ATTACHMENT 2: DATA VALIDATION REPORTS

This attachment contains the data validation reports performed by an independent subcontractor, Laboratory Data Consultants, Inc. (LDC) of Carlsbad, California.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Tidewater, Inc.
3761 Attucks Drive
Powell, OH 43065
ATTN: Mr. David Conner
David.Conner@tideh2o.net

September 27, 2022

SUBJECT: NASA JPL, 2Q2022 - Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on June 22, 2022. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #54408:

SDG #	Fraction
2210766	Volatiles, 1,2,3-Trichloropropane, Metals, Wet Chemistry

The data validation was performed under Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017)
- USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017)

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

210 pages-ADV

Attachment 1

90/10 III/IV (client select) EDD

LDC# 54408 (Tidewater - Powell, OH / NASA JPL, 2Q2022)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (524.2)		1,2,3-TCP (524M)		Metals (200.7 /200.8)		Alk. (2320B)		Cl,SO_4 NO_3-N (300.0)		NO_2-N (353.2)		Cr(VI) (218.6)		CLO_4 (314.0)		TDS (160.1)		pH (150.1)															
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	2210766	06/22/22	07/14/22	5	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0														
Total	T/PG			5	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS/MSD, and DUPs

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: July 28, 2022

Parameters: Volatiles

Validation Level: Level III

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210766

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-10-05062022	2210766-01	Water	05/16/22
MW-20-3	2210766-02	Water	05/16/22
MW-20-2	2210766-03	Water	05/16/22
Dup-8-2Q22	2210766-04	Water	05/16/22
EB-10-050622	2210766-05	Water	05/16/22

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0% with the following exceptions:

Date	Analyte	%RSD	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	0.989 (≥0.990)	All samples in SDG 2210766	UJ (all non-detects)	P

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
04/04/22 (1446)	Methyl iodide	38.7	All samples in SDG 2210766	UJ (all non-detects)	P

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
05/09/22 (1913)	Pentachloroethane	52.4	MW-20-3 MW-20-2	UJ (all non-detects)	P
05/10/22 (0700)	Bromomethane	31.7	TB-10-05062022 Dup-8-2Q22 EB-10-050622	UJ (all non-detects)	P
05/10/22 (0724)	Pentachloroethane	96.2	TB-10-05062022 Dup-8-2Q22 EB-10-050622	UJ (all non-detects)	P

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample TB-10-05062022 was identified as a trip blank. No contaminants were found.

Sample EB-10-05062022 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-20-2 and Dup-8-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-20-2	Dup-8-2Q22	
1,2-Dichloroethane	0.43	0.65	41
Tetrachloroethene	0.28	0.37	28
Trichloroethene	0.34	0.51	40

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to IC %RSD, ICV %D, and continuing calibration %D, data were qualified as estimated in five samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Volatiles - Data Qualification Summary - SDG 2210766

Sample	Analyte	Flag	A or P	Reason
TB-10-05062022 MW-20-3 MW-20-2 Dup-8-2Q22 EB-10-050622	Methyl Iodide	UJ (all non-detects)	P	Initial calibration (%RSD)
TB-10-05062022 MW-20-3 MW-20-2 Dup-8-2Q22 EB-10-050622	Methyl Iodide	UJ (all non-detects)	P	Initial calibration verification (%D)
MW-20-3 MW-20-2 TB-10-05062022 Dup-8-2Q22 EB-10-050622	Pentachloroethane	UJ (all non-detects)	P	Continuing calibration (%D)
TB-10-05062022 Dup-8-2Q22 EB-10-050622	Bromomethane	UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 2Q2022
Volatiles - Laboratory Blank Data Qualification Summary - SDG 2210766

No Sample Data Qualified in this SDG

LDC #: 54408A1a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/21/22
SDG #: 2210766 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: fh
2nd Reviewer: AL

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / Δ	
II.	GC/MS Instrument performance check	Δ	
III.	Initial calibration/ICV	SW / SW	% RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks	Δ	
VI.	Field blanks	ND	TB = 1 EB = 5
VII.	Surrogate spikes	Δ	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	SW	D = 3, 4
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	Δ	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	TB-10-05062022	2210766-01	Water	05/16/22
2	MW-20-3	2210766-02	Water	05/16/22
3	MW-20-2	2210766-03	Water	05/16/22
4	Dup-8-2Q22	2210766-04	Water	05/16/22
5	EB-10-050622	2210766-05	Water	05/16/22
6				
7				
8				
9				

Notes:

1	B139141-BLK1						
2	B139142-BLK1						

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54408A1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?

Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?

Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____

Y N N/A Did the initial calibration meet the acceptance criteria?

Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15, 20, 15 RSD% and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: 20)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	4/4/22	ICAL	Methyl Iodide		0.989 (I 0.990)	all	J/UJ/P ND

LDC #: 54408 A1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?

Y N N/A Were all %D within the validation criteria of ≤20 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0% / 30%)	Associated Samples	Qualifications
	4/4/22 1446	ICV	Methyl Iodide	38.7	All	J|W|P ND

LDC #: 54408A1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤30 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	5/9/22	2208845-ccv2	Pentachloroethane	52.4		3, 3	J/UJ/P ND
	~~1848~~						
	1913						
	5/10/22	2208850-ccv1	B	31.7		1, 4, 5	J/UJ/P ND
	0700					B139141-BLK	
	5/10/22	2208850-ccv2	Pentachloroethane	96.2		↓	J/UJ/P ND
	0724						
	5/10/22	2208850-ccv4	Methyl Iodide	50.1		B139142-BLK1	J/UJ/P ND
	1940		Pentachloroethane	79.8		↓	

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LDC #: 54408A16

VALIDATION FINDINGS WORKSHEET
Field Duplicates

METHOD: ___ GC ___ HPLC 524.2

Y N N/A Were field duplicate pairs identified in this SDG?

Y N N/A Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ug/L)		%RPD Limit (≤ %)	Qualification (Parent only)
	~~2~~ 3	~~3~~ 4		
K	0.43	0.65	41	
AA	0.28	0.37	28	
S	0.34	0.51	40	

Compound	Concentration ( )		%RPD Limit (≤ %)	Qualification (Parent only)

Compound	Concentration ( )		%RPD Limit (≤ %))	Qualification (Parent only)

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: July 28, 2022

Parameters: 1,2,3-Trichloropropane

Validation Level: Level III

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210766

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-20-3	2210766-02	Water	05/16/22
MW-20-2	2210766-03	Water	05/16/22
Dup-8-2Q22	2210766-04	Water	05/16/22
EB-10-050622	2210766-05	Water	05/16/22

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,2,3-Trichloropropane by Environmental Protection Agency (EPA) Method 524 Modified

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB-10-050622 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-20-2 and Dup-8-2Q22 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Data Qualification Summary - SDG 2210766

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Laboratory Blank Data Qualification Summary - SDG 2210766

No Sample Data Qualified in this SDG

LDC #: 54408A1b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/21/22
SDG #: 2210766 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: QF
2nd Reviewer: QF

METHOD: GC/MS 1,2,3-Trichloropropane (EPA Method 524M)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = 4
VII.	Surrogate spikes	AN	not required
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D = 2, 3
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	MW-20-3	2210766-02	Water	05/16/22
2	MW-20-2	2210766-03	Water	05/16/22
3	Dup-8-2Q22	2210766-04	Water	05/16/22
4	EB-10-050622	2210766-05	Water	05/16/22
5				
6				
7				
8				
9				

Notes:

	B139271						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: September 23, 2022

Parameters: Metals

Validation Level: Level III

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210766

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-20-3	2210766-02	Water	05/16/22
MW-20-2	2210766-03	Water	05/16/22
Dup-8-2Q22	2210766-04	Water	05/16/22
EB-10-050622	2210766-05	Water	05/16/22

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Calcium, Chromium, Iron, Lead, Magnesium, Potassium, and Sodium by Environmental Protection Agency (EPA) Method 200.7 and 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Calcium Magnesium	0.017580 mg/L 0.023540 mg/L	EB-10-050622

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-10-050622	Calcium Magnesium	0.030 mg/L 0.035 mg/L	0.030U mg/L 0.035U mg/L

VI. Field Blanks

Sample EB-10-050622 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-10-050622	05/06/22	Calcium Magnesium	0.030 mg/L 0.035 mg/L	MW-20-3 MW-20-2 Dup-8-2Q22

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples MW-20-2 and Dup-8-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	MW-20-2	Dup-8-2Q22	
Calcium	85	83	2

Analyte	Concentration (mg/L)		RPD
	MW-20-2	Dup-8-2Q22	
Manganese	30	29	3
Sodium	21	21	0
Potassium	3.0	2.9	3

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

XIII. Target Analyte Quantitation

Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to laboratory blank contamination, data were qualified as not detected in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Metals - Data Qualification Summary - SDG 2210766

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
Metals - Laboratory Blank Data Qualification Summary - SDG 2210766

Sample	Analyte	Modified Final Concentration	A or P
EB-10-050622	Calcium Magnesium	0.030U mg/L 0.035U mg/L	A

NASA JPL, 2Q2022
Metals - Field Blank Data Qualification Summary - SDG 2210766

No Sample Data Qualified in this SDG

LDC #: 54408A4a **VALIDATION COMPLETENESS WORKSHEET** Date: 9/22/22
SDG #: 2210766 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: LN
2nd Reviewer: Q

METHOD: Metals (EPA Method 200.7/200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB: 4
VII.	Matrix Spike/Matrix Spike Duplicates	N	
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	D: (2,3)
XII.	Internal Standard (ICP-MS)	A	
XIII.	Target Analyte Quantitation	N	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	MW-20-3	2210766-02	Water	05/16/22
2	MW-20-2	2210766-03	Water	05/16/22
3	Dup-8-2Q22	2210766-04	Water	05/16/22
4	EB-10-050622	2210766-05	Water	05/16/22
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

Notes:

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Reviewer: LN

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-4	Fe, Cr, Pb, As, Ca, Mg, Na, K

Analysis Method

ICP	
ICP-MS	
CVAA	

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: LN

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 4

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	4								
Ca	0.017850		0.10	0.030 U								
Mg	0.023540		0.050	0.035 U								

Comments: U at concentration

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: LN

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Blank units: mg/L
Sampling Date: 5/6/22

Associated sample units: mg/L
Associated Samples: 1-3

			Sample Identification									
Analyte	Blank ID	Action Level	NQ									
	4											
Ca	0.030	0.10										
Mg	0.035	0.050										

Comments: The action level, when applicable, is establised at 5X the highest concentration.

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: LN

Method: Metals

Analyte	Concentration (mg/L)		RPD (≤ 30)	Qualifiers (Parents Only)
	2	3		
Calcium	85	83	2	
Mangnesium	30	29	3	
Sodium	21	21	0	
Potassium	3.0	2.9	3	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: September 23, 2022

Parameters: Wet Chemistry

Validation Level: Level III

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210766

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-20-3	2210766-02	Water	05/16/22
MW-20-2	2210766-03	Water	05/16/22
Dup-8-2Q22	2210766-04	Water	05/16/22
EB-10-050622	2210766-05	Water	05/16/22
MW-20-3MS	2210766-02MS	Water	05/16/22
MW-20-3MSD	2210766-02MSD	Water	05/16/22
MW-20-3DUP	2210766-02DUP	Water	05/16/22

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by EPA Method 218.6
Nitrite as Nitrogen by EPA Method 353.2
Perchlorate by EPA Method 314.0
pH by EPA Method 150.1
Total Dissolved Solids by EPA Method 160.1

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
MW-20-3	Hexavalent chromium	271 hours	24 hours	J (all detects)	P
MW-20-2 Dup-8-2Q22	Hexavalent chromium	270 hours	24 hours	J (all detects)	P
EB-10-050622	Hexavalent chromium	268 hours	24 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chloride Nitrate as N Sulfate	0.16400 mg/L 0.024000 mg/L 0.21400 mg/L	MW-20-3 MW-20-2 Dup-8-2Q22 EB-10-050622

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-10-050622	Chloride Nitrate as N Sulfate	0.18 mg/L 0.029 mg/L 0.17 mg/L	0.18U mg/L 0.029U mg/L 0.17U mg/L

V. Field Blanks

Sample EB-10-050622 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-10-050622	05/06/22	Total dissolved solids Hexavalent chromium Chloride Nitrate as N Sulfate	3.3 mg/L 0.000086 mg/L 0.18 mg/L 0.029 mg/L 0.17 mg/L	MW-20-3 MW-20-2 Dup-8-2Q22

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-20-3	Hexavalent chromium	0.000048 mg/L	0.000048U mg/L
MW-20-2	Hexavalent chromium	0.00012 mg/L	0.00012U mg/L
Dup-8-2Q22	Hexavalent chromium	0.00012 mg/L	0.00012U mg/L

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples MW-20-2 and Dup-8-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	MW-20-2	Dup-8-2Q22	
Total dissolved solids	490	490	0
Hexavalent chromium	0.00012	0.00012	0
Chloride	59	60	2
Nitrate as N	4.2	4.5	7
Sulfate	82	82	0
Perchlorate	1.8	1.5	18
Nitrite as N	0.018	0.011	48
Alkalinity, bicarbonate	250	250	0
Alkalinity, total	200	200	0

X. Target Analyte Quantitation

Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, data were qualified as estimated in four samples.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

Due to equipment blank contamination, data were qualified as not detected in three samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Wet Chemistry - Data Qualification Summary - SDG 2210766

Sample	Analyte	Flag	A or P	Reason
MW-20-3 MW-20-2 Dup-8-2Q22 EB-10-050622	Hexavalent chromium	J (all detects)	P	Technical holding times

NASA JPL, 2Q2022
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 2210766

Sample	Analyte	Modified Final Concentration	A or P
EB-10-050622	Chloride Nitrate as N Sulfate	0.18U mg/L 0.029U mg/L 0.17U mg/L	A

NASA JPL, 2Q2022
Wet Chemistry - Field Blank Data Qualification Summary - SDG 2210766

Sample	Analyte	Modified Final Concentration	A or P
MW-20-3	Hexavalent chromium	0.000048U mg/L	A
MW-20-2	Hexavalent chromium	0.00012U mg/L	A
Dup-8-2Q22	Hexavalent chromium	0.00012U mg/L	A

LDC #: 54408A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/22/22
SDG #: 2210766 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: LN
2nd Reviewer: CQ

METHOD: (Analyte) Alkalinity (SM2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA Method 218.6), Perchlorate (EPA Method 314.0), pH (EPA Method 150.1), TDS (EPA Method 160.1)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/SW	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	EB: 4
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	
IX.	Field duplicates	SW	D: (2,3)
X.	Target Analyte Quantitation	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	MW-20-3	2210766-02	Water	05/16/22
2	MW-20-2	2210766-03	Water	05/16/22
3	Dup-8-2Q22	2210766-04	Water	05/16/22
4	EB-10-050622	2210766-05	Water	05/16/22
5	MW-20-3MS	2210766-02MS	Water	05/16/22
6	MW-20-3MSD	2210766-02MSD	Water	05/16/22
7	MW-20-3DUP	2210766-02DUP	Water	05/16/22
8				
9				
10				
11				
12				
13				
14				

Notes:

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-4	Alkalinity, Chloride, Nitrate-N, Sulfate, Nitrite-N, Cr(VI), Perchlorate, pH
	TDS
QC	
5,6	Chloride, Nitrate-N, Sulfate, Nitrite-N
7	Chloride, Nitrate-N, Sulfate, Nitrite-N

VALIDATION FINDINGS WORKSHEETS
Holding Time

METHOD: Inorganics
All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 218.6 Analyte: Cr(VI) Holding Time: 24 Hours			
Sample ID	Sampling Date	Analysis Date	Total Time from Collection to Analysis	Qualifier	Det/ND
1	5/6/2022 10:30	5/17/2022 17:55	271	J/R/P	Dets
2	5/6/2022 11:15	5/17/2022 18:05	270	J/R/P	Dets
3	5/6/2022 11:30	5/17/2022 18:15	270	J/R/P	Dets
4	5/6/2022 14:05	5/17/2022 18:24	268	J/R/P	Dets

Preservation

Sample ID	Preservation	Preservation Requirement (pH)	Qualifier	Det/ND

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: LN

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-4

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	4								
Chloride	0.16400		0.5	0.18 U								
Nitrate-N	0.024000		0.1	0.029 U								
Sulfate	0.21400		1	0.17 U								

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is establised at 5X the highest ICB, CCB, or PB concentration.

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: LN

METHOD: Inorganics

Blank units: mg/L
Associated sample units: mg/L
Sampling Date: 5/6/22
Associated Samples: 1-3

			Sample Identification									
Analyte	Blank ID	Action Level	1	2	3							
	4											
TDS	3.3	5										
Cr(VI)	0.000086	0.0002	0.000048 U	0.00012 U	0.00012 U							
Chloride	0.18	0.5										
Nitrate-N	0.029	0.1										
Sulfate	0.17	1										

Comments: U at concentration

METHOD: Inorganics

Analyte	Concentration (mg/L)		RPD (≤ 30)	Qualifiers (Parents Only)
	2	3		
TDS	490	490	0	
Cr(VI)	0.00012	0.00012	0	
Chloride	59	60	2	
Nitrate-N	4.2	4.5	7	
Sulfate	82	82	0	
Perchlorate	1.8	1.5	18	
Nitrite-N	0.018	0.011	48	
Alkalinity (Bicarbonate)	250	250	0	
Alkalinity (Total)	200	200	0	

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Tidewater, Inc.
3761 Attucks Drive
Powell, OH 43065
ATTN: Mr. David Conner
David.Conner@tideh2o.net

October 31, 2022

SUBJECT: NASA JPL, 2Q2022 - Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on June 23, 2022. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #54409:

SDG #	Fraction
2210193 2210373	Volatiles, 1,2,3-Trichloropropane, Metals, Wet Chemistry

The data validation was performed under Level III &IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017)
- USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017)

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

646 pages-ADV

Attachment 1

90/10 III/IV (client select) EDD

LDC# 54409 (Tidewater - Powell, OH / NASA JPL, 2Q2022)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (524.2)		1,2,3-TCP (524M)		Metals (200.7 /200.8)		Alk. (2320B)		Cl,SO_4 NO_3-N (300.0)		NO_2-N (353.2)		Cr(VI) (218.6)		CLO_4 (314.0)		TDS (160.1)		pH (150.1)															
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	2210193	06/23/22	07/15/22	11	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0														
A	2210193	06/23/22	07/15/22	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0														
B	2210373	06/23/22	07/15/22	8	0	7	0	7	0	7	0	7	0	7	0	7	0	7	0	7	0	7	0														
B	2210373	06/23/22	07/15/22	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0														
Total	T/PG			22	0	20	0	20	0	20	0	20	0	20	0	20	0	20	0	20	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	202

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS/MSD, and DUPs

V:\LOGIN\Tidewater\NASA JPL\54409ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: September 30, 2022

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210193

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-3-5	2210193-01	Water	05/2/22
MW-3-4	2210193-02	Water	05/2/22
DUP-5-2Q22	2210193-03	Water	05/2/22
MW-3-3**	2210193-04**	Water	05/2/22
MW-3-2	2210193-05	Water	05/2/22
MW-3-1	2210193-06	Water	05/2/22
TB-6-050222	2210193-07	Water	05/2/22
MW-25-5	2210193-08	Water	05/2/22
MW-25-4	2210193-09	Water	05/2/22
MW-25-3	2210193-10	Water	05/2/22
EB-6-050222	2210193-11	Water	05/2/22
SB-2-050222	2210193-12	Water	05/2/22
MW-25-3MS	2210193-10MS	Water	05/2/22
MW-25-3MSD	2210193-10MSD	Water	05/2/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990 with the following exceptions:

Date	Analyte	r^2	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	0.989	All samples in SDG 2210193	UJ (all non-detects)	P

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	38.7	All samples in SDG 2210193	UJ (all non-detects)	P

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
05/05/22	Pentachloroethane	78.7	All samples in SDG 2210193	UJ (all non-detects)	P

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample TB-6-050222 was identified as a trip blank. No contaminants were found.

Sample EB-6-050222 was identified as an equipment blank. No contaminants were found.

Sample SB-2-050222 was identified as a source blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-3-4 and DUP-5-2Q22 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All target analyte quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to initial calibration r^2, ICV %D, and continuing calibration %D, data were qualified as estimated in twelve samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Volatiles - Data Qualification Summary - SDG 2210193

Sample	Analyte	Flag	A or P	Reason
MW-3-5 MW-3-4 DUP-5-2Q22 MW-3-3** MW-3-2 MW-3-1 TB-6-050222 MW-25-5 MW-25-4 MW-25-3 EB-6-050222 SB-2-050222	Methyl iodide	UJ (all non-detects)	P	Initial calibration (RRF)
MW-3-5 MW-3-4 DUP-5-2Q22 MW-3-3** MW-3-2 MW-3-1 TB-6-050222 MW-25-5 MW-25-4 MW-25-3 EB-6-050222 SB-2-050222	Methyl iodide	UJ (all non-detects)	P	Initial calibration verification (%D)
MW-3-5 MW-3-4 DUP-5-2Q22 MW-3-3** MW-3-2 MW-3-1 TB-6-050222 MW-25-5 MW-25-4 MW-25-3 EB-6-050222 SB-2-050222	Pentachloroethane	UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 2Q2022
Volatiles - Laboratory Blank Data Qualification Summary - SDG 2210193

No Sample Data Qualified in this SDG

LDC #: 54409A1a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/26/22
SDG #: 2210193 Level III/IV Page: 1 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: FT
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW / SW	% RSD ≤ 20, 12 ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 7 EB = 11 SB = 12
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D = 2, 3
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-3-5	2210193-01	Water	05/12/22
2	MW-3-4	2210193-02	Water	05/12/22
3	DUP-5-2Q22	2210193-03	Water	05/12/22
4	MW-3-3**	2210193-04**	Water	05/12/22
5	MW-3-2	2210193-05	Water	05/12/22
6	MW-3-1	2210193-06	Water	05/12/22
7	TB-6-050222	2210193-07	Water	05/12/22
8	MW-25-5	2210193-08	Water	05/12/22
9	MW-25-4	2210193-09	Water	05/12/22
10	MW-25-3	2210193-10	Water	05/12/22
11	EB-6-050222	2210193-11	Water	05/12/22
12	SB-2-050222	2210193-12	Water	05/12/22
13	MW-25-3MS	2210193-10MS	Water	05/12/22
14	MW-25-3MSD	2210193-10MSD	Water	05/12/22

LDC #: 54409A1a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/26/22
SDG #: 2210193 Level III/IV Page: 2 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: EJ
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
15				
16				
17				

Notes:

	B138869						

LDC #: 54409A1a

VALIDATION FINDINGS CHECKLIST

Reviewer: FQ

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?		✓		
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?		✓		
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

LDC #: 54409A1a

VALIDATION FINDINGS CHECKLIST

Reviewer: FM

X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?	NA		✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54409A1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15% 20% RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ____%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	4/4/22	KAL-Y5	Methyl Iodide		0.989 (≥0.990)	All	J/UJ/P ND

LDC #: 54409A1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?

Y N N/A Were all %D within the validation criteria of ≤~~20~~ %D? 30

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%/30%)	Associated Samples	Qualifications
	4/4/22 1446	ICV-Y5	Methyl Iodide	38.7	All	J/UJ/P ND

LDC #: 54409A1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) S24.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y N N/A Were all %D and RRFs within the validation criteria of ≤~~20~~ %D and ≥0.05 RRF ? 30

#	Date	Standard ID	Compound	Finding %D (Limit: ≤~~20.0%~~)30	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	5/5/22 2035	CCV4-V5	Pentachloroethane	78.7 (≤30%)		All	J/UJ/P

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: GCMS 524.2

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

RRF = (Ax)(Cis)/(Ais)(Cx)
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

Where:
Ax = Area of compound
Cx = Concentration of compound
S = Standard deviation of the RRFs
X = Mean of the RRFs
Ais = Area of associated internal standard
Cis = Concentration of internal Standard

#	Standard ID	Calibration Date	Compound	Reported (RRF 10 std)	Recalculated (RRF 10 std)	Reported AverageRRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
	ICAL MSV5	4/4/2022	I	0.8519021	0.8519021	0.8428623	0.8428623	4.57114	4.57114
			CC	0.8205145	0.8205145	0.8119389	0.8119389	9.41256	9.41256
			BB	0.5189625	0.5189625	0.5220887	0.5220887	10.54667	10.54667

LDC #: 54409A1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV3	5/5/22 2010	I (1st internal standard)	0.842623	0.8204094	0.8204094	2.7	2.7
			CC (2nd internal standard)	0.8119389	0.7411465	0.7411465	8.7	8.7
			BB (3rd internal standard)	0.5220887	0.5122669	0.5122669	1.9	1.9
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #:________

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 4

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4	10.0	10.020	100	100	0
Toluene-d8	↓	9.77	97.7	97.7	↓
Bromofluorobenzene	↓	8.98	89.8	89.8	↓

Sample ID:________

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:________

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:________

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:________

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #:_____

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 8260)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the target analytes identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD sample: 13 & 14

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	25.0	25.0	ND	23.670	22.570	94.7	94.7	90.3	90.3	4.76	4.76
Trichloroethene	↓	↓	↓	24.720	23.320	98.9	98.9	93.3	93.3	5.83	5.83
Benzene	↓	↓	↓	23.510	22.440	94.0	94.0	89.8	89.8	4.66	4.66
Toluene	↓	↓	↓	24.820	23.840	99.3	99.3	95.4	95.4	4.03	4.03
Chlorobenzene	↓	↓	↓	23.170	22.030	92.7	92.7	88.1	88.1	5.04	5.04

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #:_____

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: B138869-LCS

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
V	25.0	NA	23.230	NA	92.9	92.9				
P	↓	↓	23.710	↓	94.8	94.8				
DP	↓	↓	24.030	↓	96.1	96.1				
D	↓	↓	24.750	↓	99.0	99.0				
HH1	↓	↓	24.110	↓	96.4	96.4				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #:_____

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page:____of____
Reviewer:_____

METHOD: GC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. B138869-LCS Y

Conc. = $\frac{(1057158)(10.0)}{(246931)(1842976)}$

=

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	LCS	Y	23.230	23.230	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: September 30, 2022

Parameters: 1,2,3-Trichloropropane

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210193

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-3-5	2210193-01	Water	05/2/22
MW-3-4	2210193-02	Water	05/2/22
DUP-5-2Q22	2210193-03	Water	05/2/22
MW-3-3**	2210193-04**	Water	05/2/22
MW-3-2	2210193-05	Water	05/2/22
MW-3-1	2210193-06	Water	05/2/22
MW-25-5	2210193-08	Water	05/2/22
MW-25-4	2210193-09	Water	05/2/22
MW-25-3	2210193-10	Water	05/2/22
EB-6-050222	2210193-11	Water	05/2/22
SB-2-050222	2210193-12	Water	05/2/22
MW-25-3MS	2210193-10MS	Water	05/2/22
MW-25-3MSD	2210193-10MSD	Water	05/2/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,2,3-Trichloropropane by Environmental Protection Agency (EPA) Method 524 Modified

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB-6-050222 was identified as an equipment blank. No contaminants were found.

Sample SB-2-050222 was identified as a source blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-3-4 and DUP-5-2Q22 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All analyte quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Data Qualification Summary - SDG 2210193

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Laboratory Blank Data Qualification Summary - SDG 2210193

No Sample Data Qualified in this SDG

LDC #: 54409A1b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/26/22
SDG #: 2210193 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer:
2nd Reviewer:

METHOD: GC/MS 1,2,3-Trichloropropane (EPA Method 524M)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤20 ICV ≤30
IV.	Continuing calibration	A	CCV ≤30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=10 SB=11
VII.	Surrogate spikes	N	not required
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D=2,3
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-3-5	2210193-01	Water	05/12/22
2	MW-3-4	2210193-02	Water	05/12/22
3	DUP-5-2Q22	2210193-03	Water	05/12/22
4	MW-3-3**	2210193-04**	Water	05/12/22
5	MW-3-2	2210193-05	Water	05/12/22
6	MW-3-1	2210193-06	Water	05/12/22
7	MW-25-5	2210193-08	Water	05/12/22
8	MW-25-4	2210193-09	Water	05/12/22
9	MW-25-3	2210193-10	Water	05/12/22
10	EB-6-050222	2210193-11	Water	05/12/22
11	SB-2-050222	2210193-12	Water	05/12/22
12	MW-25-3MS	2210193-10MS	Water	05/12/22
13	MW-25-3MSD	2210193-10MSD	Water	05/12/22
14	B139165			

LDC #: 54409A1b

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: M

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?	✓			
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?			✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?				
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54409A1b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50U std)	Recalc RRF (50 std)	Reported Average RRF (initial)	Recalc Average RRF (initial)	Reported %RSD	Recalc %RSD
1	ICAL MS1b	5/6/22	XX (1st internal standard)	1.070689	1.070699	1.006215	1.006215	14.084	14.084
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						

LDC #: 54409A1b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV1	5/9/22 0546	XX (1st internal standard)	1.006215	0.899843	0.899843	10.6	10.6
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54409A1b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC)

MSC = Matrix spike concentration; MSDC = Matrix spike duplicate concentration

MS/MSD sample: 12 + 13

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
XX	0.05	0.05	ND	0.05533	0.05030	111	111	101	101	9.52	9.52

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54409 A1b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: B139165 - LCS

Compound	Spike Added (ng/L)		Spiked Sample Concentration (ng/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
XX	0.0500	NA	0.0441	NA	88.2	88.2	NA			

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54409A1b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: MJ

METHOD: GC/MS 524 M

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. B139165-LCS XX

Conc. = $\frac{(12929)(50.0)}{(14568)(1.006215)(1000)}$

= 0.0441 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	LCS	XX	0.0441	0.0441	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: September 30, 2022

Parameters: Metals

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210193

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-3-5	2210193-01	Water	05/2/22
MW-3-4	2210193-02	Water	05/2/22
DUP-5-2Q22	2210193-03	Water	05/2/22
MW-3-3**	2210193-04**	Water	05/2/22
MW-3-2	2210193-05	Water	05/2/22
MW-3-1	2210193-06	Water	05/2/22
MW-25-5	2210193-08	Water	05/2/22
MW-25-4	2210193-09	Water	05/2/22
MW-25-3	2210193-10	Water	05/2/22
EB-6-050222	2210193-11	Water	05/2/22
SB-2-050222	2210193-12	Water	05/2/22
MW-3-4MS	2210193-02MS	Water	05/2/22
MW-3-4MSD	2210193-02MSD	Water	05/2/22
MW-3-4DUP	2210193-02DUP	Water	05/2/22
MW-25-5MS	2210193-08MS	Water	05/2/22
MW-25-5MSD	2210193-08MSD	Water	05/2/22
MW-25-5DUP	2210193-08DUP	Water	05/2/22
MW-25-3MS	2210193-10MS	Water	05/2/22
MW-25-3MSD	2210193-10MSD	Water	05/2/22
MW-25-3DUP	2210193-10DUP	Water	05/2/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Arsenic, Calcium, Chromium, Iron, Lead, Magnesium, Potassium, and Sodium by Environmental Protection Agency (EPA) Method 200.7 and 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% with the following exceptions:

Date	Analyte	%RSD	Associated Samples	Flag	A or P
05/06/22	Arsenic Chromium	8.6 8.6	MW-3-4	J (all detects)	A
05/06/22	Lead	8.6	MW-3-4	UJ (all non-detects)	A

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis was not required by the method.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Calcium	0.03714 mg/L	MW-3-5 MW-3-4 DUP-5-2Q22 MW-3-3** MW-3-2 MW-3-1 MW-25-5 MW-25-4 MW-25-3 EB-6-050222 SB-2-050222
ICB/CCB	Chromium	0.506 ug/L	MW-25-5

Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Iron	47.013 ug/L	DUP-5-2Q22 MW-3-3** MW-3-2 MW-3-1 MW-25-5 MW-25-4 MW-25-3 EB-6-050222 SB-2-050222
ICB/CCB	Potassium	0.1065 ug/L	DUP-5-2Q22 MW-3-3** MW-3-2 MW-3-1 MW-25-5 MW-25-4 MW-25-3 EB-6-050222 SB-2-050222

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-6-050222	Calcium	0.087 mg/L	0.087U mg/L
SB-2-050222	Calcium	0.063 mg/L	0.063U mg/L
MW-3-1	Iron	210 ug/L	210U ug/L

VI. Field Blanks

Sample EB-6-050222 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-6-050222	05/02/2022	Calcium Sodium	0.087 mg/L 0.18 mg/L	MW-3-5 MW-3-4 DUP-5-2Q22 MW-3-3** MW-3-2 MW-3-1 MW-25-5 MW-25-4 MW-25-3

Sample SB-2-050222 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
SB-2-050222	05/02/2022	Calcium Sodium	0.063 mg/L 0.17 mg/L	MW-3-5 MW-3-4 DUP-5-2Q22 MW-3-3** MW-3-2 MW-3-1 MW-25-5 MW-25-4 MW-25-3

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. For MW-25-3MS/MSD, no data were qualified for Calcium percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples MW-3-4 and DUP-5-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-3-4	DUP-5-2Q22	
Iron	3500	2900	19
Arsenic	4.7	2.9	47
Chromium	5.9	4.7	23

Analyte	Concentration (mg/L)		RPD
	MW-3-4	DUP-5-2Q22	
Calcium	60	59	2
Magnesium	19	19	0
Sodium	22	22	0
Potassium	2.9	2.9	0

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to ICP-MS %RSD, data were qualified as estimated in one sample.

Due to laboratory blank contamination, data were qualified as not detected in three samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Metals - Data Qualification Summary - SDG 2210193

Sample	Analyte	Flag	A or P	Reason
MW-3-4	Arsenic Chromium	J (all detects)	A	ICP-MS (%RSD)
MW-3-4	Lead	UJ (all non-detects)	A	ICP-MS (%RSD)

NASA JPL, 2Q2022
Metals - Laboratory Blank Data Qualification Summary - SDG 2210193

Sample	Analyte	Modified Final Concentration	A or P
EB-6-050222	Calcium	0.087U mg/L	A
SB-2-050222	Calcium	0.063U mg/L	A
MW-3-1	Iron	210U ug/L	A

NASA JPL, 2Q2022
Metals - Field Blank Data Qualification Summary - SDG 2210193

No Sample Data Qualified in this SDG

LDC #: 54409A4a **VALIDATION COMPLETENESS WORKSHEET** Date: 9/26/22
SDG #: 2210193 Level III/IV Page: 1 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer:

METHOD: Metals (EPA Method 200.7/200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	ICP/MS Tune	SW	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB=10, SB=11
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD;(18,19) Ca>4xSpike
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	(2,3)
XII.	Internal Standard (ICP-MS)	A	Review for level 4 only.
XIII.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-3-5	2210193-01	Water	05/12/22
2	MW-3-4	2210193-02	Water	05/12/22
3	DUP-5-2Q22	2210193-03	Water	05/12/22
4	MW-3-3**	2210193-04**	Water	05/12/22
5	MW-3-2	2210193-05	Water	05/12/22
6	MW-3-1	2210193-06	Water	05/12/22
7	MW-25-5	2210193-08	Water	05/12/22
8	MW-25-4	2210193-09	Water	05/12/22
9	MW-25-3	2210193-10	Water	05/12/22
10	EB-6-050222	2210193-11	Water	05/12/22
11	SB-2-050222	2210193-12	Water	05/12/22
12	MW-3-4MS	2210193-02MS	Water	05/12/22
13	MW-3-4MSD	2210193-02MSD	Water	05/12/22
14	MW-3-4DUP	2210193-02DUP	Water	05/12/22
15	MW-25-5MS	2210193-08MS	Water	05/12/22

LDC #: 54409A4a **VALIDATION COMPLETENESS WORKSHEET** Date: 9/26/22
SDG #: 2210193 Level III/IV Page: 2 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer:

METHOD: Metals (EPA Method 200.7/200.8)

	Client ID	Lab ID	Matrix	Date
16	MW-25-5MSD	2210193-08MSD	Water	05/12/22
17	MW-25-5DUP	2210193-08DUP	Water	05/12/22
18	MW-25-3MS	2210193-10MS	Water	05/12/22
19	MW-25-3MSD	2210193-10MSD	Water	05/12/22
20	MW-25-3DUP	2210193-10DUP	Water	05/12/22
21				
22				
23				

Notes:

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
Were all water samples preserved to a pH of <2.	Yes			
II. ICP-MS Tune				
Were mass resolutions within 0.1 amu for all isotopes in the tuning solution?	Yes			
Were %RSDs of isoptoes in the tuning solution ≤5%?	~~Yes~~ No			
III. Calibration				
Were all instuments calibrated daily?	Yes			
Were the proper standards used?	Yes			
Were all initial and continuing calibration verifications within the 90-110% (80-120% for mercury) QC limits?	Yes			
Were the low level standard checks within 70-130%?	Yes			
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?	Yes			
Was there contamination in the initial and continuing calibration blanks?	Yes			
V. Interference Check Sample				
Were the interference check samples performed daily?	Yes			
Were the AB solution recoveries within 80-120%?	Yes			
VI. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries with the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	Yes			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	Yes			
VII. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
VIII. Internal Standards				
Were all percent recoveries within the 30-120% (60-125% for EPA Method 200.8) QC limits?	Yes			
If the recoveries were outside the limits, was a reanalysis performed?	Yes			
IX. Serial Dilution				
Were all percent differences <10%?	Yes			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		No		
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	
XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?	Yes			
Were target analytes detected in the field duplicates?	Yes			
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-11	As,Ca,Cr,Fe,Pb,Mg,K,Na
QC:	
18-20	Ca,Fe,Mg,Na,K
12-20	As,Cr,Pb

Analysis Method

ICP	Ca,Fe,Mg,K,Na
ICP-MS	As,Cr,Pb
CVAA	

ICP-MS Tune

METHOD: Trace Metals (EPA SW 846 Methods 6020)

The ICP-MS tune was performed at the required frequency and all isotopes in the tuning solution had a mass resolution of 0.1 amu and the percent relative standard deviation (%RSD) were within 5% with the following exceptions:

Date	Analyte (mass)	Assocaited Metals	Mass (Limit)	%RSD	Assocaited Samples	Qualification	Det/ND
5/6/2022	U, 238.1	As,Cr,Pb	5	8.6	2	J/UJ/A	Det: As,Cr; ND: Pb

Comments:

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-11

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	10	11							
Ca	0.03714		0.18569	0.087	0.063							

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: ug/L Associated Samples: 7

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (ug/L)**	**Action Level**	No Qual								
Cr		0.506	2.53									

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: ug/L Associated Samples: 3-11

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (ug/L)**	**Action Level**	6								
Fe		47.013	235.065	210								

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is established at 5X the highest ICB, CCB, or PB concentration.

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: ug/L Associated Samples: 3-11

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (ug/L)**	**Action Level**	No Qual								
K		0.1065	0.5325									

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is established at 5X the highest ICB, CCB, or PB concentration.

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Blank units: mg/L
Associated sample units: mg/L
Sampling Date: 5/2/2022
Associated Samples: 1-9

			Sample Identification									
Analyte	Blank ID	Action Level	No Qual									
	10											
Ca	0.087	0.435										
Na	0.18	0.9										

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Blank units: mg/L
Associated sample units: mg/L
Sampling Date: 5/2/2022
Associated Samples: 1-9

			Sample Identification									
Analyte	Blank ID	Action Level	No Qual									
	11											
Ca	0.063	0.315										
Na	0.17	0.85										

Comments: The action level, when applicable, is establised at 5X the highest concentration.

