.02	mg/L	1	07/10/17 19:29	O	SM4500CLG-97
pH	8.69	1.00	pH Units	1	07/11/17 08:30	BS/EG	SM4500-H B-00

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
August 02, 2017
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

August 02, 2017

QA/QC Data

SDG I.D.: GBY55608

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 393253 (mg/L), QC Sample No: BY55639 (BY55608, BY55609)													
Cadmium - Water	BRL	0.0001	0.0001	<0.0001	NC	105			95.4			75 - 125	20
Lead (Furnace) - Water	BRL	0.001	0.005	0.004	NC	102			85.5			75 - 125	30
QA/QC Batch 393255 (mg/L), QC Sample No: BY55988 (BY55608, BY55609)													
ICP Metals - Aqueous													
Aluminum	BRL	0.005	0.007	0.007	NC	85.7			98.7			75 - 125	20
Calcium	BRL	0.005	40.2	41.3	2.70	88.6			NC			75 - 125	20
Chromium	BRL	0.001	<0.001	<0.001	NC	90.0			95.5			75 - 125	20
Copper	BRL	0.003	0.010	0.010	NC	89.9			99.3			75 - 125	20
Magnesium	BRL	0.005	4.74	4.85	2.30	88.0			NC			75 - 125	20
Nickel	BRL	0.001	0.001	0.001	NC	90.1			95.9			75 - 125	20
Zinc	BRL	0.001	0.028	0.029	3.50	87.3			94.4			75 - 125	20

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

August 02, 2017

QA/QC Data

SDG I.D.: GBY55608

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 393104 (mg/L), QC Sample No: BY55256 (BY55610)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	94.1							
QA/QC Batch 393545 (mg/L), QC Sample No: BY55352 (BY55608, BY55609)													
Total Organic Carbon	BRL	1.0	10.7	11.1	3.70	101			99.0			85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 393214 (mg/L), QC Sample No: BY55352 (BY55608)													
Total Solids	BRL	10	420	420	0	100						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 393182 (mg/L), QC Sample No: BY55587 (BY55608)													
Tot. Diss. Solids	BRL	10	370	370	0	103						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 393197 (mg/L), QC Sample No: BY55594 (BY55608, BY55609)													
Alkalinity-CaCO3	BRL	5.00	134	129	3.80	109						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 393209 (umhos/cm), QC Sample No: BY55594 (BY55608, BY55609)													
Conductivity	BRL	5.00	1900	1900	0	100						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 393191 (pH), QC Sample No: BY55594 (BY55609, BY55610)													
pH				7.83		98.7						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 393714 (mg/L), QC Sample No: BY55625 (BY55608, BY55609)													
Ammonia as Nitrogen	BRL	0.05	0.30	0.31	NC	99.2			106			90 - 110	20

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
August 02, 2017

Wednesday, August 02, 2017
Criteria: None
State: MA

Sample Criteria Exceedances Report

GBY55608 - NEB

SampId	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedances. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedance information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

PHOENIX
Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac
NY # 11301

Analysis Comments

August 02, 2017 SDG I.D.: GBY55608

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

PHOENIX Environmental Laboratories, Inc.

CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: service@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 29° WLLTRB Pg of

Data Delivery (check one):
☐ Fax #:
☒ Email: kimberly.wills@gza.com
Format: ☐ Excel ☐ Pdf ☐ Gis Key

Customer: New England Bioassay
Address: 77 Batson Drive
Manchester, CT 06042

Project: Barnhardt Mfg (MA)
Report to: Kim Wills
Invoice to: Kim Wills

Project P.O: 22019
Phone #: 860-643-9560
Fax #: 860-646-7169

Client Sample - Information - Identification

Samplers Signature _____ Date _____

Matrix Code:
DW=drinking water WW=wastewater S=soil/solid O=other
GW=groundwater SL=sludge A=air

