PERFORMANCE EVALUATION

Scheduled Study

WP16-2

23-Mar-2016 Through 06-May-2016

RT2179

RTC Labcode

VA01116

EPA Labcode

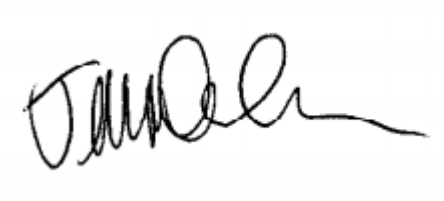
Participating Laboratory:

Coastal Bioanalysts, Inc
Pete DeLisle
6400 Enterprise Court
Gloucester VA 23061 US

Thank you for participating in study WP16-2. Additional information about this study may be found online at www.sigmaaldrich.com/pt.

Sigma-Aldrich RTC Inc.
2931 Soldier Springs Road
Laramie, WY 82070 USA
1-307-742-5452
www.sigmaaldrich.com

Sincerely,



Jennifer Duhon
Proficiency Testing Supervisor

Accreditors

Evaluations of this dataset will be sent to the accreditor(s) listed below using your laboratory's labcode listed above each accrediting agency. If any of the information listed below is incorrect, please contact RTC immediately.

Accredating Labcode
Kentucky DEP

Patrick Garrity
WP/WS
200 Fair Oaks Lane 4th Floor
Frankfort KY 40601 US

Accredating Labcode
Commonwealth of Virginia DGS-DCLS

Lab Certification
600 North 5th St.
Richmond VA 23219-3691 US

RTC is accrediated to perform PT programs for the scope of accredation to ISO/IEC 17043 under ANAB certificate AP-1469

Test Code 13 / EPA Method 2000

Method:EPA 2000.0 - Fathead minnow, 48-hr Acute, nonrenewal, MHSF 25°C (2002) [10213602]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Fathead Minnow Acute MHSF 25° - LC50 [1,2]	17.7 %	16.9	10.9 to 22.9	0.27	Acceptable
754 / WET013-1EA - Lot LRAB0728 /Analyst:AG/ Analysis Date: 2016-03-30	*Evaluation Criteria - 5* ☐*Voluntary*				*Evaluation Parameter - deviations:2*

Test Code 15 / EPA Method 1000

Method:EPA 1000.0 - Fathead minnow, 7-day Chronic, daily renewal, MHSF 25°C (2002) [10214207]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Fathead Minnow Chronic MHSF - Survival NOEC [1,2] 756 / WET015-1EA - Lot LRAB0729 /Analyst:GB/ Analysis Date: 2016-03-23	25 %	25	12.5 to 50	0	Acceptable
	Evaluation Criteria - 8 ☐*Voluntary*				*Evaluation Parameter - a:1, b:0, c:0, d:12.5*
Fathead Minnow Chronic MHSF - Growth IC25 (ON) [1,2] 808 / WET015-1EA - Lot LRAB0729 /Analyst:GB/ Analysis Date: 2016-03-23	36.6 %	50.3	28.7 to 71.9	-1.27	Acceptable
	Evaluation Criteria - 8 ☐*Voluntary*				*Evaluation Parameter - a:1, b:0, c:0, d:10.8*
Fathead Minnow Chronic MHSF - Growth NOEC (ON) [1,2] 810 / WET015-1EA - Lot LRAB0729 /Analyst:GB/ Analysis Date: 2016-03-23	25 %	25	12.5 to 50	0	Acceptable
	Evaluation Criteria - 8 ☐*Voluntary*				*Evaluation Parameter - a:1, b:0, c:0, d:6.25*

Test Code 19 / EPA Method 2002

Method:EPA 2002.0 - Ceriodaphnia dubia, 48-hr Acute, renewal, MHSF 25°C (2002) [10214809]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Ceriodaphnia Acute MHSF 25° - LC50 [1,2]	>100 %	88.5	33.9 to 143	-3.24	Acceptable
764 / WET019-1EA - Lot LRAB0730 /Analyst:PB/ Analysis Date: 2016-03-30	*Evaluation Criteria - 8* ☐*Voluntary*			*Evaluation Parameter - a:1, b:0, c:0, d:27.3*	