Method: Metals

Analyte	Concentration (mg/L)		RPD
	2	3	
Iron (ug/L)	3500	2900	19
Arsenic (ug/L)	4.7	2.9	47
Chromium (ug/L)	5.9	4.7	23
Calcium	60	59	2
Magnesium	19	19	0
Sodium	22	22	0
Potassium	2.9	2.9	0

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

An intial calibration verification (ICV), continuing calibration verification (CCV), low level calibration check (LLCC), and interference check sample (ICSAB) percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis

True = concentration of each analyte in the source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalcuated %R	Reported %R	Acceptable (Y/N)
ICV	ICP	Fe	19.693	20	98.465	98.5	Y
CCV	ICP	Ca	51.039	50	102.078	102	Y
LLCC	ICP	Na	0.55584	0.5	111.168	111	Y
ICSAB	ICP	Mg	509.99	500	101.998	102	Y
ICV	ICP-MS	As	123.01	125	98.408	98.4	Y
CCV	ICP-MS	Cr	40.497	40	101.2425	101	Y
LLCC	ICP-MS	Pb	1.054	1	105.4	105	Y
ICSAB	ICP-MS						Y
ICV	CVAA						
CCV	CVAA						

ICP-MS Tune	QC Parameter	Mass	Actual	Required
5/10/2022	Mass Axis	9	9.075	± 0.1 amu
5/10/2022	%RSD	24	0.9	≤ 5%

VALIDATION FINDINGS CHECKLIST

Quality Control Sample Recalculations

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Percent recoveries (%R) for the laboratory control sample (LCS), matrix spike (MS), and post digestion spike (PDS) were recalculated using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis. For the MS calculation, Found = SSR (Spiked Sample Result) - SR (Sample Result)

True = concentration of each analyte in the source

The sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = (Absolute value(S-D)x 200) / (S+D)

S = Original sample concentration

D = Duplicate sample concentration

The serial dilution percent difference (%D) was recalculated using the following formula.

%D = (Absolute value (I - SDR)) x 100 / (I)

I = Initial sample result

SDR = Serial dilution result (with a 5x dilution applied)

Sample ID	Type of Analysis	Element	Found/S/I	True/D/SDR	Recalcuated %R/RPD/%D	Reported %R/RPD/%D	Acceptable (Y/N)
B139041-BS1	LCS	K	10.111	10	101.11	101	Y
18	MS	Fe	1020.9	1000	102.09	102	Y
14	Duplicate	As	3.878	4.669	18.50941851	18.5	Y
18PDS	PDS	Mg	10.254	10.00	102.54	103	Y
18SD	Serial dilution	Cr	3.435	3.489	1.54772141	1.55	Y

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Analytes were recalculated and verified using the following equation:
Concentration = (Result from raw data x Final volume x Dilution factor) / (Initial volume)

Sample ID	Analyte	Raw Data (ppb)	Dilution	Initial Volume (mL)	Final Volume (mL)	Reported Result (ug/L)	Recalcuated Result (ug/L)	Acceptable (Y/N)
4	Fe	1.022	1	50	50	1000	1022	Y
4	As	1.454	1	50	50	1.5	1.454	Y

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: September 30, 2022

Parameters: Wet Chemistry

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210193

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-3-5	2210193-01	Water	05/2/22
MW-3-4	2210193-02	Water	05/2/22
DUP-5-2Q22	2210193-03	Water	05/2/22
MW-3-3**	2210193-04**	Water	05/2/22
MW-3-2	2210193-05	Water	05/2/22
MW-3-1	2210193-06	Water	05/2/22
MW-25-5	2210193-08	Water	05/2/22
MW-25-4	2210193-09	Water	05/2/22
MW-25-3	2210193-10	Water	05/2/22
EB-6-050222	2210193-11	Water	05/2/22
SB-2-050222	2210193-12	Water	05/2/22
MW-3-5MS	2210193-01MS	Water	05/2/22
MW-3-5MSD	2210193-01MSD	Water	05/2/22
MW-3-5DUP	2210193-01DUP	Water	05/2/22
MW-25-3MS	2210193-10MS	Water	05/2/22
MW-25-3MSD	2210193-10MSD	Water	05/2/22
MW-25-3DUP	2210193-10DUP	Water	05/2/22
SB-2-050222MS	2210193-12MS	Water	05/2/22
SB-2-050222MSD	2210193-12MSD	Water	05/2/22
SB-2-050222DUP	2210193-12DUP	Water	05/2/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by EPA Method 218.6
Nitrite as Nitrogen by EPA Method 353.2
Perchlorate by EPA Method 314.0
pH by EPA 150.1
Total Dissolved Solids by EPA Method 160.1

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
MW-3-5 MW-3-4 DUP-5-2Q22	pH	96 hours	48 hours	J (all detects)	P
MW-3-3** MW-3-2	pH	95 hours	48 hours	J (all detects)	P
MW-3-1	pH	94 hours	48 hours	J (all detects)	P
MW-25-5	pH	92 hours	48 hours	J (all detects)	P
MW-25-4 MW-25-3 EB-6-050222 SB-2-050222	pH	91 hours	48 hours	J (all detects)	P
MW-3-5 MW-3-4	Hexavalent chromium	175 hours	48 hours	J (all detects)	P
MW-25-5 EB-6-050222 SB-2-050222	Hexavalent chromium	170 hours	48 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
05/12/22	2209334-CCV2	Perchlorate	88.4 (90-110)	DUP-5-2Q22 MW-3-3** MW-3-2 MW-25-4 MW-25-3 MW-3-1 MW-25-5 SB-2-050222	J (all detects) UJ (all non-detects)	A

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
05/12/22	2209334-CCV3	Perchlorate	85.9 (90-110)	MW-3-4	J (all detects)	A

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chloride	0.241 mg/L	MW-3-5 MW-3-4 DUP-5-2Q22 MW-3-3** MW-3-2 MW-3-1 MW-25-5 MW-25-4 EB-6-050222 SB-2-050222
PB (prep blank)	Chloride Sulfate	0.21 mg/L 0.348 mg/L	MW-25-3
ICB/CCB	Hexavalent chromium Chloride Sulfate	0.00002 mg/L 0.244 mg/L 0.415 mg/L	MW-3-5 MW-3-4 DUP-5-2Q22 MW-3-3** MW-3-2 MW-3-1 MW-25-5 MW-25-4 MW-25-3 EB-6-050222 SB-2-050222

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-6-050222	Chloride	0.21 mg/L	0.21U mg/L
SB-2-050222	Chloride	0.22 mg/L	0.22U mg/L

V. Field Blanks

Sample EB-6-050222 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-6-050222	05/02/2022	Total dissolved solids Hexavalent chromium Chloride Nitrate as nitrogen	3.3 mg/L 0.00008 ug/L 0.21 mg/L 0.044 mg/L	MW-3-5 MW-3-4 DUP-5-2Q22 MW-3-3** MW-3-2 MW-3-1 MW-25-5 MW-25-4 MW-25-3

Sample SB-2-050222 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
SB-2-050222	05/02/2022	Total dissolved solids Hexavalent chromium Chloride Nitrate as nitrogen Sulfate	4 mg/L 0.00006 ug/L 0.22 mg/L 0.075 mg/L 0.33 mg/L	MW-3-5 MW-3-4 DUP-5-2Q22 MW-3-3** MW-3-2 MW-3-1 MW-25-5 MW-25-4 MW-25-3

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-3-1	Hexavalent chromium	0.00015 ug/L	0.00015U ug/L
MW-25-5	Hexavalent chromium	0.00014 ug/L	0.00014U ug/L

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples MW-24-3-020222 and DUP-3-1Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	MW-24-3-020222	DUP-3-1Q22	
pH (S.U.)	7.64	7.58	1
Total dissolved solids	320	320	0
Chloride	19	20	5
Nitrate as nitrogen	1.2	1.1	9
Sulfate	38	38	0
Perchlorate	2.7	2.6	4
Alkalinity	190	190	0

Analyte	Concentration (ug/L)		RPD
	MW-24-3-020222	DUP-3-1Q22	
Hexavalent chromium	0.00039	0.00033	17

X Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time and continuing calibration %R, data were qualified as estimated in eleven samples.

Due to laboratory blank contamination, data were qualified as not detected in two samples.

Due to field blank contamination, data were qualified as not detected in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Wet Chemistry - Data Qualification Summary - SDG 2210193

Sample	Analyte	Flag	A or P	Reason
MW-3-5 MW-3-4 DUP-5-2Q22 MW-3-3** MW-3-2 MW-3-1 MW-25-5 MW-25-4 MW-25-3 EB-6-050222 SB-2-050222	pH	J (all detects)	P	Technical holding times
MW-3-5 MW-3-4 MW-25-5 EB-6-050222 SB-2-050222	Hexavalent chromium	J (all detects)	P	Technical holding times
DUP-5-2Q22 MW-3-3** MW-3-2 MW-25-4 MW-25-3 MW-3-4 MW-3-1 MW-25-5 SB-2-050222	Perchlorate	J (all detects) UJ (all non-detects)	A	Continuing calibration (%R)

NASA JPL, 2Q2022
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 2210193

Sample	Analyte	Modified Final Concentration	A or P
EB-6-050222	Chloride	0.21U mg/L	A
SB-2-050222	Chloride	0.22U mg/L	A

NASA JPL, 2Q2022
Wet Chemistry - Field Blank Data Qualification Summary - SDG 2210193

Sample	Analyte	Modified Final Concentration	A or P
MW-3-1	Hexavalent chromium	0.00015U ug/L	A
MW-25-5	Hexavalent chromium	0.00014U ug/L	A

LDC #: 54409A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/27/22
SDG #: 2210193 Level III/IV Page: 1 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer: G

METHOD: (Analyte) Alkalinity (SM2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA Method 218.6), Perchlorate (EPA Method 314.0), pH (EPA Method 150.1), TDS (EPA Method 160.1)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	A	
III.	Calibration verification	SW	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	EB = 10, SB = 11
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	(2,3)
X.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XI	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-3-5	2210193-01	Water	05/12/22
2	MW-3-4	2210193-02	Water	05/12/22
3	DUP-5-2Q22	2210193-03	Water	05/12/22
4	MW-3-3**	2210193-04**	Water	05/12/22
5	MW-3-2	2210193-05	Water	05/12/22
6	MW-3-1	2210193-06	Water	05/12/22
7	MW-25-5	2210193-08	Water	05/12/22
8	MW-25-4	2210193-09	Water	05/12/22
9	MW-25-3	2210193-10	Water	05/12/22
10	EB-6-050222	2210193-11	Water	05/12/22
11	SB-2-050222	2210193-12	Water	05/12/22
12	MW-3-5MS	2210193-01MS	Water	05/12/22
13	MW-3-5MSD	2210193-01MSD	Water	05/12/22
14	MW-3-5DUP	2210193-01DUP	Water	05/12/22
15	MW-25-3MS	2210193-10MS	Water	05/12/22
16	MW-25-3MSD	2210193-10MSD	Water	05/12/22

LDC #: 54409A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/21/22
SDG #: 2210193 Level III/IV Page: 2 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer:

METHOD: (Analyte) Alkalinity (SM2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA Method 218.6), Perchlorate (EPA Method 314.0), pH (EPA Method 150.1), TDS (EPA Method 160.1)

	Client ID	Lab ID	Matrix	Date
17	MW-25-3DUP	2210193-10DUP	Water	05/12/22
18	SB-2-050222MS	2210193-12MS	Water	05/12/22
19	SB-2-050222MSD	2210193-12MSD	Water	05/12/22
20	SB-2-050222DUP	2210193-12DUP	Water	05/12/22
21				
22				
23				

Notes:

METHOD: Inorganics				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
II. Calibration				
Were all instruments calibrated at the required frequency?	Yes			
Were the proper number of standards used?	Yes			
Were all initial and continuing calibration verifications within the QC limits?		No		
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
Were balance checks performed as required?			NA	
III. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?	Yes			
Was there contamination in the initial and continuing calibration blanks?	Yes			
IV. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries within the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	Yes			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	Yes			
V. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	

XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?	Yes			
Were target analytes detected in the field duplicates?	Yes			
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-11	Alkalinity,Cl,NO3-N,SO4,NO2-N,Cr(VI),CLO4,pH,TDS
QC:	
17	pH,TDS
15-17	Cr(VI),CLO4
12-17	Cl,NO3-N,SO4
15-20	NO2-N
17	Alkalinity

METHOD: Inorganics
All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 150.1 Analyte: pH Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
1	5/2/2022 7:40	5/6/2022 8:37	96	J/UJ/P	Det
2	5/2/2022 8:15	5/6/2022 8:48	96	J/UJ/P	Det
3	5/2/2022 8:30	5/6/2022 8:58	96	J/UJ/P	Det
4	5/2/2022 9:15	5/6/2022 9:08	95	J/UJ/P	Det
5	5/2/2022 10:00	5/6/2022 9:19	95	J/UJ/P	Det
6	5/2/2022 11:20	5/6/2022 9:29	94	J/UJ/P	Det
7	5/2/2022 13:25	5/6/2022 9:39	92	J/UJ/P	Det
8	5/2/2022 14:00	5/6/2022 9:49	91	J/UJ/P	Det
9	5/2/2022 14:35	5/6/2022 10:19	91	J/UJ/P	Det
10	5/2/2022 15:00	5/6/2022 10:38	91	J/UJ/P	Det
11	5/2/2022 15:10	5/6/2022 10:45	91	J/UJ/P	Det

All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 218.6 Analyte: Hexavalent Chromium Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
1	5/2/2022 7:40	5/9/2022 15:20	175	J/R/P	Det
2	5/2/2022 8:15	5/9/2022 15:30	175	J/R/P	Det
7	5/2/2022 13:35	5/9/2022 16:18	170	J/R/P	Det
10	5/2/2022 15:00	5/9/2022 17:34	170	J/R/P	Det
11	5/2/2022 15:10	5/9/2022 18:03	170	J/R/P	Det

Calibration

METHOD: Inorganics

All initial calibration verifications (ICVs) and continuing calibration verifications (CCVs) were performed at the required frequency and were within the acceptance limits with the following exceptions:

Date	Time	Calibration ID	Analyte	%R	%R Limits	Associated Samples	Qualification	Det/ND
5/12/2022	1:32	2209334-CCV2	CLO4	88.4	90-110	3-9,11	J/UJ/A	~~Det: 3-5,8-9, ND: 6-7,11~~ Det→ND
5/12/2022	4:36	2209334-CCV3	CLO4	85.9	90-110	2	J/UJ/A	Det

Comments:

Laboratory Blank Contamination (PB/ICB/CCB)

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-8,10-11

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	10	11							
Cl	0.241		1.205	0.21	0.22							

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 9

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	No Qual								
Cl	0.21		1.05									
SO4	0.348		1.74									

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-11

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	10	11							
Cr(VI)		0.00002	0.0001									
Cl		0.244	1.22	0.21	0.22							
SO4		0.415	2.075									

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is establised at 5X the highest ICB, CCB, or PB concentration.

Field Blanks

METHOD: Inorganics

Blank units: mg/L Associated sample units: mg/L

Sampling Date: 5/2/2022 Associated Samples: 1-9

			Sample Identification									
Analyte	Blank ID	Action Level	1	2	3	4	5	6	7	8	9	
	10											
~~pH (S.U.)~~	~~6.28~~		~~7.54~~	~~7.64~~	~~7.58~~	~~7.59~~	7.64	8.05	~~8.76~~	~~8.02~~	~~8.03~~	
TDS	3.3											
Cr(VI) (ug/L)	0.00008							0.00015	0.00014			
Cl	0.21											
NO3-N	0.044											

METHOD: Inorganics

Blank units: mg/L Associated sample units: mg/L

Sampling Date: 5/2/2022 Associated Samples: 1-9

			Sample Identification									
Analyte	Blank ID	Action Level	1	2	3	4	5	6	7	8	9	
	11											
~~pH (S.U.)~~	~~6.21~~		~~7.54~~	~~7.64~~	~~7.58~~	~~7.59~~	~~7.64~~	~~8.05~~	~~8.76~~	~~8.02~~	~~8.03~~	
TDS	4											
Cr(VI) (ug/L)	0.00006							0.00015	0.00014			
Cl	0.22											
NO3-N	0.075											
SO4	0.33											

Comments: The action level, when applicable, is estabilised at 5X the highest concentration.

Field Duplicates

METHOD: Inorganics

Analyte	Concentration (mg/L)		RPD
	2	3	
pH (S.U.)	7.64	7.58	1
Total Dissolved Solids	320	320	0
(ug/L)→ Hexavalent Chromium	0.00039	0.00033	17
Chloride	19	20	5
Nitrate as N	1.2	1.1	9
Sulfate	38	38	0
Perchlorate	2.7	2.6	4
Alkalinity	190	190	0

METHOD: Inorganics

The correlation coefficient (r) for the calibration of NO2-N were recalculated.
Calibration date:
An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:
%R = (Found/True) x 100
Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of Analysis	Analyte	Standard	Concentration (mg/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial Calibration	NO2-N	s1	0	0.0071	0.999863	0.999863	Y
		s2	0.02	0.01767			
		s3	0.05	0.03349			
		s4	0.1	0.06057			
		s5	0.5	0.26577			
		s6	1	0.53683			
		s7					
		s8					
		s9					
		s10					
		s11					
		s12					

Type of Analysis	Analyte	Found (mg/L)	True (mg/L)		Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Calibration verification	Cr(VI)	26.215	25.00		104.86	105	Y
Calibration verification	CLO4	9.1823	10.00		91.823	91.8	Y
Calibration verification	Cl	47.457	50.00		94.914	94.9	Y

Quality Control Sample Recalculations

METHOD: Inorganics

Percent recoveries (%R) for the laboratory control sample (LCS) and matrix spike (MS) were recalcuated using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis. For the MS calculation, Found = SSR (Spiked Sample Result) - SR (Sample Result)

True = concentration of each analyte in the source

The sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = (Absolute value(S-D)x 200) / (S+D)

S = Original sample concentration

D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found/S	True/D	Recalculated %R/RPD	Reported %R/RPD	Acceptable (Y/N)
B138974-BS1	LCS	TDS	565	586	96.41638225	96.4	Y
15	MS	Cr(VI)	0.020485	0.020202	101.4008514	101	Y
9	Duplicate	pH	8.05	8.03	0.248756219	0.249	Y

Sample Calculation Verification

METHOD: Inorganics

Analytes were recalculated and verified using the following equation:

Concentration = (Result from raw data x Final volume x Dilution factor) / (Percent solids (if applicable) x Initial weight or volume)

Sample ID	Analyte	Raw Data (ppb)	Dilution	Initial Volume (mL)	Final Volume (mL)	Reported Result (mg/L)	Recalculated Result (mg/L)	Acceptable (Y/N)
4	pH (S.U.)	7.59	1	50	50	7.59	7.59	Y
4	TDS	159	2	100	100	320	318	Y
4	Cr(VI)	0.412619756	1	20	20	0.00041	0.00041262	Y
4	SO4	40.09556787	1	20	20	39	40.09556787	Y
4	CLO4	3.00	1	20	20	2.4	3.00	Y
4	NO2-N	ND	ND			ND	ND	Y
4	Alkalinity	187.51	1	50	50	190	187.51	Y

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: September 30, 2022

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210373

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-7-050322	2210373-01	Water	05/3/22
MW-25-2	2210373-02	Water	05/3/22
MW-25-1	2210373-03	Water	05/3/22
MW-18-4**	2210373-04**	Water	05/3/22
MW-18-5	2210373-05	Water	05/3/22
MW-18-3	2210373-06	Water	05/3/22
MW-18-2	2210373-07	Water	05/3/22
MW-20-5**	2210373-08**	Water	05/3/22
MW-20-4	2210373-09	Water	05/3/22
EB-7-050322	2210373-10	Water	05/3/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990 with the following exceptions:

Date	Analyte	r^2	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	0.989	All samples in SDG 2210373	UJ (all non-detects)	P

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	38.7	All samples in SDG 2210373	UJ (all non-detects)	P

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
05/09/22	Pentachloroethane	52.4	All samples in SDG 2210373	UJ (all non-detects)	P

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample TB-7-050322 was identified as a trip blank. No contaminants were found.

Sample EB-7-050322 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-7-050322	05/13/22	Methylene chloride	0.23 ug/L	MW-25-2 MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4

Sample SB-2-050222 (from SDG 2210193) was identified as a source blank. No contaminants were found.

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All target analyte quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to initial calibration r^2, ICV %D, and continuing calibration %D, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Volatiles - Data Qualification Summary - SDG 2210373

Sample	Analyte	Flag	A or P	Reason
TB-7-050322 MW-25-2 MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4 EB-7-050322	Methyl iodide	UJ (all non-detects)	P	Initial calibration (RRF)
TB-7-050322 MW-25-2 MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4 EB-7-050322	Methyl iodide	UJ (all non-detects)	P	Initial calibration verification (%D)
TB-7-050322 MW-25-2 MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4 EB-7-050322	Pentachloroethane	UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 2Q2022
Volatiles - Laboratory Blank Data Qualification Summary - SDG 2210373

No Sample Data Qualified in this SDG

LDC #: 54409B1a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/25/22
SDG #: 2210373 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer:
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW/SW	%RSD ≤ 20, 1x ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks	A	* *
VI.	Field blanks SW	NA	TB=1 EB=1U SB=SB-2-050222 (2210193)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	TB-7-050322	2210373-01	Water	05/13/22
2	MW-25-2	2210373-02	Water	05/13/22
3	MW-25-1	2210373-03	Water	05/13/22
4	MW-18-4**	2210373-04**	Water	05/13/22
5	MW-18-5	2210373-05	Water	05/13/22
6	MW-18-3	2210373-06	Water	05/13/22
7	MW-18-2	2210373-07	Water	05/13/22
8	MW-20-5**	2210373-08**	Water	05/13/22
9	MW-20-4	2210373-09	Water	05/13/22
10	EB-7-050322	2210373-10	Water	05/13/22
11				
12				
13	B139140			
14				

LDC #: 54409B 1a

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?		✓		
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?		✓		
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54409B/a

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15% 20% RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ____%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	4/4/22	ICAL - Y5	Methyl Iodide		0.989 (≥0.990)	all	J/UJ/P NV

INICAL.wpd

LDC #: 54409B1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~ 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?

Y N N/A Were all %D within the validation criteria of ≤20 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0%/30%)	Associated Samples	Qualifications
	4/4/22 1446	ICV	Methyl Iodide	38.7	All	J/UJ/P ND

LDC #: 54409B2

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~ 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y N N/A Were all %D and RRFs within the validation criteria of ≤~~20 %~~30D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ~~<20.0%~~ 30)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	5/9/22 1913	CCV2	Pentachloroethane	52.4		All	J/UJ/p ND

LDC #: 54409B2a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~ 524.2

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 5/13/22
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: EB Associated Samples: 2 → 9 (ND

Compound	Blank ID	Sample Identification								
	10									
E	0.23									

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC #: 54409B/a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (10 std)	Recalc RRF (10 std)	Reported Average RRF (initial)	Recalc Average RRF (initial)	Reported %RSD	Recalc %RSD
1	ICAL V5 2205009	4/4/22	K (1st internal standard)	0.7365493	0.7365493	0.711926	0.711926	1.975059	1.97606
			CU (2nd internal standard)	0.8268164	0.8268164	0.7677929	0.7677929	9.205932	9.2059
			BP (3rd internal standard)	0.5423192	0.5423192	0.5135746	0.5135746	10.65077	10.651
			(4th internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						

LDC #: 54409B1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method 8260)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the target analytes identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where:
ave. RRF = initial calibration average RRF
A_x = Area of target analyte
C_x = Concentration of target analyte
RRF = continuing calibration RRF
A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Target Analyte (Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV	5/9/22 1848	K	0.711926	0.7216665	0.7216665	1.4	1.4
			CC	0.7647929	0.7431458	0.7431458	2.8	2.8
			BD	0.5135746	0.5381522	0.5381522	4.8	4.8
2								
3								
4								

LDC #: 54409B/a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 4

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4	10.0	10.110	101	101	0
Toluene-d8	↓	9.900	99	99	↓
Bromofluorobenzene	↓	9.64	96.4	96.4	↓

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 54409B1a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: BI39140-BS1

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Y	25.0	NA	23.440	NA	93.8	93.8				
P	↓	↓	24.350	↓	97.4	97.4				
DD			22.670		90.7	90.7				
D			24.740		99.0	99.0				
HHH			22.600		90.4	90.4	NA			

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54409B1a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: FZ

METHOD: GC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #4 , K

Conc. = $\frac{(132927)(10.0)}{(278969)(0.711926)}$

= 0.6693 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	4	K	0.67	0.6693	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: September 30, 2022

Parameters: 1,2,3-Trichloropropane

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210373

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-25-2	2210373-02	Water	05/3/22
MW-25-1	2210373-03	Water	05/3/22
MW-18-4**	2210373-04**	Water	05/3/22
MW-18-5	2210373-05	Water	05/3/22
MW-18-3	2210373-06	Water	05/3/22
MW-18-2	2210373-07	Water	05/3/22
MW-20-5**	2210373-08**	Water	05/3/22
MW-20-4	2210373-09	Water	05/3/22
EB-7-050322	2210373-10	Water	05/3/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,2,3-Trichloropropane by Environmental Protection Agency (EPA) Method 524 Modified

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB-7-050322 was identified as an equipment blank. No contaminants were found.

Sample SB-2-050222 (from SDG 2210193) was identified as a source blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All analyte quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Data Qualification Summary - SDG 2210373

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Laboratory Blank Data Qualification Summary - SDG 2210373

No Sample Data Qualified in this SDG

LDC #: 54409B1b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/26/22
SDG #: 2210373 Level III/IV Page: 1 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer:
2nd Reviewer:

METHOD: GC/MS 1,2,3-Trichloropropane (EPA Method 524M)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A A	%RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=9 SB = SB-2-050222
VII.	Surrogate spikes	N	not required (2210193)
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-25-2	2210373-02	Water	05/13/22
2	MW-25-1	2210373-03	Water	05/13/22
3	MW-18-4**	2210373-04**	Water	05/13/22
4	MW-18-5	2210373-05	Water	05/13/22
5	MW-18-3	2210373-06	Water	05/13/22
6	MW-18-2	2210373-07	Water	05/13/22
7	MW-20-5**	2210373-08**	Water	05/13/22
8	MW-20-4	2210373-09	Water	05/13/22
9	EB-7-050322	2210373-10	Water	05/13/22
10				

Notes:

	B139272-BLK1						

LDC #: 54409B1b

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: FJ

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?	✓			
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?			✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54409B1b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50U std)	Recalc RRF (50U std)	Reported Average RRF (initial)	Recalc Average RRF (initial)	Reported %RSD	Recalc %RSD
1	ICAL MSV1b	5/6/22	XX (1st internal standard)	1.070689	1.070689	1.006715	1.00675	14.048	14.048
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						

LDC #: 54409B1b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV2	5/10/22 1153	XX (1st internal standard)	1.006215	0.9366752	0.9366752	6.9	6.9
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
2	CCV1	5/11/22 0647	XX (1st internal standard)	↓	1.023273	1.023273	1.7	1.7
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54409B1b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: BI39272-LCS

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
XX	0.0500	NA	0.052540	NA	105	105	NA			

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54409 B1b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: F2

METHOD: GC MS 524 M

(Y) N N/A Were all reported results recalculated and verified for all level IV samples?
(Y) N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. B139272-LCS XX

Conc. = $\frac{(10082)(50.0)}{(9536)(1.006215)(1000)}$

= 0.0525 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	LCS	XX	0.05254 U	0.0525	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: September 29, 2022

Parameters: Metals

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210373

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-25-2	2210373-02	Water	05/03/22
MW-25-1	2210373-03	Water	05/03/22
MW-18-4**	2210373-04**	Water	05/03/22
MW-18-5	2210373-05	Water	05/03/22
MW-18-3	2210373-06	Water	05/03/22
MW-18-2	2210373-07	Water	05/03/22
MW-20-5**	2210373-08**	Water	05/03/22
MW-20-4	2210373-09	Water	05/03/22
EB-7-050322	2210373-10	Water	05/03/22
MW-25-2MS	2210373-02MS	Water	05/03/22
MW-25-2MSD	2210373-02MSD	Water	05/03/22
MW-25-2DUP	2210373-02DUP	Water	05/03/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Arsenic, Calcium, Chromium, Iron, Lead, Magnesium, Potassium, and Sodium by Environmental Protection Agency (EPA) Method 200.7 and 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis was not required by the method.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Calcium	0.030996 mg/L	MW-25-2 MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4 EB-7-050322
ICB/CCB	Magnesium Sodium	0.024156 mg/L 0.058149 mg/L	MW-25-2 MW-25-1
ICB/CCB	Calcium Sodium	0.027818 mg/L 0.066224 mg/L	MW-18-4** MW-18-5 MW-20-5** MW-20-4 EB-7-050322
ICB/CCB	Arsenic	0.946 ug/L	MW-25-2 MW-25-1 MW-18-4** MW-18-5

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-7-050322	Calcium Sodium	0.075 mg/L 0.27 mg/L	0.075U mg/L 0.27U mg/L
MW-25-2	Arsenic	1.7 mg/L	1.7U mg/L
MW-25-1	Arsenic	1.6 mg/L	1.6U mg/L
MW-18-4**	Arsenic	0.73 mg/L	0.73U mg/L
MW-18-5	Arsenic	2.3 mg/L	2.3U mg/L

VI. Field Blanks

Sample EB-7-050322 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-7-050322	05/13/2022	Calcium Magnesium Sodium	0.075 mg/L 0.022 mg/L 0.27 mg/L	MW-25-2 MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
MW-25-2MS/MSD (MW-25-2 MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4 EB-7-050322)	Sodium	132 (75-125)	-	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R, data were qualified as estimated in nine samples.

Due to laboratory blank contamination, data were qualified as not detected in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Metals - Data Qualification Summary - SDG 2210373

Sample	Analyte	Flag	A or P	Reason
MW-25-2 MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4 EB-7-050322	Sodium	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)

NASA JPL, 2Q2022
Metals - Laboratory Blank Data Qualification Summary - SDG 2210373

Sample	Analyte	Modified Final Concentration	A or P
EB-7-050322	Calcium Sodium	0.075U mg/L 0.27U mg/L	A
MW-25-2	Arsenic	1.7U mg/L	A
MW-25-1	Arsenic	1.6U mg/L	A
MW-18-4**	Arsenic	0.73U mg/L	A
MW-18-5	Arsenic	2.3U mg/L	A

NASA JPL, 2Q2022
Metals - Field Blank Data Qualification Summary - SDG 2210373

No Sample Data Qualified in this SDG

LDC #: 54409B4a **VALIDATION COMPLETENESS WORKSHEET** Date: 9/28/22
SDG #: 2210373 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer:

METHOD: Metals (EPA Method 200.7/200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB=9
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	A	Review for level 4 only.
XIII.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-25-2	2210373-02	Water	05/13/22
2	MW-25-1	2210373-03	Water	05/13/22
3	MW-18-4**	2210373-04**	Water	05/13/22
4	MW-18-5	2210373-05	Water	05/13/22
5	MW-18-3	2210373-06	Water	05/13/22
6	MW-18-2	2210373-07	Water	05/13/22
7	MW-20-5**	2210373-08**	Water	05/13/22
8	MW-20-4	2210373-09	Water	05/13/22
9	EB-7-050322	2210373-10	Water	05/13/22
10	MW-25-2MS	2210373-02MS	Water	05/13/22
11	MW-25-2MSD	2210373-02MSD	Water	05/13/22
12	MW-25-2DUP	2210373-02DUP	Water	05/13/22
13				
14				

Notes:

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
Were all water samples preserved to a pH of <2.	Yes			
II. ICP-MS Tune				
Were mass resolutions within 0.1 amu for all isotopes in the tuning solution?	Yes			
Were %RSDs of isoptoes in the tuning solution ≤5%?	Yes			
III. Calibration				
Were all instuments calibrated daily?	Yes			
Were the proper standards used?	Yes			
Were all initial and continuing calibration verifications within the 90-110% (80-120% for mercury) QC limits?	Yes			
Were the low level standard checks within 70-130%?	Yes			
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?	Yes			
Was there contamination in the initial and continuing calibration blanks?	Yes			
V. Interference Check Sample				
Were the interference check samples performed daily?	Yes			
Were the AB solution recoveries within 80-120%?	Yes			
VI. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries with the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)		No		
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	Yes			
VII. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
VIII. Internal Standards				
Were all percent recoveries within the 30-120% (60-125% for EPA Method 200.8) QC limits?	Yes			
If the recoveries were outside the limits, was a reanalysis performed?	Yes			
IX. Serial Dilution				
Were all percent differences <10%?	Yes			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		No		
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	
XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?			NA	
Were target analytes detected in the field duplicates?			NA	
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-9	As,Ca,Cr,Fe,Pb,Mg,K,Na
QC:	
10-12	Ca,Fe,Mg,K,Na

Analysis Method

ICP	Ca,Fe,Mg,K,Na
ICP-MS	As,Cr,Pb
CVAA	

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-9

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	9								
Ca	0.030996		0.15498	0.075								

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-2

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	No Qual								
Mg		0.024156	0.12078									
Na		0.058149	0.29075									

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 3-4,7-9

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	9								
Ca		0.027818	0.13909	0.075								
Na		0.066224	0.33112	0.27								

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is established at 5X the highest ICB, CCB, or PB concentration.

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-4

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (ug/L)**	**Action Level**	1	2	3	4					
As		0.946	4.73	1.7	1.6	0.73	2.3					

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is established at 5X the highest ICB, CCB, or PB concentration.

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Blank units: mg/L
Sampling Date: 5/13/2022

Associated sample units: mg/L
Associated Samples: 1-8

			Sample Identification									
Analyte	Blank ID	Action Level	No Qual									
	9											
Ca	0.075	0.375										
Mg	0.022	0.11										
Na	0.27	1.35										

Comments: The action level, when applicable, is establised at 5X the highest concentration.

VALIDATION FINDINGS WORKSHEETS
Matrix Spike/Matrix Spike Duplicates

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

MS/MSD analysis was performed by the laboratory. All MS/MSD percent recoveries (%R) and relative percent differences (RPDs) were within the acceptable limits with the following exceptions:

MS/MSD ID	Matrix	Analyte	MS %R	MSD %R	%R Limit	RPD	RPD Limit	Associated Samples	Qualification	Det/ND
10-11	Water	Na	132		75-125			1-9	J det/A	Det

Comments: Ca > 4x Spike

VALIDATION FINDINGS CHECKLIST
Calibration Calculation Verification

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
An intial calibration verification (ICV), continuing calibration verification (CCV), low level calibration check (LLCC), and interference check sample (ICSAB) percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis
True = concentration of each analyte in the source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalcuated %R	Reported %R	Acceptable (Y/N)
ICV	ICP	Fe	19.693	20	98.465	98.5	Y
CCV	ICP	Ca	47.658	50	95.316	95.3	Y
LLCC	ICP	Na	0.50936	0.5	101.872	102	Y
ICSAB	ICP	Mg	489.84	500	97.968	98	Y
ICV	ICP-MS	As	122.76	125	98.208	98.2	Y
CCV	ICP-MS	Cr	38.087	40	95.2175	95.2	Y
LLCC	ICP-MS	Pb	1.029	1	102.9	103	Y
ICSAB	ICP-MS						Y
ICV	CVAA						
CCV	CVAA						

ICP-MS Tune	QC Parameter	Mass	Actual	Required
5/12/2022	Mass Axis	24	23.985	± 0.1 amu
5/12/2022	%RSD	238	1.0	≤ 5%

VALIDATION FINDINGS CHECKLIST

Quality Control Sample Recalculations

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Percent recoveries (%R) for the laboratory control sample (LCS), matrix spike (MS), and post digestion spike (PDS) were recalculated using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis. For the MS calculation, Found = SSR (Spiked Sample Result) - SR (Sample Result)

True = concentration of each analyte in the source

The sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = (Absolute value(S-D)x 200) / (S+D)

S = Original sample concentration

D = Duplicate sample concentration

The serial dilution percent difference (%D) was recalculated using the following formula.

%D = (Absolute value (I - SDR)) x 100 / (I)

I = Initial sample result

SDR = Serial dilution result (with a 5x dilution applied)

Sample ID	Type of Analysis	Element	Found/S/I	True/D/SDR	Recalcuated %R/RPD/%D	Reported %R/RPD/%D	Acceptable (Y/N)
B139521-BS1	LCS	As	97.117	100	97.117	97.1	Y
10	MS	Fe	1038.4	1000	103.84	104	Y
12	Duplicate	K	2.3915	2.5779	7.5019117	7.5	Y
10PDS	PDS	Mg	9.112	10.00	91.12	91.1	Y
10SD	Serial dilution	Na	30.502	29.927	1.921341932	1.92	Y

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Analytes were recalculated and verified using the following equation:
Concentration = (Result from raw data x Final volume x Dilution factor) / (Initial volume)

Sample ID	Analyte	Raw Data (ppb)	Dilution	Initial Volume (mL)	Final Volume (mL)	Reported Result (ug/L)	Recalcuated Result (ug/L)	Acceptable (Y/N)
3	Fe	0.0936	1	50	50	94	93.6	Y
7	As (ppm)	1.075	1	50	50	1.1	1.075	Y

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: September 30, 2022

Parameters: Wet Chemistry

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210373

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-25-2	2210373-02	Water	05/03/22
MW-25-1	2210373-03	Water	05/03/22
MW-18-4**	2210373-04**	Water	05/03/22
MW-18-5	2210373-05	Water	05/03/22
MW-18-3	2210373-06	Water	05/03/22
MW-18-2	2210373-07	Water	05/03/22
MW-20-5**	2210373-08**	Water	05/03/22
MW-20-4	2210373-09	Water	05/03/22
EB-7-050322	2210373-10	Water	05/03/22
MW-25-2MS	2210373-02MS	Water	05/03/22
MW-25-2MSD	2210373-02MSD	Water	05/03/22
MW-25-2DUP	2210373-02DUP	Water	05/03/22
MW-18-4MS	2210373-04MS	Water	05/03/22
MW-18-4MSD	2210373-04MSD	Water	05/03/22
MW-18-4DUP	2210373-04DUP	Water	05/03/22
MW-18-5DUP	2210373-05DUP	Water	05/03/22
MW-20-5MS	2210373-08MS	Water	05/03/22
MW-20-5MSD	2210373-08MSD	Water	05/03/22
MW-20-5DUP	2210373-08DUP	Water	05/03/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by EPA Method 218.6
Nitrite as Nitrogen by EPA Method 353.2
Perchlorate by EPA Method 314.0
pH by EPA 150.1
Total Dissolved Solids by EPA Method 160.1

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
MW-25-2 MW-25-1	pH	81 hours	48 hours	J (all detects)	P
MW-18-4**	pH	78 hours	48 hours	J (all detects)	P
MW-18-5	pH	79 hours	48 hours	J (all detects)	P
MW-18-3 MW-18-2	pH	77 hours	48 hours	J (all detects)	P
MW-20-5** MW-20-4 EB-7-050322	pH	75 hours	48 hours	J (all detects)	P
MW-25-2	Hexavalent chromium	154 hours	48 hours	J (all detects)	P
MW-25-1	Hexavalent chromium	153 hours	48 hours	J (all detects)	P
MW-18-3	Hexavalent chromium	150 hours	48 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
05/12/22	2209334-CCV2	Perchlorate	88.4 (90-110)	MW-25-2 MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4 EB-7-050322	J (all detects) UJ (all non-detects)	A

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
05/12/22	2209334-CCV3	Perchlorate	85.9 (90-110)	MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4 EB-7-050322	J (all detects) UJ (all non-detects)	A

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chloride Sulfate Nitrite as nitrogen	0.173 mg/L 0.216 mg/L 0.017736 mg/L	MW-25-2 MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4 EB-7-050322
ICB/CCB	Hexavalent chromium	0.000021 ug/L	MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4 EB-7-050322
ICB/CCB	Chloride Sulfate Nitrite as nitrogen	0.168 mg/L 0.264 mg/L 0.018176 mg/L	MW-25-2 MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4 EB-7-050322

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-25-2	Nitrite as nitrogen	0.019 mg/L	0.019U mg/L
MW-25-1	Nitrite as nitrogen	0.018 mg/L	0.018U mg/L
MW-18-4**	Nitrite as nitrogen	0.018 mg/L	0.018U mg/L
MW-18-5	Nitrite as nitrogen	0.019 mg/L	0.019U mg/L
MW-18-3	Nitrite as nitrogen	0.017 mg/L	0.017U mg/L
MW-18-2	Nitrite as nitrogen	0.018 mg/L	0.018U mg/L
MW-20-5**	Nitrite as nitrogen	0.02 mg/L	0.02U mg/L
MW-20-4	Nitrite as nitrogen	0.019 mg/L	0.019U mg/L
EB-7-050322	Chloride Sulfate Nitrite as nitrogen Hexavalent chromium	0.15 mg/L 0.21 mg/L 0.016 mg/L 0.000084 ug/L	0.15U mg/L 0.21U mg/L 0.016U mg/L 0.000084U ug/L

V. Field Blanks

Sample EB-7-050322 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-7-050322	05/03/2022	Total dissolved solids Hexavalent chromium Chloride Sulfate Nitrite as nitrogen	3.3 mg/L 0.000084 ug/L 0.15 mg/L 0.21 mg/L 0.016 mg/L	MW-25-2 MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-25-2	Nitrite as nitrogen	0.019 mg/L	0.019U mg/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-25-1	Nitrite as nitrogen	0.018 mg/L	0.018U mg/L
MW-18-4**	Nitrite as nitrogen	0.018 mg/L	0.018U mg/L
MW-18-5	Hexavalent chromium Nitrite as nitrogen	0.00014 ug/L 0.019 mg/L	0.00014U ug/L 0.019U mg/L
MW-18-3	Nitrite as nitrogen	0.017 mg/L	0.017U mg/L
MW-18-2	Hexavalent chromium Nitrite as nitrogen	0.00012 ug/L 0.018 mg/L	0.00012U ug/L 0.018U mg/L
MW-20-5**	Hexavalent chromium Nitrite as nitrogen	0.00013 ug/L 0.02 mg/L	0.00013U ug/L 0.02U mg/L
MW-20-4	Hexavalent chromium Nitrite as nitrogen	0.00015 ug/L 0.019 mg/L	0.00015U ug/L 0.019U mg/L

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time and continuing calibration %R, data were qualified as estimated in nine samples.