Analysis Request

Phoenix Sample #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Hardness (0.5 mg/L)	Alkalinity (2.0 mg/L)	Specific Conductance (--)	Total Solids (--)	Total Dissolved Solids (--)	Ammonia (0.1 mg/L)	Total Organic Carbon (0.5 mg/L)	Cd (AA), Pb (AA), Cu, Zn, Ni, Al	Total Residual Chlorine (0.02 mg/L)	pH (--)	Cr, Ca, Mg	Soil VOA Vials [ ] methanol [ ] Sod Bisulfate	GL Soil container ( ) oz	PL As is 250 ml	PL 120ml As is	GL Amber 120ml [ ] As is [X] H2SO4	PL As is [X] 500ml [ ] 1000ml	PL H2SO4 [X] 250ml [ ] 1000ml	PL HNO3 [X] 250ml [ ] 1000ml	PL NaOH 250ml	Bacteria Bottle
SS608	Effluent-1 C37-2648	WW	7/9-7/10/17	0700-0700	X	X	X	X	X	X	X	X			X					1	1	1	1			
SS609	Receiving Water-1 C37-2649	O	7/10/17	0630	X	X	X			X	X	X		X						1	1	1	1			
SS610	Effluent grab-1	WW	7/10/17	0700									X	X				1								

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	7-10-17	1540
[signature]	[signature]	7-10-17	1619

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other

* Surcharge Applies

Requirements for CT
☐ Res. Criteria
☐ GW Protection
☐ GA Mobility
☐ GB Mobility
☐ SW Protection
☐ Res. Vol.
☐ Ind. Vol.

Requirements for MA
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1
☐ S-2
☐ S-3
☐ MCP Certification
☐ Other

Comments, Special Requirements or Regulations:

Please see detection limits (MLs) listed next to each parameter above. Metals MLs are listed below:

Cd 0.0005 mg/L; Pb - 0.0005 mg/L; Cu - 0.003 mg/L; Zn - 0.005 mg/L; Ni - 0.005 mg/L; Al - 0.02 mg/L

Please CC. Melanie.Cruff@gza.com and Robin.Faulk@gza.com on reports

PHOENIX
Environmental Laboratories, Inc.

Wednesday, August 02, 2017

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: BARNHARDT MFG
Sample ID#s: BY57685 - BY57686

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Telephone (860) 645-1102 Fax (860) 645-0823

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

August 02, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		07/12/17	7:00
Location Code:	NEB	Received by:	SW	07/12/17	16:16
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22019				

Laboratory Data

SDG ID: GBY57685
Phoenix ID: BY57685

Project ID: BARNHARDT MFG
Client ID: EFFLUENT-2 C37-2696

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	0.36	0.10	mg/L	2	07/17/17	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
August 02, 2017
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

August 02, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		07/12/17	6:30
Location Code:	NEB	Received by:	SW	07/12/17	16:16
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22019				

Laboratory Data

SDG ID: GBY57685
Phoenix ID: BY57686

Project ID: BARNHARDT MFG
Client ID: RECEIVING WATER-2 C37-2697

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	0.06	0.05	mg/L	1	07/17/17	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services.
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Phyllis Shiller, Laboratory Director
August 02, 2017
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

August 02, 2017

QA/QC Data

SDG I.D.: GBY57685

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 393935 (mg/L), QC Sample No: BY57633 (BY57685, BY57686)													
Ammonia as Nitrogen	BRL	0.05	0.08	0.07	NC	96.8			97.7			90 - 110	20

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
August 02, 2017

Wednesday, August 02, 2017

Criteria: None

State: MA

Sample Criteria Exceedances Report

GBY57685 - NEB

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedances. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedance information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 646-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac
NY # 11301

Analysis Comments

August 02, 2017 SDG I.D.: GBY57685

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

WCIP

CHAIN OF CUSTODY RECORD

PHOENIX Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: service@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 4.0 Pg of

Data Delivery (check one):
☐ Fax #:
☒ Email: kimberly.wills@gza.com
Format: ☐ Excel ☐ Pdf ☐ Gis Key