Test Code 21 / EPA Method 1002

Method:EPA 1002.0 - Ceriodaphnia dubia, 7-day Chronic, daily renewal, MHSF 25°C (2002) [10215006]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Ceriodaphnia Chronic MHSF - Survival NOEC [1,2] 766 / WET021-1EA - Lot LRAB0731 /Analyst:GB/ Analysis Date: 2016-03-29	50 % *Evaluation Criteria - 8* ☐ *Voluntary*	50	25 to 100	0 *Evaluation Parameter - a:1, b:0, c:0, d:25*	Acceptable
Ceriodaphnia Chronic MHSF - Reproduction IC25 [1,2] 767 / WET021-1EA - Lot LRAB0731 /Analyst:GB/ Analysis Date: 2016-03-29	59.2 % *Evaluation Criteria - 5* ☐ *Voluntary*	38.9	0 to 101	0.66 *Evaluation Parameter - deviations:2*	Acceptable
Ceriodaphnia Chronic MHSF - Reproduction NOEC [1,2] 768 / WET021-1EA - Lot LRAB0731 /Analyst:GB/ Analysis Date: 2016-03-29	50 % *Evaluation Criteria - 8* ☐ *Voluntary*	25	12.5 to 50	2 *Evaluation Parameter - a:1, b:0, c:0, d:12.5*	Acceptable

Test Code 32 / EPA Method 2021

Method:EPA 2021.0 - Daphnia magna, 48-hr Acute, nonrenewal, MHSF 25°C (2002) [10215415]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Daphnia Magna Acute MHSF 25° - LC50 [2]	<6.25 %	12.3	0 to 55.7	-0.57	Acceptable
788 / WET032-1EA - Lot LRAB0733 /Analyst:BA/ Analysis Date: 2016-04-07	*Evaluation Criteria - 5* ☒*Voluntary*				*Evaluation Parameter - deviations:2*

Test Code 42 / EPA Method 2007

Method:EPA 2007.0 - Mysid, 48-hr Acute, nonrenewal, 40-fath SW, 25°C (2002) [10216009]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Mysid Acute 40 F 25° - LC50 [1,2]	14.4 %	15.5	11.2 to 19.8	-0.52	Acceptable
798 / WET042-1EA - Lot LRAB0754 /Analyst:PB/ Analysis Date: 2016-03-31	*Evaluation Criteria - 8* ☐*Voluntary*			*Evaluation Parameter - a:1, b:0, c:0, d:2.13*	

Test Code 43 / EPA Method 1007

Method:EPA 1007.0 - Mysid, 7-day Chronic, daily renewal, 40-fathoms SW 26°C (2002) [10254009]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Mysid Chronic 40 F Survival NOEC [2] 799 / WET043-1EA - Lot LRAB0755 /Analyst:GB/ Analysis Date: 2016-03-30	100 % *Evaluation Criteria - 8* ☐ *Voluntary*	100	50 to 100	0	Acceptable *Evaluation Parameter - a:1, b:0, c:0, d:25.0*
Mysid Chronic 40 F Growth IC25 (ON) [2] 816 / WET043-1EA - Lot LRAB0755 /Analyst:GB/ Analysis Date: 2016-03-30	>100 % *Evaluation Criteria - 8* ☐ *Voluntary*	96.2	77.3 to 115	-10.19	Acceptable *Evaluation Parameter - a:1, b:0, c:0, d:9.44*
Mysid Chronic 40 F Growth NOEC (ON) [2] 818 / WET043-1EA - Lot LRAB0755 /Analyst:GB/ Analysis Date: 2016-03-30	100 % *Evaluation Criteria - 8* ☐ *Voluntary*	100	50 to 100	0	Acceptable *Evaluation Parameter - a:1, b:0, c:0, d:25*