Due to laboratory blank contamination, data were qualified as not detected in nine samples.

Due to field blank contamination, data were qualified as not detected in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Wet Chemistry - Data Qualification Summary - SDG 2210373

Sample	Analyte	Flag	A or P	Reason
MW-25-2 MW-25-1 MW-18-4** MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4 EB-7-050322	pH	J (all detects)	P	Technical holding times
MW-25-2 MW-25-1 MW-18-3	Hexavalent chromium	J (all detects)	P	Technical holding times
MW-25-2 MW-25-1 MW-18-4**	Perchlorate	J (all detects)	A	Continuing calibration (%R)
MW-18-5 MW-18-3 MW-18-2 MW-20-5** MW-20-4 EB-7-050322	Perchlorate	UJ (all non-detects)	A	Continuing calibration (%R)

NASA JPL, 2Q2022
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 2210373

Sample	Analyte	Modified Final Concentration	A or P
MW-25-2	Nitrite as nitrogen	0.019U mg/L	A
MW-25-1	Nitrite as nitrogen	0.018U mg/L	A
MW-18-4**	Nitrite as nitrogen	0.018U mg/L	A
MW-18-5	Nitrite as nitrogen	0.019U mg/L	A
MW-18-3	Nitrite as nitrogen	0.017U mg/L	A
MW-18-2	Nitrite as nitrogen	0.018U mg/L	A
MW-20-5**	Nitrite as nitrogen	0.02U mg/L	A
MW-20-4	Nitrite as nitrogen	0.019U mg/L	A

Sample	Analyte	Modified Final Concentration	A or P
EB-7-050322	Chloride Sulfate Nitrite as nitrogen	0.15U mg/L 0.21U mg/L 0.016U mg/L	A
EB-7-050322	Hexavalent chromium	0.000084U ug/L	A

NASA JPL, 2Q2022
Wet Chemistry - Field Blank Data Qualification Summary - SDG 2210373

Sample	Analyte	Modified Final Concentration	A or P
MW-25-2	Nitrite as nitrogen	0.019U mg/L	A
MW-25-1	Nitrite as nitrogen	0.018U mg/L	A
MW-18-4**	Nitrite as nitrogen	0.018U mg/L	A
MW-18-5	Hexavalent chromium Nitrite as nitrogen	0.00014U ug/L 0.019U mg/L	A
MW-18-3	Nitrite as nitrogen	0.017U mg/L	A
MW-18-2	Hexavalent chromium Nitrite as nitrogen	0.00012U ug/L 0.018U mg/L	A
MW-20-5**	Hexavalent chromium Nitrite as nitrogen	0.00013U ug/L 0.02U mg/L	A
MW-20-4	Hexavalent chromium Nitrite as nitrogen	0.00015U ug/L 0.019U mg/L	A

LDC #: 54409B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/28/22
SDG #: 2210373 Level III/IV Page: 1 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer:

METHOD: (Analyte) Alkalinity (SM2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA Method 218.6), Perchlorate (EPA Method 314.0), pH (EPA Method 150.1), TDS (EPA Method 160.1)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/SW	
II	Initial calibration	A	
III.	Calibration verification	SW	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	E=9
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XI	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-25-2	2210373-02	Water	05/13/22
2	MW-25-1	2210373-03	Water	05/13/22
3	MW-18-4**	2210373-04**	Water	05/13/22
4	MW-18-5	2210373-05	Water	05/13/22
5	MW-18-3	2210373-06	Water	05/13/22
6	MW-18-2	2210373-07	Water	05/13/22
7	MW-20-5**	2210373-08**	Water	05/13/22
8	MW-20-4	2210373-09	Water	05/13/22
9	EB-7-050322	2210373-10	Water	05/13/22
10	MW-25-2MS	2210373-02MS	Water	05/13/22
11	MW-25-2MSD	2210373-02MSD	Water	05/13/22
12	MW-25-2DUP	2210373-02DUP	Water	05/13/22
13	MW-18-4MS	2210373-04MS	Water	05/13/22
14	MW-18-4MSD	2210373-04MSD	Water	05/13/22
15	MW-18-4DUP	2210373-04DUP	Water	05/13/22
16	MW-18-5DUP	2210373-05DUP	Water	05/13/22

LDC #: 54409B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/28/22
SDG #: 2210373 Level III/IV Page: 2 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer:

METHOD: (Analyte) Alkalinity (SM2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA Method 218.6), Perchlorate (EPA Method 314.0), pH (EPA Method 150.1), TDS (EPA Method 160.1)

	Client ID	Lab ID	Matrix	Date
17	MW-20-5MS	2210373-08MS	Water	05/13/22
18	MW-20-5MSD	2210373-08MSD	Water	05/13/22
19	MW-20-5DUP	2210373-08DUP	Water	05/13/22
20				
21				
22				

Notes:

METHOD: Inorganics				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
II. Calibration				
Were all instruments calibrated at the required frequency?	Yes			
Were the proper number of standards used?	Yes			
Were all initial and continuing calibration verifications within the QC limits?		No		
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
Were balance checks performed as required?			NA	
III. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?	Yes			
Was there contamination in the initial and continuing calibration blanks?	Yes			
IV. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries within the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	Yes			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	Yes			
V. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	

XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?			NA	
Were target analytes detected in the field duplicates?			NA	
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-9	Alkalinity,Cl,NO3-N,SO4,NO2-N,Cr(VI),CLO4,pH,TDS
QC:	
16	pH,Alkalinity
12	TDS
17-19	Cr(VI)
10-12	Cl,NO3-N,SO4
13-15	NO2-N

METHOD: Inorganics
All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 150.1 Analyte: pH Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
1	5/3/2022 7:55	5/6/2022 17:24	81	J/UJ/P	Det
2	5/3/2022 8:25	5/6/2022 17:31	81	J/UJ/P	Det
3	5/3/2022 11:20	5/6/2022 17:40	78	J/UJ/P	Det
4	5/3/2022 10:30	5/6/2022 18:06	79	J/UJ/P	Det
5	5/3/2022 12:45	5/6/2022 18:21	77	J/UJ/P	Det
6	5/3/2022 13:20	5/6/2022 18:29	77	J/UJ/P	Det
7	5/3/2022 14:50	5/6/2022 18:36	75	J/UJ/P	Det
8	5/3/2022 15:25	5/6/2022 18:44	75	J/UJ/P	Det
9	5/3/2022 15:35	5/6/2022 18:52	75	J/UJ/P	Det

METHOD: Inorganics
All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 218.6 Analyte: Hexavalent Chromium Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
1	5/3/2022 7:55	5/9/2022 18:13	154	J/R/P	Det
2	5/3/2022 8:25	5/9/2022 18:22	153	J/R/P	Det
5	5/3/2022 12:45	5/9/2022 19:10	150	J/R/P	Det

Calibration

METHOD: Inorganics

All initial calibration verifications (ICVs) and continuing calibration verifications (CCVs) were performed at the required frequency and were within the acceptance limits with the following exceptions:

Date	Time	Calibration ID	Analyte	%R	%R Limits	Associated Samples	Qualification	Det/ND
5/12/2022	1:47	2209334-CCV2	CLO4	88.4	90-110	1-9	J/UJ/A	Det: 1-3; ND:4-9
5/12/2022	4:36	2209334-CCV3	CLO4	85.9	90-110	2-9	J/UJ/A	Det: 2-3; ND:4-9

Comments:

Laboratory Blank Contamination (PB/ICB/CCB)

METHOD: Inorganics

Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-9

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	1	2	3	4	5	6	7	8	9
Cl	0.173		0.865									0.15
SO4	0.216		1.08									0.21
NO2-N	0.017736		0.08868	0.019	0.018	0.018	0.019	0.017	0.018	0.02	0.019	0.016

METHOD: Inorganics

Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: ug/L Associated Samples: 3-9

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (ug/L)**	**Action Level**	9								
Cr(VI)		0.000021	0.000105	0.000084								

METHOD: Inorganics

Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-9

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	1	2	3	4	5	6	7	8	9
Cl		0.168	0.84									0.15
SO4		0.264	1.32									0.21
NO2-N		0.018176	0.09088	0.019	0.018	0.018	0.019	0.017	0.018	0.02	0.019	0.016

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is establised at 5X the highest ICB, CCB, or PB concentration.

Field Blanks

METHOD: Inorganics

Blank units: mg/L Associated sample units: mg/L

Sampling Date: 5/3/2022 Associated Samples: 1-8

			Sample Identification							
Analyte	Blank ID	Action Level	1	2	3	4	5	6	7	8
	9									
~~pH (S.U.)~~	~~6.37~~		~~7.96~~	~~7.68~~	~~8.2~~	~~9.12~~	~~8.21~~	~~8~~	~~8.75~~	~~8.87~~
TDS	3.3									
Cr(VI) (ug/L)	0.000084					0.00014		0.00012	0.00013	0.00015
Cl	0.15									
SO4	0.21									
NO2-N	0.016	0.08	0.019	0.018	0.018	0.019	0.017	0.018	0.02	0.019

Comments: The action level, when applicable, is estabilised at 5X the highest concentration.

METHOD: Inorganics

The correlation coefficient (r) for the calibration of NO2-N were recalculated.
Calibration date:
An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:
%R = (Found/True) x 100
Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of Analysis	Analyte	Standard	Concentration (mg/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial Calibration	NO2-N	s1	0	0.0071	0.999863	0.999863	Y
		s2	0.02	0.01767			
		s3	0.05	0.03349			
		s4	0.1	0.06057			
		s5	0.5	0.26577			
		s6	1	0.53683			
		s7					
		s8					
		s9					
		s10					
		s11					
		s12					

Type of Analysis	Analyte	Found (mg/L)	True (mg/L)		Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Calibration verification	Cr(VI)	26.215	25.00		104.86	105	Y
Calibration verification	CLO4	9.4412	10.00		94.412	94.4	Y
Calibration verification	Cl	50.621	50.00		101.242	101	Y

Quality Control Sample Recalculations

METHOD: Inorganics

Percent recoveries (%R) for the laboratory control sample (LCS) and matrix spike (MS) were recalcuated using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis. For the MS calculation, Found = SSR (Spiked Sample Result) - SR (Sample Result)

True = concentration of each analyte in the source

The sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = (Absolute value(S-D)x 200) / (S+D)

S = Original sample concentration

D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found/S	True/D	Recalculated %R/RPD	Reported %R/RPD	Acceptable (Y/N)
B138202-BS2	LCS	pH	7.02	7	100.2857143	100	Y
17	MS	Cr(VI)	0.020086	0.020202	99.42579943	99.4	Y
12	Duplicate	TDS	496.66	500	0.670238597	0.669	Y

Sample Calculation Verification

METHOD: Inorganics

Analytes were recalculated and verified using the following equation:

Concentration = (Result from raw data x Final volume x Dilution factor) / (Percent solids (if applicable) x Initial weight or volume)

Sample ID	Analyte	Raw Data (ppb)	Dilution	Initial Volume (mL)	Final Volume (mL)	Reported Result (mg/L)	Recalculated Result (mg/L)	Acceptable (Y/N)
3	pH (S.U.)	8.2	1	50	50	8.2	8.2	Y
3	TDS	138	2	100	100	280	276	Y
3	Cr(VI) (ug/L)	2.851900393	1	20	20	0.0029	0.0028519	Y
3	NO3-N (ppm)	1.30425475	1	20	20	1.3	1.30425475	Y
3	CLO4 (ug/L)	12.31	1	20	20	12	12.31	Y
7	NO2-N	0.02	1	20	20	0.02	0.02	Y
7	Alkalinity	119.5	1	50	50	120	119.5	Y

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SDG: 2210193

Analytical Method EPA-150.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-5-2Q22	2210193-03	pH	5/6/2022	7.58	Y	y	v	J	0.05	0.05	pH Units
EB-6-050222	2210193-11	pH	5/6/2022	6.28	Y	y	v	J	0.05	0.05	pH Units
MW-25-3	2210193-10	pH	5/6/2022	8.03	Y	y	v	J	0.05	0.05	pH Units
MW-25-4	2210193-09	pH	5/6/2022	8.02	Y	y	v	J	0.05	0.05	pH Units
MW-25-5	2210193-08	pH	5/6/2022	8.76	Y	y	v	J	0.05	0.05	pH Units
MW-3-1	2210193-06	pH	5/6/2022	8.05	Y	y	v	J	0.05	0.05	pH Units
MW-3-2	2210193-05	pH	5/6/2022	7.64	Y	y	v	J	0.05	0.05	pH Units
MW-3-3	2210193-04	pH	5/6/2022	7.59	Y	y	v	J	0.05	0.05	pH Units
MW-3-4	2210193-02	pH	5/6/2022	7.64	Y	y	v	J	0.05	0.05	pH Units
MW-3-5	2210193-01	pH	5/6/2022	7.54	Y	y	v	J	0.05	0.05	pH Units
SB-2-050222	2210193-12	pH	5/6/2022	6.21	Y	y	v	J	0.05	0.05	pH Units

Analytical Method EPA-160.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-5-2Q22	2210193-03	Total Dissolved Solids @ 180 C	5/5/2022	320	Y	y	v		20	10	mg/L
EB-6-050222	2210193-11	Total Dissolved Solids @ 180 C	5/5/2022	3.3	Y	y	v j		6.7	3.3	mg/L
MW-25-3	2210193-10	Total Dissolved Solids @ 180 C	5/5/2022	450	Y	y	v		20	10	mg/L
MW-25-4	2210193-09	Total Dissolved Solids @ 180 C	5/5/2022	530	Y	y	v		33	17	mg/L
MW-25-5	2210193-08	Total Dissolved Solids @ 180 C	5/5/2022	250	Y	y	v		20	10	mg/L
MW-3-1	2210193-06	Total Dissolved Solids @ 180 C	5/5/2022	340	Y	y	v		20	10	mg/L
MW-3-2	2210193-05	Total Dissolved Solids @ 180 C	5/5/2022	310	Y	y	v		20	10	mg/L
MW-3-3	2210193-04	Total Dissolved Solids @ 180 C	5/5/2022	320	Y	y	v		20	10	mg/L
MW-3-4	2210193-02	Total Dissolved Solids @ 180 C	5/5/2022	320	Y	y	v		20	10	mg/L
MW-3-5	2210193-01	Total Dissolved Solids @ 180 C	5/5/2022	320	Y	y	v		20	10	mg/L

SDG: 2210193

Analytical Method	EPA-160.1										
Sample ID	**Lab Sample ID**	**Chemical Name**	**Anal Date**	**Result**	**Report**	**Detect**	**Lab Qual**	**Val Qual**	**RL**	**MDL**	**Units**
SB-2-050222	2210193-12	Total Dissolved Solids @ 180 C	5/5/2022	4	Y	y	v j		6.7	3.3	mg/L

Analytical Method	EPA-200.7										
Sample ID	**Lab Sample ID**	**Chemical Name**	**Anal Date**	**Result**	**Report**	**Detect**	**Lab Qual**	**Val Qual**	**RL**	**MDL**	**Units**
DUP-5-2Q22	2210193-03	Total Recoverable Calcium	5/10/2022	59	Y	y	v		0.10	0.014	mg/L
DUP-5-2Q22	2210193-03	Total Recoverable Potassium	5/10/2022	2.9	Y	y	v		1.0	0.10	mg/L
DUP-5-2Q22	2210193-03	Total Recoverable Iron	5/10/2022	2900	Y	y	v		50	30	ug/L
DUP-5-2Q22	2210193-03	Total Recoverable Magnesium	5/10/2022	19	Y	y	v		0.050	0.019	mg/L
DUP-5-2Q22	2210193-03	Total Recoverable Sodium	5/10/2022	22	Y	y	v		0.50	0.051	mg/L
EB-6-050222	2210193-11	Total Recoverable Iron	5/10/2022	50	Y	n	u		50	30	ug/L
EB-6-050222	2210193-11	Total Recoverable Magnesium	5/10/2022	0.05	Y	n	u		0.050	0.019	mg/L
EB-6-050222	2210193-11	Total Recoverable Sodium	5/10/2022	0.18	Y	y	v j		0.50	0.051	mg/L
EB-6-050222	2210193-11	Total Recoverable Potassium	5/10/2022	1	Y	n	u		1.0	0.10	mg/L
EB-6-050222	2210193-11	Total Recoverable Calcium	5/10/2022	0.087	Y	n	v j	U	0.10	0.014	mg/L
MW-25-3	2210193-10	Total Recoverable Calcium	5/10/2022	78	Y	y	v		0.10	0.014	mg/L
MW-25-3	2210193-10	Total Recoverable Magnesium	5/10/2022	23	Y	y	v		0.050	0.019	mg/L
MW-25-3	2210193-10	Total Recoverable Sodium	5/10/2022	34	Y	y	v		0.50	0.051	mg/L
MW-25-3	2210193-10	Total Recoverable Potassium	5/10/2022	2.8	Y	y	v		1.0	0.10	mg/L
MW-25-3	2210193-10	Total Recoverable Iron	5/10/2022	50	Y	n	u		50	30	ug/L
MW-25-4	2210193-09	Total Recoverable Calcium	5/10/2022	99	Y	y	v		0.10	0.014	mg/L
MW-25-4	2210193-09	Total Recoverable Magnesium	5/10/2022	26	Y	y	v		0.050	0.019	mg/L
MW-25-4	2210193-09	Total Recoverable Potassium	5/10/2022	2.5	Y	y	v		1.0	0.10	mg/L
MW-25-4	2210193-09	Total Recoverable Iron	5/10/2022	50	Y	n	u		50	30	ug/L
MW-25-4	2210193-09	Total Recoverable Sodium	5/10/2022	47	Y	y	v		0.50	0.051	mg/L
MW-25-5	2210193-08	Total Recoverable Potassium	5/10/2022	2.1	Y	y	v		1.0	0.10	mg/L

SDG: 2210193

Analytical Method EPA-200.7

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-25-5	2210193-08	Total Recoverable Calcium	5/10/2022	12	Y	y	v		0.10	0.014	mg/L
MW-25-5	2210193-08	Total Recoverable Sodium	5/10/2022	64	Y	y	v		0.50	0.051	mg/L
MW-25-5	2210193-08	Total Recoverable Iron	5/10/2022	50	Y	n	u		50	30	ug/L
MW-25-5	2210193-08	Total Recoverable Magnesium	5/10/2022	7.1	Y	y	v		0.050	0.019	mg/L
MW-3-1	2210193-06	Total Recoverable Magnesium	5/10/2022	21	Y	y	v		0.050	0.019	mg/L
MW-3-1	2210193-06	Total Recoverable Sodium	5/10/2022	26	Y	y	v		0.50	0.051	mg/L
MW-3-1	2210193-06	Total Recoverable Calcium	5/10/2022	61	Y	y	v		0.10	0.014	mg/L
MW-3-1	2210193-06	Total Recoverable Potassium	5/10/2022	3.4	Y	y	v		1.0	0.10	mg/L
MW-3-1	2210193-06	Total Recoverable Iron	5/10/2022	210	Y	n	v	U	50	30	ug/L
MW-3-2	2210193-05	Total Recoverable Iron	5/10/2022	50	Y	n	u		50	30	ug/L
MW-3-2	2210193-05	Total Recoverable Calcium	5/10/2022	61	Y	y	v		0.10	0.014	mg/L
MW-3-2	2210193-05	Total Recoverable Magnesium	5/10/2022	19	Y	y	v		0.050	0.019	mg/L
MW-3-2	2210193-05	Total Recoverable Potassium	5/10/2022	3	Y	y	v		1.0	0.10	mg/L
MW-3-2	2210193-05	Total Recoverable Sodium	5/10/2022	23	Y	y	v		0.50	0.051	mg/L
MW-3-3	2210193-04	Total Recoverable Iron	5/10/2022	1000	Y	y	v		50	30	ug/L
MW-3-3	2210193-04	Total Recoverable Calcium	5/10/2022	57	Y	y	v		0.10	0.014	mg/L
MW-3-3	2210193-04	Total Recoverable Potassium	5/10/2022	2.8	Y	y	v		1.0	0.10	mg/L
MW-3-3	2210193-04	Total Recoverable Magnesium	5/10/2022	18	Y	y	v		0.050	0.019	mg/L
MW-3-3	2210193-04	Total Recoverable Sodium	5/10/2022	21	Y	y	v		0.50	0.051	mg/L
MW-3-4	2210193-02	Total Recoverable Potassium	5/10/2022	2.9	Y	y	v		1.0	0.10	mg/L
MW-3-4	2210193-02	Total Recoverable Magnesium	5/10/2022	19	Y	y	v		0.050	0.019	mg/L
MW-3-4	2210193-02	Total Recoverable Iron	5/10/2022	3500	Y	y	v		50	30	ug/L
MW-3-4	2210193-02	Total Recoverable Sodium	5/10/2022	22	Y	y	v		0.50	0.051	mg/L
MW-3-4	2210193-02	Total Recoverable Calcium	5/10/2022	60	Y	y	v		0.10	0.014	mg/L
MW-3-5	2210193-01	Total Recoverable Magnesium	5/6/2022	18	Y	y	v		0.050	0.019	mg/L

SDG: 2210193

Analytical Method EPA-200.7

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-3-5	2210193-01	Total Recoverable Iron	5/6/2022	2500	Y	y	v		50	30	ug/L
MW-3-5	2210193-01	Total Recoverable Potassium	5/6/2022	2.6	Y	y	v		1.0	0.10	mg/L
MW-3-5	2210193-01	Total Recoverable Calcium	5/6/2022	57	Y	y	v		0.10	0.014	mg/L
MW-3-5	2210193-01	Total Recoverable Sodium	5/6/2022	21	Y	y	v		0.50	0.051	mg/L
SB-2-050222	2210193-12	Total Recoverable Sodium	5/10/2022	0.17	Y	y	v j		0.50	0.051	mg/L
SB-2-050222	2210193-12	Total Recoverable Iron	5/10/2022	50	Y	n	u		50	30	ug/L
SB-2-050222	2210193-12	Total Recoverable Potassium	5/10/2022	1	Y	n	u		1.0	0.10	mg/L
SB-2-050222	2210193-12	Total Recoverable Magnesium	5/10/2022	0.05	Y	n	u		0.050	0.019	mg/L
SB-2-050222	2210193-12	Total Recoverable Calcium	5/10/2022	0.063	Y	n	v j	U	0.10	0.014	mg/L

Analytical Method EPA-200.8

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-5-2Q22	2210193-03	Total Recoverable Chromium	5/6/2022	4.7	Y	y	v		3.0	0.50	ug/L
DUP-5-2Q22	2210193-03	Total Recoverable Lead	5/6/2022	1	Y	n	u		1.0	0.10	ug/L
DUP-5-2Q22	2210193-03	Total Recoverable Arsenic	5/6/2022	2.9	Y	y	v		2.0	0.70	ug/L
EB-6-050222	2210193-11	Total Recoverable Lead	5/10/2022	1	Y	n	u		1.0	0.10	ug/L
EB-6-050222	2210193-11	Total Recoverable Chromium	5/10/2022	3	Y	n	u		3.0	0.50	ug/L
EB-6-050222	2210193-11	Total Recoverable Arsenic	5/10/2022	2	Y	n	u		2.0	0.70	ug/L
MW-25-3	2210193-10	Total Recoverable Chromium	5/6/2022	3.5	Y	y	v		3.0	0.50	ug/L
MW-25-3	2210193-10	Total Recoverable Lead	5/6/2022	1	Y	n	u		1.0	0.10	ug/L
MW-25-3	2210193-10	Total Recoverable Arsenic	5/6/2022	2	Y	n	u		2.0	0.70	ug/L
MW-25-4	2210193-09	Total Recoverable Lead	5/10/2022	1	Y	n	u		1.0	0.10	ug/L
MW-25-4	2210193-09	Total Recoverable Chromium	5/10/2022	0.97	Y	y	v j		3.0	0.50	ug/L
MW-25-4	2210193-09	Total Recoverable Arsenic	5/10/2022	1.1	Y	y	v j		2.0	0.70	ug/L
MW-25-5	2210193-08	Total Recoverable Lead	5/9/2022	1	Y	n	u		1.0	0.10	ug/L

SDG: 2210193

Analytical Method EPA-200.8

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-25-5	2210193-08	Total Recoverable Chromium	5/9/2022	3	Y	n	u		3.0	0.50	ug/L
MW-25-5	2210193-08	Total Recoverable Arsenic	5/9/2022	2	Y	n	u		2.0	0.70	ug/L
MW-3-1	2210193-06	Total Recoverable Chromium	5/6/2022	3	Y	n	u		3.0	0.50	ug/L
MW-3-1	2210193-06	Total Recoverable Arsenic	5/6/2022	2	Y	n	u		2.0	0.70	ug/L
MW-3-1	2210193-06	Total Recoverable Lead	5/6/2022	1	Y	n	u		1.0	0.10	ug/L
MW-3-2	2210193-05	Total Recoverable Arsenic	5/6/2022	2	Y	n	u		2.0	0.70	ug/L
MW-3-2	2210193-05	Total Recoverable Chromium	5/6/2022	3	Y	n	u		3.0	0.50	ug/L
MW-3-2	2210193-05	Total Recoverable Lead	5/6/2022	1	Y	n	u		1.0	0.10	ug/L
MW-3-3	2210193-04	Total Recoverable Arsenic	5/6/2022	1.5	Y	y	v j		2.0	0.70	ug/L
MW-3-3	2210193-04	Total Recoverable Chromium	5/6/2022	0.81	Y	y	v j		3.0	0.50	ug/L
MW-3-3	2210193-04	Total Recoverable Lead	5/6/2022	1	Y	n	u		1.0	0.10	ug/L
MW-3-4	2210193-02	Total Recoverable Chromium	5/6/2022	5.9	Y	y	v	J	3.0	0.50	ug/L
MW-3-4	2210193-02	Total Recoverable Lead	5/6/2022	1	Y	n	u	UJ	1.0	0.10	ug/L
MW-3-4	2210193-02	Total Recoverable Arsenic	5/6/2022	4.7	Y	y	v	J	2.0	0.70	ug/L
MW-3-5	2210193-01	Total Recoverable Lead	5/6/2022	1	Y	n	u		1.0	0.10	ug/L
MW-3-5	2210193-01	Total Recoverable Chromium	5/6/2022	5.3	Y	y	v		3.0	0.50	ug/L
MW-3-5	2210193-01	Total Recoverable Arsenic	5/6/2022	1.9	Y	y	v j		2.0	0.70	ug/L
SB-2-050222	2210193-12	Total Recoverable Arsenic	5/10/2022	2	Y	n	u		2.0	0.70	ug/L
SB-2-050222	2210193-12	Total Recoverable Lead	5/10/2022	1	Y	n	u		1.0	0.10	ug/L
SB-2-050222	2210193-12	Total Recoverable Chromium	5/10/2022	3	Y	n	u		3.0	0.50	ug/L

Analytical Method EPA-218.6

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-5-2Q22	2210193-03	Hexavalent Chromium	5/9/2022	######	Y	y	v		0.0002	0.0000	mg/L
EB-6-050222	2210193-11	Hexavalent Chromium	5/9/2022	######	Y	y	v j	J	0.0002	0.0000	mg/L

SDG: 2210193

Analytical Method EPA-218.6

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-25-3	2210193-10	Hexavalent Chromium	5/9/2022	0.0038	Y	y	v		0.0002	0.0000	mg/L
MW-25-4	2210193-09	Hexavalent Chromium	5/9/2022	0.0013	Y	y	v		0.0002	0.0000	mg/L
MW-25-5	2210193-08	Hexavalent Chromium	5/9/2022	######	Y	n	v j	U	0.0002	0.0000	mg/L
MW-3-1	2210193-06	Hexavalent Chromium	5/9/2022	######	Y	n	v j	U	0.0002	0.0000	mg/L
MW-3-2	2210193-05	Hexavalent Chromium	5/9/2022	######	Y	y	v		0.0002	0.0000	mg/L
MW-3-3	2210193-04	Hexavalent Chromium	5/9/2022	######	Y	y	v		0.0002	0.0000	mg/L
MW-3-4	2210193-02	Hexavalent Chromium	5/9/2022	######	Y	y	v	J	0.0002	0.0000	mg/L
MW-3-5	2210193-01	Hexavalent Chromium	5/9/2022	######	Y	y	v	J	0.0002	0.0000	mg/L
SB-2-050222	2210193-12	Hexavalent Chromium	5/9/2022	######	Y	y	v j	J	0.0002	0.0000	mg/L

Analytical Method EPA-300.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-5-2Q22	2210193-03	Chloride	5/3/2022	20	Y	y	v		0.50	0.13	mg/L
DUP-5-2Q22	2210193-03	Nitrate as N	5/3/2022	1.1	Y	y	v		0.10	0.024	mg/L
DUP-5-2Q22	2210193-03	Sulfate	5/3/2022	38	Y	y	v		1.0	0.14	mg/L
EB-6-050222	2210193-11	Nitrate as N	5/3/2022	0.044	Y	y	v j		0.10	0.024	mg/L
EB-6-050222	2210193-11	Sulfate	5/3/2022	1	Y	n	u		1.0	0.14	mg/L
EB-6-050222	2210193-11	Chloride	5/3/2022	0.21	Y	n	v j	U	0.50	0.13	mg/L
MW-25-3	2210193-10	Chloride	5/3/2022	46	Y	y	v		0.50	0.13	mg/L
MW-25-3	2210193-10	Nitrate as N	5/3/2022	9.4	Y	y	v		0.10	0.024	mg/L
MW-25-3	2210193-10	Sulfate	5/3/2022	65	Y	y	v		1.0	0.14	mg/L
MW-25-4	2210193-09	Sulfate	5/3/2022	92	Y	y	v		1.0	0.14	mg/L
MW-25-4	2210193-09	Nitrate as N	5/3/2022	6.8	Y	y	v		0.10	0.024	mg/L
MW-25-4	2210193-09	Chloride	5/3/2022	62	Y	y	v		0.50	0.13	mg/L
MW-25-5	2210193-08	Chloride	5/3/2022	15	Y	y	v		0.50	0.13	mg/L

SDG: 2210193

Analytical Method EPA-300.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-25-5	2210193-08	Sulfate	5/3/2022	65	Y	y	v		1.0	0.14	mg/L
MW-25-5	2210193-08	Nitrate as N	5/3/2022	0.1	Y	n	u		0.10	0.024	mg/L
MW-3-1	2210193-06	Sulfate	5/3/2022	37	Y	y	v		1.0	0.14	mg/L
MW-3-1	2210193-06	Nitrate as N	5/3/2022	6	Y	y	v		0.10	0.024	mg/L
MW-3-1	2210193-06	Chloride	5/3/2022	12	Y	y	v		0.50	0.13	mg/L
MW-3-2	2210193-05	Sulfate	5/3/2022	38	Y	y	v		1.0	0.14	mg/L
MW-3-2	2210193-05	Chloride	5/3/2022	20	Y	y	v		0.50	0.13	mg/L
MW-3-2	2210193-05	Nitrate as N	5/3/2022	1.4	Y	y	v		0.10	0.024	mg/L
MW-3-3	2210193-04	Nitrate as N	5/3/2022	1.1	Y	y	v		0.10	0.024	mg/L
MW-3-3	2210193-04	Sulfate	5/3/2022	39	Y	y	v		1.0	0.14	mg/L
MW-3-3	2210193-04	Chloride	5/3/2022	20	Y	y	v		0.50	0.13	mg/L
MW-3-4	2210193-02	Chloride	5/3/2022	19	Y	y	v		0.50	0.13	mg/L
MW-3-4	2210193-02	Nitrate as N	5/3/2022	1.2	Y	y	v		0.10	0.024	mg/L
MW-3-4	2210193-02	Sulfate	5/3/2022	38	Y	y	v		1.0	0.14	mg/L
MW-3-5	2210193-01	Nitrate as N	5/3/2022	1.1	Y	y	v		0.10	0.024	mg/L
MW-3-5	2210193-01	Sulfate	5/3/2022	39	Y	y	v		1.0	0.14	mg/L
MW-3-5	2210193-01	Chloride	5/3/2022	20	Y	y	v		0.50	0.13	mg/L
SB-2-050222	2210193-12	Nitrate as N	5/4/2022	0.075	Y	y	v j		0.10	0.024	mg/L
SB-2-050222	2210193-12	Sulfate	5/4/2022	0.33	Y	y	v j		1.0	0.14	mg/L
SB-2-050222	2210193-12	Chloride	5/4/2022	0.22	Y	n	v j	U	0.50	0.13	mg/L

Analytical Method EPA-314.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-5-2Q22	2210193-03	Perchlorate	5/11/2022	2.6	Y	y	v	J	2.0	0.81	ug/L
EB-6-050222	2210193-11	Perchlorate	5/12/2022	2	Y	n	u		2.0	0.81	ug/L

SDG: 2210193

Analytical Method EPA-314.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-25-3	2210193-10	Perchlorate	5/11/2022	8.2	Y	y	v	J	2.0	0.81	ug/L
MW-25-4	2210193-09	Perchlorate	5/12/2022	7.3	Y	y	v	J	2.0	0.81	ug/L
MW-25-5	2210193-08	Perchlorate	5/12/2022	2	Y	n	u	UJ	2.0	0.81	ug/L
MW-3-1	2210193-06	Perchlorate	5/11/2022	2	Y	n	u	UJ	2.0	0.81	ug/L
MW-3-2	2210193-05	Perchlorate	5/11/2022	3.4	Y	y	v	J	2.0	0.81	ug/L
MW-3-3	2210193-04	Perchlorate	5/11/2022	2.4	Y	y	v	J	2.0	0.81	ug/L
MW-3-4	2210193-02	Perchlorate	5/12/2022	2.7	Y	y	v	J	2.0	0.81	ug/L
MW-3-5	2210193-01	Perchlorate	5/12/2022	2.6	Y	y	v		2.0	0.81	ug/L
SB-2-050222	2210193-12	Perchlorate	5/12/2022	2	Y	n	u	UJ	2.0	0.81	ug/L

Analytical Method EPA-353.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-5-2Q22	2210193-03	Nitrite as N	5/3/2022	0.05	Y	n	u		0.050	0.010	mg/L
EB-6-050222	2210193-11	Nitrite as N	5/3/2022	0.05	Y	n	u		0.050	0.010	mg/L
MW-25-3	2210193-10	Nitrite as N	5/3/2022	0.05	Y	n	u		0.050	0.010	mg/L
MW-25-4	2210193-09	Nitrite as N	5/3/2022	0.05	Y	n	u		0.050	0.010	mg/L
MW-25-5	2210193-08	Nitrite as N	5/3/2022	0.05	Y	n	u		0.050	0.010	mg/L
MW-3-1	2210193-06	Nitrite as N	5/3/2022	0.05	Y	n	u		0.050	0.010	mg/L
MW-3-2	2210193-05	Nitrite as N	5/3/2022	0.05	Y	n	u		0.050	0.010	mg/L
MW-3-3	2210193-04	Nitrite as N	5/3/2022	0.05	Y	n	u		0.050	0.010	mg/L
MW-3-4	2210193-02	Nitrite as N	5/3/2022	0.05	Y	n	u		0.050	0.010	mg/L
MW-3-5	2210193-01	Nitrite as N	5/3/2022	0.05	Y	n	u		0.050	0.010	mg/L
SB-2-050222	2210193-12	Nitrite as N	5/3/2022	0.05	Y	n	u		0.050	0.010	mg/L

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units

SDG: 2210193

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-5-2Q22	2210193-03	Methyl ethyl ketone	5/6/2022	5	Y	n	u		5.0	3.3	ug/L
DUP-5-2Q22	2210193-03	Methyl isobutyl ketone	5/6/2022	5	Y	n	u		5.0	2.4	ug/L
DUP-5-2Q22	2210193-03	Ethyl methacrylate	5/6/2022	4	Y	n	u		4.0	1.3	ug/L
DUP-5-2Q22	2210193-03	Methyl iodide	5/6/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
DUP-5-2Q22	2210193-03	Chloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-5-2Q22	2210193-03	Chloromethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
DUP-5-2Q22	2210193-03	Chloroform	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-5-2Q22	2210193-03	4-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.093	ug/L
DUP-5-2Q22	2210193-03	2,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
DUP-5-2Q22	2210193-03	1,1-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
DUP-5-2Q22	2210193-03	Hexachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
DUP-5-2Q22	2210193-03	Methyl methacrylate	5/6/2022	5	Y	n	u		5.0	1.2	ug/L
DUP-5-2Q22	2210193-03	Methacrylonitrile	5/6/2022	10	Y	n	u		10	2.3	ug/L
DUP-5-2Q22	2210193-03	Dibromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
DUP-5-2Q22	2210193-03	trans-1,4-Dichloro-2-butene	5/6/2022	5	Y	n	u		5.0	1.8	ug/L
DUP-5-2Q22	2210193-03	Diethyl ether	5/6/2022	2	Y	n	u		2.0	0.33	ug/L
DUP-5-2Q22	2210193-03	1,3-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
DUP-5-2Q22	2210193-03	Ethyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.32	ug/L
DUP-5-2Q22	2210193-03	2-Hexanone	5/6/2022	10	Y	n	u		10	5.0	ug/L
DUP-5-2Q22	2210193-03	2-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-5-2Q22	2210193-03	Chlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-5-2Q22	2210193-03	1,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-5-2Q22	2210193-03	trans-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-5-2Q22	2210193-03	cis-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
DUP-5-2Q22	2210193-03	1,1-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L