Customer: New England Bioassay
Address: 77 Batson Drive
Manchester, CT 06042

Project: Bainhardt Mfg (MA)
Report to: Kim Wills
Invoice to: Kim Wills

Project P.O: 22019
Phone #: 860-643-9560
Fax #: 860-646-7169

Client Sample - Information - Identification

Sampler's Signature _____ Date _____

Matrix Code:
DW=drinking water WW=wastewater S=soil/solid O=other
GW=groundwater SL=sludge A=air

Analysis Request

Phoenix Sample #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Ammonia (0.1 mg/L)	pH (--)	Total Residual Chlorine (0.02 mg/L)	Soil VOA Vials [ ] methanol [ ] Sod Bisulfate	GL Soil container ( ) oz	PL As is 250 ml	PL As is 120ml	GL Amber 250ml [ ] As is [ ] H2SO4	PL As is 1000ml	PL H2SO4 [X] 250ml [ ] 1000ml	PL HNO3 [ ] 250ml [ ] 1000ml	PL NaOH 250ml	Bacteria Bottle
57685	Effluent-2 C37-2696	WW	7/11-12/17	0700-0700	X									1			
57686	Receiving Water-2 C37-2697	O	7/12/17	0630	X									1			
	~~Effluent Grab - 2~~					X	X										

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	7-12-17	1545
[signature]	[signature]	7-12-17	1616

Comments, Special Requirements or Regulations:

Please see detection limits (MLs) listed next to each parameter above

Please CC: Melanie.Cruff@gza.com and Robin.Faulk@gza.com on reports

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other

* Surcharge Applies

Requirements for CT
☐ Res. Criteria
☐ GW Protection
☐ GA Mobility
☐ GB Mobility
☐ SW Protection
☐ Res. Vol.
☐ Ind. Vol.

Requirements for MA
☐ GW-1
☐ GW 2
☐ GW-3
☐ S-1
☐ S-2
☐ S 3
☐ MCP Certification
☐ Other

PHOENIX
Environmental Laboratories, Inc.

Wednesday, August 02, 2017

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: BARNHARDT MFG
Sample ID#s: BY60371 - BY60372

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Telephone (860) 645-1102 Fax (860) 645-0823

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

August 02, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		07/14/17	7:00
Location Code:	NEB	Received by:	LB	07/14/17	16:17
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22019				

Laboratory Data

SDG ID: GBY60371
Phoenix ID: BY60371

Project ID: BARNHARDT MFG
Client ID: EFFLUENT 3 C37-2756

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	0.66	0.10	mg/L	2	07/21/17	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services.
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Phyllis Shiller, Laboratory Director
August 02, 2017
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

August 02, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		07/14/17	6:30
Location Code:	NEB	Received by:	LB	07/14/17	16:17
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22019				

Laboratory Data

SDG ID: GBY60371
Phoenix ID: BY60372

Project ID: BARNHARDT MFG
Client ID: RECEIVING WATER 3 C37-2757

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	0.10	0.05	mg/L	1	07/21/17	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
August 02, 2017
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

August 02, 2017

QA/QC Data

SDG I.D.: GBY60371

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 394558 (mg/L), QC Sample No: BY60397 (BY60371, BY60372)													
Ammonia as Nitrogen	BRL	0.05	0.44	0.45	2.20	101			103			90 - 110	20

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
August 02, 2017

Wednesday, August 02, 2017

Criteria: None

State: MA

Sample Criteria Exceedances Report

GBY60371 - NEB

Sample No	Accode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedances. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedance information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

PHOENIX

Environmental Laboratories, Inc.
687 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac
NY # 11301

Analysis Comments

August 02, 2017 SDG I.D.: GBY60371

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

PHOENIX Environmental Laboratories, Inc.

CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester CT 06040
Email: service@phoenixlabs.com Fax (860) 645 0823
Client Services (860) 645-8726

Temp Pg of

Data Delivery (check one):
- [ ] Fax #:
- [x] Email: kimberly.wills@gza.com

Format: [ ] Excel [ ] Pdf [ ] Gis Key

Customer: New England Bioassay
Address: 77 Batson Drive
Manchester, CT 06042

Project: Barnhardt Mfg (MA)
Report to: Kim Wills
Invoice to: Kim Wills

Project P.O: 22019
Phone #: 860-643-9560
Fax #: 860-646-7169

Client Sample - Information - Identification

Sampler's Signature _____ Date _____

Matrix Code:
DW=drinking water WW=wastewater S=soil/solid O=other
GW=groundwater SL=sludge A=air

Analysis Request

Phoenix Sample #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Ammonia (0.1 mg/L)	pH (-)	Total Residual Chlorine (0.02 mg/L)	Soil VOA Vials [ ] methanol [ ] Sod Bisulfate	GL Soil container ( ) oz	PL As is 250 ml	PL As is 120ml	GL Amber 250ml [ ] As is [ ] H2SO4	PL As is 1000ml	PL H2SO4 [X] 250ml [ ] 1000ml	PL HNO3 [ ] 250ml [ ] 1000ml	PL NaOH 250ml	Bacteria Bottle
60371	Effluent-3 C37-2756	WW	7/13-14/17	0700-0700	X								1				
60372	Receiving Water-3 C37-2757	O	7/14/17	0630	X								1				
	~~Effluent Grab 3~~					X	X										

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	7-14-17	1555
	Coparadise	7-14-17	1617

Comments, Special Requirements or Regulations:

Please see detection limits (MLs) listed next to each parameter above

Please CC: Melanie.Cruft@gza.com and Robin.Faulk@gza.com on reports

Turnaround:
- [ ] 1 Day*
- [ ] 2 Days*
- [ ] 3 Days*
- [x] Standard
- [ ] Other

* Surcharge Applies

Requirements for CT
- [ ] Res. Criteria
- [ ] GW Protection
- [ ] GA Mobility
- [ ] GB Mobility
- [ ] SW Protection
- [ ] Res. Vol.
- [ ] Ind. Vol.

Requirements for MA
- [ ] GW-1
- [ ] GW-2
- [ ] GW-3
- [ ] S-1
- [ ] S-2
- [ ] S-3
- [ ] MCP Certification
- [ ] Other

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

Sample Set #1

EFFLUENT

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X **Composite**
Sample ID: Effluent
Start Date: 7/9/17 Time: 7AM
End Date: 7/10/17 Time: 7AM

RECEIVING WATER

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X Grab
Sample ID: North River
Date Collected: 7/10/17
Time Collected: 6:30 AM

Sampling Method: X **Grab** (for pH and TRC only X)
Date Collected: 7/10/17
Time Collected: 7AM

Sample Type:
____ Prechlorinated
____ Dechlorinated
____ Unchlorinated
____ Chlorinated

Effluent Sampling Location and Procedures: Final effluent composite by Flow

Receiving Water Sampling Location and Procedures: North River above outfall behind building 119

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	[illegible]	Date:	7/10/17	Time:	10:32
Received By:	Chris Ro	Date:	7/10/17	Time:	10:32
Relinquished By:	Chris Ro	Date:	7/10/17	Time:	1226P
Received By: (NEB)	[illegible]	Date:	7/10/17	Time:	1226

Optional Information

Purchase Order # to reference on invoice:

Received ON ICE

FOR NEB USE ONLY

*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**

Temperature of Effluent Upon Receipt at Lab: 4.2 °C
Temperature of Receiving Water Upon Receipt at Lab: 4.7 °C

Effluent COC# C37-2648
Receiving Water COC# C37-2649

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

Sample Set #2

EFFLUENT

Sampler: Keith Gammell
Title: WWTP Operator
Facility: Barnhardt Manufacturing

Sampling Method: X Composite
Sample ID: Effluent
Start Date: 7/11/17 Time: 7 am
End Date: 7/12/17 Time: 7 am