Test Code 46 / EPA Method 2004

Method:EPA 2004.0 - Sheepshead Minnow, 48-hr Acute, nonrenewal, 40-fathoms SW 20°C (2002) [10216601]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Sheepshead Minnow Acute 40 F 25° - LC50 [2]	35.4 %	40.1	27.3 to 52.9	-0.74	Acceptable
804 / WET046-1EA - Lot LRAB0758 /Analyst:GB/ Analysis Date: 2016-04-09	*Evaluation Criteria - 8* ☐*Voluntary*			*Evaluation Parameter - a:1, b:0, c:0, d:6.39*	

Test Code 47 / EPA Method 1004

Method:EPA 1004.0 - Sheapshead Minnow, 7-day Chronic, daily renewal, 40-fathoms SW 25°C (2002) [10216805]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Sheepshead Minnow Chronic 40 F - Survival NOEC [2] 805 / WET047-1EA - Lot LRAB0759 /Analyst:PB/ Analysis Date: 2016-04-13	12.5 %	12.5 *Evaluation Criteria - 8* ☐*Voluntary*	6.25 to 25	0 *Evaluation Parameter - a:1, b:0, c:0, d:6.25*	Acceptable
Sheepshead Minnow Chronic 40 F - Growth IC25 (ON) [2] 820 / WET047-1EA - Lot LRAB0759 /Analyst:PB/ Analysis Date: 2016-04-13	13.8 %	10.2 *Evaluation Criteria - 8* ☐*Voluntary*	0 to 20.5	0.7 *Evaluation Parameter - a:1, b:0, c:0, d:5.14*	Acceptable
Sheepshead Minnow Chronic 40 F - Growth NOEC (ON) [2] 822 / WET047-1EA - Lot LRAB0759 /Analyst:PB/ Analysis Date: 2016-04-13	6.25 %	12.5 *Evaluation Criteria - 8* ☐*Voluntary*	6.25 to 25	-1 *Evaluation Parameter - a:1, b:0, c:0, d:6.25*	Acceptable

Sample Information

Fathead Minnow, 7Day, MHSF

WET015-1EA / Lot LRAB0729

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Fathead Minnow Chronic MHSF - Survival NOEC [1,2] 756 Test Code 15 / EPA Method 1000	%	25	37.5	15.8
Fathead Minnow Chronic MHSF - Growth IC25 (ON) [1,2] 808 Test Code 15 / EPA Method 1000	%	50.3	45.7	10.8
Fathead Minnow Chronic MHSF - Growth IC25 (SN) [1,2] 809 Test Code 15 / EPA Method 1000	%	55.6	0	0
Fathead Minnow Chronic MHSF - Growth NOEC (ON) [1,2] 810 Test Code 15 / EPA Method 1000	%	25	0	0
Fathead Minnow Chronic MHSF - Growth NOEC (SN) [1,2] 811 Test Code 15 / EPA Method 1000	%	25	0	0

Fathead Minnow Acute MHSF 25ºC

WET013-1EA / Lot LRAB0728

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Fathead Minnow Acute MHSF 25° - LC50 [1,2] 754 Test Code 13 / EPA Method 2000	%	14.4	16.9	3

Ceriodaphnia Acute MHSF 25ºC

WET019-1EA / Lot LRAB0730

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Ceriodaphnia Acute MHSF 25° - LC50 [1,2] 764 Test Code 19 / EPA Method 2002	%	88.5	53.6	62.8