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Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-5-2Q22	2210193-03	Benzene	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
DUP-5-2Q22	2210193-03	Bromobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-5-2Q22	2210193-03	Bromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
DUP-5-2Q22	2210193-03	Acetone	5/6/2022	10	Y	n	u		10	6.6	ug/L
DUP-5-2Q22	2210193-03	Bromodichloromethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
DUP-5-2Q22	2210193-03	1,2-Dibromo-3-chloropropane	5/6/2022	1	Y	n	u		1.0	0.89	ug/L
DUP-5-2Q22	2210193-03	Bromomethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
DUP-5-2Q22	2210193-03	n-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-5-2Q22	2210193-03	sec-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
DUP-5-2Q22	2210193-03	Bromoform	5/6/2022	0.5	Y	n	u		0.50	0.46	ug/L
DUP-5-2Q22	2210193-03	1-Chlorobutane	5/6/2022	0	Y	y	v				ug/L
DUP-5-2Q22	2210193-03	Propionitrile	5/6/2022	20	Y	n	u		20	6.2	ug/L
DUP-5-2Q22	2210193-03	Tetrahydrofuran	5/6/2022	20	Y	n	u		20	5.2	ug/L
DUP-5-2Q22	2210193-03	p- & m-Xylenes	5/6/2022	0.5	Y	n	u		0.50	0.34	ug/L
DUP-5-2Q22	2210193-03	o-Xylene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
DUP-5-2Q22	2210193-03	1,2-Dichloroethane-d4 (Surrogate)	5/6/2022	9.9	Y	y	v s				ug/L
DUP-5-2Q22	2210193-03	tert-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
DUP-5-2Q22	2210193-03	4-Bromofluorobenzene (Surrogate)	5/6/2022	8.8	Y	y	v s				ug/L
DUP-5-2Q22	2210193-03	Carbon tetrachloride	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-5-2Q22	2210193-03	Chloroacetonitrile	5/6/2022	0	Y	y	v				ug/L
DUP-5-2Q22	2210193-03	2-Nitropropane	5/6/2022	0	Y	y	v				ug/L
DUP-5-2Q22	2210193-03	1,1-Dichloropropanone	5/6/2022	0	Y	y	v				ug/L
DUP-5-2Q22	2210193-03	Nitrobenzene	5/6/2022	0	Y	y	v				ug/L
DUP-5-2Q22	2210193-03	Methyl acrylate	5/6/2022	0	Y	y	v				ug/L
DUP-5-2Q22	2210193-03	Pentachloroethane	5/6/2022	2	Y	n	u	UJ	2.0	0.63	ug/L

SDG: 2210193

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-5-2Q22	2210193-03	Toluene-d8 (Surrogate)	5/6/2022	9.6	Y	y	v s				ug/L
DUP-5-2Q22	2210193-03	1,1-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-5-2Q22	2210193-03	1,1,1,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-5-2Q22	2210193-03	Styrene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
DUP-5-2Q22	2210193-03	n-Propylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
DUP-5-2Q22	2210193-03	Naphthalene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
DUP-5-2Q22	2210193-03	Methyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-5-2Q22	2210193-03	Methylene chloride	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-5-2Q22	2210193-03	p-Isopropyltoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-5-2Q22	2210193-03	1,1,2,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-5-2Q22	2210193-03	Ethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-5-2Q22	2210193-03	Hexachlorobutadiene	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
DUP-5-2Q22	2210193-03	Dichlorodifluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-5-2Q22	2210193-03	1,4-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-5-2Q22	2210193-03	1,2-Dibromoethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
DUP-5-2Q22	2210193-03	Dibromomethane	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
DUP-5-2Q22	2210193-03	1,2-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-5-2Q22	2210193-03	Allyl chloride	5/6/2022	5	Y	n	u		5.0	0.47	ug/L
DUP-5-2Q22	2210193-03	cis-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-5-2Q22	2210193-03	Isopropylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-5-2Q22	2210193-03	1,3,5-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-5-2Q22	2210193-03	t-Butyl alcohol	5/6/2022	2	Y	n	u		2.0	2.0	ug/L
DUP-5-2Q22	2210193-03	1,2-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-5-2Q22	2210193-03	Tetrachloroethene	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
DUP-5-2Q22	2210193-03	Carbon disulfide	5/6/2022	0.5	Y	n	u		0.50	0.48	ug/L

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Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-5-2Q22	2210193-03	t-Amyl Methyl ether	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
DUP-5-2Q22	2210193-03	Acrylonitrile	5/6/2022	5	Y	n	u		5.0	1.5	ug/L
DUP-5-2Q22	2210193-03	Vinyl chloride	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
DUP-5-2Q22	2210193-03	trans-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
DUP-5-2Q22	2210193-03	1,2,4-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-5-2Q22	2210193-03	1,1,1-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-5-2Q22	2210193-03	Toluene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-5-2Q22	2210193-03	1,2,3-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
DUP-5-2Q22	2210193-03	1,3-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
DUP-5-2Q22	2210193-03	1,2,4-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-5-2Q22	2210193-03	1,1,2-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-5-2Q22	2210193-03	Trichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
DUP-5-2Q22	2210193-03	Trichlorofluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-5-2Q22	2210193-03	1,2,3-Trichloropropane	5/6/2022	1	Y	n	u		1.0	0.78	ug/L
DUP-5-2Q22	2210193-03	1,1,2-Trichloro-1,2,2-trifluoroethane	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-6-050222	2210193-11	1,3,5-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-6-050222	2210193-11	trans-1,4-Dichloro-2-butene	5/6/2022	5	Y	n	u		5.0	1.8	ug/L
EB-6-050222	2210193-11	Carbon disulfide	5/6/2022	0.5	Y	n	u		0.50	0.48	ug/L
EB-6-050222	2210193-11	t-Amyl Methyl ether	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-6-050222	2210193-11	Allyl chloride	5/6/2022	5	Y	n	u		5.0	0.47	ug/L
EB-6-050222	2210193-11	Acrylonitrile	5/6/2022	5	Y	n	u		5.0	1.5	ug/L
EB-6-050222	2210193-11	Acetone	5/6/2022	10	Y	n	u		10	6.6	ug/L
EB-6-050222	2210193-11	Vinyl chloride	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
EB-6-050222	2210193-11	t-Butyl alcohol	5/6/2022	2	Y	n	u		2.0	2.0	ug/L
EB-6-050222	2210193-11	1,2,4-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L

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EB-6-050222	2210193-11	1,1,2-Trichloro-1,2,2-trifluoroethane	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-6-050222	2210193-11	1,2,3-Trichloropropane	5/6/2022	1	Y	n	u		1.0	0.78	ug/L
EB-6-050222	2210193-11	Trichlorofluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-6-050222	2210193-11	Trichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-6-050222	2210193-11	1,1,2-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-6-050222	2210193-11	1,1,1-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-6-050222	2210193-11	1,2,3-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-6-050222	2210193-11	Toluene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-6-050222	2210193-11	Diethyl ether	5/6/2022	2	Y	n	u		2.0	0.33	ug/L
EB-6-050222	2210193-11	Nitrobenzene	5/6/2022	0	Y	y	v				ug/L
EB-6-050222	2210193-11	1,2,4-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-6-050222	2210193-11	Tetrahydrofuran	5/6/2022	20	Y	n	u		20	5.2	ug/L
EB-6-050222	2210193-11	2-Nitropropane	5/6/2022	0	Y	y	v				ug/L
EB-6-050222	2210193-11	Chloroacetonitrile	5/6/2022	0	Y	y	v				ug/L
EB-6-050222	2210193-11	Methyl acrylate	5/6/2022	0	Y	y	v				ug/L
EB-6-050222	2210193-11	1,2-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-6-050222	2210193-11	1-Chlorobutane	5/6/2022	0	Y	y	v				ug/L
EB-6-050222	2210193-11	Tetrachloroethene	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
EB-6-050222	2210193-11	4-Bromofluorobenzene (Surrogate)	5/6/2022	8.8	Y	y	v s				ug/L
EB-6-050222	2210193-11	Toluene-d8 (Surrogate)	5/6/2022	9.7	Y	y	v s				ug/L
EB-6-050222	2210193-11	1,2-Dichloroethane-d4 (Surrogate)	5/6/2022	9.8	Y	y	v s				ug/L
EB-6-050222	2210193-11	1,1-Dichloropropanone	5/6/2022	0	Y	y	v				ug/L
EB-6-050222	2210193-11	p- & m-Xylenes	5/6/2022	0.5	Y	n	u		0.50	0.34	ug/L
EB-6-050222	2210193-11	Ethyl methacrylate	5/6/2022	4	Y	n	u		4.0	1.3	ug/L
EB-6-050222	2210193-11	Propionitrile	5/6/2022	20	Y	n	u		20	6.2	ug/L

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EB-6-050222	2210193-11	Pentachloroethane	5/6/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
EB-6-050222	2210193-11	Methyl methacrylate	5/6/2022	5	Y	n	u		5.0	1.2	ug/L
EB-6-050222	2210193-11	Methyl isobutyl ketone	5/6/2022	5	Y	n	u		5.0	2.4	ug/L
EB-6-050222	2210193-11	Methyl iodide	5/6/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
EB-6-050222	2210193-11	Methyl ethyl ketone	5/6/2022	5	Y	n	u		5.0	3.3	ug/L
EB-6-050222	2210193-11	Methacrylonitrile	5/6/2022	10	Y	n	u		10	2.3	ug/L
EB-6-050222	2210193-11	2-Hexanone	5/6/2022	10	Y	n	u		10	5.0	ug/L
EB-6-050222	2210193-11	Hexachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
EB-6-050222	2210193-11	Ethyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.32	ug/L
EB-6-050222	2210193-11	o-Xylene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
EB-6-050222	2210193-11	Carbon tetrachloride	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-6-050222	2210193-11	cis-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
EB-6-050222	2210193-11	1,2-Dibromoethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
EB-6-050222	2210193-11	1,2-Dibromo-3-chloropropane	5/6/2022	1	Y	n	u		1.0	0.89	ug/L
EB-6-050222	2210193-11	Dibromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
EB-6-050222	2210193-11	4-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.093	ug/L
EB-6-050222	2210193-11	2-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-6-050222	2210193-11	Chloromethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
EB-6-050222	2210193-11	Chloroform	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-6-050222	2210193-11	1,2-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-6-050222	2210193-11	Chlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-6-050222	2210193-11	1,3-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
EB-6-050222	2210193-11	tert-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
EB-6-050222	2210193-11	sec-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
EB-6-050222	2210193-11	n-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L

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EB-6-050222	2210193-11	Bromomethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
EB-6-050222	2210193-11	Bromoform	5/6/2022	0.5	Y	n	u		0.50	0.46	ug/L
EB-6-050222	2210193-11	Bromodichloromethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
EB-6-050222	2210193-11	Bromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
EB-6-050222	2210193-11	Bromobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-6-050222	2210193-11	Benzene	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
EB-6-050222	2210193-11	Chloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-6-050222	2210193-11	trans-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
EB-6-050222	2210193-11	1,1,1,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-6-050222	2210193-11	Styrene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
EB-6-050222	2210193-11	n-Propylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
EB-6-050222	2210193-11	Naphthalene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
EB-6-050222	2210193-11	Methyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-6-050222	2210193-11	Methylene chloride	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-6-050222	2210193-11	p-Isopropyltoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-6-050222	2210193-11	Isopropylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-6-050222	2210193-11	Dibromomethane	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
EB-6-050222	2210193-11	Ethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-6-050222	2210193-11	1,1,2,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-6-050222	2210193-11	cis-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-6-050222	2210193-11	1,1-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-6-050222	2210193-11	2,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
EB-6-050222	2210193-11	1,3-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
EB-6-050222	2210193-11	1,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-6-050222	2210193-11	trans-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L

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EB-6-050222	2210193-11	1,1-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
EB-6-050222	2210193-11	1,1-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-6-050222	2210193-11	Dichlorodifluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-6-050222	2210193-11	1,4-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-6-050222	2210193-11	Hexachlorobutadiene	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-3	2210193-10	t-Butyl alcohol	5/5/2022	2	Y	n	u		2.0	2.0	ug/L
MW-25-3	2210193-10	1,1,2-Trichloro-1,2,2-trifluoroethane	5/5/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-3	2210193-10	1,1,2,2-Tetrachloroethane	5/5/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-3	2210193-10	Diethyl ether	5/5/2022	2	Y	n	u		2.0	0.33	ug/L
MW-25-3	2210193-10	trans-1,4-Dichloro-2-butene	5/5/2022	5	Y	n	u		5.0	1.8	ug/L
MW-25-3	2210193-10	Carbon disulfide	5/5/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-25-3	2210193-10	t-Amyl Methyl ether	5/5/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-3	2210193-10	Acrylonitrile	5/5/2022	5	Y	n	u		5.0	1.5	ug/L
MW-25-3	2210193-10	Acetone	5/5/2022	10	Y	n	u		10	6.6	ug/L
MW-25-3	2210193-10	Vinyl chloride	5/5/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-3	2210193-10	Ethyl t-butyl ether	5/5/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-25-3	2210193-10	1,2,4-Trimethylbenzene	5/5/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-3	2210193-10	Hexachloroethane	5/5/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-3	2210193-10	1,2,3-Trichloropropane	5/5/2022	1	Y	n	u		1.0	0.78	ug/L
MW-25-3	2210193-10	Trichlorofluoromethane	5/5/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-3	2210193-10	Trichloroethene	5/5/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-3	2210193-10	1,1,2-Trichloroethane	5/5/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-3	2210193-10	1,1,1-Trichloroethane	5/5/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-3	2210193-10	1,2,4-Trichlorobenzene	5/5/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-3	2210193-10	1,2,3-Trichlorobenzene	5/5/2022	0.5	Y	n	u		0.50	0.19	ug/L

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MW-25-3	2210193-10	Toluene	5/5/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-3	2210193-10	Allyl chloride	5/5/2022	5	Y	n	u		5.0	0.47	ug/L
MW-25-3	2210193-10	1,3,5-Trimethylbenzene	5/5/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-3	2210193-10	p- & m-Xylenes	5/5/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-25-3	2210193-10	Methyl acrylate	5/5/2022	0	Y	y	v				ug/L
MW-25-3	2210193-10	Chloroacetonitrile	5/5/2022	0	Y	y	v				ug/L
MW-25-3	2210193-10	1-Chlorobutane	5/5/2022	0	Y	y	v				ug/L
MW-25-3	2210193-10	Nitrobenzene	5/5/2022	0	Y	y	v				ug/L
MW-25-3	2210193-10	2-Nitropropane	5/5/2022	0	Y	y	v				ug/L
MW-25-3	2210193-10	1,1-Dichloropropanone	5/5/2022	0	Y	y	v				ug/L
MW-25-3	2210193-10	4-Bromofluorobenzene (Surrogate)	5/5/2022	9.3	Y	y	v s				ug/L
MW-25-3	2210193-10	Toluene-d8 (Surrogate)	5/5/2022	9.8	Y	y	v s				ug/L
MW-25-3	2210193-10	Ethyl methacrylate	5/5/2022	4	Y	n	u		4.0	1.3	ug/L
MW-25-3	2210193-10	o-Xylene	5/5/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-3	2210193-10	1,1,1,2-Tetrachloroethane	5/5/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-3	2210193-10	Tetrahydrofuran	5/5/2022	20	Y	n	u		20	5.2	ug/L
MW-25-3	2210193-10	Propionitrile	5/5/2022	20	Y	n	u		20	6.2	ug/L
MW-25-3	2210193-10	Pentachloroethane	5/5/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-25-3	2210193-10	Methyl methacrylate	5/5/2022	5	Y	n	u		5.0	1.2	ug/L
MW-25-3	2210193-10	Methyl isobutyl ketone	5/5/2022	5	Y	n	u		5.0	2.4	ug/L
MW-25-3	2210193-10	Methyl iodide	5/5/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-25-3	2210193-10	Methyl ethyl ketone	5/5/2022	5	Y	n	u		5.0	3.3	ug/L
MW-25-3	2210193-10	Methacrylonitrile	5/5/2022	10	Y	n	u		10	2.3	ug/L
MW-25-3	2210193-10	2-Hexanone	5/5/2022	10	Y	n	u		10	5.0	ug/L
MW-25-3	2210193-10	1,2-Dichloroethane-d4 (Surrogate)	5/5/2022	10	Y	y	v s				ug/L

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MW-25-3	2210193-10	Chlorobenzene	5/5/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-3	2210193-10	Tetrachloroethene	5/5/2022	3.4	Y	y	v		0.50	0.23	ug/L
MW-25-3	2210193-10	1,2-Dichlorobenzene	5/5/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-3	2210193-10	Dibromomethane	5/5/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-25-3	2210193-10	1,2-Dibromoethane	5/5/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-25-3	2210193-10	1,2-Dibromo-3-chloropropane	5/5/2022	1	Y	n	u		1.0	0.89	ug/L
MW-25-3	2210193-10	Dibromochloromethane	5/5/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-25-3	2210193-10	4-Chlorotoluene	5/5/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-25-3	2210193-10	2-Chlorotoluene	5/5/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-3	2210193-10	Chloromethane	5/5/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-3	2210193-10	1,4-Dichlorobenzene	5/5/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-3	2210193-10	Chloroethane	5/5/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-3	2210193-10	Dichlorodifluoromethane	5/5/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-3	2210193-10	Carbon tetrachloride	5/5/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-3	2210193-10	tert-Butylbenzene	5/5/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-3	2210193-10	sec-Butylbenzene	5/5/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-3	2210193-10	n-Butylbenzene	5/5/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-3	2210193-10	Bromomethane	5/5/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-3	2210193-10	Bromoform	5/5/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-25-3	2210193-10	Bromodichloromethane	5/5/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-3	2210193-10	Bromochloromethane	5/5/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-25-3	2210193-10	Bromobenzene	5/5/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-3	2210193-10	Chloroform	5/5/2022	0.36	Y	y	v j		0.50	0.14	ug/L
MW-25-3	2210193-10	1,1-Dichloropropene	5/5/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-3	2210193-10	Styrene	5/5/2022	0.5	Y	n	u		0.50	0.12	ug/L

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MW-25-3	2210193-10	n-Propylbenzene	5/5/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-25-3	2210193-10	Naphthalene	5/5/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-25-3	2210193-10	Methyl t-butyl ether	5/5/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-3	2210193-10	Methylene chloride	5/5/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-3	2210193-10	p-Isopropyltoluene	5/5/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-3	2210193-10	Isopropylbenzene	5/5/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-3	2210193-10	Hexachlorobutadiene	5/5/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-3	2210193-10	Ethylbenzene	5/5/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-3	2210193-10	1,3-Dichlorobenzene	5/5/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-25-3	2210193-10	cis-1,3-Dichloropropene	5/5/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-3	2210193-10	Benzene	5/5/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-3	2210193-10	2,2-Dichloropropane	5/5/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-3	2210193-10	1,3-Dichloropropane	5/5/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-3	2210193-10	1,2-Dichloropropane	5/5/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-3	2210193-10	trans-1,2-Dichloroethene	5/5/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-3	2210193-10	cis-1,2-Dichloroethene	5/5/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-25-3	2210193-10	1,1-Dichloroethene	5/5/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-25-3	2210193-10	1,2-Dichloroethane	5/5/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-3	2210193-10	1,1-Dichloroethane	5/5/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-3	2210193-10	trans-1,3-Dichloropropene	5/5/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-4	2210193-09	t-Butyl alcohol	5/6/2022	2	Y	n	u		2.0	2.0	ug/L
MW-25-4	2210193-09	trans-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-4	2210193-09	1,1,1,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-4	2210193-09	1,2-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-4	2210193-09	1,1-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L

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MW-25-4	2210193-09	cis-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-25-4	2210193-09	trans-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-4	2210193-09	1,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-4	2210193-09	1,3-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-4	2210193-09	2,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-4	2210193-09	Dichlorodifluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-4	2210193-09	cis-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-4	2210193-09	1,4-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-4	2210193-09	Ethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-4	2210193-09	Hexachlorobutadiene	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-4	2210193-09	Isopropylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-4	2210193-09	p-Isopropyltoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-4	2210193-09	Methylene chloride	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-4	2210193-09	Methyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-4	2210193-09	Naphthalene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-25-4	2210193-09	n-Propylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-25-4	2210193-09	Benzene	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-4	2210193-09	1,1-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-4	2210193-09	Chloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-4	2210193-09	Bromobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-4	2210193-09	Bromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-25-4	2210193-09	Bromodichloromethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-4	2210193-09	Bromoform	5/6/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-25-4	2210193-09	Bromomethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-4	2210193-09	n-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-25-4	2210193-09	sec-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-4	2210193-09	tert-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-4	2210193-09	1,1-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-4	2210193-09	Chlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-4	2210193-09	1,1,2,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-4	2210193-09	Chloroform	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-4	2210193-09	Chloromethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-4	2210193-09	2-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-4	2210193-09	4-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-25-4	2210193-09	Dibromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-25-4	2210193-09	1,2-Dibromo-3-chloropropane	5/6/2022	1	Y	n	u		1.0	0.89	ug/L
MW-25-4	2210193-09	Dibromomethane	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-25-4	2210193-09	Allyl chloride	5/6/2022	5	Y	n	u		5.0	0.47	ug/L
MW-25-4	2210193-09	1,3-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-25-4	2210193-09	Carbon tetrachloride	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-4	2210193-09	o-Xylene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-4	2210193-09	Styrene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-25-4	2210193-09	Methacrylonitrile	5/6/2022	10	Y	n	u		10	2.3	ug/L
MW-25-4	2210193-09	Methyl ethyl ketone	5/6/2022	5	Y	n	u		5.0	3.3	ug/L
MW-25-4	2210193-09	Methyl iodide	5/6/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-25-4	2210193-09	Methyl isobutyl ketone	5/6/2022	5	Y	n	u		5.0	2.4	ug/L
MW-25-4	2210193-09	Methyl methacrylate	5/6/2022	5	Y	n	u		5.0	1.2	ug/L
MW-25-4	2210193-09	Pentachloroethane	5/6/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-25-4	2210193-09	Propionitrile	5/6/2022	20	Y	n	u		20	6.2	ug/L
MW-25-4	2210193-09	Hexachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L

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MW-25-4	2210193-09	p- & m-Xylenes	5/6/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-25-4	2210193-09	Ethyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-25-4	2210193-09	1,2-Dichloroethane-d4 (Surrogate)	5/6/2022	9.7	Y	y	v s				ug/L
MW-25-4	2210193-09	Toluene-d8 (Surrogate)	5/6/2022	10	Y	y	v s				ug/L
MW-25-4	2210193-09	4-Bromofluorobenzene (Surrogate)	5/6/2022	8.9	Y	y	v s				ug/L
MW-25-4	2210193-09	1-Chlorobutane	5/6/2022	0	Y	y	v				ug/L
MW-25-4	2210193-09	Methyl acrylate	5/6/2022	0	Y	y	v				ug/L
MW-25-4	2210193-09	Nitrobenzene	5/6/2022	0	Y	y	v				ug/L
MW-25-4	2210193-09	2-Nitropropane	5/6/2022	0	Y	y	v				ug/L
MW-25-4	2210193-09	1,1-Dichloropropanone	5/6/2022	0	Y	y	v				ug/L
MW-25-4	2210193-09	Chloroacetonitrile	5/6/2022	0	Y	y	v				ug/L
MW-25-4	2210193-09	Tetrahydrofuran	5/6/2022	20	Y	n	u		20	5.2	ug/L
MW-25-4	2210193-09	1,2,4-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-4	2210193-09	Tetrachloroethene	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-25-4	2210193-09	Toluene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-4	2210193-09	1,2,3-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-4	2210193-09	1,2,4-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-4	2210193-09	1,1,1-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-4	2210193-09	1,1,2-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-4	2210193-09	Trichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-4	2210193-09	Trichlorofluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-4	2210193-09	2-Hexanone	5/6/2022	10	Y	n	u		10	5.0	ug/L
MW-25-4	2210193-09	1,1,2-Trichloro-1,2,2-trifluoroethane	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-4	2210193-09	1,2-Dibromoethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-25-4	2210193-09	1,3,5-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L

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MW-25-4	2210193-09	Vinyl chloride	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-4	2210193-09	Acetone	5/6/2022	10	Y	n	u		10	6.6	ug/L
MW-25-4	2210193-09	Acrylonitrile	5/6/2022	5	Y	n	u		5.0	1.5	ug/L
MW-25-4	2210193-09	t-Amyl Methyl ether	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-4	2210193-09	Carbon disulfide	5/6/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-25-4	2210193-09	trans-1,4-Dichloro-2-butene	5/6/2022	5	Y	n	u		5.0	1.8	ug/L
MW-25-4	2210193-09	Diethyl ether	5/6/2022	2	Y	n	u		2.0	0.33	ug/L
MW-25-4	2210193-09	Ethyl methacrylate	5/6/2022	4	Y	n	u		4.0	1.3	ug/L
MW-25-4	2210193-09	1,2,3-Trichloropropane	5/6/2022	1	Y	n	u		1.0	0.78	ug/L
MW-25-4	2210193-09	1,2-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-5	2210193-08	1,1-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-5	2210193-08	2-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-5	2210193-08	cis-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-5	2210193-08	1,1-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-5	2210193-08	Nitrobenzene	5/6/2022	0	Y	y	v				ug/L
MW-25-5	2210193-08	1,3-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-5	2210193-08	1,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-5	2210193-08	trans-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-5	2210193-08	cis-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-25-5	2210193-08	Ethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-5	2210193-08	1,2-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-5	2210193-08	Hexachlorobutadiene	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-5	2210193-08	Dichlorodifluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-5	2210193-08	1,4-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-5	2210193-08	1,3-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L

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MW-25-5	2210193-08	1,2-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-5	2210193-08	Dibromomethane	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-25-5	2210193-08	1,2-Dibromoethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-25-5	2210193-08	1,2-Dibromo-3-chloropropane	5/6/2022	1	Y	n	u		1.0	0.89	ug/L
MW-25-5	2210193-08	Dibromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-25-5	2210193-08	4-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-25-5	2210193-08	1,1-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-25-5	2210193-08	Tetrachloroethene	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-25-5	2210193-08	1,3,5-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-5	2210193-08	1,2,4-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-5	2210193-08	1,1,2-Trichloro-1,2,2-trifluoroethane	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-5	2210193-08	1,2,3-Trichloropropane	5/6/2022	1	Y	n	u		1.0	0.78	ug/L
MW-25-5	2210193-08	Trichlorofluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-5	2210193-08	Trichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-5	2210193-08	1,1,2-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-5	2210193-08	1,1,1-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-5	2210193-08	1,2,4-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-5	2210193-08	trans-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-5	2210193-08	Toluene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-5	2210193-08	2,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-5	2210193-08	1,1,2,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-5	2210193-08	1,1,1,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-5	2210193-08	Styrene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-25-5	2210193-08	n-Propylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-25-5	2210193-08	Naphthalene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-25-5	2210193-08	Methyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-5	2210193-08	Methylene chloride	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-5	2210193-08	p-Isopropyltoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-5	2210193-08	Isopropylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-5	2210193-08	1,2,3-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-5	2210193-08	Tetrahydrofuran	5/6/2022	20	Y	n	u		20	5.2	ug/L
MW-25-5	2210193-08	Ethyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-25-5	2210193-08	Hexachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-5	2210193-08	Vinyl chloride	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-5	2210193-08	2-Hexanone	5/6/2022	10	Y	n	u		10	5.0	ug/L
MW-25-5	2210193-08	Methacrylonitrile	5/6/2022	10	Y	n	u		10	2.3	ug/L
MW-25-5	2210193-08	Methyl ethyl ketone	5/6/2022	5	Y	n	u		5.0	3.3	ug/L
MW-25-5	2210193-08	Methyl iodide	5/6/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-25-5	2210193-08	Methyl isobutyl ketone	5/6/2022	5	Y	n	u		5.0	2.4	ug/L
MW-25-5	2210193-08	Methyl methacrylate	5/6/2022	5	Y	n	u		5.0	1.2	ug/L
MW-25-5	2210193-08	Ethyl methacrylate	5/6/2022	4	Y	n	u		4.0	1.3	ug/L
MW-25-5	2210193-08	Propionitrile	5/6/2022	20	Y	n	u		20	6.2	ug/L
MW-25-5	2210193-08	1-Chlorobutane	5/6/2022	0	Y	y	v				ug/L
MW-25-5	2210193-08	p- & m-Xylenes	5/6/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-25-5	2210193-08	o-Xylene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-5	2210193-08	1,2-Dichloroethane-d4 (Surrogate)	5/6/2022	9.8	Y	y	v s				ug/L
MW-25-5	2210193-08	Toluene-d8 (Surrogate)	5/6/2022	9.7	Y	y	v s				ug/L
MW-25-5	2210193-08	4-Bromofluorobenzene (Surrogate)	5/6/2022	9.1	Y	y	v s				ug/L
MW-25-5	2210193-08	Chloromethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-5	2210193-08	2-Nitropropane	5/6/2022	0	Y	y	v				ug/L

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MW-25-5	2210193-08	Methyl acrylate	5/6/2022	0	Y	y	v				ug/L
MW-25-5	2210193-08	1,1-Dichloropropanone	5/6/2022	0	Y	y	v				ug/L
MW-25-5	2210193-08	Pentachloroethane	5/6/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-25-5	2210193-08	Chlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-5	2210193-08	Chloroform	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-5	2210193-08	Chloroacetonitrile	5/6/2022	0	Y	y	v				ug/L
MW-25-5	2210193-08	Diethyl ether	5/6/2022	2	Y	n	u		2.0	0.33	ug/L
MW-25-5	2210193-08	Chloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-5	2210193-08	Carbon tetrachloride	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-5	2210193-08	tert-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-5	2210193-08	sec-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-5	2210193-08	n-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-5	2210193-08	Bromomethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-5	2210193-08	Bromoform	5/6/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-25-5	2210193-08	Bromodichloromethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-5	2210193-08	t-Amyl Methyl ether	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-5	2210193-08	Carbon disulfide	5/6/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-25-5	2210193-08	Bromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-25-5	2210193-08	t-Butyl alcohol	5/6/2022	2	Y	n	u		2.0	2.0	ug/L
MW-25-5	2210193-08	trans-1,4-Dichloro-2-butene	5/6/2022	5	Y	n	u		5.0	1.8	ug/L
MW-25-5	2210193-08	Allyl chloride	5/6/2022	5	Y	n	u		5.0	0.47	ug/L
MW-25-5	2210193-08	Acrylonitrile	5/6/2022	5	Y	n	u		5.0	1.5	ug/L
MW-25-5	2210193-08	Acetone	5/6/2022	10	Y	n	u		10	6.6	ug/L
MW-25-5	2210193-08	Benzene	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-5	2210193-08	Bromobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L

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MW-3-1	2210193-06	1,3-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-3-1	2210193-06	1,4-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-1	2210193-06	1,1-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-1	2210193-06	1,1-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-1	2210193-06	1,2-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-1	2210193-06	1,1-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-1	2210193-06	cis-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-1	2210193-06	Dichlorodifluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-1	2210193-06	trans-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-1	2210193-06	1,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-1	2210193-06	Hexachlorobutadiene	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-1	2210193-06	2,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-1	2210193-06	cis-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-1	2210193-06	trans-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-1	2210193-06	Ethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-1	2210193-06	1,2-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-1	2210193-06	tert-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-1	2210193-06	Isopropylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-1	2210193-06	1,3-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-1	2210193-06	Carbon tetrachloride	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-1	2210193-06	p-Isopropyltoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-1	2210193-06	1,2,4-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-1	2210193-06	Benzene	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-1	2210193-06	Bromobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-1	2210193-06	Bromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L

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MW-3-1	2210193-06	Bromodichloromethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-1	2210193-06	Bromoform	5/6/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-3-1	2210193-06	Bromomethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-1	2210193-06	Chlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-1	2210193-06	sec-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-1	2210193-06	Dibromomethane	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-3-1	2210193-06	Chloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-1	2210193-06	Chloroform	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-1	2210193-06	Chloromethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-1	2210193-06	2-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-1	2210193-06	4-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-3-1	2210193-06	Dibromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-3-1	2210193-06	1,2-Dibromo-3-chloropropane	5/6/2022	1	Y	n	u		1.0	0.89	ug/L
MW-3-1	2210193-06	1,2-Dibromoethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-3-1	2210193-06	n-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-1	2210193-06	Tetrahydrofuran	5/6/2022	20	Y	n	u		20	5.2	ug/L
MW-3-1	2210193-06	Diethyl ether	5/6/2022	2	Y	n	u		2.0	0.33	ug/L
MW-3-1	2210193-06	Ethyl methacrylate	5/6/2022	4	Y	n	u		4.0	1.3	ug/L
MW-3-1	2210193-06	Ethyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-3-1	2210193-06	Hexachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-1	2210193-06	2-Hexanone	5/6/2022	10	Y	n	u		10	5.0	ug/L
MW-3-1	2210193-06	Methacrylonitrile	5/6/2022	10	Y	n	u		10	2.3	ug/L
MW-3-1	2210193-06	Methyl ethyl ketone	5/6/2022	5	Y	n	u		5.0	3.3	ug/L
MW-3-1	2210193-06	Methyl iodide	5/6/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-3-1	2210193-06	Methyl isobutyl ketone	5/6/2022	5	Y	n	u		5.0	2.4	ug/L

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MW-3-1	2210193-06	Methyl methacrylate	5/6/2022	5	Y	n	u		5.0	1.2	ug/L
MW-3-1	2210193-06	trans-1,4-Dichloro-2-butene	5/6/2022	5	Y	n	u		5.0	1.8	ug/L
MW-3-1	2210193-06	Propionitrile	5/6/2022	20	Y	n	u		20	6.2	ug/L
MW-3-1	2210193-06	Toluene-d8 (Surrogate)	5/6/2022	10	Y	y	v s				ug/L
MW-3-1	2210193-06	p- & m-Xylenes	5/6/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-3-1	2210193-06	o-Xylene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-1	2210193-06	1,2-Dichloroethane-d4 (Surrogate)	5/6/2022	9.9	Y	y	v s				ug/L
MW-3-1	2210193-06	4-Bromofluorobenzene (Surrogate)	5/6/2022	9.1	Y	y	v s				ug/L
MW-3-1	2210193-06	2-Nitropropane	5/6/2022	0	Y	y	v				ug/L
MW-3-1	2210193-06	Chloroacetonitrile	5/6/2022	0	Y	y	v				ug/L
MW-3-1	2210193-06	1,1-Dichloropropanone	5/6/2022	0	Y	y	v				ug/L
MW-3-1	2210193-06	1-Chlorobutane	5/6/2022	0	Y	y	v				ug/L
MW-3-1	2210193-06	Methyl acrylate	5/6/2022	0	Y	y	v				ug/L
MW-3-1	2210193-06	Methylene chloride	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-1	2210193-06	Pentachloroethane	5/6/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-3-1	2210193-06	1,1,2,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-1	2210193-06	Nitrobenzene	5/6/2022	0	Y	y	v				ug/L
MW-3-1	2210193-06	Carbon disulfide	5/6/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-3-1	2210193-06	Methyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-1	2210193-06	Naphthalene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-3-1	2210193-06	n-Propylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-3-1	2210193-06	1,1,1,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-1	2210193-06	Tetrachloroethene	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-3-1	2210193-06	Toluene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-1	2210193-06	1,2,3-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-3-1	2210193-06	1,2,4-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-1	2210193-06	1,1,1-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-1	2210193-06	Acetone	5/6/2022	10	Y	n	u		10	6.6	ug/L
MW-3-1	2210193-06	t-Butyl alcohol	5/6/2022	2	Y	n	u		2.0	2.0	ug/L
MW-3-1	2210193-06	t-Amyl Methyl ether	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-1	2210193-06	Styrene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-3-1	2210193-06	1,1,2-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-1	2210193-06	Allyl chloride	5/6/2022	5	Y	n	u		5.0	0.47	ug/L
MW-3-1	2210193-06	Acrylonitrile	5/6/2022	5	Y	n	u		5.0	1.5	ug/L
MW-3-1	2210193-06	Vinyl chloride	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-1	2210193-06	1,3,5-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-1	2210193-06	1,1,2-Trichloro-1,2,2-trifluoroethane	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-1	2210193-06	1,2,3-Trichloropropane	5/6/2022	1	Y	n	u		1.0	0.78	ug/L
MW-3-1	2210193-06	Trichlorofluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-1	2210193-06	Trichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-2	2210193-05	1,2,4-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-2	2210193-05	1,1,1-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-2	2210193-05	p-Isopropyltoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-2	2210193-05	1,1,1,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-2	2210193-05	1,1,2-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-2	2210193-05	Toluene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-2	2210193-05	Tetrachloroethene	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-3-2	2210193-05	1,1,2,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-2	2210193-05	1,2,3-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-2	2210193-05	Styrene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-3-2	2210193-05	n-Propylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-3-2	2210193-05	Naphthalene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-3-2	2210193-05	Methylene chloride	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-2	2210193-05	Trichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-2	2210193-05	Diethyl ether	5/6/2022	2	Y	n	u		2.0	0.33	ug/L
MW-3-2	2210193-05	Isopropylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-2	2210193-05	Hexachlorobutadiene	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-2	2210193-05	Methyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-2	2210193-05	Allyl chloride	5/6/2022	5	Y	n	u		5.0	0.47	ug/L
MW-3-2	2210193-05	Carbon tetrachloride	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-2	2210193-05	Ethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-2	2210193-05	Hexachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-2	2210193-05	Ethyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-3-2	2210193-05	Ethyl methacrylate	5/6/2022	4	Y	n	u		4.0	1.3	ug/L
MW-3-2	2210193-05	trans-1,4-Dichloro-2-butene	5/6/2022	5	Y	n	u		5.0	1.8	ug/L
MW-3-2	2210193-05	Carbon disulfide	5/6/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-3-2	2210193-05	t-Amyl Methyl ether	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-2	2210193-05	Trichlorofluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-2	2210193-05	Acrylonitrile	5/6/2022	5	Y	n	u		5.0	1.5	ug/L
MW-3-2	2210193-05	Acetone	5/6/2022	10	Y	n	u		10	6.6	ug/L
MW-3-2	2210193-05	Vinyl chloride	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-2	2210193-05	1,3,5-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-2	2210193-05	1,2,4-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-2	2210193-05	1,1,2-Trichloro-1,2,2-trifluoroethane	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-2	2210193-05	1,2,3-Trichloropropane	5/6/2022	1	Y	n	u		1.0	0.78	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-3-2	2210193-05	t-Butyl alcohol	5/6/2022	2	Y	n	u		2.0	2.0	ug/L
MW-3-2	2210193-05	sec-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-2	2210193-05	Chloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-2	2210193-05	2-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-2	2210193-05	Chloromethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-2	2210193-05	Chloroform	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-2	2210193-05	2-Hexanone	5/6/2022	10	Y	n	u		10	5.0	ug/L
MW-3-2	2210193-05	Chlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-2	2210193-05	Dibromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-3-2	2210193-05	tert-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-2	2210193-05	1,2-Dibromo-3-chloropropane	5/6/2022	1	Y	n	u		1.0	0.89	ug/L
MW-3-2	2210193-05	n-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-2	2210193-05	Bromomethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-2	2210193-05	Bromoform	5/6/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-3-2	2210193-05	Bromodichloromethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-2	2210193-05	Bromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-2	2210193-05	Bromobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-2	2210193-05	Benzene	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-2	2210193-05	Chloroacetonitrile	5/6/2022	0	Y	y	v				ug/L
MW-3-2	2210193-05	1,2-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-2	2210193-05	cis-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-2	2210193-05	1,1-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-2	2210193-05	2,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-2	2210193-05	1,3-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-2	2210193-05	1,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-3-2	2210193-05	trans-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-2	2210193-05	4-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-3-2	2210193-05	1,1-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-2	2210193-05	trans-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-2	2210193-05	1,1-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-2	2210193-05	Dichlorodifluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-2	2210193-05	1,4-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-2	2210193-05	1,3-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-3-2	2210193-05	1,2-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-2	2210193-05	Dibromomethane	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-3-2	2210193-05	1,2-Dibromoethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-3-2	2210193-05	cis-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-2	2210193-05	1,1-Dichloropropanone	5/6/2022	0	Y	y	v				ug/L
MW-3-2	2210193-05	Methacrylonitrile	5/6/2022	10	Y	n	u		10	2.3	ug/L
MW-3-2	2210193-05	Toluene-d8 (Surrogate)	5/6/2022	10	Y	y	v s				ug/L
MW-3-2	2210193-05	1-Chlorobutane	5/6/2022	0	Y	y	v				ug/L
MW-3-2	2210193-05	Methyl acrylate	5/6/2022	0	Y	y	v				ug/L
MW-3-2	2210193-05	2-Nitropropane	5/6/2022	0	Y	y	v				ug/L
MW-3-2	2210193-05	Nitrobenzene	5/6/2022	0	Y	y	v				ug/L
MW-3-2	2210193-05	4-Bromofluorobenzene (Surrogate)	5/6/2022	8.9	Y	y	v s				ug/L
MW-3-2	2210193-05	1,2-Dichloroethane-d4 (Surrogate)	5/6/2022	10	Y	y	v s				ug/L
MW-3-2	2210193-05	Methyl isobutyl ketone	5/6/2022	5	Y	n	u		5.0	2.4	ug/L
MW-3-2	2210193-05	p- & m-Xylenes	5/6/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-3-2	2210193-05	Methyl ethyl ketone	5/6/2022	5	Y	n	u		5.0	3.3	ug/L
MW-3-2	2210193-05	Tetrahydrofuran	5/6/2022	20	Y	n	u		20	5.2	ug/L