RECEIVING WATER

Sampler: Keith Gammell
Title: WWTP Operator
Facility: Barnhardt Manufacturing

Sampling Method: X Grab
Sample ID: North River
Date Collected: 7/12/17
Time Collected: 6:30 Am

Sampling Method: _____ Grab (for pH and TRC only_____)
Date Collected: 7/12/17
Time Collected: 7AM

Sample Type:
_____ Prechlorinated
_____ Dechlorinated
_____ Unchlorinated
_____ Chlorinated

Effluent Sampling Location and Procedures: Final effluent composite by Flow

Receiving Water Sampling Location and Procedures: North River above outfall behind bowling (18

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	[signature]	Date: 7/12/17	Time: 1600
Received By:	[signature]	Date: 7/12/17	Time: 1000
Relinquished By:	[signature]	Date: 7/12/17	Time: 1142
Received By:	[signature]	Date: 7/12/17	Time: 1142

Optional Information

Purchase Order # to reference on invoice: _____

Received
ON ICE

FOR NEB USE ONLY

*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**

Temperature of Effluent Upon Receipt at Lab: 7.6 °C
Temperature of Receiving Water Upon Receipt at Lab: 5.2 °C

Effluent COC# C37-2696
Receiving Water COC# C37-2697

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

Sample set #3

EFFLUENT

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X **Composite**
Sample ID: Effluent
Start Date: 7/13/17 Time: 7AM
End Date: 7/14/17 Time: 7AM

RECEIVING WATER

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X Grab
Sample ID: North River
Date Collected: 7/14/17
Time Collected: 6:30AM

Sampling Method: _____ **Grab** (for pH and TRC only_____)
Date Collected: 7/14/17
Time Collected: 7AM

Sample Type:
_____ Prechlorinated
_____ Dechlorinated
_____ Unchlorinated
_____ Chlorinated

Effluent Sampling Location and Procedures: Final effluent composite by flow

Receiving Water Sampling Location and Procedures: North River above outfall behind bldg 119

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	[signature]	Date: 7/14/17	Time: 1000
Received By:	[signature]	Date: 7/14/17	Time: 1000
Relinquished By:	[signature]	Date: 7/14/17	Time: 1155
Received By:	[signature]	Date: 7/14/17	Time: 1155

Optional Information

Purchase Order # to reference on invoice: _____

Received
ON ICE

FOR NEB USE ONLY

*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**

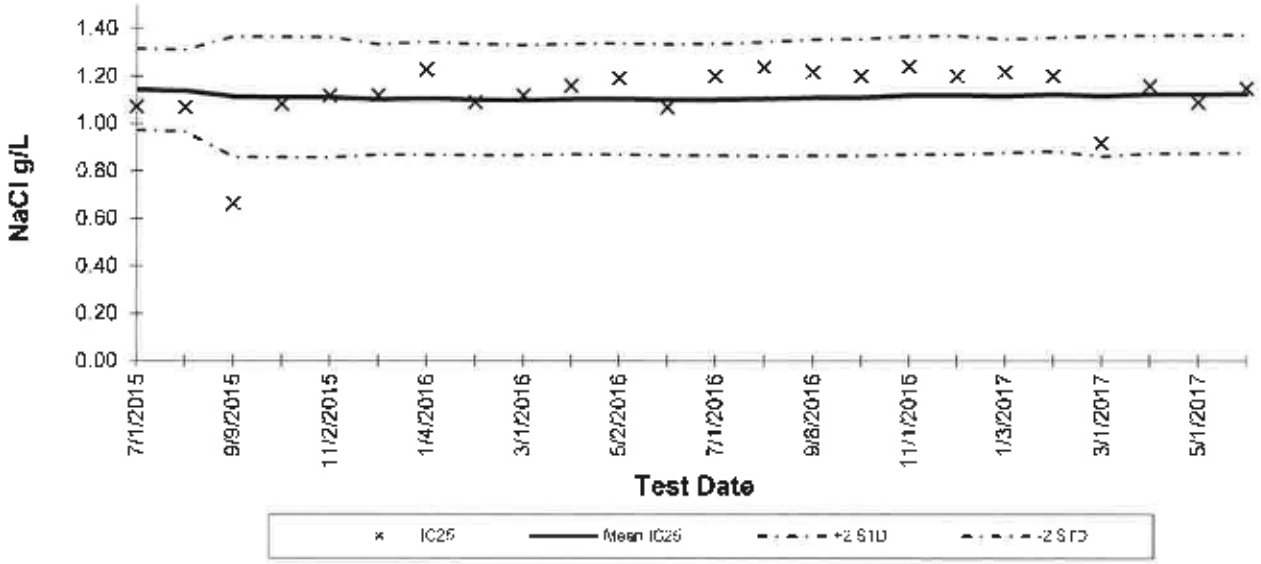
Temperature of Effluent Upon Receipt at Lab: 4.7 °C
Effluent COC# C37-2756