Ceriodaphnia Chronic MHSF

WET021-1EA / Lot LRAB0731

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Ceriodaphnia Chronic MHSF - Survival NOEC [1,2] 766 Test Code 21 / EPA Method 1002	%	50	0	0
Ceriodaphnia Chronic MHSF - Reproduction IC25 [1,2] 767 Test Code 21 / EPA Method 1002	%	20.4	38.9	30.9
Ceriodaphnia Chronic MHSF - Reproduction NOEC [1,2] 768 Test Code 21 / EPA Method 1002	%	25	33.5	28.8

Daphnia Magna Acute MHSF 25ºC

WET032-1EA / Lot LRAB0733

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Daphnia Magna Acute MHSF 25° - LC50 [2] 788 Test Code 32 / EPA Method 2021	%	7.80	12.3	21.7

Mysid Acute 40 Fathoms Seawater 25ºC

WET042-1EA / Lot LRAB0754

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Mysid Acute 40 F 25° - LC50 [1,2] 798 Test Code 42 / EPA Method 2007	%	15.5	0	0

Mysid Chronic 40 Fathoms Seawater

WET043-1EA / Lot LRAB0755

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Mysid Chronic 40 F Survival NOEC [2] 799 Test Code 43 / EPA Method 1007	%	100	0	0
Mysid Chronic 40 F Growth IC25 (ON) [2] 816 Test Code 43 / EPA Method 1007	%	96.2	0	0
Mysid Chronic 40 F Growth IC25 (SN) [2] 817 Test Code 43 / EPA Method 1007	%		0	0
Mysid Chronic 40 F Growth NOEC (ON) [2] 818 Test Code 43 / EPA Method 1007	%	100	0	0
Mysid Chronic 40 F Growth NOEC (SN) [2] 819 Test Code 43 / EPA Method 1007	%		0	0

Sheepshead Minnow Acute 40 Fathoms Seawater 25ºC

WET046-1EA / Lot LRAB0758

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Sheepshead Minnow Acute 40 F 25° - LC50 [2] 804 Test Code 46 / EPA Method 2004	%	40.1	0	0

Sheepshead Minnow Chronic 40 Fathoms Seawater

WET047-1EA / Lot LRAB0759

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Sheepshead Minnow Chronic 40 F - Survival NOEC [2] 805 Test Code 47 / EPA Method 1004	%	12.5	0	0
Sheepshead Minnow Chronic 40 F - Growth IC25 (ON) [2] 820 Test Code 47 / EPA Method 1004	%	10.2	0	0
Sheepshead Minnow Chronic 40 F - Growth IC25 (SN) [2] 821 Test Code 47 / EPA Method 1004	%		0	0
Sheepshead Minnow Chronic 40 F - Growth NOEC (ON) [2] 822 Test Code 47 / EPA Method 1004	%	12.5	0	0
Sheepshead Minnow Chronic 40 F - Growth NOEC (SN) [2] 823 Test Code 47 / EPA Method 1004	%		0	0

Definitions and Interpretation of Statistical Analysis:

Assigned Value: Value attributed to a particular quantity and accepted, sometimes by convention, as having an uncertainty appropriate for a given purpose. See ISO/IEC 17043 for additional information. In general the assigned value is the value used to assess proficiency and may or may not be the made to value (gravimetric value).

Accept. Window: The range of values that constitute acceptable performance for a laboratory participating in this PT study.

Z: A Z-Score tells how a single data point compares to normal data. A Z-Score says not only whether a point was above or below average, but how unusual the measurement is. Generally, a method result with a Z-Score less than |2| is considered to be in control, a Z-Score between |2| and |3| is considered 'Questionable', but still within control and a Z greater than |3| is considered not acceptable and the method is out of control. For WS studies, a z-score greater than |2| is unacceptable. Calculated as **Z = (Reported Value - Assigned Value) / Proficiency Std. Dev.**

Proficiency Std. Dev.: Standard deviation calculated based on **Evaluation Criteria.**

Study Mean: Statistical study mean calculated using a robust statisitical model (RTC employs the 'Biweight Program'). Robust statistical techniques to minimize the influence that extreme results can have on estimates of the mean and standard deviation. NOTE - These techniques assign less weight to extreme results, rather than eliminate them from a data set.