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MW-3-2	2210193-05	Propionitrile	5/6/2022	20	Y	n	u		20	6.2	ug/L
MW-3-2	2210193-05	Pentachloroethane	5/6/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-3-2	2210193-05	Methyl methacrylate	5/6/2022	5	Y	n	u		5.0	1.2	ug/L
MW-3-2	2210193-05	Methyl iodide	5/6/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-3-2	2210193-05	o-Xylene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-3	2210193-04	Bromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-3	2210193-04	Bromobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-3	2210193-04	Benzene	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-3	2210193-04	1,1,2-Trichloro-1,2,2-trifluoroethane	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-3	2210193-04	Bromodichloromethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-3	2210193-04	1,3,5-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-3	2210193-04	Vinyl chloride	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-3	2210193-04	Acetone	5/6/2022	10	Y	n	u		10	6.6	ug/L
MW-3-3	2210193-04	1,2,4-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-3	2210193-04	Bromoform	5/6/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-3-3	2210193-04	Chloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-3	2210193-04	n-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-3	2210193-04	tert-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-3	2210193-04	Chlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-3	2210193-04	Acrylonitrile	5/6/2022	5	Y	n	u		5.0	1.5	ug/L
MW-3-3	2210193-04	Hexachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-3	2210193-04	Chloroform	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-3	2210193-04	Chloromethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-3	2210193-04	Bromomethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-3	2210193-04	2-Hexanone	5/6/2022	10	Y	n	u		10	5.0	ug/L

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MW-3-3	2210193-04	o-Xylene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-3	2210193-04	p- & m-Xylenes	5/6/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-3-3	2210193-04	Tetrahydrofuran	5/6/2022	20	Y	n	u		20	5.2	ug/L
MW-3-3	2210193-04	Propionitrile	5/6/2022	20	Y	n	u		20	6.2	ug/L
MW-3-3	2210193-04	Pentachloroethane	5/6/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-3-3	2210193-04	Methyl methacrylate	5/6/2022	5	Y	n	u		5.0	1.2	ug/L
MW-3-3	2210193-04	Methyl isobutyl ketone	5/6/2022	5	Y	n	u		5.0	2.4	ug/L
MW-3-3	2210193-04	Methyl iodide	5/6/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-3-3	2210193-04	Ethyl methacrylate	5/6/2022	4	Y	n	u		4.0	1.3	ug/L
MW-3-3	2210193-04	Methacrylonitrile	5/6/2022	10	Y	n	u		10	2.3	ug/L
MW-3-3	2210193-04	Allyl chloride	5/6/2022	5	Y	n	u		5.0	0.47	ug/L
MW-3-3	2210193-04	1,2-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-3	2210193-04	Ethyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-3-3	2210193-04	2-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-3	2210193-04	Diethyl ether	5/6/2022	2	Y	n	u		2.0	0.33	ug/L
MW-3-3	2210193-04	trans-1,4-Dichloro-2-butene	5/6/2022	5	Y	n	u		5.0	1.8	ug/L
MW-3-3	2210193-04	Carbon disulfide	5/6/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-3-3	2210193-04	t-Butyl alcohol	5/6/2022	2	Y	n	u		2.0	2.0	ug/L
MW-3-3	2210193-04	t-Amyl Methyl ether	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-3	2210193-04	Methyl ethyl ketone	5/6/2022	5	Y	n	u		5.0	3.3	ug/L
MW-3-3	2210193-04	1,2,3-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-3	2210193-04	Methylene chloride	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-3	2210193-04	Methyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-3	2210193-04	Naphthalene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-3-3	2210193-04	n-Propylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-3-3	2210193-04	Styrene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-3-3	2210193-04	1,1,1,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-3	2210193-04	1,1,2,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-3	2210193-04	Dichlorodifluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-3	2210193-04	Toluene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-3	2210193-04	Hexachlorobutadiene	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-3	2210193-04	1,2,4-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-3	2210193-04	1,1,1-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-3	2210193-04	1,1,2-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-3	2210193-04	Trichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-3	2210193-04	Trichlorofluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-3	2210193-04	1,2,3-Trichloropropane	5/6/2022	1	Y	n	u		1.0	0.78	ug/L
MW-3-3	2210193-04	Carbon tetrachloride	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-3	2210193-04	1,2-Dichloroethane-d4 (Surrogate)	5/6/2022	10	Y	y	v s				ug/L
MW-3-3	2210193-04	Tetrachloroethene	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-3-3	2210193-04	trans-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-3	2210193-04	Dibromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-3-3	2210193-04	1,2-Dibromo-3-chloropropane	5/6/2022	1	Y	n	u		1.0	0.89	ug/L
MW-3-3	2210193-04	1,2-Dibromoethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-3-3	2210193-04	Dibromomethane	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-3-3	2210193-04	1,2-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-3	2210193-04	1,3-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-3-3	2210193-04	1,4-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-3	2210193-04	1,1-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-3	2210193-04	p-Isopropyltoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L

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MW-3-3	2210193-04	cis-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-3	2210193-04	Isopropylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-3	2210193-04	1,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-3	2210193-04	1,3-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-3	2210193-04	2,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-3	2210193-04	1,1-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-3	2210193-04	cis-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-3	2210193-04	trans-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-3	2210193-04	Ethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-3	2210193-04	4-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-3-3	2210193-04	1,1-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-3	2210193-04	4-Bromofluorobenzene (Surrogate)	5/6/2022	9	Y	y	v s				ug/L
MW-3-3	2210193-04	2-Nitropropane	5/6/2022	0	Y	y	v				ug/L
MW-3-3	2210193-04	1,1-Dichloropropanone	5/6/2022	0	Y	y	v				ug/L
MW-3-3	2210193-04	1-Chlorobutane	5/6/2022	0	Y	y	v				ug/L
MW-3-3	2210193-04	Nitrobenzene	5/6/2022	0	Y	y	v				ug/L
MW-3-3	2210193-04	Methyl acrylate	5/6/2022	0	Y	y	v				ug/L
MW-3-3	2210193-04	Chloroacetonitrile	5/6/2022	0	Y	y	v				ug/L
MW-3-3	2210193-04	Toluene-d8 (Surrogate)	5/6/2022	9.8	Y	y	v s				ug/L
MW-3-3	2210193-04	sec-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-4	2210193-02	1,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-4	2210193-02	Hexachlorobutadiene	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-4	2210193-02	Ethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-4	2210193-02	trans-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-4	2210193-02	cis-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-3-4	2210193-02	1,1-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-4	2210193-02	1,3-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-4	2210193-02	Naphthalene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-3-4	2210193-02	2,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-4	2210193-02	Isopropylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-4	2210193-02	p-Isopropyltoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-4	2210193-02	trans-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-4	2210193-02	Methyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-4	2210193-02	1,4-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-4	2210193-02	n-Propylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-3-4	2210193-02	Styrene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-3-4	2210193-02	1,1,1,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-4	2210193-02	1,1,2,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-4	2210193-02	Tetrachloroethene	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-3-4	2210193-02	Toluene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-4	2210193-02	Methylene chloride	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-4	2210193-02	1,2-Dibromoethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-3-4	2210193-02	sec-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-4	2210193-02	tert-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-4	2210193-02	Carbon tetrachloride	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-4	2210193-02	Chlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-4	2210193-02	Chloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-4	2210193-02	Chloroform	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-4	2210193-02	2-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-4	2210193-02	4-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.093	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-3-4	2210193-02	1,1-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-4	2210193-02	1,2-Dibromo-3-chloropropane	5/6/2022	1	Y	n	u		1.0	0.89	ug/L
MW-3-4	2210193-02	cis-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-4	2210193-02	Dibromomethane	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-3-4	2210193-02	1,2-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-4	2210193-02	1,3-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-3-4	2210193-02	1,2,3-Trichloropropane	5/6/2022	1	Y	n	u		1.0	0.78	ug/L
MW-3-4	2210193-02	Dichlorodifluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-4	2210193-02	1,2,3-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-4	2210193-02	1,2-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-4	2210193-02	1,1-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-4	2210193-02	Dibromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-3-4	2210193-02	1,2-Dichloroethane-d4 (Surrogate)	5/6/2022	9.5	Y	y	v s				ug/L
MW-3-4	2210193-02	Trichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-4	2210193-02	Methyl ethyl ketone	5/6/2022	5	Y	n	u		5.0	3.3	ug/L
MW-3-4	2210193-02	Methyl iodide	5/6/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-3-4	2210193-02	Methyl isobutyl ketone	5/6/2022	5	Y	n	u		5.0	2.4	ug/L
MW-3-4	2210193-02	Methyl methacrylate	5/6/2022	5	Y	n	u		5.0	1.2	ug/L
MW-3-4	2210193-02	Pentachloroethane	5/6/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-3-4	2210193-02	Propionitrile	5/6/2022	20	Y	n	u		20	6.2	ug/L
MW-3-4	2210193-02	Tetrahydrofuran	5/6/2022	20	Y	n	u		20	5.2	ug/L
MW-3-4	2210193-02	2-Hexanone	5/6/2022	10	Y	n	u		10	5.0	ug/L
MW-3-4	2210193-02	o-Xylene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-4	2210193-02	Hexachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-4	2210193-02	Toluene-d8 (Surrogate)	5/6/2022	9.9	Y	y	v s				ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-3-4	2210193-02	4-Bromofluorobenzene (Surrogate)	5/6/2022	9.2	Y	y	v s				ug/L
MW-3-4	2210193-02	1-Chlorobutane	5/6/2022	0	Y	y	v				ug/L
MW-3-4	2210193-02	2-Nitropropane	5/6/2022	0	Y	y	v				ug/L
MW-3-4	2210193-02	Methyl acrylate	5/6/2022	0	Y	y	v				ug/L
MW-3-4	2210193-02	Nitrobenzene	5/6/2022	0	Y	y	v				ug/L
MW-3-4	2210193-02	1,1-Dichloropropanone	5/6/2022	0	Y	y	v				ug/L
MW-3-4	2210193-02	Chloroacetonitrile	5/6/2022	0	Y	y	v				ug/L
MW-3-4	2210193-02	p- & m-Xylenes	5/6/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-3-4	2210193-02	Acrylonitrile	5/6/2022	5	Y	n	u		5.0	1.5	ug/L
MW-3-4	2210193-02	1,1,1-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-4	2210193-02	1,1,2-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-4	2210193-02	n-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-4	2210193-02	Trichlorofluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-4	2210193-02	Chloromethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-4	2210193-02	1,1,2-Trichloro-1,2,2-trifluoroethane	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-4	2210193-02	1,2,4-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-4	2210193-02	1,3,5-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-4	2210193-02	Methacrylonitrile	5/6/2022	10	Y	n	u		10	2.3	ug/L
MW-3-4	2210193-02	Acetone	5/6/2022	10	Y	n	u		10	6.6	ug/L
MW-3-4	2210193-02	1,2,4-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-4	2210193-02	Allyl chloride	5/6/2022	5	Y	n	u		5.0	0.47	ug/L
MW-3-4	2210193-02	t-Amyl Methyl ether	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-4	2210193-02	t-Butyl alcohol	5/6/2022	2	Y	n	u		2.0	2.0	ug/L
MW-3-4	2210193-02	Carbon disulfide	5/6/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-3-4	2210193-02	trans-1,4-Dichloro-2-butene	5/6/2022	5	Y	n	u		5.0	1.8	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-3-4	2210193-02	Diethyl ether	5/6/2022	2	Y	n	u		2.0	0.33	ug/L
MW-3-4	2210193-02	Ethyl methacrylate	5/6/2022	4	Y	n	u		4.0	1.3	ug/L
MW-3-4	2210193-02	Ethyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-3-4	2210193-02	Vinyl chloride	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-4	2210193-02	Bromoform	5/6/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-3-4	2210193-02	Bromodichloromethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-4	2210193-02	Bromomethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-4	2210193-02	Bromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-4	2210193-02	Bromobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-4	2210193-02	Benzene	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-5	2210193-01	1,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-5	2210193-01	1,3-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-3-5	2210193-01	1,4-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-5	2210193-01	Dichlorodifluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-5	2210193-01	1,1-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-5	2210193-01	1,2-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-5	2210193-01	1,1-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-5	2210193-01	1,2-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-5	2210193-01	trans-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-5	2210193-01	4-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-3-5	2210193-01	1,3-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-5	2210193-01	cis-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-5	2210193-01	Dibromomethane	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-3-5	2210193-01	1,2-Dibromoethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-3-5	2210193-01	Allyl chloride	5/6/2022	5	Y	n	u		5.0	0.47	ug/L

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MW-3-5	2210193-01	Dibromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-3-5	2210193-01	Vinyl chloride	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-5	2210193-01	sec-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-5	2210193-01	n-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-5	2210193-01	Bromomethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-5	2210193-01	Bromoform	5/6/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-3-5	2210193-01	Bromodichloromethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-5	2210193-01	Bromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-3-5	2210193-01	Bromobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-5	2210193-01	1,2-Dibromo-3-chloropropane	5/6/2022	1	Y	n	u		1.0	0.89	ug/L
MW-3-5	2210193-01	1,2,4-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-3-5	2210193-01	1,1-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-5	2210193-01	cis-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-5	2210193-01	trans-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-5	2210193-01	Chloroform	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-5	2210193-01	1,1,1,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-5	2210193-01	1,1,2,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-5	2210193-01	Tetrachloroethene	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-3-5	2210193-01	Toluene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-5	2210193-01	Chloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-5	2210193-01	Chlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-5	2210193-01	tert-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-5	2210193-01	1,2,3-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-5	2210193-01	Acrylonitrile	5/6/2022	5	Y	n	u		5.0	1.5	ug/L
MW-3-5	2210193-01	1,1,1-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L

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MW-3-5	2210193-01	1,1,2-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-5	2210193-01	Trichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-5	2210193-01	Trichlorofluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-5	2210193-01	1,2,3-Trichloropropane	5/6/2022	1	Y	n	u		1.0	0.78	ug/L
MW-3-5	2210193-01	1,1,2-Trichloro-1,2,2-trifluoroethane	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-5	2210193-01	1,2,4-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-5	2210193-01	1,3,5-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-5	2210193-01	trans-1,4-Dichloro-2-butene	5/6/2022	5	Y	n	u		5.0	1.8	ug/L
MW-3-5	2210193-01	Acetone	5/6/2022	10	Y	n	u		10	6.6	ug/L
MW-3-5	2210193-01	t-Amyl Methyl ether	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-3-5	2210193-01	Carbon tetrachloride	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-3-5	2210193-01	p-Isopropyltoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-5	2210193-01	1,1-Dichloropropanone	5/6/2022	0	Y	y	v				ug/L
MW-3-5	2210193-01	Nitrobenzene	5/6/2022	0	Y	y	v				ug/L
MW-3-5	2210193-01	2-Nitropropane	5/6/2022	0	Y	y	v				ug/L
MW-3-5	2210193-01	1-Chlorobutane	5/6/2022	0	Y	y	v				ug/L
MW-3-5	2210193-01	Chloroacetonitrile	5/6/2022	0	Y	y	v				ug/L
MW-3-5	2210193-01	n-Propylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-3-5	2210193-01	2-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-5	2210193-01	Methyl acrylate	5/6/2022	0	Y	y	v				ug/L
MW-3-5	2210193-01	t-Butyl alcohol	5/6/2022	2	Y	n	u		2.0	2.0	ug/L
MW-3-5	2210193-01	Naphthalene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-3-5	2210193-01	Isopropylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-5	2210193-01	Hexachlorobutadiene	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-3-5	2210193-01	Ethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L

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MW-3-5	2210193-01	Styrene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-3-5	2210193-01	2,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-3-5	2210193-01	Benzene	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-5	2210193-01	Chloromethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-5	2210193-01	Methyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-3-5	2210193-01	Methacrylonitrile	5/6/2022	10	Y	n	u		10	2.3	ug/L
MW-3-5	2210193-01	Methylene chloride	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-3-5	2210193-01	Diethyl ether	5/6/2022	2	Y	n	u		2.0	0.33	ug/L
MW-3-5	2210193-01	4-Bromofluorobenzene (Surrogate)	5/6/2022	9.3	Y	y	v s				ug/L
MW-3-5	2210193-01	Ethyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-3-5	2210193-01	Carbon disulfide	5/6/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-3-5	2210193-01	Ethyl methacrylate	5/6/2022	4	Y	n	u		4.0	1.3	ug/L
MW-3-5	2210193-01	2-Hexanone	5/6/2022	10	Y	n	u		10	5.0	ug/L
MW-3-5	2210193-01	Methyl ethyl ketone	5/6/2022	5	Y	n	u		5.0	3.3	ug/L
MW-3-5	2210193-01	Methyl iodide	5/6/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-3-5	2210193-01	o-Xylene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-3-5	2210193-01	Hexachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-3-5	2210193-01	1,2-Dichloroethane-d4 (Surrogate)	5/6/2022	9.8	Y	y	v s				ug/L
MW-3-5	2210193-01	Methyl isobutyl ketone	5/6/2022	5	Y	n	u		5.0	2.4	ug/L
MW-3-5	2210193-01	p- & m-Xylenes	5/6/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-3-5	2210193-01	Tetrahydrofuran	5/6/2022	20	Y	n	u		20	5.2	ug/L
MW-3-5	2210193-01	Propionitrile	5/6/2022	20	Y	n	u		20	6.2	ug/L
MW-3-5	2210193-01	Pentachloroethane	5/6/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-3-5	2210193-01	Methyl methacrylate	5/6/2022	5	Y	n	u		5.0	1.2	ug/L
MW-3-5	2210193-01	Toluene-d8 (Surrogate)	5/6/2022	9.9	Y	y	v s				ug/L

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SB-2-050222	2210193-12	Methyl acrylate	5/6/2022	0	Y	y	v				ug/L
SB-2-050222	2210193-12	Methyl isobutyl ketone	5/6/2022	5	Y	n	u		5.0	2.4	ug/L
SB-2-050222	2210193-12	Methyl methacrylate	5/6/2022	5	Y	n	u		5.0	1.2	ug/L
SB-2-050222	2210193-12	Pentachloroethane	5/6/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
SB-2-050222	2210193-12	Propionitrile	5/6/2022	20	Y	n	u		20	6.2	ug/L
SB-2-050222	2210193-12	Tetrahydrofuran	5/6/2022	20	Y	n	u		20	5.2	ug/L
SB-2-050222	2210193-12	Trichlorofluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
SB-2-050222	2210193-12	p- & m-Xylenes	5/6/2022	0.5	Y	n	u		0.50	0.34	ug/L
SB-2-050222	2210193-12	o-Xylene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
SB-2-050222	2210193-12	1,2-Dichloroethane-d4 (Surrogate)	5/6/2022	9.9	Y	y	v s				ug/L
SB-2-050222	2210193-12	Toluene-d8 (Surrogate)	5/6/2022	9.8	Y	y	v s				ug/L
SB-2-050222	2210193-12	4-Bromofluorobenzene (Surrogate)	5/6/2022	9.1	Y	y	v s				ug/L
SB-2-050222	2210193-12	1,1-Dichloropropanone	5/6/2022	0	Y	y	v				ug/L
SB-2-050222	2210193-12	Chloroacetonitrile	5/6/2022	0	Y	y	v				ug/L
SB-2-050222	2210193-12	Nitrobenzene	5/6/2022	0	Y	y	v				ug/L
SB-2-050222	2210193-12	2-Nitropropane	5/6/2022	0	Y	y	v				ug/L
SB-2-050222	2210193-12	1-Chlorobutane	5/6/2022	0	Y	y	v				ug/L
SB-2-050222	2210193-12	Chloromethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
SB-2-050222	2210193-12	Dichlorodifluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
SB-2-050222	2210193-12	1,4-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
SB-2-050222	2210193-12	1,3-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
SB-2-050222	2210193-12	1,2-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
SB-2-050222	2210193-12	Dibromomethane	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
SB-2-050222	2210193-12	1,2-Dibromoethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
SB-2-050222	2210193-12	1,2-Dibromo-3-chloropropane	5/6/2022	1	Y	n	u		1.0	0.89	ug/L

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SB-2-050222	2210193-12	Dibromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
SB-2-050222	2210193-12	Bromobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
SB-2-050222	2210193-12	2-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
SB-2-050222	2210193-12	1,1-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
SB-2-050222	2210193-12	Chloroform	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
SB-2-050222	2210193-12	Chloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
SB-2-050222	2210193-12	Chlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
SB-2-050222	2210193-12	Carbon tetrachloride	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
SB-2-050222	2210193-12	tert-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
SB-2-050222	2210193-12	sec-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
SB-2-050222	2210193-12	n-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
SB-2-050222	2210193-12	Bromomethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
SB-2-050222	2210193-12	Bromodichloromethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
SB-2-050222	2210193-12	4-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.093	ug/L
SB-2-050222	2210193-12	Ethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
SB-2-050222	2210193-12	Styrene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
SB-2-050222	2210193-12	n-Propylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
SB-2-050222	2210193-12	Naphthalene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
SB-2-050222	2210193-12	1,1,1,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
SB-2-050222	2210193-12	Methyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
SB-2-050222	2210193-12	Methylene chloride	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
SB-2-050222	2210193-12	p-Isopropyltoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
SB-2-050222	2210193-12	Isopropylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
SB-2-050222	2210193-12	1,1,2-Trichloro-1,2,2-trifluoroethane	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
SB-2-050222	2210193-12	1,1-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
SB-2-050222	2210193-12	Methyl iodide	5/6/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
SB-2-050222	2210193-12	1,2-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
SB-2-050222	2210193-12	trans-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
SB-2-050222	2210193-12	cis-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
SB-2-050222	2210193-12	1,1-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
SB-2-050222	2210193-12	2,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
SB-2-050222	2210193-12	1,3-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
SB-2-050222	2210193-12	1,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
SB-2-050222	2210193-12	trans-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
SB-2-050222	2210193-12	cis-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
SB-2-050222	2210193-12	Bromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
SB-2-050222	2210193-12	Hexachlorobutadiene	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
SB-2-050222	2210193-12	t-Butyl alcohol	5/6/2022	2	Y	n	u		2.0	2.0	ug/L
SB-2-050222	2210193-12	Bromoform	5/6/2022	0.5	Y	n	u		0.50	0.46	ug/L
SB-2-050222	2210193-12	1,1,2-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
SB-2-050222	2210193-12	Trichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
SB-2-050222	2210193-12	1,2,3-Trichloropropane	5/6/2022	1	Y	n	u		1.0	0.78	ug/L
SB-2-050222	2210193-12	1,2,4-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
SB-2-050222	2210193-12	1,3,5-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
SB-2-050222	2210193-12	Vinyl chloride	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
SB-2-050222	2210193-12	Acetone	5/6/2022	10	Y	n	u		10	6.6	ug/L
SB-2-050222	2210193-12	Acrylonitrile	5/6/2022	5	Y	n	u		5.0	1.5	ug/L
SB-2-050222	2210193-12	1,2,4-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
SB-2-050222	2210193-12	t-Amyl Methyl ether	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
SB-2-050222	2210193-12	1,2,3-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L

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SB-2-050222	2210193-12	Carbon disulfide	5/6/2022	0.5	Y	n	u		0.50	0.48	ug/L
SB-2-050222	2210193-12	trans-1,4-Dichloro-2-butene	5/6/2022	5	Y	n	u		5.0	1.8	ug/L
SB-2-050222	2210193-12	Diethyl ether	5/6/2022	2	Y	n	u		2.0	0.33	ug/L
SB-2-050222	2210193-12	Ethyl methacrylate	5/6/2022	4	Y	n	u		4.0	1.3	ug/L
SB-2-050222	2210193-12	Ethyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.32	ug/L
SB-2-050222	2210193-12	Hexachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
SB-2-050222	2210193-12	2-Hexanone	5/6/2022	10	Y	n	u		10	5.0	ug/L
SB-2-050222	2210193-12	Methacrylonitrile	5/6/2022	10	Y	n	u		10	2.3	ug/L
SB-2-050222	2210193-12	Methyl ethyl ketone	5/6/2022	5	Y	n	u		5.0	3.3	ug/L
SB-2-050222	2210193-12	Allyl chloride	5/6/2022	5	Y	n	u		5.0	0.47	ug/L
SB-2-050222	2210193-12	Tetrachloroethene	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
SB-2-050222	2210193-12	1,1,2,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
SB-2-050222	2210193-12	Benzene	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
SB-2-050222	2210193-12	Toluene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
SB-2-050222	2210193-12	1,1,1-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-6-050222	2210193-07	Bromobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-6-050222	2210193-07	Bromomethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
TB-6-050222	2210193-07	Bromoform	5/6/2022	0.5	Y	n	u		0.50	0.46	ug/L
TB-6-050222	2210193-07	Bromodichloromethane	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
TB-6-050222	2210193-07	1,3-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
TB-6-050222	2210193-07	Hexachlorobutadiene	5/6/2022	0.5	Y	n	u		0.50	0.20	ug/L
TB-6-050222	2210193-07	Carbon tetrachloride	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-6-050222	2210193-07	1,2-Dibromoethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
TB-6-050222	2210193-07	Dibromomethane	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
TB-6-050222	2210193-07	1,2-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L

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TB-6-050222	2210193-07	Bromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
TB-6-050222	2210193-07	n-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-6-050222	2210193-07	tert-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
TB-6-050222	2210193-07	Chlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-6-050222	2210193-07	Chloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-6-050222	2210193-07	Chloroform	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-6-050222	2210193-07	Chloromethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
TB-6-050222	2210193-07	2-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-6-050222	2210193-07	4-Chlorotoluene	5/6/2022	0.5	Y	n	u		0.50	0.093	ug/L
TB-6-050222	2210193-07	Dibromochloromethane	5/6/2022	0.5	Y	n	u		0.50	0.22	ug/L
TB-6-050222	2210193-07	1,2-Dibromo-3-chloropropane	5/6/2022	1	Y	n	u		1.0	0.89	ug/L
TB-6-050222	2210193-07	Benzene	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
TB-6-050222	2210193-07	sec-Butylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-6-050222	2210193-07	Carbon disulfide	5/6/2022	0.5	Y	n	u		0.50	0.48	ug/L
TB-6-050222	2210193-07	1,3,5-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-6-050222	2210193-07	Methacrylonitrile	5/6/2022	10	Y	n	u		10	2.3	ug/L
TB-6-050222	2210193-07	2-Hexanone	5/6/2022	10	Y	n	u		10	5.0	ug/L
TB-6-050222	2210193-07	Hexachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.11	ug/L
TB-6-050222	2210193-07	Ethyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.32	ug/L
TB-6-050222	2210193-07	Ethyl methacrylate	5/6/2022	4	Y	n	u		4.0	1.3	ug/L
TB-6-050222	2210193-07	Methyl iodide	5/6/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
TB-6-050222	2210193-07	trans-1,4-Dichloro-2-butene	5/6/2022	5	Y	n	u		5.0	1.8	ug/L
TB-6-050222	2210193-07	Methyl isobutyl ketone	5/6/2022	5	Y	n	u		5.0	2.4	ug/L
TB-6-050222	2210193-07	t-Butyl alcohol	5/6/2022	2	Y	n	u		2.0	2.0	ug/L
TB-6-050222	2210193-07	t-Amyl Methyl ether	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L

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Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
TB-6-050222	2210193-07	Allyl chloride	5/6/2022	5	Y	n	u		5.0	0.47	ug/L
TB-6-050222	2210193-07	Acrylonitrile	5/6/2022	5	Y	n	u		5.0	1.5	ug/L
TB-6-050222	2210193-07	Acetone	5/6/2022	10	Y	n	u		10	6.6	ug/L
TB-6-050222	2210193-07	trans-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-6-050222	2210193-07	Diethyl ether	5/6/2022	2	Y	n	u		2.0	0.33	ug/L
TB-6-050222	2210193-07	1,2-Dichloroethane-d4 (Surrogate)	5/6/2022	9.3	Y	y	v s				ug/L
TB-6-050222	2210193-07	Chloroacetonitrile	5/6/2022	0	Y	y	v				ug/L
TB-6-050222	2210193-07	2-Nitropropane	5/6/2022	0	Y	y	v				ug/L
TB-6-050222	2210193-07	Nitrobenzene	5/6/2022	0	Y	y	v				ug/L
TB-6-050222	2210193-07	1,1-Dichloropropanone	5/6/2022	0	Y	y	v				ug/L
TB-6-050222	2210193-07	1-Chlorobutane	5/6/2022	0	Y	y	v				ug/L
TB-6-050222	2210193-07	Methyl acrylate	5/6/2022	0	Y	y	v				ug/L
TB-6-050222	2210193-07	Methyl ethyl ketone	5/6/2022	5	Y	n	u		5.0	3.3	ug/L
TB-6-050222	2210193-07	Toluene-d8 (Surrogate)	5/6/2022	10	Y	y	v s				ug/L
TB-6-050222	2210193-07	1,2,4-Trimethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-6-050222	2210193-07	o-Xylene	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-6-050222	2210193-07	p- & m-Xylenes	5/6/2022	0.5	Y	n	u		0.50	0.34	ug/L
TB-6-050222	2210193-07	Tetrahydrofuran	5/6/2022	20	Y	n	u		20	5.2	ug/L
TB-6-050222	2210193-07	Propionitrile	5/6/2022	20	Y	n	u		20	6.2	ug/L
TB-6-050222	2210193-07	Pentachloroethane	5/6/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
TB-6-050222	2210193-07	Methyl methacrylate	5/6/2022	5	Y	n	u		5.0	1.2	ug/L
TB-6-050222	2210193-07	4-Bromofluorobenzene (Surrogate)	5/6/2022	8.7	Y	y	v s				ug/L
TB-6-050222	2210193-07	1,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-6-050222	2210193-07	Vinyl chloride	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
TB-6-050222	2210193-07	Isopropylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L

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Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
TB-6-050222	2210193-07	Ethylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-6-050222	2210193-07	cis-1,3-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-6-050222	2210193-07	1,1-Dichloropropene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-6-050222	2210193-07	Methylene chloride	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-6-050222	2210193-07	1,3-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-6-050222	2210193-07	Methyl t-butyl ether	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-6-050222	2210193-07	trans-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-6-050222	2210193-07	cis-1,2-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
TB-6-050222	2210193-07	1,1-Dichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.27	ug/L
TB-6-050222	2210193-07	1,2-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-6-050222	2210193-07	1,1-Dichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-6-050222	2210193-07	Dichlorodifluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-6-050222	2210193-07	2,2-Dichloropropane	5/6/2022	0.5	Y	n	u		0.50	0.18	ug/L
TB-6-050222	2210193-07	Toluene	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-6-050222	2210193-07	1,1,2-Trichloro-1,2,2-trifluoroethane	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-6-050222	2210193-07	1,2,3-Trichloropropane	5/6/2022	1	Y	n	u		1.0	0.78	ug/L
TB-6-050222	2210193-07	Trichlorofluoromethane	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-6-050222	2210193-07	Trichloroethene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-6-050222	2210193-07	1,1,2-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-6-050222	2210193-07	1,1,1-Trichloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-6-050222	2210193-07	p-Isopropyltoluene	5/6/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-6-050222	2210193-07	1,2,3-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-6-050222	2210193-07	1,4-Dichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-6-050222	2210193-07	Tetrachloroethene	5/6/2022	0.5	Y	n	u		0.50	0.23	ug/L
TB-6-050222	2210193-07	1,1,2,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.17	ug/L

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Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
TB-6-050222	2210193-07	1,1,1,2-Tetrachloroethane	5/6/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-6-050222	2210193-07	Styrene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
TB-6-050222	2210193-07	n-Propylbenzene	5/6/2022	0.5	Y	n	u		0.50	0.12	ug/L
TB-6-050222	2210193-07	Naphthalene	5/6/2022	0.5	Y	n	u		0.50	0.16	ug/L
TB-6-050222	2210193-07	1,2,4-Trichlorobenzene	5/6/2022	0.5	Y	n	u		0.50	0.15	ug/L

Analytical Method SM-2320B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-5-2Q22	2210193-03	Total Alkalinity as CaCO3	5/6/2022	190	Y	y	v		4.1	4.1	mg/L
DUP-5-2Q22	2210193-03	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
DUP-5-2Q22	2210193-03	Bicarbonate	5/6/2022	230	Y	y	v		5.0	5.0	mg/L
EB-6-050222	2210193-11	Bicarbonate	5/6/2022	5	Y	n	u		5.0	5.0	mg/L
EB-6-050222	2210193-11	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
EB-6-050222	2210193-11	Total Alkalinity as CaCO3	5/6/2022	4.1	Y	n	u		4.1	4.1	mg/L
MW-25-3	2210193-10	Bicarbonate	5/6/2022	240	Y	y	v		5.0	5.0	mg/L
MW-25-3	2210193-10	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-25-3	2210193-10	Total Alkalinity as CaCO3	5/6/2022	200	Y	y	v		4.1	4.1	mg/L
MW-25-4	2210193-09	Total Alkalinity as CaCO3	5/6/2022	240	Y	y	v		4.1	4.1	mg/L
MW-25-4	2210193-09	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-25-4	2210193-09	Bicarbonate	5/6/2022	290	Y	y	v		5.0	5.0	mg/L
MW-25-5	2210193-08	Carbonate	5/6/2022	7.7	Y	y	v		2.5	2.5	mg/L
MW-25-5	2210193-08	Bicarbonate	5/6/2022	100	Y	y	v		5.0	5.0	mg/L
MW-25-5	2210193-08	Total Alkalinity as CaCO3	5/6/2022	96	Y	y	v		4.1	4.1	mg/L
MW-3-1	2210193-06	Bicarbonate	5/6/2022	260	Y	y	v		5.0	5.0	mg/L
MW-3-1	2210193-06	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L

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Analytical Method SM-2320B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-3-1	2210193-06	Total Alkalinity as CaCO3	5/6/2022	210	Y	y	v		4.1	4.1	mg/L
MW-3-2	2210193-05	Total Alkalinity as CaCO3	5/6/2022	190	Y	y	v		4.1	4.1	mg/L
MW-3-2	2210193-05	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-3-2	2210193-05	Bicarbonate	5/6/2022	230	Y	y	v		5.0	5.0	mg/L
MW-3-3	2210193-04	Total Alkalinity as CaCO3	5/6/2022	190	Y	y	v		4.1	4.1	mg/L
MW-3-3	2210193-04	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-3-3	2210193-04	Bicarbonate	5/6/2022	230	Y	y	v		5.0	5.0	mg/L
MW-3-4	2210193-02	Total Alkalinity as CaCO3	5/6/2022	190	Y	y	v		4.1	4.1	mg/L
MW-3-4	2210193-02	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-3-4	2210193-02	Bicarbonate	5/6/2022	230	Y	y	v		5.0	5.0	mg/L
MW-3-5	2210193-01	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-3-5	2210193-01	Bicarbonate	5/6/2022	230	Y	y	v		5.0	5.0	mg/L
MW-3-5	2210193-01	Total Alkalinity as CaCO3	5/6/2022	190	Y	y	v		4.1	4.1	mg/L
SB-2-050222	2210193-12	Total Alkalinity as CaCO3	5/6/2022	4.1	Y	n	u		4.1	4.1	mg/L
SB-2-050222	2210193-12	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
SB-2-050222	2210193-12	Bicarbonate	5/6/2022	5	Y	n	u		5.0	5.0	mg/L

Analytical Method SRL 524M

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-5-2Q22	2210193-03	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
EB-6-050222	2210193-11	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-25-3	2210193-10	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-25-4	2210193-09	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-25-5	2210193-08	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-3-1	2210193-06	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L

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Analytical Method SRL 524M

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-3-2	2210193-05	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-3-3	2210193-04	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-3-4	2210193-02	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-3-5	2210193-01	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
SB-2-050222	2210193-12	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L

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SDG: 2210373

Analytical Method EPA-150.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	pH	5/6/2022	6.37	Y	y	v	J	0.05	0.05	pH Units
MW-18-2	2210373-07	pH	5/6/2022	8	Y	y	v	J	0.05	0.05	pH Units
MW-18-3	2210373-06	pH	5/6/2022	8.21	Y	y	v	J	0.05	0.05	pH Units
MW-18-4	2210373-04	pH	5/6/2022	8.2	Y	y	v	J	0.05	0.05	pH Units
MW-18-5	2210373-05	pH	5/6/2022	9.12	Y	y	v	J	0.05	0.05	pH Units
MW-20-4	2210373-09	pH	5/6/2022	8.87	Y	y	v	J	0.05	0.05	pH Units
MW-20-5	2210373-08	pH	5/6/2022	8.75	Y	y	v	J	0.05	0.05	pH Units
MW-25-1	2210373-03	pH	5/6/2022	7.68	Y	y	v	J	0.05	0.05	pH Units
MW-25-2	2210373-02	pH	5/6/2022	7.96	Y	y	v	J	0.05	0.05	pH Units