Temperature of Receiving Water Upon Receipt at Lab: 4.3 °C
Receiving Water COC# C37-2757

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042

New England Bioassay
Reference Toxicant Data: *Ceriodaphia dubia* Chronic Reproduction IC25

Reference Toxicant: Sodium chloride
Test Dates: July 2015 - July 2017



Test ID	Date	IC_{25}	Mean IC_{25}	STD	-2STD	+2STD	CV	CV National 75th%	CV National 90th%
15-955	7/1/2015	1.07	1.14	0.09	0.97	1.32	0.07	0.45	0.62
15-1211	8/3/2015	1.07	1.14	0.09	0.97	1.31	0.08	0.45	0.62
15-1375	9/9/2015	0.66	1.11	0.13	0.86	1.37	0.11	0.45	0.62
15-1540	10/1/2015	1.08	1.11	0.13	0.86	1.37	0.11	0.45	0.62
15-1691	11/2/2015	1.12	1.11	0.13	0.86	1.36	0.11	0.45	0.62
15-1897	12/28/2015	1.12	1.10	0.12	0.87	1.33	0.11	0.45	0.62
16-37	1/4/2016	1.23	1.11	0.12	0.87	1.34	0.11	0.45	0.62
16-138	2/1/2016	1.09	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-307	3/1/2016	1.12	1.10	0.12	0.87	1.33	0.11	0.45	0.62
16-463	4/1/2016	1.16	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-596	5/2/2016	1.19	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-707	6/1/2016	1.07	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-880	7/1/2016	1.20	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-1212	8/24/2016	1.24	1.10	0.12	0.86	1.34	0.11	0.45	0.62
16-1258	9/8/2016	1.22	1.11	0.12	0.87	1.35	0.11	0.45	0.62
16-1563	10/24/2016	1.20	1.11	0.12	0.87	1.36	0.11	0.45	0.62
16-1592	11/1/2016	1.24	1.12	0.12	0.87	1.37	0.11	0.45	0.62
16-1734	12/1/2016	1.20	1.12	0.13	0.87	1.37	0.11	0.45	0.62
17-14	1/3/2017	1.22	1.12	0.12	0.88	1.36	0.11	0.45	0.62
17-151	2/1/2017	1.20	1.12	0.12	0.88	1.36	0.11	0.45	0.62
17-267	3/1/2017	0.92	1.12	0.13	0.86	1.37	0.11	0.45	0.62
17-480	4/3/2017	1.16	1.12	0.12	0.87	1.37	0.11	0.45	0.62
17-616	5/1/2017	1.09	1.12	0.12	0.88	1.37	0.11	0.45	0.62
17-972	7/5/2017	1.15	1.13	0.12	0.88	1.37	0.11	0.45	0.62