Study Std. Dev.: Standard deviation calculated from study data using robust statisicals (Biweight).

Gravimetric Value: The 'prepared to' value, determined by gravimetric means. The uncertainty associated to this value is standard uncertainty and based on RTC's gravimetric tolerances.

Evaluation Criteria:

1 - Regression Equation - Acceptance windows based on TNI adopted equation of proficiency value +/- 3 proficiency standard deviations and check limits of proficiency value +/- 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c, & d as proficiency value = a * gravimetric + b and proficiency standard deviation = c * gravimetric + d.

2 - Study Robust Mean and c,d regression - Acceptance windows based on TNI adopted equation of proficiency value +/- 3 proficiency standard deviations and check limits of proficiency value +/- 2 proficiency standard deviations. Proficiency value and proficiency standard deviation calculated from robust study mean and variables c & d as proficiency value = robust mean and proficiency standard deviation = c * proficiency value + d.

3 - Fixed Limits - Acceptance windows based on span of gravimetric percentage from gravimetric as gravimetric +/- gravimetric * percentage.

4 - Adjustable Fixed Limits - Acceptance windows base on a span of gravimetric percentage from gravimetric as gravimetric +/- gravimetric * lowPercentage where gravimetric < break and gravimetric +/-

gravimetric * highPercentage where gravimetric >= break.

5 - Study Statistics - Acceptance windows based on a number of standard deviations span from the study mean as study mean +/- (deviations * standard deviation).

6 - Log Transform Statistics - Acceptance windows based on lognormal distributed data. Acceptance windows = mean(lognormal) +/- span * standard deviation(lognormal).

7 - Reserved

8 - Regression Equation 2SD - Acceptance windows based on EPA equation of proficiency value +/- 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c, & d as proficiency value = a * gravimetric + b and proficiency standard deviation = c * gravimetric + d. Generally reserved for drinking water studies.

Proficiency Test Item Preparation, Homogeneity and Stability Assessment - RTC uses proprietary and published methods for the manufacture, homogeneity and stability testing of proficiency test items. RTC's proficiency test materials meet requirements of ISO Guide 34. For more information contact RTC. Additionally RTC complies with TNI Volume 3 'General Requirements for Environmental Proficiency Test Providers', EL-V3-2009, 2009 for all TNI Fields of Proficiency Testing analytes.

Metrological Traceability - All preparations are made using balances calibrated annually traceable to NIST standards. Where appropriate analytical measurements are traceable through an unbroken chain to NIST standards, or a Certified Reference Material manufactured under ISO Guide 34 in conjunction with ISO/IEC 17025.

Statistical Analysis - RTC uses robust statistics to calculate study means and standard deviations - Reference - Kafadar, K, A Biweight Approach to the One-Sample Problem, Journal of the American Statistical Association, Vol. 77, No. 378, June, 1982, pp. 416-424.

Additional Information - Go to www.rt-corp.com/reporting for additional information on summary statistics for specific methods, advice on the interpretation of the statistical analysis, and additional comments/recommendations. If you failed an analyte it may be required to perform a corrective action and/or retest. RTC recommends that you contact your accreditation body for specific instruction.

Program analyte accrediting footnotes

[1] NELAC Compliant, covered by RTC's ANAB Proficiency Testing Provider accreditation, Cert. AP-1469

[2] ISO 17043 Accredited, covered by RTC's ANAB Proficiency Testing Provider accreditation, Cert AP-1469

Authorizing Officer: 

Date: 5/19/2016

Patrick Brumfield, ASQ CQA

QA Manager

This section of the report is for informational purposes only. If you are unsure about specific accreditation requirements, please contact your state coordinator.

UNACCEPTABLE ANALYTES

PASS RATE

Number of Reported Results:	17
Number of Passing Results:	17
Pass Rate:	100%