Analytical Method EPA-160.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	Total Dissolved Solids @ 180 C	5/6/2022	3.3	Y	y	v j		6.7	3.3	mg/L
MW-18-2	2210373-07	Total Dissolved Solids @ 180 C	5/6/2022	220	Y	y	v		20	10	mg/L
MW-18-3	2210373-06	Total Dissolved Solids @ 180 C	5/6/2022	350	Y	y	v		20	10	mg/L
MW-18-4	2210373-04	Total Dissolved Solids @ 180 C	5/6/2022	280	Y	y	v		20	10	mg/L
MW-18-5	2210373-05	Total Dissolved Solids @ 180 C	5/6/2022	180	Y	y	v		10	5.0	mg/L
MW-20-4	2210373-09	Total Dissolved Solids @ 180 C	5/6/2022	200	Y	y	v		20	10	mg/L
MW-20-5	2210373-08	Total Dissolved Solids @ 180 C	5/6/2022	180	Y	y	v		10	5.0	mg/L
MW-25-1	2210373-03	Total Dissolved Solids @ 180 C	5/6/2022	560	Y	y	v		33	17	mg/L
MW-25-2	2210373-02	Total Dissolved Solids @ 180 C	5/6/2022	500	Y	y	v		33	17	mg/L

Analytical Method EPA-200.7

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	Total Recoverable Iron	5/10/2022	50	Y	n	u		50	30	ug/L

SDG: 2210373

Analytical Method EPA-200.7

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	Total Recoverable Potassium	5/10/2022	1	Y	n	u		1.0	0.10	mg/L
EB-7-050322	2210373-10	Total Recoverable Sodium	5/10/2022	0.27	Y	n	v j	U	0.50	0.051	mg/L
EB-7-050322	2210373-10	Total Recoverable Magnesium	5/10/2022	0.022	Y	y	v j		0.050	0.019	mg/L
EB-7-050322	2210373-10	Total Recoverable Calcium	5/10/2022	0.075	Y	n	v j	U	0.10	0.014	mg/L
MW-18-2	2210373-07	Total Recoverable Iron	5/10/2022	87	Y	y	v		50	30	ug/L
MW-18-2	2210373-07	Total Recoverable Sodium	5/10/2022	19	Y	y	v	J	0.50	0.051	mg/L
MW-18-2	2210373-07	Total Recoverable Magnesium	5/10/2022	13	Y	y	v		0.050	0.019	mg/L
MW-18-2	2210373-07	Total Recoverable Calcium	5/10/2022	41	Y	y	v		0.10	0.014	mg/L
MW-18-2	2210373-07	Total Recoverable Potassium	5/10/2022	2.4	Y	y	v		1.0	0.10	mg/L
MW-18-3	2210373-06	Total Recoverable Magnesium	5/10/2022	17	Y	y	v		0.050	0.019	mg/L
MW-18-3	2210373-06	Total Recoverable Iron	5/10/2022	49	Y	y	v j		50	30	ug/L
MW-18-3	2210373-06	Total Recoverable Potassium	5/10/2022	2.8	Y	y	v		1.0	0.10	mg/L
MW-18-3	2210373-06	Total Recoverable Sodium	5/10/2022	22	Y	y	v	J	0.50	0.051	mg/L
MW-18-3	2210373-06	Total Recoverable Calcium	5/10/2022	60	Y	y	v		0.10	0.014	mg/L
MW-18-4	2210373-04	Total Recoverable Potassium	5/10/2022	1.2	Y	y	v		1.0	0.10	mg/L
MW-18-4	2210373-04	Total Recoverable Sodium	5/10/2022	31	Y	y	v	J	0.50	0.051	mg/L
MW-18-4	2210373-04	Total Recoverable Magnesium	5/10/2022	11	Y	y	v		0.050	0.019	mg/L
MW-18-4	2210373-04	Total Recoverable Calcium	5/10/2022	42	Y	y	v		0.10	0.014	mg/L
MW-18-4	2210373-04	Total Recoverable Iron	5/10/2022	94	Y	y	v		50	30	ug/L
MW-18-5	2210373-05	Total Recoverable Potassium	5/10/2022	1.1	Y	y	v		1.0	0.10	mg/L
MW-18-5	2210373-05	Total Recoverable Iron	5/10/2022	50	Y	n	u		50	30	ug/L
MW-18-5	2210373-05	Total Recoverable Sodium	5/10/2022	51	Y	y	v	J	0.50	0.051	mg/L
MW-18-5	2210373-05	Total Recoverable Calcium	5/10/2022	4.4	Y	y	v		0.10	0.014	mg/L
MW-18-5	2210373-05	Total Recoverable Magnesium	5/10/2022	2.6	Y	y	v		0.050	0.019	mg/L
MW-20-4	2210373-09	Total Recoverable Magnesium	5/10/2022	3	Y	y	v		0.050	0.019	mg/L

SDG: 2210373

Analytical Method EPA-200.7

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-20-4	2210373-09	Total Recoverable Sodium	5/10/2022	54	Y	y	v	J	0.50	0.051	mg/L
MW-20-4	2210373-09	Total Recoverable Iron	5/10/2022	37	Y	y	v j		50	30	ug/L
MW-20-4	2210373-09	Total Recoverable Calcium	5/10/2022	6.9	Y	y	v		0.10	0.014	mg/L
MW-20-4	2210373-09	Total Recoverable Potassium	5/10/2022	0.69	Y	y	v j		1.0	0.10	mg/L
MW-20-5	2210373-08	Total Recoverable Potassium	5/10/2022	1.2	Y	y	v		1.0	0.10	mg/L
MW-20-5	2210373-08	Total Recoverable Iron	5/10/2022	53	Y	y	v		50	30	ug/L
MW-20-5	2210373-08	Total Recoverable Sodium	5/10/2022	48	Y	y	v	J	0.50	0.051	mg/L
MW-20-5	2210373-08	Total Recoverable Magnesium	5/10/2022	2.1	Y	y	v		0.050	0.019	mg/L
MW-20-5	2210373-08	Total Recoverable Calcium	5/10/2022	5.9	Y	y	v		0.10	0.014	mg/L
MW-25-1	2210373-03	Total Recoverable Magnesium	5/10/2022	28	Y	y	v		0.050	0.019	mg/L
MW-25-1	2210373-03	Total Recoverable Calcium	5/10/2022	92	Y	y	v		0.10	0.014	mg/L
MW-25-1	2210373-03	Total Recoverable Sodium	5/10/2022	36	Y	y	v	J	0.50	0.051	mg/L
MW-25-1	2210373-03	Total Recoverable Potassium	5/10/2022	2.7	Y	y	v		1.0	0.10	mg/L
MW-25-1	2210373-03	Total Recoverable Iron	5/10/2022	420	Y	y	v		50	30	ug/L
MW-25-2	2210373-02	Total Recoverable Iron	5/10/2022	50	Y	n	u		50	30	ug/L
MW-25-2	2210373-02	Total Recoverable Potassium	5/10/2022	2.4	Y	y	v		1.0	0.10	mg/L
MW-25-2	2210373-02	Total Recoverable Magnesium	5/10/2022	25	Y	y	v		0.050	0.019	mg/L
MW-25-2	2210373-02	Total Recoverable Sodium	5/10/2022	30	Y	y	v	J	0.50	0.051	mg/L
MW-25-2	2210373-02	Total Recoverable Calcium	5/10/2022	81	Y	y	v		0.10	0.014	mg/L

Analytical Method EPA-200.8

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	Total Recoverable Chromium	5/12/2022	3	Y	n	u		3.0	0.50	ug/L
EB-7-050322	2210373-10	Total Recoverable Arsenic	5/12/2022	2	Y	n	u		2.0	0.70	ug/L
EB-7-050322	2210373-10	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L

SDG: 2210373

Analytical Method EPA-200.8

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-18-2	2210373-07	Total Recoverable Arsenic	5/12/2022	1.4	Y	y	v j		2.0	0.70	ug/L
MW-18-2	2210373-07	Total Recoverable Chromium	5/12/2022	3	Y	n	u		3.0	0.50	ug/L
MW-18-2	2210373-07	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-18-3	2210373-06	Total Recoverable Chromium	5/12/2022	2	Y	y	v j		3.0	0.50	ug/L
MW-18-3	2210373-06	Total Recoverable Arsenic	5/12/2022	0.92	Y	y	v j		2.0	0.70	ug/L
MW-18-3	2210373-06	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-18-4	2210373-04	Total Recoverable Chromium	5/12/2022	2.7	Y	y	v j		3.0	0.50	ug/L
MW-18-4	2210373-04	Total Recoverable Arsenic	5/12/2022	0.73	Y	n	v j	U	2.0	0.70	ug/L
MW-18-4	2210373-04	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-18-5	2210373-05	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-18-5	2210373-05	Total Recoverable Chromium	5/12/2022	3	Y	n	u		3.0	0.50	ug/L
MW-18-5	2210373-05	Total Recoverable Arsenic	5/12/2022	2.3	Y	n	v	U	2.0	0.70	ug/L
MW-20-4	2210373-09	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-20-4	2210373-09	Total Recoverable Arsenic	5/12/2022	1.3	Y	y	v j		2.0	0.70	ug/L
MW-20-4	2210373-09	Total Recoverable Chromium	5/12/2022	3	Y	n	u		3.0	0.50	ug/L
MW-20-5	2210373-08	Total Recoverable Arsenic	5/12/2022	1.1	Y	y	v j		2.0	0.70	ug/L
MW-20-5	2210373-08	Total Recoverable Chromium	5/12/2022	3	Y	n	u		3.0	0.50	ug/L
MW-20-5	2210373-08	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-25-1	2210373-03	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-25-1	2210373-03	Total Recoverable Chromium	5/12/2022	1.9	Y	y	v j		3.0	0.50	ug/L
MW-25-1	2210373-03	Total Recoverable Arsenic	5/12/2022	1.6	Y	n	v j	U	2.0	0.70	ug/L
MW-25-2	2210373-02	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-25-2	2210373-02	Total Recoverable Chromium	5/12/2022	2.6	Y	y	v j		3.0	0.50	ug/L
MW-25-2	2210373-02	Total Recoverable Arsenic	5/12/2022	1.7	Y	n	v j	U	2.0	0.70	ug/L

SDG: 2210373

Analytical Method EPA-218.6

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	Hexavalent Chromium	5/9/2022	######	Y	n	v j	U	0.0002	0.0000	mg/L
MW-18-2	2210373-07	Hexavalent Chromium	5/9/2022	######	Y	n	v j	U	0.0002	0.0000	mg/L
MW-18-3	2210373-06	Hexavalent Chromium	5/9/2022	0.0019	Y	y	v	J	0.0002	0.0000	mg/L
MW-18-4	2210373-04	Hexavalent Chromium	5/9/2022	0.0029	Y	y	v		0.0002	0.0000	mg/L
MW-18-5	2210373-05	Hexavalent Chromium	5/9/2022	######	Y	n	v j	U	0.0002	0.0000	mg/L
MW-20-4	2210373-09	Hexavalent Chromium	5/9/2022	######	Y	n	v j	U	0.0002	0.0000	mg/L
MW-20-5	2210373-08	Hexavalent Chromium	5/9/2022	######	Y	n	v j	U	0.0002	0.0000	mg/L
MW-25-1	2210373-03	Hexavalent Chromium	5/9/2022	######	Y	y	v	J	0.0002	0.0000	mg/L
MW-25-2	2210373-02	Hexavalent Chromium	5/9/2022	0.003	Y	y	v	J	0.0002	0.0000	mg/L

Analytical Method EPA-300.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	Chloride	5/4/2022	0.15	Y	n	v j	U	0.50	0.13	mg/L
EB-7-050322	2210373-10	Nitrate as N	5/4/2022	0.1	Y	n	u		0.10	0.024	mg/L
EB-7-050322	2210373-10	Sulfate	5/4/2022	0.21	Y	n	v j	U	1.0	0.14	mg/L
MW-18-2	2210373-07	Sulfate	5/4/2022	23	Y	y	v		1.0	0.14	mg/L
MW-18-2	2210373-07	Nitrate as N	5/4/2022	0.2	Y	y	v		0.10	0.024	mg/L
MW-18-2	2210373-07	Chloride	5/4/2022	6.5	Y	y	v		0.50	0.13	mg/L
MW-18-3	2210373-06	Sulfate	5/4/2022	39	Y	y	v		1.0	0.14	mg/L
MW-18-3	2210373-06	Chloride	5/4/2022	20	Y	y	v		0.50	0.13	mg/L
MW-18-3	2210373-06	Nitrate as N	5/4/2022	0.82	Y	y	v		0.10	0.024	mg/L
MW-18-4	2210373-04	Nitrate as N	5/4/2022	1.3	Y	y	v		0.10	0.024	mg/L
MW-18-4	2210373-04	Sulfate	5/4/2022	24	Y	y	v		1.0	0.14	mg/L
MW-18-4	2210373-04	Chloride	5/4/2022	11	Y	y	v		0.50	0.13	mg/L
MW-18-5	2210373-05	Sulfate	5/4/2022	2.9	Y	y	v		1.0	0.14	mg/L

SDG: 2210373

Analytical Method EPA-300.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-18-5	2210373-05	Chloride	5/4/2022	9.4	Y	y	v		0.50	0.13	mg/L
MW-18-5	2210373-05	Nitrate as N	5/4/2022	0.1	Y	n	u		0.10	0.024	mg/L
MW-20-4	2210373-09	Chloride	5/4/2022	9.5	Y	y	v		0.50	0.13	mg/L
MW-20-4	2210373-09	Nitrate as N	5/4/2022	0.1	Y	n	u		0.10	0.024	mg/L
MW-20-4	2210373-09	Sulfate	5/4/2022	10	Y	y	v		1.0	0.14	mg/L
MW-20-5	2210373-08	Chloride	5/4/2022	7.7	Y	y	v		0.50	0.13	mg/L
MW-20-5	2210373-08	Sulfate	5/4/2022	4.8	Y	y	v		1.0	0.14	mg/L
MW-20-5	2210373-08	Nitrate as N	5/4/2022	0.1	Y	n	u		0.10	0.024	mg/L
MW-25-1	2210373-03	Nitrate as N	5/4/2022	7.7	Y	y	v		0.10	0.024	mg/L
MW-25-1	2210373-03	Sulfate	5/4/2022	120	Y	y	v		1.0	0.14	mg/L
MW-25-1	2210373-03	Chloride	5/4/2022	66	Y	y	v		0.50	0.13	mg/L
MW-25-2	2210373-02	Chloride	5/4/2022	53	Y	y	v		0.50	0.13	mg/L
MW-25-2	2210373-02	Nitrate as N	5/4/2022	8.8	Y	y	v		0.10	0.024	mg/L
MW-25-2	2210373-02	Sulfate	5/4/2022	88	Y	y	v		1.0	0.14	mg/L

Analytical Method EPA-314.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	Perchlorate	5/12/2022	2	Y	n	u	UJ	2.0	0.81	ug/L
MW-18-2	2210373-07	Perchlorate	5/12/2022	2	Y	n	u	UJ	2.0	0.81	ug/L
MW-18-3	2210373-06	Perchlorate	5/12/2022	2	Y	n	u	UJ	2.0	0.81	ug/L
MW-18-4	2210373-04	Perchlorate	5/12/2022	12	Y	y	v	J	2.0	0.81	ug/L
MW-18-5	2210373-05	Perchlorate	5/12/2022	2	Y	n	u	UJ	2.0	0.81	ug/L
MW-20-4	2210373-09	Perchlorate	5/12/2022	2	Y	n	u	UJ	2.0	0.81	ug/L
MW-20-5	2210373-08	Perchlorate	5/12/2022	2	Y	n	u	UJ	2.0	0.81	ug/L
MW-25-1	2210373-03	Perchlorate	5/12/2022	6.2	Y	y	v	J	2.0	0.81	ug/L

SDG: 2210373

Analytical Method EPA-314.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-25-2	2210373-02	Perchlorate	5/12/2022	9.7	Y	y	v	J	2.0	0.81	ug/L

Analytical Method EPA-353.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	Nitrite as N	5/4/2022	0.016	Y	n	v j	U	0.050	0.010	mg/L
MW-18-2	2210373-07	Nitrite as N	5/4/2022	0.018	Y	n	v j	U	0.050	0.010	mg/L
MW-18-3	2210373-06	Nitrite as N	5/4/2022	0.017	Y	n	v j	U	0.050	0.010	mg/L
MW-18-4	2210373-04	Nitrite as N	5/4/2022	0.018	Y	n	v j	U	0.050	0.010	mg/L
MW-18-5	2210373-05	Nitrite as N	5/4/2022	0.019	Y	n	v j	U	0.050	0.010	mg/L
MW-20-4	2210373-09	Nitrite as N	5/4/2022	0.019	Y	n	v j	U	0.050	0.010	mg/L
MW-20-5	2210373-08	Nitrite as N	5/4/2022	0.02	Y	n	v j	U	0.050	0.010	mg/L
MW-25-1	2210373-03	Nitrite as N	5/4/2022	0.018	Y	n	v j	U	0.050	0.010	mg/L
MW-25-2	2210373-02	Nitrite as N	5/4/2022	0.019	Y	n	v j	U	0.050	0.010	mg/L

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
EB-7-050322	2210373-10	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-7-050322	2210373-10	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-7-050322	2210373-10	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-7-050322	2210373-10	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
EB-7-050322	2210373-10	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-7-050322	2210373-10	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
EB-7-050322	2210373-10	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
EB-7-050322	2210373-10	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
EB-7-050322	2210373-10	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L

SDG: 2210373

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	Toluene-d8 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
EB-7-050322	2210373-10	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
EB-7-050322	2210373-10	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-7-050322	2210373-10	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
EB-7-050322	2210373-10	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
EB-7-050322	2210373-10	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
EB-7-050322	2210373-10	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
EB-7-050322	2210373-10	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
EB-7-050322	2210373-10	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
EB-7-050322	2210373-10	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
EB-7-050322	2210373-10	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
EB-7-050322	2210373-10	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
EB-7-050322	2210373-10	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
EB-7-050322	2210373-10	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
EB-7-050322	2210373-10	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
EB-7-050322	2210373-10	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-7-050322	2210373-10	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
EB-7-050322	2210373-10	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
EB-7-050322	2210373-10	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-7-050322	2210373-10	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
EB-7-050322	2210373-10	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
EB-7-050322	2210373-10	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
EB-7-050322	2210373-10	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
EB-7-050322	2210373-10	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
EB-7-050322	2210373-10	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L

SDG: 2210373

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
EB-7-050322	2210373-10	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-7-050322	2210373-10	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
EB-7-050322	2210373-10	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.5	Y	y	v s				ug/L
EB-7-050322	2210373-10	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
EB-7-050322	2210373-10	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
EB-7-050322	2210373-10	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-7-050322	2210373-10	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
EB-7-050322	2210373-10	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
EB-7-050322	2210373-10	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-7-050322	2210373-10	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-7-050322	2210373-10	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
EB-7-050322	2210373-10	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-7-050322	2210373-10	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
EB-7-050322	2210373-10	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-7-050322	2210373-10	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-7-050322	2210373-10	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-7-050322	2210373-10	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
EB-7-050322	2210373-10	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
EB-7-050322	2210373-10	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-7-050322	2210373-10	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-7-050322	2210373-10	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-7-050322	2210373-10	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
EB-7-050322	2210373-10	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
EB-7-050322	2210373-10	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L

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EB-7-050322	2210373-10	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
EB-7-050322	2210373-10	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-7-050322	2210373-10	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
EB-7-050322	2210373-10	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
EB-7-050322	2210373-10	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
EB-7-050322	2210373-10	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
EB-7-050322	2210373-10	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-7-050322	2210373-10	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
EB-7-050322	2210373-10	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-7-050322	2210373-10	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-7-050322	2210373-10	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
EB-7-050322	2210373-10	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
EB-7-050322	2210373-10	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
EB-7-050322	2210373-10	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-7-050322	2210373-10	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-7-050322	2210373-10	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-7-050322	2210373-10	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
EB-7-050322	2210373-10	Methylene chloride	5/10/2022	0.23	Y	y	v j		0.50	0.21	ug/L
EB-7-050322	2210373-10	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-7-050322	2210373-10	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
EB-7-050322	2210373-10	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
EB-7-050322	2210373-10	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-7-050322	2210373-10	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-7-050322	2210373-10	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-7-050322	2210373-10	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L

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EB-7-050322	2210373-10	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
EB-7-050322	2210373-10	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-7-050322	2210373-10	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
EB-7-050322	2210373-10	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
EB-7-050322	2210373-10	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-2	2210373-07	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-18-2	2210373-07	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-2	2210373-07	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-2	2210373-07	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-18-2	2210373-07	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-2	2210373-07	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-18-2	2210373-07	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-2	2210373-07	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-2	2210373-07	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-2	2210373-07	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-2	2210373-07	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-18-2	2210373-07	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-2	2210373-07	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-18-2	2210373-07	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-18-2	2210373-07	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-2	2210373-07	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-18-2	2210373-07	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-18-2	2210373-07	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-18-2	2210373-07	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-2	2210373-07	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L

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MW-18-2	2210373-07	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-18-2	2210373-07	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-18-2	2210373-07	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-18-2	2210373-07	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-18-2	2210373-07	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-2	2210373-07	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-18-2	2210373-07	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-2	2210373-07	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-2	2210373-07	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-2	2210373-07	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-2	2210373-07	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-18-2	2210373-07	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-2	2210373-07	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-2	2210373-07	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-2	2210373-07	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-18-2	2210373-07	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-18-2	2210373-07	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-18-2	2210373-07	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-18-2	2210373-07	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-18-2	2210373-07	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-18-2	2210373-07	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-2	2210373-07	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-2	2210373-07	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-18-2	2210373-07	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-2	2210373-07	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L

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MW-18-2	2210373-07	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-18-2	2210373-07	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-18-2	2210373-07	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-2	2210373-07	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-2	2210373-07	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-2	2210373-07	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-2	2210373-07	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-18-2	2210373-07	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-18-2	2210373-07	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-2	2210373-07	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-2	2210373-07	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-18-2	2210373-07	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-18-2	2210373-07	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-18-2	2210373-07	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-18-2	2210373-07	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-18-2	2210373-07	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-18-2	2210373-07	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-18-2	2210373-07	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-18-2	2210373-07	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-18-2	2210373-07	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-2	2210373-07	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-18-2	2210373-07	Toluene-d8 (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
MW-18-2	2210373-07	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.3	Y	y	v s				ug/L
MW-18-2	2210373-07	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-18-2	2210373-07	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L

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MW-18-2	2210373-07	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-18-2	2210373-07	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-18-2	2210373-07	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-18-2	2210373-07	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-18-2	2210373-07	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-2	2210373-07	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-2	2210373-07	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-18-2	2210373-07	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-2	2210373-07	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-2	2210373-07	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-2	2210373-07	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-18-2	2210373-07	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-2	2210373-07	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-2	2210373-07	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-18-2	2210373-07	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-18-2	2210373-07	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-18-2	2210373-07	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-2	2210373-07	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-2	2210373-07	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-2	2210373-07	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-18-3	2210373-06	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-3	2210373-06	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-18-3	2210373-06	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-18-3	2210373-06	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-18-3	2210373-06	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L

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MW-18-3	2210373-06	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-18-3	2210373-06	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-18-3	2210373-06	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-18-3	2210373-06	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-3	2210373-06	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	9.9	Y	y	v s				ug/L
MW-18-3	2210373-06	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-18-3	2210373-06	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.5	Y	y	v s				ug/L
MW-18-3	2210373-06	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-18-3	2210373-06	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-18-3	2210373-06	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-18-3	2210373-06	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-18-3	2210373-06	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-18-3	2210373-06	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-18-3	2210373-06	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-3	2210373-06	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-18-3	2210373-06	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-18-3	2210373-06	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-18-3	2210373-06	Toluene-d8 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-18-3	2210373-06	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-3	2210373-06	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-3	2210373-06	Trichlorofluoromethane	5/10/2022	0.17	Y	y	v j		0.50	0.14	ug/L
MW-18-3	2210373-06	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-18-3	2210373-06	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-3	2210373-06	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-3	2210373-06	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-18-3	2210373-06	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-18-3	2210373-06	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-18-3	2210373-06	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-18-3	2210373-06	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-18-3	2210373-06	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-3	2210373-06	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-18-3	2210373-06	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-18-3	2210373-06	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-18-3	2210373-06	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-18-3	2210373-06	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-18-3	2210373-06	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-18-3	2210373-06	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-18-3	2210373-06	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-18-3	2210373-06	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-18-3	2210373-06	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-18-3	2210373-06	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-18-3	2210373-06	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-18-3	2210373-06	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-18-3	2210373-06	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-3	2210373-06	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-3	2210373-06	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-3	2210373-06	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-3	2210373-06	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-18-3	2210373-06	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-3	2210373-06	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L

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MW-18-3	2210373-06	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-3	2210373-06	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-3	2210373-06	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-3	2210373-06	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-18-3	2210373-06	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-18-3	2210373-06	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-3	2210373-06	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-3	2210373-06	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-18-3	2210373-06	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-3	2210373-06	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-3	2210373-06	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-3	2210373-06	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-3	2210373-06	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-3	2210373-06	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-18-3	2210373-06	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-3	2210373-06	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-18-3	2210373-06	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-3	2210373-06	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-3	2210373-06	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-3	2210373-06	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-3	2210373-06	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-18-3	2210373-06	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-18-3	2210373-06	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-3	2210373-06	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-18-3	2210373-06	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L

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MW-18-3	2210373-06	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-18-3	2210373-06	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-3	2210373-06	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-18-3	2210373-06	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-3	2210373-06	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-3	2210373-06	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-3	2210373-06	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-3	2210373-06	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-18-3	2210373-06	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-18-3	2210373-06	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-18-4	2210373-04	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-18-4	2210373-04	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-4	2210373-04	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-4	2210373-04	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-18-4	2210373-04	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-4	2210373-04	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-4	2210373-04	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-4	2210373-04	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-18-4	2210373-04	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-4	2210373-04	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-4	2210373-04	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-4	2210373-04	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-18-4	2210373-04	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-4	2210373-04	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-4	2210373-04	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L

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MW-18-4	2210373-04	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-4	2210373-04	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-18-4	2210373-04	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-18-4	2210373-04	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-18-4	2210373-04	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-4	2210373-04	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-4	2210373-04	Tetrachloroethene	5/10/2022	0.58	Y	y	v		0.50	0.23	ug/L
MW-18-4	2210373-04	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-4	2210373-04	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-4	2210373-04	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-4	2210373-04	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-4	2210373-04	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-4	2210373-04	Chloroform	5/10/2022	0.67	Y	y	v		0.50	0.14	ug/L
MW-18-4	2210373-04	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-18-4	2210373-04	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-4	2210373-04	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-18-4	2210373-04	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-18-4	2210373-04	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-18-4	2210373-04	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-18-4	2210373-04	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-4	2210373-04	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-4	2210373-04	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-18-4	2210373-04	Carbon tetrachloride	5/10/2022	1.5	Y	y	v		0.50	0.17	ug/L
MW-18-4	2210373-04	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-18-4	2210373-04	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L

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MW-18-4	2210373-04	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-4	2210373-04	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-18-4	2210373-04	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-4	2210373-04	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-18-4	2210373-04	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-18-4	2210373-04	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-18-4	2210373-04	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-18-4	2210373-04	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-18-4	2210373-04	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-4	2210373-04	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-18-4	2210373-04	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-4	2210373-04	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-4	2210373-04	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-4	2210373-04	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-18-4	2210373-04	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-18-4	2210373-04	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-18-4	2210373-04	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-18-4	2210373-04	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-18-4	2210373-04	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-18-4	2210373-04	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-18-4	2210373-04	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-18-4	2210373-04	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-18-4	2210373-04	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-4	2210373-04	Toluene-d8 (Surrogate)	5/10/2022	9.9	Y	y	v s				ug/L
MW-18-4	2210373-04	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.6	Y	y	v s				ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-18-4	2210373-04	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-18-4	2210373-04	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-18-4	2210373-04	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-18-4	2210373-04	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-18-4	2210373-04	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-18-4	2210373-04	Trichloroethene	5/10/2022	0.77	Y	y	v		0.50	0.19	ug/L
MW-18-4	2210373-04	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-18-4	2210373-04	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-18-4	2210373-04	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-18-4	2210373-04	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-4	2210373-04	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-18-4	2210373-04	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-18-4	2210373-04	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-18-4	2210373-04	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-4	2210373-04	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-4	2210373-04	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-18-4	2210373-04	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-18-4	2210373-04	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-18-4	2210373-04	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-18-4	2210373-04	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-18-4	2210373-04	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-18-4	2210373-04	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-18-4	2210373-04	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-18-4	2210373-04	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-4	2210373-04	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-18-5	2210373-05	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-5	2210373-05	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-18-5	2210373-05	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-5	2210373-05	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-5	2210373-05	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-5	2210373-05	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-5	2210373-05	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-5	2210373-05	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-5	2210373-05	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-5	2210373-05	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-18-5	2210373-05	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-5	2210373-05	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-18-5	2210373-05	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-5	2210373-05	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-5	2210373-05	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-5	2210373-05	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-18-5	2210373-05	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-18-5	2210373-05	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-18-5	2210373-05	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-5	2210373-05	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-5	2210373-05	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-5	2210373-05	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-18-5	2210373-05	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-18-5	2210373-05	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-5	2210373-05	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-18-5	2210373-05	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-5	2210373-05	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-5	2210373-05	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-5	2210373-05	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-18-5	2210373-05	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-5	2210373-05	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-18-5	2210373-05	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-18-5	2210373-05	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-5	2210373-05	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-18-5	2210373-05	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-18-5	2210373-05	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-18-5	2210373-05	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-5	2210373-05	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-5	2210373-05	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-18-5	2210373-05	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-5	2210373-05	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-18-5	2210373-05	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-18-5	2210373-05	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-5	2210373-05	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-5	2210373-05	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-18-5	2210373-05	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-18-5	2210373-05	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-18-5	2210373-05	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-18-5	2210373-05	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-18-5	2210373-05	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-18-5	2210373-05	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-5	2210373-05	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-18-5	2210373-05	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-5	2210373-05	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-18-5	2210373-05	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-18-5	2210373-05	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-18-5	2210373-05	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-18-5	2210373-05	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-18-5	2210373-05	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-18-5	2210373-05	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-18-5	2210373-05	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-18-5	2210373-05	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-18-5	2210373-05	Toluene-d8 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-18-5	2210373-05	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-18-5	2210373-05	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-18-5	2210373-05	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-18-5	2210373-05	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-18-5	2210373-05	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-18-5	2210373-05	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-18-5	2210373-05	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-5	2210373-05	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-18-5	2210373-05	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-18-5	2210373-05	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-18-5	2210373-05	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-18-5	2210373-05	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-18-5	2210373-05	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
MW-18-5	2210373-05	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-18-5	2210373-05	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-18-5	2210373-05	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-18-5	2210373-05	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-18-5	2210373-05	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-18-5	2210373-05	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-18-5	2210373-05	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-18-5	2210373-05	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-18-5	2210373-05	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-18-5	2210373-05	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-18-5	2210373-05	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-18-5	2210373-05	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-18-5	2210373-05	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-18-5	2210373-05	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-20-4	2210373-09	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-20-4	2210373-09	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-4	2210373-09	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-20-4	2210373-09	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-4	2210373-09	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-20-4	2210373-09	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-4	2210373-09	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-4	2210373-09	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-20-4	2210373-09	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-20-4	2210373-09	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-20-4	2210373-09	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-4	2210373-09	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-20-4	2210373-09	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-4	2210373-09	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-20-4	2210373-09	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-4	2210373-09	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-4	2210373-09	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-4	2210373-09	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-4	2210373-09	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-20-4	2210373-09	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-20-4	2210373-09	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-20-4	2210373-09	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-4	2210373-09	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-4	2210373-09	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-20-4	2210373-09	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-20-4	2210373-09	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-20-4	2210373-09	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-20-4	2210373-09	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-4	2210373-09	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-20-4	2210373-09	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-20-4	2210373-09	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-4	2210373-09	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-20-4	2210373-09	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-4	2210373-09	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-4	2210373-09	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-20-4	2210373-09	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-4	2210373-09	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-20-4	2210373-09	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-20-4	2210373-09	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-20-4	2210373-09	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-20-4	2210373-09	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-20-4	2210373-09	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-20-4	2210373-09	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-20-4	2210373-09	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-4	2210373-09	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-20-4	2210373-09	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-20-4	2210373-09	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-20-4	2210373-09	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-20-4	2210373-09	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-20-4	2210373-09	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-20-4	2210373-09	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-20-4	2210373-09	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-20-4	2210373-09	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-20-4	2210373-09	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-20-4	2210373-09	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-20-4	2210373-09	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-20-4	2210373-09	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-20-4	2210373-09	Toluene-d8 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-20-4	2210373-09	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
MW-20-4	2210373-09	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-20-4	2210373-09	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-20-4	2210373-09	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-20-4	2210373-09	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-20-4	2210373-09	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-20-4	2210373-09	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-20-4	2210373-09	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-20-4	2210373-09	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-20-4	2210373-09	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-4	2210373-09	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-20-4	2210373-09	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-4	2210373-09	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-20-4	2210373-09	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-4	2210373-09	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-20-4	2210373-09	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-20-4	2210373-09	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-20-4	2210373-09	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-20-4	2210373-09	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-20-4	2210373-09	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-4	2210373-09	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-20-4	2210373-09	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-20-4	2210373-09	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-20-4	2210373-09	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-20-4	2210373-09	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-20-4	2210373-09	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-20-4	2210373-09	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L

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MW-20-4	2210373-09	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-20-4	2210373-09	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-20-4	2210373-09	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-20-4	2210373-09	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-4	2210373-09	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-5	2210373-08	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-20-5	2210373-08	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-5	2210373-08	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-5	2210373-08	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-20-5	2210373-08	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-20-5	2210373-08	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-5	2210373-08	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-5	2210373-08	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-20-5	2210373-08	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-20-5	2210373-08	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-5	2210373-08	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-20-5	2210373-08	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-20-5	2210373-08	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-5	2210373-08	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-20-5	2210373-08	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-20-5	2210373-08	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-5	2210373-08	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-20-5	2210373-08	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-5	2210373-08	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-20-5	2210373-08	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L

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MW-20-5	2210373-08	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-5	2210373-08	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-20-5	2210373-08	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-5	2210373-08	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-20-5	2210373-08	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-20-5	2210373-08	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-5	2210373-08	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-20-5	2210373-08	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-20-5	2210373-08	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-20-5	2210373-08	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-20-5	2210373-08	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-5	2210373-08	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-20-5	2210373-08	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-5	2210373-08	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-5	2210373-08	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-20-5	2210373-08	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-20-5	2210373-08	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-5	2210373-08	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-20-5	2210373-08	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-20-5	2210373-08	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-20-5	2210373-08	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-20-5	2210373-08	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-20-5	2210373-08	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-20-5	2210373-08	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-20-5	2210373-08	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L

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MW-20-5	2210373-08	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-20-5	2210373-08	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-20-5	2210373-08	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-20-5	2210373-08	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-20-5	2210373-08	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-20-5	2210373-08	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-20-5	2210373-08	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-20-5	2210373-08	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-5	2210373-08	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-5	2210373-08	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-20-5	2210373-08	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-20-5	2210373-08	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-20-5	2210373-08	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-20-5	2210373-08	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-20-5	2210373-08	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-20-5	2210373-08	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-20-5	2210373-08	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.6	Y	y	v s				ug/L
MW-20-5	2210373-08	Toluene-d8 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-20-5	2210373-08	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-20-5	2210373-08	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-20-5	2210373-08	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-20-5	2210373-08	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-20-5	2210373-08	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-20-5	2210373-08	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-20-5	2210373-08	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-20-5	2210373-08	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-20-5	2210373-08	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-20-5	2210373-08	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-20-5	2210373-08	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-20-5	2210373-08	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-20-5	2210373-08	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-20-5	2210373-08	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-5	2210373-08	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-20-5	2210373-08	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-20-5	2210373-08	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-20-5	2210373-08	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-20-5	2210373-08	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-20-5	2210373-08	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-20-5	2210373-08	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-20-5	2210373-08	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-20-5	2210373-08	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-20-5	2210373-08	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-20-5	2210373-08	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-20-5	2210373-08	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-20-5	2210373-08	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-1	2210373-03	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-1	2210373-03	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-25-1	2210373-03	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-1	2210373-03	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-1	2210373-03	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L

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MW-25-1	2210373-03	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-1	2210373-03	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-25-1	2210373-03	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-1	2210373-03	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-25-1	2210373-03	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-1	2210373-03	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-1	2210373-03	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-1	2210373-03	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-1	2210373-03	Chloroform	5/10/2022	0.81	Y	y	v		0.50	0.14	ug/L
MW-25-1	2210373-03	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-1	2210373-03	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-25-1	2210373-03	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-1	2210373-03	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-25-1	2210373-03	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-25-1	2210373-03	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-1	2210373-03	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-25-1	2210373-03	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-1	2210373-03	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-1	2210373-03	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-1	2210373-03	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-1	2210373-03	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-25-1	2210373-03	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-25-1	2210373-03	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-1	2210373-03	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-1	2210373-03	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L

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MW-25-1	2210373-03	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-25-1	2210373-03	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-1	2210373-03	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-25-1	2210373-03	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-25-1	2210373-03	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-1	2210373-03	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-25-1	2210373-03	Toluene-d8 (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
MW-25-1	2210373-03	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-25-1	2210373-03	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-25-1	2210373-03	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-25-1	2210373-03	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-25-1	2210373-03	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-1	2210373-03	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-25-1	2210373-03	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-25-1	2210373-03	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-25-1	2210373-03	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-1	2210373-03	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-25-1	2210373-03	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-25-1	2210373-03	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-25-1	2210373-03	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-25-1	2210373-03	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-25-1	2210373-03	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-25-1	2210373-03	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-25-1	2210373-03	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-25-1	2210373-03	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L

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MW-25-1	2210373-03	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-1	2210373-03	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-25-1	2210373-03	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-1	2210373-03	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-25-1	2210373-03	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-25-1	2210373-03	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-25-1	2210373-03	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-25-1	2210373-03	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-25-1	2210373-03	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.7	Y	y	v s				ug/L
MW-25-1	2210373-03	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-1	2210373-03	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-1	2210373-03	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-1	2210373-03	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-1	2210373-03	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-1	2210373-03	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-1	2210373-03	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-1	2210373-03	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-1	2210373-03	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-1	2210373-03	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-1	2210373-03	Methyl t-butyl ether	5/10/2022	0.39	Y	y	v j		0.50	0.14	ug/L
MW-25-1	2210373-03	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-25-1	2210373-03	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-25-1	2210373-03	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-25-1	2210373-03	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-1	2210373-03	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L

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MW-25-1	2210373-03	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-1	2210373-03	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-25-1	2210373-03	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-1	2210373-03	Trichloroethene	5/10/2022	0.38	Y	y	v j		0.50	0.19	ug/L
MW-25-1	2210373-03	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-1	2210373-03	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-1	2210373-03	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-1	2210373-03	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-25-1	2210373-03	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-1	2210373-03	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-2	2210373-02	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-2	2210373-02	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-2	2210373-02	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-25-2	2210373-02	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-25-2	2210373-02	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-25-2	2210373-02	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-2	2210373-02	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-2	2210373-02	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-2	2210373-02	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-2	2210373-02	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-2	2210373-02	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-2	2210373-02	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-25-2	2210373-02	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-2	2210373-02	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-2	2210373-02	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L

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MW-25-2	2210373-02	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-25-2	2210373-02	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-2	2210373-02	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-2	2210373-02	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-2	2210373-02	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-2	2210373-02	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-2	2210373-02	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-2	2210373-02	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-25-2	2210373-02	Tetrachloroethene	5/10/2022	0.55	Y	y	v		0.50	0.23	ug/L
MW-25-2	2210373-02	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-2	2210373-02	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-2	2210373-02	Trichloroethene	5/10/2022	0.32	Y	y	v j		0.50	0.19	ug/L
MW-25-2	2210373-02	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-2	2210373-02	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-2	2210373-02	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-2	2210373-02	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-25-2	2210373-02	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-2	2210373-02	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-2	2210373-02	Chloroform	5/10/2022	0.27	Y	y	v j		0.50	0.14	ug/L
MW-25-2	2210373-02	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-2	2210373-02	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-2	2210373-02	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-25-2	2210373-02	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-25-2	2210373-02	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-2	2210373-02	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L

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MW-25-2	2210373-02	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-2	2210373-02	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-25-2	2210373-02	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-25-2	2210373-02	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-25-2	2210373-02	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-2	2210373-02	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-2	2210373-02	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-25-2	2210373-02	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-2	2210373-02	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-2	2210373-02	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-2	2210373-02	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-25-2	2210373-02	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-25-2	2210373-02	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-25-2	2210373-02	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-2	2210373-02	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-2	2210373-02	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-2	2210373-02	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-25-2	2210373-02	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-25-2	2210373-02	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-25-2	2210373-02	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-25-2	2210373-02	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-25-2	2210373-02	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-25-2	2210373-02	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-25-2	2210373-02	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-25-2	2210373-02	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L

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MW-25-2	2210373-02	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-25-2	2210373-02	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-25-2	2210373-02	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-25-2	2210373-02	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-25-2	2210373-02	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-25-2	2210373-02	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.9	Y	y	v s				ug/L
MW-25-2	2210373-02	Toluene-d8 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-25-2	2210373-02	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-25-2	2210373-02	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-25-2	2210373-02	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-25-2	2210373-02	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-25-2	2210373-02	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-25-2	2210373-02	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-25-2	2210373-02	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-25-2	2210373-02	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-25-2	2210373-02	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-25-2	2210373-02	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-25-2	2210373-02	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-25-2	2210373-02	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-25-2	2210373-02	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-25-2	2210373-02	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-25-2	2210373-02	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-25-2	2210373-02	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-25-2	2210373-02	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-25-2	2210373-02	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L

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TB-7-050322	2210373-01	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
TB-7-050322	2210373-01	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
TB-7-050322	2210373-01	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
TB-7-050322	2210373-01	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
TB-7-050322	2210373-01	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
TB-7-050322	2210373-01	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-7-050322	2210373-01	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
TB-7-050322	2210373-01	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
TB-7-050322	2210373-01	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
TB-7-050322	2210373-01	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
TB-7-050322	2210373-01	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
TB-7-050322	2210373-01	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
TB-7-050322	2210373-01	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
TB-7-050322	2210373-01	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
TB-7-050322	2210373-01	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
TB-7-050322	2210373-01	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
TB-7-050322	2210373-01	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
TB-7-050322	2210373-01	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
TB-7-050322	2210373-01	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
TB-7-050322	2210373-01	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-7-050322	2210373-01	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
TB-7-050322	2210373-01	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
TB-7-050322	2210373-01	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
TB-7-050322	2210373-01	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-7-050322	2210373-01	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L

SDG: 2210373

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
TB-7-050322	2210373-01	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-7-050322	2210373-01	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
TB-7-050322	2210373-01	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-7-050322	2210373-01	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-7-050322	2210373-01	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-7-050322	2210373-01	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-7-050322	2210373-01	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
TB-7-050322	2210373-01	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
TB-7-050322	2210373-01	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-7-050322	2210373-01	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-7-050322	2210373-01	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-7-050322	2210373-01	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
TB-7-050322	2210373-01	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-7-050322	2210373-01	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-7-050322	2210373-01	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-7-050322	2210373-01	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-7-050322	2210373-01	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-7-050322	2210373-01	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-7-050322	2210373-01	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-7-050322	2210373-01	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
TB-7-050322	2210373-01	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-7-050322	2210373-01	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
TB-7-050322	2210373-01	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-7-050322	2210373-01	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
TB-7-050322	2210373-01	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L

SDG: 2210373

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
TB-7-050322	2210373-01	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
TB-7-050322	2210373-01	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
TB-7-050322	2210373-01	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-7-050322	2210373-01	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
TB-7-050322	2210373-01	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-7-050322	2210373-01	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
TB-7-050322	2210373-01	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
TB-7-050322	2210373-01	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
TB-7-050322	2210373-01	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
TB-7-050322	2210373-01	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-7-050322	2210373-01	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-7-050322	2210373-01	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
TB-7-050322	2210373-01	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
TB-7-050322	2210373-01	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-7-050322	2210373-01	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-7-050322	2210373-01	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-7-050322	2210373-01	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
TB-7-050322	2210373-01	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-7-050322	2210373-01	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-7-050322	2210373-01	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
TB-7-050322	2210373-01	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-7-050322	2210373-01	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
TB-7-050322	2210373-01	Toluene-d8 (Surrogate)	5/10/2022	9.9	Y	y	v s				ug/L
TB-7-050322	2210373-01	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
TB-7-050322	2210373-01	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L

SDG: 2210373

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
TB-7-050322	2210373-01	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
TB-7-050322	2210373-01	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
TB-7-050322	2210373-01	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
TB-7-050322	2210373-01	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
TB-7-050322	2210373-01	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-7-050322	2210373-01	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-7-050322	2210373-01	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-7-050322	2210373-01	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-7-050322	2210373-01	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
TB-7-050322	2210373-01	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
TB-7-050322	2210373-01	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
TB-7-050322	2210373-01	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-7-050322	2210373-01	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
TB-7-050322	2210373-01	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-7-050322	2210373-01	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L

Analytical Method SM-2320B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	Bicarbonate	5/6/2022	5	Y	n	u		5.0	5.0	mg/L
EB-7-050322	2210373-10	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
EB-7-050322	2210373-10	Total Alkalinity as CaCO3	5/6/2022	4.1	Y	n	u		4.1	4.1	mg/L
MW-18-2	2210373-07	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-18-2	2210373-07	Total Alkalinity as CaCO3	5/6/2022	150	Y	y	v		4.1	4.1	mg/L
MW-18-2	2210373-07	Bicarbonate	5/6/2022	180	Y	y	v		5.0	5.0	mg/L
MW-18-3	2210373-06	Total Alkalinity as CaCO3	5/6/2022	220	Y	y	v		4.1	4.1	mg/L

SDG: 2210373

Analytical Method SM-2320B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-18-3	2210373-06	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-18-3	2210373-06	Bicarbonate	5/6/2022	260	Y	y	v		5.0	5.0	mg/L
MW-18-4	2210373-04	Total Alkalinity as CaCO3	5/6/2022	170	Y	y	v		4.1	4.1	mg/L
MW-18-4	2210373-04	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-18-4	2210373-04	Bicarbonate	5/6/2022	210	Y	y	v		5.0	5.0	mg/L
MW-18-5	2210373-05	Bicarbonate	5/6/2022	120	Y	y	v		5.0	5.0	mg/L
MW-18-5	2210373-05	Carbonate	5/6/2022	14	Y	y	v		2.5	2.5	mg/L
MW-18-5	2210373-05	Total Alkalinity as CaCO3	5/6/2022	120	Y	y	v		4.1	4.1	mg/L
MW-20-4	2210373-09	Carbonate	5/6/2022	11	Y	y	v		2.5	2.5	mg/L
MW-20-4	2210373-09	Total Alkalinity as CaCO3	5/6/2022	130	Y	y	v		4.1	4.1	mg/L
MW-20-4	2210373-09	Bicarbonate	5/6/2022	130	Y	y	v		5.0	5.0	mg/L
MW-20-5	2210373-08	Total Alkalinity as CaCO3	5/6/2022	120	Y	y	v		4.1	4.1	mg/L
MW-20-5	2210373-08	Bicarbonate	5/6/2022	130	Y	y	v		5.0	5.0	mg/L
MW-20-5	2210373-08	Carbonate	5/6/2022	8.8	Y	y	v		2.5	2.5	mg/L
MW-25-1	2210373-03	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-25-1	2210373-03	Bicarbonate	5/6/2022	270	Y	y	v		5.0	5.0	mg/L
MW-25-1	2210373-03	Total Alkalinity as CaCO3	5/6/2022	220	Y	y	v		4.1	4.1	mg/L
MW-25-2	2210373-02	Bicarbonate	5/6/2022	260	Y	y	v		5.0	5.0	mg/L
MW-25-2	2210373-02	Total Alkalinity as CaCO3	5/6/2022	220	Y	y	v		4.1	4.1	mg/L
MW-25-2	2210373-02	Carbonate	5/6/2022	2.5	Y	n	u		2.5	2.5	mg/L

Analytical Method SRL 524M

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-7-050322	2210373-10	1,2,3-Trichloropropane	5/11/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-18-2	2210373-07	1,2,3-Trichloropropane	5/11/2022	0.005	Y	n	u		0.0050	0.0010	ug/L

SDG: 2210373

Analytical Method SRL 524M

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-18-3	2210373-06	1,2,3-Trichloropropane	5/11/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-18-4	2210373-04	1,2,3-Trichloropropane	5/11/2022	0.029	Y	y	v		0.0050	0.0010	ug/L
MW-18-5	2210373-05	1,2,3-Trichloropropane	5/11/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-20-4	2210373-09	1,2,3-Trichloropropane	5/11/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-20-5	2210373-08	1,2,3-Trichloropropane	5/11/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-25-1	2210373-03	1,2,3-Trichloropropane	5/11/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-25-2	2210373-02	1,2,3-Trichloropropane	5/11/2022	0.005	Y	n	u		0.0050	0.0010	ug/L

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Tidewater, Inc.
3761 Attucks Drive
Powell, OH 43065
ATTN: Mr. David Conner
David.Conner@tideh2o.net

November 1, 2022

SUBJECT: NASA JPL, 2Q2022 - Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on June 29, 2022. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #54410:

SDG #	Fraction
2210539 2210682	Volatiles, 1,2,3-Trichloropropane, 1,4-Dioxane, Metals, Wet Chemistry

The data validation was performed under Level III &IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017)
- USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017)

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

534 pages-ADV

Attachment 1

90/10 III/IV (client select) EDD

LDC# 54410 (Tidewater - Powell, OH / NASA JPL, 2Q2022)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (524.2)		1,2,3-TCP (524M)		1,4-Dioxane (8270C)		Metals (200.7 /200.8)		Alk. (2320B)		Cl,SO_4 NO_3-N (300.0)		NO_2-N (353.2)		Cr(VI) (218.6)		CLO_4 (314.0)		TDS (160.1)		pH (150.1)													
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	2210539	06/29/22	07/21/22	6	0	5	0	0	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0										
A	2210539	06/29/22	07/21/22	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0										
B	2210682	06/29/22	07/21/22	10	0	6	0	-	-	6	0	6	0	9	0	9	0	6	0	9	0	6	0	6	0												
Total	T/PG			17	0	12	0	1	0	12	0	12	0	15	0	15	0	12	0	15	0	12	0	12	0	0	0	0	0	0	0	0	0	0	0	0	135

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS/MSD, and DUPs

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: August 2, 2022

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210539

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-8-050422	2210539-01	Water	05/04/22
MW-17-5	2210539-02	Water	05/04/22
MW-17-4**	2210539-03**	Water	05/04/22
MW-17-3	2210539-04	Water	05/04/22
MW-17-2	2210539-05	Water	05/04/22
MW-17-1	2210539-06	Water	05/04/22
EB-8-050422	2210539-07	Water	05/04/22
MW-17-2MS	2210539-05MS	Water	05/04/22
MW-17-2MSD	2210539-05MSD	Water	05/04/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990 with the following exceptions:

Date	Analyte	r^2	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	0.989	All samples in SDG 2210539	UJ (all non-detects)	P

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	38.7	All samples in SDG 2210539	UJ (all non-detects)	P

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
05/09/22	Pentachloroethane	52.4	All samples in SDG 2210539	UJ (all non-detects)	P

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample TB-8-050422 was identified as a trip blank. No contaminants were found.

Sample EB-8-050422 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-3-4 and DUP-5-2Q22 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All target analyte quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to initial calibration r^2, ICV %D, and continuing calibration %D, data were qualified as estimated in seven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Volatiles - Data Qualification Summary - SDG 2210539

Sample	Analyte	Flag	A or P	Reason
TB-8-050422 MW-17-5 MW-17-4** MW-17-3 MW-17-2 MW-17-1 EB-8-050422	Methyl iodide	UJ (all non-detects)	P	Initial calibration (RRF)
TB-8-050422 MW-17-5 MW-17-4** MW-17-3 MW-17-2 MW-17-1 EB-8-050422	Methyl iodide	UJ (all non-detects)	P	Initial calibration verification (%D)
TB-8-050422 MW-17-5 MW-17-4** MW-17-3 MW-17-2 MW-17-1 EB-8-050422	Pentachloroethane	UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 2Q2022
Volatiles - Laboratory Blank Data Qualification Summary - SDG 2210539

No Sample Data Qualified in this SDG

LDC #: 54410A1a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/26/22
SDG #: 2210539 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	NA / SW	% RSD ≤ 20, r² ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1 EB = 7
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	TB-8-050422	2210539-01	Water	05/04/22
2	MW-17-5	2210539-02	Water	05/04/22
3	MW-17-4**	2210539-03**	Water	05/04/22
4	MW-17-3	2210539-04	Water	05/04/22
5	MW-17-2	2210539-05	Water	05/04/22
6	MW-17-1	2210539-06	Water	05/04/22
7	EB-8-050422	2210539-07	Water	05/04/22
8	MW-17-2MS	2210539-05MS	Water	05/04/22
9	MW-17-2MSD	2210539-05MSD	Water	05/04/22
10				

Notes:

	B139140						

LDC #: 54410A1a

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: RT

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓	✓		
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓	✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?		✓		
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54410A1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15, 20, 15 RSD% and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: _____)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	4/4/22	ICAL #5	Methyl Iodide		0.989	All	J/UJ/P ND

LDC #: 54410A1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?

~~X~~ N N/A Were all %D within the validation criteria of ~~≤20~~ %D? 30

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0% /30%)	Associated Samples	Qualifications
	4/4/22 1446	~~CC~~ ICV	Methyl Iodide	38.7 (≤30)	All	J/UJ/P MD

LDC #: 54410A1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y N N/A Were all %D and RRFs within the validation criteria of ≤~~20%~~D and ≥0.05 RRF ? 30

#	Date	Standard ID	Compound	Finding %D (Limit: ~~≤20.0%~~ 30)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	5/9/22	CCV1	Pentachloroethane	52.4	(≤30	All	J/UJ/P ND
	~~5/8/22~~ FD						
	1913						

CONCAL.wpd

LDC #: 54410A1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (10 std)	Recalc RRF (10 std)	Reported Average RRF (initial)	Recalc Average RRF (initial)	Reported %RSD	Recalc %RSD
1	ICAL 220509	4/4/22	K (1st internal standard)	0.7365493	0.7365493	0.711926	0.711926	1.975059	1.975
			CC (2nd internal standard)	0.8268164	0.8268164	0.7647929	0.7647929	9.205932	9.206
			BP (3rd internal standard)	0.5423192	0.5423192	0.5135746	0.5135746	10.65077	10.65
			(4th internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						

LDC #: 54410A1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV1	5/9/22 1848	K (1st internal standard)	0.711926	0.7216665	0.7216665	1.4	1.4
			CC (2nd internal standard)	0.7647929	0.743458	0.743458	2.8	2.8
			BB (3rd internal standard)	0.5135746	0.538522	0.538522	4.8	4.8
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54410A/a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #3

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4	10.0	10.0	100	100	0
Toluene-d8	↓	10.09	101	101	↓
Bromofluorobenzene	↓	9.76	97.6	97.6	↓

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 54410A1a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD sample: 8 and 9

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Y	25.0	25.0	ND	23.980	23.740	95.9	95.9	95.0	95.0	1.01	1.01
P	↓	↓	↓	25.250	25.440	101	101	102	102	0.750	0.750
DD	↓	↓	↓	23.660	23.090	94.6	94.6	92.2	92.2	2.61	2.61
D	↓	↓	↓	24.750	24.710	99.0	99.0	98.8	98.8	0.162	0.162
HH	↓	↓	↓	22.990	22.580	92.0	92.0	90.3	90.3	1.80	1.80

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54410A /a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: BI39140 - LCS

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
V	25.0	NA	23.40	NA	93.8	93.8				
P	↓	↓	24.350	↓	97.4	97.4				
DD			22.670		90.7	90.7				
D			24.740		99.0	99.0				
HHH			22.600		90.4	90.4	NA			

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54410A/a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: EJ

METHOD: GC MS 524.2

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #3 , K

Conc. = $\frac{(11516)(10.0)}{(290278)(0.711926)}$

=

0.5572 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	#3	K	~~1.0~~ 0.56	0.5572	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: August 2, 2022

Parameters: 1,2,3-Trichloropropane

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210539

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-17-5	2210539-02	Water	05/04/22
MW-17-4**	2210539-03**	Water	05/04/22
MW-17-3	2210539-04	Water	05/04/22
MW-17-2	2210539-05	Water	05/04/22
MW-17-1	2210539-06	Water	05/04/22
EB-8-050422	2210539-07	Water	05/04/22
MW-17-2MS	2210539-05MS	Water	05/04/22
MW-17-2MSD	2210539-05MSD	Water	05/04/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,2,3-Trichloropropane by Environmental Protection Agency (EPA) Method 524 Modified

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB-8-050422 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All analyte quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Data Qualification Summary - SDG 2210539

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Laboratory Blank Data Qualification Summary - SDG 2210539

No Sample Data Qualified in this SDG

LDC #: 54410A1b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/26/22
SDG #: 2210539 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS 1,2,3-Trichloropropane (EPA Method 524M)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = 6
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-17-5	2210539-02	Water	05/04/22
2	MW-17-4**	2210539-03**	Water	05/04/22
3	MW-17-3	2210539-04	Water	05/04/22
4	MW-17-2	2210539-05	Water	05/04/22
5	MW-17-1	2210539-06	Water	05/04/22
6	EB-8-050422	2210539-07	Water	05/04/22
7	MW-17-2MS	2210539-05MS	Water	05/04/22
8	MW-17-2MSD	2210539-05MSD	Water	05/04/22
9				

Notes:

	B139164						

LDC #: 54410A1b

VALIDATION FINDINGS CHECKLIST

Reviewer: BT

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?	✓			
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?			✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓		•	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54410A1b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50U std)	Recalc RRF (50U std)	Reported Average RRF (initial)	Recalc Average RRF (initial)	Reported %RSD	Recalc %RSD
1	ICAL	5/6/22	XX (1st internal standard)	1.070689	1.070689	1.006215	1.006215	14.0484	14.0484
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						

LDC #: 54410A1b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV1	5/9/22 0546	XX (1st internal standard)	1.006215	0.899843	0.899843	10.6	10.6
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54410A16

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = | MSC - MSC | * 2/(MSC + MSDC)

MSC = Matrix spike concentration; MSDC = Matrix spike duplicate concentration

MS/MSD sample: 7 & 8

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
XX	0.0500	0.0500	NR	0.0500	0.05003	100	100	100	100	0.06	0.06

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54410A1b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = | LCSC - LCSDC | * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: B139164 - LCS

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
XX	0.05	NA	00533	NA	107	107			-	

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54410A16

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: KF

METHOD: GC MS 524 M

(Y) N N/A Were all reported results recalculated and verified for all level IV samples?
(Y) N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. BI39164-BS1 XX

Conc. = $\frac{(16623)(50.0)}{(15491)(1.006215)(1000)}$

= 0.05332 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	BS1	XX	0.053320	0.05332	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: August 2, 2022

Parameters: 1,4-Dioxane

Validation Level: Level IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210539

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-17-4	2210539-03	Water	05/04/22

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270C

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

All target analyte quantitations met validation criteria.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria.

Manual integrations were reviewed and were considered acceptable. The laboratory provided before and after integration printouts.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2022
1,4-Dioxane - Data Qualification Summary - SDG 2210539

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG 2210539

No Sample Data Qualified in this SDG

LDC #: 54410A2c **VALIDATION COMPLETENESS WORKSHEET** Date: 7/26/22
SDG #: 2210539 Level IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS 1,4-Dioxane (EPA SW-846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RF ICV ≤20
IV.	Continuing calibration	A	CCV ≤20
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	
XIII.	Target analyte identification	A	MI
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	MW-17-4	2210539-03	Water	05/04/22
2				
3				
4				
5				
6				
7				
8				
9				

Notes:

	B139528						

LDC #: 54410 A2C

VALIDATION FINDINGS CHECKLIST

Reviewer: FT

Method: Semivolatiles (EPA SW 846 Method 8270 C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% 15/30% and relative response factors (RRF) within method criteria?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the blanks validation findings worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?		✓		
Were target analytes detected in the field blanks?			✓	
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recoveries (%R) was less than 10%, was a reanalysis performed to confirm %R ?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
IX. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target analytes detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Target analyte quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the target analyte?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?				
XIV. System performance	✓			
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. 1,1'-Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

Method: 8270C

Calibration Date	System	Compound	Standard	(Y) Response	(X) Concentration
5/6/2022	MS-B4	1,4 Dioxane	1	0.070078215	0.05
			2	0.251681167	0.25
			3	0.490075989	0.50
			4	1.135075410	1.25
			5	1.908999470	2.00
			6	2.313048000	2.50

Regression Output		***Reported***
Constant	*0.019974*	*nr*
Std Err of Y Est		
R Squared	*0.999143*	*0.999000*
Degrees of Freedom		
X Coefficient(s)	*0.923529*	*nr*
Std Err of Coef.		
Correlation Coefficient	*0.999572*	
Coefficient of Determination (r^2)	*0.999143*	*0.999000*

LDC #: 54410A2C

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 C)
The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the target analytes identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
A_x = Area of target analyte
C_x = Concentration of target analyte
RRF = continuing calibration RRF
A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Target Analyte (Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	ccv1	5/9/22 17446	1,4- Dioxane (1st IS)	20000	22110	22110	10.6	10.6
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
2	ccv1	5/13/22 0815	1,4- Dioxane (1st IS)	20000	21750	21750	8.8	8.8
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
3			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54410A2c

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1 0.97/990

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5 S-d8	8.0308	~~6.316~~ F7	78.6	78.6	U
2-Fluorobiphenyl		6.3491			
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
~~2,4,6-Tribromophenol~~					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					

LDC #: 54410 A2c

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the target analytes identified below using the following calculation:

$$SSC = \frac{(A_x)(C_{IS})(Fv)(Df)}{(A_{IS})(RRF)(Vs \text{ or } Ws)(\%S/100)}$$

%Recovery = (SSC/SA)*100

RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where: A_x= Area of the target analyte
A_{IS}= Area for the specific internal standard
C_{IS} = Concentration of internal standard
Fv =Final volume of extract
Df= Dilution factor
RRF= Average relative response factor of the target analyte
Ws= Initial weight of the sample
%S= Percent Solid
SSC = Spiked sample concentration
LCS = Laboratory control sample
LCSD = Laboratory control sample duplicate
Vs= Initial volume of the sample

LCS/LCSD samples: B139528-LCS

Compound	Spike Added (ug/L)		Spike Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
~~Phenol~~ 1,4-Dioxane	50.0	NA	40.352	NA	80.7	80.7	NA			
~~N-Nitroso-di-n-propylamine~~										
4-Chloro-3-methylphenol										
Acenaphthene										
Pentachlorophenol										
~~Pyrene~~										

LDC #: 54410A2C

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 7
Reviewer: FT

METHOD: __ GC __ HPLC _ GCMS 8270 C

(Y) N N/A Were all reported results recalculated and verified for all level IV samples?
(Y) N N/A Were all recalculated results for detected target analytes within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. B139528-LCS Compound Name 1,4-Dioxane

Concentration = $\frac{\left(\frac{1201158}{1225202} - 0.019974\right)(40)(0.97)(1000)}{(0.923529)(1000)}$ =

= 40.349

#	Sample ID	Compound	Reported Concentrations (ug/L)	Recalculated Results Concentrations (ug/L)	Qualifications
	LCS	1,4-Dioxane	40.352	40.349	

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 3, 2022

Parameters: Metals

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210539

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-17-5	2210539-02	Water	05/04/22
MW-17-4**	2210539-03**	Water	05/04/22
MW-17-3	2210539-04	Water	05/04/22
MW-17-2	2210539-05	Water	05/04/22
MW-17-1	2210539-06	Water	05/04/22
EB-8-050422	2210539-07	Water	05/04/22
MW-17-2MS	2210539-05MS	Water	05/04/22
MW-17-2MSD	2210539-05MSD	Water	05/04/22
MW-17-2DUP	2210539-05DUP	Water	05/04/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Arsenic, Calcium, Chromium, Iron, Lead, Magnesium, Potassium, and Sodium by Environmental Protection Agency (EPA) Method 200.7 and 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis was not required by the method.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Calcium Magnesium	0.03729 mg/L 0.03133 mg/L	All samples in SDG 2210539
ICB/CCB	Magnesium	0.020033 mg/L	MW-17-4** MW-17-3 MW-17-1 EB-8-050422
ICB/CCB	Magnesium	0.029089 mg/L	MW-17-5 MW-17-2
ICB/CCB	Arsenic	0.946 ug/L	MW-17-2

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-8-050422	Calcium Magnesium	0.13 mg/L 0.062 mg/L	0.13U mg/L 0.062U mg/L

VI. Field Blanks

Sample EB-8-050422 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-8-050422	05/04/22	Iron Calcium Magnesium Sodium Potassium	36 ug/L 0.13 mg/L 0.062 mg/L 0.33 mg/L 0.1 mg/L	MW-17-5 MW-17-4** MW-17-3 MW-17-2 MW-17-1

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Metals - Data Qualification Summary - SDG 2210539

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
Metals - Laboratory Blank Data Qualification Summary - SDG 2210539

Sample	Analyte	Modified Final Concentration	A or P
EB-8-050422	Calcium Magnesium	0.13U mg/L 0.062U mg/L	A

NASA JPL, 2Q2022
Metals - Field Blank Data Qualification Summary - SDG 2210539

No Sample Data Qualified in this SDG

LDC #: 54410A4a **VALIDATION COMPLETENESS WORKSHEET** Date: 9/28/22
SDG #: 2210539 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer: CJ

METHOD: Metals (EPA Method 200.7/200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB=2
VII.	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	A	Reviewed for level 4 only
XIII.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-17-5	2210539-02	Water	05/04/22
2	MW-17-4**	2210539-03**	Water	05/04/22
3	MW-17-3	2210539-04	Water	05/04/22
4	MW-17-2	2210539-05	Water	05/04/22
5	MW-17-1	2210539-06	Water	05/04/22
6	EB-8-050422	2210539-07	Water	05/04/22
7	MW-17-2MS	2210539-05MS	Water	05/04/22
8	MW-17-2MSD	2210539-05MSD	Water	05/04/22
9	MW-17-2DUP	2210539-05DUP	Water	05/04/22
10				
11				
12				
13				

Notes:

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
Were all water samples preserved to a pH of <2.	Yes			
II. ICP-MS Tune				
Were mass resolutions within 0.1 amu for all isotopes in the tuning solution?	Yes			
Were %RSDs of isoptoes in the tuning solution ≤5%?	Yes			
III. Calibration				
Were all instuments calibrated daily?	Yes			
Were the proper standards used?	Yes			
Were all initial and continuing calibration verifications within the 90-110% (80-120% for mercury) QC limits?	Yes			
Were the low level standard checks within 70-130%?	Yes			
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?	Yes			
Was there contamination in the initial and continuing calibration blanks?	Yes			
V. Interference Check Sample				
Were the interference check samples performed daily?	Yes			
Were the AB solution recoveries within 80-120%?	Yes			
VI. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries with the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	Yes			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	Yes			
VII. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
VIII. Internal Standards				
Were all percent recoveries within the 30-120% (60-125% for EPA Method 200.8) QC limits?	Yes			
If the recoveries were outside the limits, was a reanalysis performed?	Yes			
IX. Serial Dilution				
Were all percent differences <10%?	Yes			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		No		
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	
XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?			NA	
Were target analytes detected in the field duplicates?			NA	
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-6	As,Ca,Cr,Fe,Pb,Mg,K,Na
QC:	
7-9	As,Ca,Cr,Fe,Pb,Mg,K,Na

Analysis Method

ICP	Ca,Fe,Mg,K,Na
ICP-MS	As,Cr,Pb
CVAA	

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-6

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	6								
Ca	0.03729		0.18647	0.13								
Mg	0.03133		0.15663	0.062								

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: Associated Samples: 2-3,5-6

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	6								
Mg		0.020033	0.10017	0.062								

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1,4

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	No Qual								
Mg		0.029089	0.14545									

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is established at 5X the highest ICB, CCB, or PB concentration.

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: ug/L Associated Samples: 4

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (ug/L)**	**Action Level**	No Qual								
As		0.946	4.73									

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is established at 5X the highest ICB, CCB, or PB concentration.

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Blank units: mg/L
Associated sample units: mg/L
Sampling Date: 5/4/2022
Associated Samples: 1-5

			Sample Identification									
Analyte	Blank ID	Action Level	No Qual									
	6											
Fe (ug/L)	36	180										
Ca	0.13	0.65										
Mg	0.062	0.31										
Na	0.33	1.65										
K	0.1	0.5										

Comments: The action level, when applicable, is establised at 5X the highest concentration.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 3, 2022

Parameters: Wet Chemistry

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210539

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-17-5	2210539-02	Water	05/04/22
MW-17-4**	2210539-03**	Water	05/04/22
MW-17-3	2210539-04	Water	05/04/22
MW-17-2	2210539-05	Water	05/04/22
MW-17-1	2210539-06	Water	05/04/22
EB-8-050422	2210539-07	Water	05/04/22
MW-17-2MS	2210539-05MS	Water	05/04/22
MW-17-2MSD	2210539-05MSD	Water	05/04/22
MW-17-2DUP	2210539-05DUP	Water	05/04/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by EPA Method 218.6
Nitrite as Nitrogen by EPA Method 353.2
Perchlorate by EPA Method 314.0
pH by EPA 150.1
Total Dissolved Solids by EPA Method 160.1

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
MW-17-5 MW-17-4**	pH	129 hours	48 hours	J (all detects)	P
MW-17-3	pH	128 hours	48 hours	J (all detects)	P
MW-17-2 MW-17-1	pH	140 hours	48 hours	J (all detects)	P
EB-8-050422	pH	139 hours	48 hours	J (all detects)	P
MW-17-4**	Hexavalent chromium	229 hours	48 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chloride Nitrate as N Nitrite as N	0.241 mg/L 0.034 mg/L 0.01036 mg/L	All samples in SDG 2210539
PB (prep blank)	Sulfate	0.337 mg/L	MW-17-4** MW-17-3 MW-17-2 MW-17-1 EB-8-050422
ICB/CCB	Chloride	0.233 mg/L	All samples in SDG 2210539

Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Sulfate	0.399 mg/L	MW-17-4** MW-17-3 MW-17-2 MW-17-1 EB-8-050422
ICB/CCB	Nitrite as N	0.010954 mg/L	MW-17-5 MW-17-4** MW-17-3 MW-17-1 EB-8-050422

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-17-5	Nitrite as N	0.011 mg/L	0.011U mg/L
MW-17-4**	Nitrite as N	0.011 mg/L	0.011U mg/L
MW-17-3	Nitrate as N Nitrite as N	0.058 mg/L 0.011 mg/L	0.058U mg/L 0.011U mg/L
MW-17-2	Nitrate as N Nitrite as N	0.096 mg/L 0.011 mg/L	0.096U mg/L 0.011U mg/L
MW-17-1	Nitrite as N	0.011 mg/L	0.011U mg/L
EB-8-050422	Chloride Nitrite as N	0.24 mg/L 0.012 mg/L	0.24U mg/L 0.012U mg/L

V. Field Blanks

Sample EB-8-050422 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-8-050422	05/04/22	Total dissolved solids Hexavalent chromium Chloride Nitrite as N	4 mg/L 0.000098 mg/L 0.24 mg/L 0.012 mg/L	MW-17-5 MW-17-4** MW-17-3 MW-17-2 MW-17-1

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-17-5	Nitrite as N	0.011 mg/L	0.011U mg/L
MW-17-4**	Nitrite as N	0.011 mg/L	0.011U mg/L
MW-17-3	Hexavalent chromium Nitrite as N	0.000021 mg/L 0.011 mg/L	0.000021U mg/L 0.011U mg/L
MW-17-2	Hexavalent chromium Nitrite as N	0.000025 mg/L 0.011 mg/L	0.000025U mg/L 0.011U mg/L
MW-17-1	Hexavalent chromium Nitrite as N	0.00014 mg/L 0.011 mg/L	0.00014U mg/L 0.011U mg/L

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
MW-17-2MS/MSD (All samples in SDG 2210539)	Nitrate as N	12.4 (≤10)	J (all detects) UJ (all non-detects)	A
MW-17-2MS/MSD (MW-17-4** MW-17-3 MW-17-2 MW-17-1 EB-8-050422)	Sulfate	12 (≤10)	J (all detects) UJ (all non-detects)	A

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time and MS/MSD RPD, data were qualified as estimated in six samples.

Due to laboratory blank contamination, data were qualified as not detected in six samples.

Due to equipment blank contamination, data were qualified as not detected in five samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Wet Chemistry - Data Qualification Summary - SDG 2210539

Sample	Analyte	Flag	A or P	Reason
MW-17-5 MW-17-3 MW-17-2 MW-17-1 EB-8-050422	pH	J (all detects)	P	Technical holding times
MW-17-4**	pH Hexavalent chromium	J (all detects) J (all detects)	P	Technical holding times
MW-17-5 MW-17-4** MW-17-3 MW-17-2 MW-17-1 EB-8-050422	Nitrate as N	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (RPD)
MW-17-4** MW-17-3 MW-17-2 MW-17-1 EB-8-050422	Sulfate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (RPD)

NASA JPL, 2Q2022
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 2210539

Sample	Analyte	Modified Final Concentration	A or P
MW-17-5	Nitrite as N	0.011U mg/L	A
MW-17-4**	Nitrite as N	0.011U mg/L	A
MW-17-3	Nitrate as N Nitrite as N	0.058U mg/L 0.011U mg/L	A
MW-17-2	Nitrate as N Nitrite as N	0.096U mg/L 0.011U mg/L	A
MW-17-1	Nitrite as N	0.011U mg/L	A
EB-8-050422	Chloride Nitrite as N	0.24U mg/L 0.012U mg/L	A

NASA JPL, 2Q2022
Wet Chemistry - Field Blank Data Qualification Summary - SDG 2210539

Sample	Analyte	Modified Final Concentration	A or P
MW-17-5	Nitrite as N	0.011U mg/L	A
MW-17-4**	Nitrite as N	0.011U mg/L	A
MW-17-3	Hexavalent chromium Nitrite as N	0.000021U mg/L 0.011U mg/L	A
MW-17-2	Hexavalent chromium Nitrite as N	0.000025U mg/L 0.011U mg/L	A
MW-17-1	Hexavalent chromium Nitrite as N	0.00014U mg/L 0.011U mg/L	A

LDC #: 54410A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/29/22
SDG #: 2210539 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer:

METHOD: (Analyte) Alkalinity (SM2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA Method 218.6), Perchlorate (EPA Method 314.0), pH (EPA Method 150.1), TDS (EPA Method 160.1)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /SW	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	EB=6
VI.	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XI	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-17-5	2210539-02	Water	05/04/22
2	MW-17-4**	2210539-03**	Water	05/04/22
3	MW-17-3	2210539-04	Water	05/04/22
4	MW-17-2	2210539-05	Water	05/04/22
5	MW-17-1	2210539-06	Water	05/04/22
6	EB-8-050422	2210539-07	Water	05/04/22
7	MW-17-2MS	2210539-05MS	Water	05/04/22
8	MW-17-2MSD	2210539-05MSD	Water	05/04/22
9	MW-17-2DUP	2210539-05DUP	Water	05/04/22
10				
11				
12				
13				
14				

Notes:

METHOD: Inorganics				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
II. Calibration				
Were all instruments calibrated at the required frequency?	Yes			
Were the proper number of standards used?	Yes			
Were all initial and continuing calibration verifications within the QC limits?	Yes			
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
Were balance checks performed as required?			NA	
III. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?	Yes			
Was there contamination in the initial and continuing calibration blanks?	Yes			
IV. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries within the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	Yes			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?		No		
V. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	

XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?			NA	
Were target analytes detected in the field duplicates?			NA	
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-6	Alkalinity,Cl,NO3-N,NO2-N,Cr(VI),CLO4,pH,TDS
2-6	SO4
QC:	
9	pH,TDS
7-9	Cr(VI),Cl,NO3-N,SO4,CLO4,NO2-N,Alkalinity

Holding Time

METHOD: Inorganics

All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 150.1 Analyte: pH Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
1	5/4/2022 8:25	5/9/2022 18:16	129	J/UJ/P	Det
2	5/4/2022 8:57	5/9/2022 18:27	129	J/UJ/P	Det
3	5/4/2022 10:10	5/9/2022 18:37	128	J/UJ/P	Det
4	5/4/2022 12:05	5/10/2022 8:48	140	J/UJ/P	Det
5	5/4/2022 13:05	5/10/2022 9:09	140	J/UJ/P	Det
6	5/4/2022 13:45	5/10/2022 9:20	139	J/UJ/P	Det

METHOD: Inorganics

All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 218.6 Analyte: Hexavalent Chromium Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
2	5/4/2022 8:57	5/13/2022 22:11	229	J/R/P	Det

Laboratory Blank Contamination (PB/ICB/CCB) Reviewer: Jada Morales

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-6

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	1	2	3	4	5	6			
Cl	0.241		1.205						0.24			
NO3-N	0.034		0.17			0.058	0.096		~~0.024~~			
NO2-N	0.01036		0.0518	0.011	0.011	0.011	0.011	0.011	0.012			

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 2-6

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	6								
SO4	0.337		1.685	~~0.14~~								

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-6

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	6								
Cl		0.233	1.165	0.24								

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is establised at 5X the highest ICB, CCB, or PB concentration.

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 2-6

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	6								
SO4		0.399	1.995	0.14								

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-3,5-6

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	1	2	3	4	6				
NO2-N		0.010954	0.05477	0.011	0.011	0.011	0.011	0.012				

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is establised at 5X the highest ICB, CCB, or PB concentration.

Field Blanks

METHOD: Inorganics

Blank units: mg/L Associated sample units: mg/L

Sampling Date: 5/4/2022 Associated Samples: 1-5

			Sample Identification							
Analyte	Blank ID	Action Level	1	2	3	4	5			
	6									
TDS	4									
Cr(VI)	0.000098				0.000021	0.000025	0.00014			
Cl	0.24									
NO2-N	0.012		0.011	0.011	0.011	0.011	0.011			
~~NO3-N~~	~~[illegible]~~									

Comments: The action level, when applicable, is establised at 5X the highest concentration.

Matrix Spike/Matrix Spike Duplicates

METHOD: Inorganics

MS/MSD analysis was performed by the laboratory. All MS/MSD percent recoveries (%R) and relative percent differences (RPDs) were within the acceptable limits with the following exceptions:

MS/MSD ID	Matrix	Analyte	MS %R	MSD %R	%R Limit	RPD	RPD Limit	Associated Samples	Qualification	Det/ND
7-8	Water	NO3-N				12.4	10	1-6	J/UJ/A	Det/ND
		SO4				12	10	2-6	J/UJ/A	Det/ND

Comments:

Initial and Continuing Calibration Calculation Verification

METHOD: Inorganics

The correlation coefficient (r) for the calibration of NO2-N were recalculated.

Calibration date:

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True = concentration of each analyte in the ICV or CCV source

Type of Analysis	Analyte	Standard	Concentration (mg/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial Calibration	NO2-N	s1	0	0.0071	0.999863	0.999863	Y
		s2	0.02	0.01767			
		s3	0.05	0.03349			
		s4	0.1	0.06057			
		s5	0.5	0.26577			
		s6	1	0.53683			
		s7					
		s8					
		s9					
		s10					
		s11					
		s12					

Type of Analysis	Analyte	Found (mg/L)	True (mg/L)		Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Calibration verification	Cr(VI)	26.204	25.00		104.816	105	Y
Calibration verification	CLO4	9.7594	10.00		97.594	97.6	Y
Calibration verification	Cl	50.668	50.00		101.336	101	Y

Quality Control Sample Recalculations

METHOD: Inorganics

Percent recoveries (%R) for the laboratory control sample (LCS) and matrix spike (MS) were recalcuated using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis. For the MS calculation, Found = SSR (Spiked Sample Result) - SR (Sample Result)

True = concentration of each analyte in the source

The sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = (Absolute value(S-D)x 200) / (S+D)

S = Original sample concentration

D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found/S	True/D	Recalculated %R/RPD	Reported %R/RPD	Acceptable (Y/N)
B138206-BS2	LCS	pH	7.07	7	101	101	Y
7	MS	Cr(VI)	0.022002	0.020202	108.9100089	109	Y
9	Duplicate	TDS	393.33	403.33	2.510481259	2.51	Y

Sample Calculation Verification

METHOD: Inorganics

Analytes were recalculated and verified using the following equation:

Concentration = (Result from raw data x Final volume x Dilution factor) / (Percent solids (if applicable) x Initial weight or volume)

Sample ID	Analyte	Raw Data (ppb)	Dilution	Initial Volume (mL)	Final Volume (mL)	Reported Result (mg/L)	Recalculated Result (mg/L)	Acceptable (Y/N)
2	pH (S.U.)	8.25	1	50	50	8.25	8.25	Y
2	TDS	134	3.33	100	100	450	446.22	Y
2	Cr(VI)	2.115368768	1	20	20	0.0021	0.002115369	Y
2	NO3-N (ppm)	8.698647757	1	20	20	8.7	8.698647757	Y
2	CLO4 (ug/L)	4.00	1	20	20	4.1	4.00	Y
2	NO2-N	0.01	1	20	20	0.011	0.010	Y
2	Alkalinity	202.68	1	50	50	200	202.68	Y

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: August 2, 2022

Parameters: Volatiles

Validation Level: Level III

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210682

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-1	2210682-01	Water	05/05/22
TB-9-05052022	2210682-02	Water	05/05/22
MW-5	2210682-03	Water	05/05/22
MW-8	2210682-04	Water	05/05/22
MW-9	2210682-05	Water	05/05/22
MW-10	2210682-06	Water	05/05/22
MW-15	2210682-07	Water	05/05/22
EB-9-050522	2210682-08	Water	05/05/22
DUP-6-2Q22	2210682-09	Water	05/05/22
DUP-7-2Q22	2210682-10	Water	05/05/22
MW-1MS	2210682-01MS	Water	05/05/22
MW-1MSD	2210682-01MSD	Water	05/05/22
MW-15MS	2210682-07MS	Water	05/05/22
MW-15MSD	2210682-07MSD	Water	05/05/22

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990 with the following exceptions:

Date	Analyte	r^2	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	0.989	All samples in SDG 2210682	UJ (all non-detects)	P

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	38.7	All samples in SDG 2210682	UJ (all non-detects)	P

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
05/10/22 (07:00)	Bromomethane	31.7	MW-1 TB-9-05052022 MW-5 MW-8 MW-9 MW-10 EB-9-050522 DUP-6-2Q22 DUP-7-2Q22	UJ (all non-detects)	P
05/10/22 (07:24)	Pentachloroethane	96.2	MW-1 TB-9-05052022 MW-5 MW-8 MW-9 MW-10 EB-9-050522 DUP-6-2Q22 DUP-7-2Q22	UJ (all non-detects)	P
05/10/22 (19:40)	Methyl iodide Pentachloroethane	50.1 79.8	MW-15	UJ (all non-detects) UJ (all non-detects)	P

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample TB-9-05052022 was identified as a trip blank. No contaminants were found.

Sample EB-9-050522 was identified as an equipment blank. No contaminants were found.

VII. Surrogates`

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-9 and DUP-6-2Q22 and samples MW-10 and DUP-7-2Q22 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to initial calibration r^2, ICV %D, and continuing calibration %D, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Volatiles - Data Qualification Summary - SDG 2210682

Sample	Analyte	Flag	A or P	Reason
MW-1 TB-9-05052022 MW-5 MW-8 MW-9 MW-10 MW-15 EB-9-050522 DUP-6-2Q22 DUP-7-2Q22	Methyl iodide	UJ (all non-detects)	P	Initial calibration (RRF)
MW-1 TB-9-05052022 MW-5 MW-8 MW-9 MW-10 MW-15 EB-9-050522 DUP-6-2Q22 DUP-7-2Q22	Methyl iodide	UJ (all non-detects)	P	Initial calibration verification (%D)
MW-1 TB-9-05052022 MW-5 MW-8 MW-9 MW-10 EB-9-050522 DUP-6-2Q22 DUP-7-2Q22	Bromomethane Pentachloroethane	UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)
MW-15	Methyl iodide Pentachloroethane	UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 2Q2022
Volatiles - Laboratory Blank Data Qualification Summary - SDG 2210682

No Sample Data Qualified in this SDG

LDC #: 54410B1a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/25/22
SDG #: 2210682 Level III Page: 1 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer:
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /Δ	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW SW	%RSD ≤ 20, r² ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 2 EB = 4
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D = 5,9 6,10
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1 1	MW-1	2210682-01	Water	05/05/22
2 1	TB-9-05052022	2210682-02	Water	05/05/22
3 1	MW-5	2210682-03	Water	05/05/22
4 1	MW-8	2210682-04	Water	05/05/22
5 1	MW-9 D	2210682-05	Water	05/05/22
6 1	MW-10 ~~D~~	2210682-06	Water	05/05/22
7 3	MW-15 D1	2210682-07	Water	05/05/22
8 1	EB-9-050522	2210682-08	Water	05/05/22
9 1	DUP-6-2Q22 D	2210682-09	Water	05/05/22
10 1	DUP-7-2Q22 D1	2210682-10	Water	05/05/22
11 1	MW-1MS	2210682-01MS	Water	05/05/22
12 1	MW-1MSD	2210682-01MSD	Water	05/05/22
13 3	MW-15MS	2210682-07MS	Water	05/05/22
14 3	MW-15MSD	2210682-07MSD	Water	05/05/22

LDC #: 54410B1a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/25/22
SDG #: 2210682 Level III Page: 2 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: AP
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
15				
16				
17				

Notes:

1	B139140-BLK)						
2	B139141-BLK)						
3	B139142-BLK)						

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54410B1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~)524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15, 20, 15 RSD% and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit:_____)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	4/4/22	ICAL-Y5	Methyl Iodide		0.989 (I0.990)	All	J/UJ/P NP

INICAL.wpd

LDC #: 54410B1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?

Y N N/A Were all %D within the validation criteria of ~~≤20~~ %D? 30%

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%/30%)	Associated Samples	Qualifications
	4/4/22 1416	ICV-Y5	Methyl Iodide	38.7 (≤30)	All	J/UJ/P ND

ICVvoa.wpd

LDC #: 54410B1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 5242.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y N N/A Were all %D and RRFs within the validation criteria of ≤~~20~~ 30 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤~~20.0%~~ 30)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	5/9/22 1913	ccv2	Pentachloroethane	52.4		B139140-MB, 11, 12	J/UJ/P ND
	5/10/22 0700	ccv1	B	31.7		1-6, 8, 9, 10 B139141-MB	J/UJ/P ND
	5/10/22 0724	ccv2	Pentachloroethane	96.2		↓	J/UJ/P ND
	5/10/22 1941	ccv4	Methyl Iodide Pentachloroethane	50.1 79.8		7, 13, 14 B139142-MB	J/UJ/P ND

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: August 2, 2022

Parameters: 1,2,3-Trichloropropane

Validation Level: Level III

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210682

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-1	2210682-01	Water	05/05/22
MW-9	2210682-05	Water	05/05/22
MW-15	2210682-07	Water	05/05/22
EB-9-050522	2210682-08	Water	05/05/22
DUP-6-2Q22	2210682-09	Water	05/05/22
DUP-7-2Q22	2210682-10	Water	05/05/22
MW-1MS	2210682-01MS	Water	05/05/22
MW-1MSD	2210682-01MSD	Water	05/05/22
MW-15MS	2210682-07MS	Water	05/05/22
MW-15MSD	2210682-07MSD	Water	05/05/22

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,2,3-Trichloropropane by Environmental Protection Agency (EPA) Method 524 Modified

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB-9-050522 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-9 and DUP-6-2Q22 and samples MW-15 and DUP-7-2Q22 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Data Qualification Summary - SDG 2210682

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Laboratory Blank Data Qualification Summary - SDG 2210682

No Sample Data Qualified in this SDG

LDC #: 54410B1b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/26/22
SDG #: 2210682 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: AP
2nd Reviewer:

METHOD: GC/MS 1,2,3-Trichloropropane (EPA Method 524M)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=4
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D: 2,5 3,6
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1	MW-1		2210682-01	Water	05/05/22
2	MW-9	D	2210682-05	Water	05/05/22
3	MW-15	D,	2210682-07	Water	05/05/22
4	EB-9-050522		2210682-08	Water	05/05/22
5	DUP-6-2Q22	D	2210682-09	Water	05/05/22
6	DUP-7-2Q22	D,	2210682-10	Water	05/05/22
7	MW-1MS		2210682-01MS	Water	05/05/22
8	MW-1MSD		2210682-01MSD	Water	05/05/22
9	MW-15MS		2210682-07MS	Water	05/05/22
10	MW-15MSD		2210682-07MSD	Water	05/05/22
11					

Notes:

	~~B39~~ B139271						
	B139272						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 3, 2022

Parameters: Metals

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210682

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-1	2210682-01	Water	05/05/22
MW-9	2210682-05	Water	05/05/22
MW-15	2210682-07	Water	05/05/22
EB-9-050522	2210682-08	Water	05/05/22
DUP-6-2Q22	2210682-09	Water	05/05/22
DUP-7-2Q22	2210682-10	Water	05/05/22
MW-1MS	2210682-01MS	Water	05/05/22
MW-1MSD	2210682-01MSD	Water	05/05/22
MW-1DUP	2210682-01DUP	Water	05/05/22
MW-15MS	2210682-07MS	Water	05/05/22
MW-15MSD	2210682-07MSD	Water	05/05/22
MW-15DUP	2210682-07DUP	Water	05/05/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Arsenic, Calcium, Chromium, Iron, Lead, Magnesium, Potassium, and Sodium by Environmental Protection Agency (EPA) Method 200.7 and 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis was not required by the method.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Calcium Magnesium	0.02437 mg/L 0.02581 mg/L	MW-1 MW-9 EB-9-050522
PB (prep blank)	Calcium Magnesium	0.01785 mg/L 0.02354 mg/L	MW-15 DUP-6-2Q22 DUP-7-2Q22

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-9-050522	Calcium Magnesium	0.043 mg/L 0.022 mg/L	0.043U mg/L 0.022U mg/L

VI. Field Blanks

Sample EB-9-050522 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-9-050522	05/05/22	Calcium Magnesium	0.043 mg/L 0.022 mg/L	MW-1 MW-9 MW-15 DUP-6-2Q22 DUP-7-2Q22

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. For MW-15MS/MSD, no data were qualified for calcium percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples MW-9 and DUP-6-2Q22 and samples MW-15 and DUP-7-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-9	DUP-6-2Q22	
Iron	400 ug/L	550 ug/L	32
Arsenic	1.3 ug/L	0.97 ug/L	29
Chromium	28 ug/L	29 ug/L	4
Calcium	63 mg/L	62 mg/L	2
Magnesium	19 mg/L	19 mg/L	0
Sodium	24 mg/L	24 mg/L	0
Potassium	3.1 mg/L	3.1 mg/L	0

Analyte	Concentration		RPD
	MW-15	DUP-7-2Q22	
Iron	45 ug/L	44 ug/L00000000	2
Arsenic	1.1 ug/L	0.83 ug/L	28
Chromium	3.9 ug/L	3.4 ug/L	14
Calcium	59 mg/L	56 mg/L	5
Magnesium	18 mg/L	17 mg/L	6
Sodium	28 mg/L	27 mg/L	4
Potassium	2.9 mg/L	2.8 mg/L	4

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Metals - Data Qualification Summary - SDG 2210682

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
Metals - Laboratory Blank Data Qualification Summary - SDG 2210682

Sample	Analyte	Modified Final Concentration	A or P
EB-9-050522	Calcium Magnesium	0.043U mg/L 0.022U mg/L	A

NASA JPL, 2Q2022
Metals - Field Blank Data Qualification Summary - SDG 2210682

No Sample Data Qualified in this SDG

LDC #: 54410B4a **VALIDATION COMPLETENESS WORKSHEET** Date: 9/29/22
SDG #: 2210682 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer:

METHOD: Metals (EPA Method 200.7/200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB=4
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD;(10,11) Ca>4xSpike
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	(2,5);(3,6)
XII.	Internal Standard (ICP-MS)	N	
XIII.	Target Analyte Quantitation	N	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	MW-1	2210682-01	Water	05/05/22
2	MW-9	2210682-05	Water	05/05/22
3	MW-15	2210682-07	Water	05/05/22
4	EB-9-050522	2210682-08	Water	05/05/22
5	DUP-6-2Q22	2210682-09	Water	05/05/22
6	DUP-7-2Q22	2210682-10	Water	05/05/22
7	MW-1MS	2210682-01MS	Water	05/05/22
8	MW-1MSD	2210682-01MSD	Water	05/05/22
9	MW-1DUP	2210682-01DUP	Water	05/05/22
10	MW-15MS	2210682-07MS	Water	05/05/22
11	MW-15MSD	2210682-07MSD	Water	05/05/22
12	MW-15DUP	2210682-07DUP	Water	05/05/22
13				
14				

Notes:

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-6	As,Ca,Cr,Fe,Pb,Mg,K,Na
QC:	
7-12	As,Ca,Cr,Fe,Pb,Mg,K,Na

Analysis Method

ICP	Ca,Fe,Mg,K,Na
ICP-MS	As,Cr,Pb,
CVAA	

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-2,4

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	4								
Ca	0.02437		0.12184	0.043								
Mg	0.02581		0.12904	0.022								

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 3,5-6

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	No Qual								
Ca	0.01785		0.08925									
Mg	0.02354		0.1177									

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is established at 5X the highest ICB, CCB, or PB concentration.

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Blank units: mg/L
Associated sample units: mg/L
Sampling Date: 5/5/2022
Associated Samples: 1-3,5-6

			Sample Identification									
Analyte	Blank ID	Action Level	No Qual									
	4											
Ca	0.043	0.215										
Mg	0.022	0.11										

Comments: The action level, when applicable, is establised at 5X the highest concentration.

Field Duplicates

Method: Metals

Analyte	Concentration (mg/L)		RPD
	2	5	
Iron (ug/L)	400	550	32
Arsenic (ug/L)	1.3	0.97	29
Chromium (ug/L)	28	29	4
Calcium	63	62	2
Magnesium	19	19	0
Sodium	24	24	0
Potassium	3.1	3.1	0

Analyte	Concentration (mg/L)		RPD
	3	6	
Iron (ug/L)	45	44	2
Arsenic (ug/L)	1.1	0.83	28
Chromium (ug/L)	3.9	3.4	14
Calcium	59	56	5
Magnesium	18	17	6
Sodium	28	27	4
Potassium	2.9	2.8	4

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 3, 2022

Parameters: Wet Chemistry

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210682

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-1	2210682-01	Water	05/05/22
MW-5	2210682-03	Water	05/05/22
MW-8	2210682-04	Water	05/05/22
MW-9	2210682-05	Water	05/05/22
MW-10	2210682-06	Water	05/05/22
MW-15	2210682-07	Water	05/05/22
EB-9-050522	2210682-08	Water	05/05/22
DUP-6-2Q22	2210682-09	Water	05/05/22
DUP-7-2Q22	2210682-10	Water	05/05/22
MW-1MS	2210682-01MS	Water	05/05/22
MW-1MSD	2210682-01MSD	Water	05/05/22
MW-1DUP	2210682-01DUP	Water	05/05/22
MW-15DUP	2210682-07DUP	Water	05/05/22
DUP-7-2Q22DUP	2210682-10DUP	Water	05/05/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by EPA Method 218.6
Nitrite as Nitrogen by EPA Method 353.2
Perchlorate by EPA Method 314.0
pH by EPA 150.1
Total Dissolved Solids by EPA Method 160.1

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
MW-1	pH	146 hours	48 hours	J (all detects)	P
MW-9 DUP-6-2Q22 DUP-7-2Q22	pH	145 hours	48 hours	J (all detects)	P
MW-15 EB-9-050522	pH	144 hours	48 hours	J (all detects)	P
MW-1	Hexavalent chromium	292 hours	48 hours	J (all detects)	P
MW-9 DUP-6-2Q22 DUP-7-2Q22	Hexavalent chromium	291 hours	48 hours	J (all detects)	P
MW-15	Hexavalent chromium	290 hours	48 hours	J (all detects)	P
EB-9-050522	Hexavalent chromium	289 hours	48 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Hexavalent chromium	0.000028 mg/L	DUP-7-2Q22
ICB/CCB	Chloride Nitrate as N Sulfate	0.202 mg/L 0.033 mg/L 0.221 mg/L	MW-1 MW-5 MW-8 MW-9 MW-103
ICB/CCB	Chloride Sulfate Nitrite as N	0.204 mg/L 0.248 mg/L 0.022762 mg/L	MW-15 EB-9-050522 DUP-6-2Q22 DUP-7-2Q22

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-9-050222	Chloride Sulfate Nitrite as N	0.2 mg/L 0.22 mg/L 0.016 mg/L	0.2U mg/L 0.22U mg/L 0.016U mg/L

V. Field Blanks

Sample EB-9-050522 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-9-050222	05/05/22	Chloride Nitrate as N Sulfate Nitrite as N	0.2 mg/L 0.08 mg/L 0.22 mg/L 0.016 mg/L	MW-1 MW-5 MW-8 MW-9 MW-10 MW-15 DUP-6-2Q22 DUP-7-2Q22
EB-9-050522	05/05/22	Total dissolved solids Hexavalent chromium Alkalinity	4 mg/L 0.00013 mg/L 5.4 mg/L	MW-1 MW-9 MW-15 DUP-6-2Q22 DUP-7-2Q22

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X

blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-1	Hexavalent chromium	0.000076 mg/L	0.000076U mg/L

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples MW-24-3-020222 and DUP-3-1Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-24-3-020222	DUP-3-1Q22	
pH	7.62 SU	7.6 SU	0
Total dissolved solids	360 mg/L	360 mg/L	0
Hexavalent chromium	0.0015 mg/L	0.0013 mg/L	14
Chloride	34 mg/L	34 mg/L	0
Nitrate as N	2.4 mg/L	5.6 mg/L	80
Sulfate	56 mg/L	56 mg/L	0
Alkalinity	180 mg/L	180 mg/L	0

Analyte	Concentration		RPD
	MW-24-3-020222	DUP-3-1Q22	
pH	7.79 SU	7.63 SU	2
Total dissolved solids	350 mg/L	350 mg/L	0
Hexavalent chromium	0.00074 mg/L	0.00076 mg/L	3
Chloride	24 mg/L	23 mg/L	4
Nitrate as N	1.3 mg/L	1.3 mg/L	0
Sulfate	50 mg/L	49 mg/L	2
Alkalinity	190 mg/L	190 mg/L	0

X Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, data were qualified as estimated in six samples.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

Due to equipment blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Wet Chemistry - Data Qualification Summary - SDG 2210682

Sample	Analyte	Flag	A or P	Reason
MW-1 MW-9 MW-15 EB-9-050522 DUP-6-2Q22 DUP-7-2Q22	pH Hexavalent chromium	J (all detects)	P	Technical holding times

NASA JPL, 2Q2022
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 2210682

Sample	Analyte	Modified Final Concentration	A or P
EB-9-050222	Chloride Sulfate Nitrite as N	0.2U mg/L 0.22U mg/L 0.016U mg/L	A

NASA JPL, 2Q2022
Wet Chemistry - Field Blank Data Qualification Summary - SDG 2210682

Sample	Analyte	Modified Final Concentration	A or P
MW-1	Hexavalent chromium	0.000076U mg/L	A

LDC #: 54410B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/30/22

SDG #: 2210682 Level III Page: 1 of 1

Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM

2nd Reviewer:

METHOD: (Analyte) Alkalinity (SM2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA Method 218.6), Perchlorate (EPA Method 314.0), pH (EPA Method 150.1), TDS (EPA Method 160.1)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / SW	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	EB=7
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	(4,8) ; (6,9)
X.	Target Analyte Quantitation	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	MW-1	2210682-01	Water	05/05/22
2	MW-5	2210682-03	Water	05/05/22
3	MW-8	2210682-04	Water	05/05/22
4	MW-9	2210682-05	Water	05/05/22
5	MW-10	2210682-06	Water	05/05/22
6	MW-15	2210682-07	Water	05/05/22
7	EB-9-050522	2210682-08	Water	05/05/22
8	DUP-6-2Q22	2210682-09	Water	05/05/22
9	DUP-7-2Q22	2210682-10	Water	05/05/22
10	MW-1MS	2210682-01MS	Water	05/05/22
11	MW-1MSD	2210682-01MSD	Water	05/05/22
12	MW-1DUP	2210682-01DUP	Water	05/05/22
13	MW-15DUP	2210682-07DUP	Water	05/05/22
14	DUP-7-2Q22DUP	2210682-10DUP	Water	05/05/22
15				

Notes:

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1,4,6-9	pH,TDS,Cr(VI),Alkalinity
1-9	Cl,NO3-N,SO4,CLO4,NO2-N
QC:	
12,14	pH,Alkalinity
13	TDS
10-12	Cr(VI),Cl,NO3-N,NO2-NSO4,CLO4

METHOD: Inorganics
All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 150.1 Analyte: pH Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
1	5/5/2022 11:35	5/11/2022 13:34	146	J/UJ/P	Det
4	5/5/2022 13:02	5/11/2022 14:39	145	J/UJ/P	Det
6	5/5/2022 14:04	5/11/2022 14:50	144	J/UJ/P	Det
7	5/5/2022 15:00	5/11/2022 15:00	144	J/UJ/P	Det
8	5/5/2022 13:17	5/11/2022 15:08	145	J/UJ/P	Det
9	5/5/2022 14:19	5/11/2022 15:49	145	J/UJ/P	Det

METHOD: Inorganics
All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 218.6 Analyte: Hexavalent Chromium Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
1	5/5/2022 11:35	5/17/2022 15:56	292	J/R/P	Det
4	5/5/2022 13:02	5/17/2022 16:34	291	J/R/P	Det
6	5/5/2022 14:04	5/17/2022 16:44	290	J/R/P	Det
7	5/5/2022 15:00	5/17/2022 16:53	289	J/R/P	Det
8	5/5/2022 13:17	5/17/2022 17:07	291	J/R/P	Det
9	5/5/2022 14:19	5/17/2022 17:46	291	J/R/P	Det

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: Jada Morales

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 9

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	No Qual								
Cr(VI)		0.000028										

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-5

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	No Qual								
Cl		0.202										
NO3-N		0.033										
SO4		0.221										

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 6-9

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	No Qual	7							
Cl		0.204			0.2U							
SO4		0.248			0.22							
NO2-N		0.022762			0.016							

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is estabilised at 5X the highest ICB, CCB, or PB concentration.

Field Blanks

METHOD: Inorganics

Blank units: mg/L Associated sample units: mg/L

Sampling Date: 5/5/2022 Associated Samples: 1-6,8-7

			Sample Identification									
Analyte	Blank ID	Action Level	No Qual									
	7											
Cl	0.2											
NO3-N	0.08											
SO4	0.22											
NO2-N	0.016											

METHOD: Inorganics

Blank units: mg/L Associated sample units: mg/L

Sampling Date: 5/5/2022 Associated Samples: 1,4,6,8-9

			Sample Identification									
Analyte	Blank ID	Action Level	1									
	7											
TDS	4											
Cr(VI)	0.00013		0.000076									
Alkalinity	5.4											

Comments: The action level, when applicable, is estabilised at 5X the highest concentration.

Field Duplicates

METHOD: Inorganics

Analyte	Concentration (mg/L)		RPD
	4	8	
pH (S.U.)	7.62	7.6	0
Total Dissolved Solids	360	360	0
Hexavalent Chromium	0.0015	0.0013	14
Chloride	34	34	0
Nitrate as N	2.4	5.6	80
Sulfate	56	56	0
Alkalinity	180	180	0

Analyte	Concentration (mg/L)		RPD
	6	9	
pH (S.U.)	7.79	7.63	2
Total Dissolved Solids	350	350	0
Hexavalent Chromium	0.00074	0.00076	3
Chloride	24	23	4
Nitrate as N	1.3	1.3	0
Sulfate	50	49	2
Alkalinity	190	190	0

NASA JPL, 2Q2022 - LDC 54410

SDG: 2210539

Analytical Method EPA-150.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	pH	5/10/2022	6.31	Y	y	v	J	0.05	0.05	pH Units
MW-17-1	2210539-06	pH	5/10/2022	7.85	Y	y	v	J	0.05	0.05	pH Units
MW-17-2	2210539-05	pH	5/10/2022	8.18	Y	y	v	J	0.05	0.05	pH Units
MW-17-3	2210539-04	pH	5/9/2022	8.43	Y	y	v	J	0.05	0.05	pH Units
MW-17-4	2210539-03	pH	5/9/2022	8.25	Y	y	v	J	0.05	0.05	pH Units
MW-17-5	2210539-02	pH	5/9/2022	8.3	Y	y	v	J	0.05	0.05	pH Units

Analytical Method EPA-160.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	Total Dissolved Solids @ 180 C	5/9/2022	4	Y	y	v j		6.7	3.3	mg/L
MW-17-1	2210539-06	Total Dissolved Solids @ 180 C	5/9/2022	320	Y	y	v		20	10	mg/L
MW-17-2	2210539-05	Total Dissolved Solids @ 180 C	5/9/2022	400	Y	y	v		33	17	mg/L
MW-17-3	2210539-04	Total Dissolved Solids @ 180 C	5/9/2022	360	Y	y	v		20	10	mg/L
MW-17-4	2210539-03	Total Dissolved Solids @ 180 C	5/9/2022	450	Y	y	v		33	17	mg/L
MW-17-5	2210539-02	Total Dissolved Solids @ 180 C	5/9/2022	430	Y	y	v		33	17	mg/L

Analytical Method EPA-200.7

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	Total Recoverable Magnesium	5/13/2022	0.062	Y	y	v	U	0.050	0.019	mg/L
EB-8-050422	2210539-07	Total Recoverable Iron	5/13/2022	36	Y	y	v j		50	30	ug/L
EB-8-050422	2210539-07	Total Recoverable Calcium	5/13/2022	0.13	Y	y	v	U	0.10	0.014	mg/L
EB-8-050422	2210539-07	Total Recoverable Sodium	5/13/2022	0.33	Y	y	v j		0.50	0.051	mg/L
EB-8-050422	2210539-07	Total Recoverable Potassium	5/13/2022	1	Y	n	u		1.0	0.10	mg/L
MW-17-1	2210539-06	Total Recoverable Magnesium	5/13/2022	20	Y	y	v		0.050	0.019	mg/L
MW-17-1	2210539-06	Total Recoverable Potassium	5/13/2022	2.7	Y	y	v		1.0	0.10	mg/L

SDG: 2210539

Analytical Method EPA-200.7

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-1	2210539-06	Total Recoverable Calcium	5/13/2022	65	Y	y	v		0.10	0.014	mg/L
MW-17-1	2210539-06	Total Recoverable Iron	5/13/2022	41	Y	y	v j		50	30	ug/L
MW-17-1	2210539-06	Total Recoverable Sodium	5/13/2022	19	Y	y	v		0.50	0.051	mg/L
MW-17-2	2210539-05	Total Recoverable Calcium	5/13/2022	46	Y	y	v		0.10	0.014	mg/L
MW-17-2	2210539-05	Total Recoverable Magnesium	5/13/2022	17	Y	y	v		0.050	0.019	mg/L
MW-17-2	2210539-05	Total Recoverable Sodium	5/13/2022	18	Y	y	v		0.50	0.051	mg/L
MW-17-2	2210539-05	Total Recoverable Potassium	5/13/2022	2.6	Y	y	v		1.0	0.10	mg/L
MW-17-2	2210539-05	Total Recoverable Iron	5/13/2022	130	Y	y	v		50	30	ug/L
MW-17-3	2210539-04	Total Recoverable Iron	5/13/2022	200	Y	y	v		50	30	ug/L
MW-17-3	2210539-04	Total Recoverable Potassium	5/13/2022	3	Y	y	v		1.0	0.10	mg/L
MW-17-3	2210539-04	Total Recoverable Sodium	5/13/2022	31	Y	y	v		0.50	0.051	mg/L
MW-17-3	2210539-04	Total Recoverable Magnesium	5/13/2022	32	Y	y	v		0.050	0.019	mg/L
MW-17-3	2210539-04	Total Recoverable Calcium	5/13/2022	39	Y	y	v		0.10	0.014	mg/L
MW-17-4	2210539-03	Total Recoverable Potassium	5/13/2022	2	Y	y	v		1.0	0.10	mg/L
MW-17-4	2210539-03	Total Recoverable Sodium	5/13/2022	49	Y	y	v		0.50	0.051	mg/L
MW-17-4	2210539-03	Total Recoverable Magnesium	5/13/2022	18	Y	y	v		0.050	0.019	mg/L
MW-17-4	2210539-03	Total Recoverable Calcium	5/13/2022	68	Y	y	v		0.10	0.014	mg/L
MW-17-4	2210539-03	Total Recoverable Iron	5/13/2022	50	Y	n	u		50	30	ug/L
MW-17-5	2210539-02	Total Recoverable Sodium	5/13/2022	50	Y	y	v		0.50	0.051	mg/L
MW-17-5	2210539-02	Total Recoverable Iron	5/13/2022	160	Y	y	v		50	30	ug/L
MW-17-5	2210539-02	Total Recoverable Potassium	5/13/2022	2.1	Y	y	v		1.0	0.10	mg/L
MW-17-5	2210539-02	Total Recoverable Calcium	5/13/2022	60	Y	y	v		0.10	0.014	mg/L
MW-17-5	2210539-02	Total Recoverable Magnesium	5/13/2022	17	Y	y	v		0.050	0.019	mg/L

SDG: 2210539

Analytical Method EPA-200.8

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
EB-8-050422	2210539-07	Total Recoverable Arsenic	5/12/2022	2	Y	n	u		2.0	0.70	ug/L
EB-8-050422	2210539-07	Total Recoverable Chromium	5/12/2022	3	Y	n	u		3.0	0.50	ug/L
MW-17-1	2210539-06	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-17-1	2210539-06	Total Recoverable Arsenic	5/12/2022	0.7	Y	y	v j		2.0	0.70	ug/L
MW-17-1	2210539-06	Total Recoverable Chromium	5/12/2022	3	Y	n	u		3.0	0.50	ug/L
MW-17-2	2210539-05	Total Recoverable Chromium	5/12/2022	3	Y	n	u		3.0	0.50	ug/L
MW-17-2	2210539-05	Total Recoverable Arsenic	5/12/2022	2	Y	n	u		2.0	0.70	ug/L
MW-17-2	2210539-05	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-17-3	2210539-04	Total Recoverable Arsenic	5/12/2022	2	Y	n	u		2.0	0.70	ug/L
MW-17-3	2210539-04	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-17-3	2210539-04	Total Recoverable Chromium	5/12/2022	3	Y	n	u		3.0	0.50	ug/L
MW-17-4	2210539-03	Total Recoverable Chromium	5/12/2022	1.8	Y	y	v j		3.0	0.50	ug/L
MW-17-4	2210539-03	Total Recoverable Arsenic	5/12/2022	2.4	Y	y	v		2.0	0.70	ug/L
MW-17-4	2210539-03	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-17-5	2210539-02	Total Recoverable Arsenic	5/12/2022	1.8	Y	y	v j		2.0	0.70	ug/L
MW-17-5	2210539-02	Total Recoverable Chromium	5/12/2022	1.4	Y	y	v j		3.0	0.50	ug/L
MW-17-5	2210539-02	Total Recoverable Lead	5/12/2022	0.13	Y	y	v j		1.0	0.10	ug/L

Analytical Method EPA-218.6

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	Hexavalent Chromium	5/13/2022	######	Y	y	v j		0.0002	0.0000	mg/L
MW-17-1	2210539-06	Hexavalent Chromium	5/13/2022	######	Y	y	v j	U	0.0002	0.0000	mg/L
MW-17-2	2210539-05	Hexavalent Chromium	5/13/2022	######	Y	y	v j	U	0.0002	0.0000	mg/L
MW-17-3	2210539-04	Hexavalent Chromium	5/13/2022	######	Y	y	v j	U	0.0002	0.0000	mg/L

SDG: 2210539

Analytical Method EPA-218.6

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-4	2210539-03	Hexavalent Chromium	5/13/2022	0.0021	Y	y	v	J	0.0002	0.0000	mg/L
MW-17-5	2210539-02	Hexavalent Chromium	5/13/2022	0.0013	Y	y	v		0.0002	0.0000	mg/L

Analytical Method EPA-300.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	Chloride	5/5/2022	0.24	Y	y	v j	U	0.50	0.13	mg/L
EB-8-050422	2210539-07	Sulfate	5/5/2022	1	Y	n	u	UJ	1.0	0.14	mg/L
EB-8-050422	2210539-07	Nitrate as N	5/5/2022	0.1	Y	n	u	UJ	0.10	0.024	mg/L
MW-17-1	2210539-06	Nitrate as N	5/5/2022	1.8	Y	y	v	J	0.10	0.024	mg/L
MW-17-1	2210539-06	Chloride	5/5/2022	22	Y	y	v		0.50	0.13	mg/L
MW-17-1	2210539-06	Sulfate	5/5/2022	42	Y	y	v	J	1.0	0.14	mg/L
MW-17-2	2210539-05	Nitrate as N	5/5/2022	0.096	Y	y	v j	UJ	0.10	0.024	mg/L
MW-17-2	2210539-05	Sulfate	5/5/2022	28	Y	y	v	J	1.0	0.14	mg/L
MW-17-2	2210539-05	Chloride	5/5/2022	8.8	Y	y	v		0.50	0.13	mg/L
MW-17-3	2210539-04	Nitrate as N	5/5/2022	0.058	Y	y	v j	UJ	0.10	0.024	mg/L
MW-17-3	2210539-04	Sulfate	5/5/2022	79	Y	y	v	J	1.0	0.14	mg/L
MW-17-3	2210539-04	Chloride	5/5/2022	55	Y	y	v		0.50	0.13	mg/L
MW-17-4	2210539-03	Chloride	5/5/2022	55	Y	y	v		0.50	0.13	mg/L
MW-17-4	2210539-03	Sulfate	5/5/2022	63	Y	y	v	J	1.0	0.14	mg/L
MW-17-4	2210539-03	Nitrate as N	5/5/2022	8.7	Y	y	v	J	0.10	0.024	mg/L
MW-17-5	2210539-02	Nitrate as N	5/5/2022	8.1	Y	y	v	J	0.10	0.024	mg/L
MW-17-5	2210539-02	Chloride	5/5/2022	53	Y	y	v		0.50	0.13	mg/L

Analytical Method EPA-314.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	Perchlorate	5/13/2022	2	Y	n	u		2.0	0.81	ug/L

SDG: 2210539

Analytical Method EPA-314.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-1	2210539-06	Perchlorate	5/13/2022	2	Y	n	u		2.0	0.81	ug/L
MW-17-2	2210539-05	Perchlorate	5/12/2022	2	Y	n	u		2.0	0.81	ug/L
MW-17-3	2210539-04	Perchlorate	5/13/2022	2	Y	n	u		2.0	0.81	ug/L
MW-17-4	2210539-03	Perchlorate	5/13/2022	4.1	Y	y	v		2.0	0.81	ug/L
MW-17-5	2210539-02	Perchlorate	5/13/2022	3.7	Y	y	v		2.0	0.81	ug/L

Analytical Method EPA-353.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	Nitrite as N	5/5/2022	0.012	Y	y	v j	U	0.050	0.010	mg/L
MW-17-1	2210539-06	Nitrite as N	5/5/2022	0.011	Y	y	v j	U	0.050	0.010	mg/L
MW-17-2	2210539-05	Nitrite as N	5/5/2022	0.011	Y	y	v j	U	0.050	0.010	mg/L
MW-17-3	2210539-04	Nitrite as N	5/5/2022	0.011	Y	y	v j	U	0.050	0.010	mg/L
MW-17-4	2210539-03	Nitrite as N	5/5/2022	0.011	Y	y	v j	U	0.050	0.010	mg/L
MW-17-5	2210539-02	Nitrite as N	5/5/2022	0.011	Y	y	v j	U	0.050	0.010	mg/L

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
EB-8-050422	2210539-07	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-8-050422	2210539-07	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-8-050422	2210539-07	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-8-050422	2210539-07	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
EB-8-050422	2210539-07	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-8-050422	2210539-07	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
EB-8-050422	2210539-07	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-8-050422	2210539-07	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L

SDG: 2210539

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
EB-8-050422	2210539-07	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
EB-8-050422	2210539-07	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
EB-8-050422	2210539-07	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-8-050422	2210539-07	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
EB-8-050422	2210539-07	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
EB-8-050422	2210539-07	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-8-050422	2210539-07	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
EB-8-050422	2210539-07	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
EB-8-050422	2210539-07	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
EB-8-050422	2210539-07	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
EB-8-050422	2210539-07	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
EB-8-050422	2210539-07	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
EB-8-050422	2210539-07	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
EB-8-050422	2210539-07	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-8-050422	2210539-07	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
EB-8-050422	2210539-07	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
EB-8-050422	2210539-07	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
EB-8-050422	2210539-07	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
EB-8-050422	2210539-07	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-8-050422	2210539-07	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-8-050422	2210539-07	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-8-050422	2210539-07	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
EB-8-050422	2210539-07	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
EB-8-050422	2210539-07	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L

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Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
EB-8-050422	2210539-07	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
EB-8-050422	2210539-07	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
EB-8-050422	2210539-07	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
EB-8-050422	2210539-07	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
EB-8-050422	2210539-07	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
EB-8-050422	2210539-07	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
EB-8-050422	2210539-07	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
EB-8-050422	2210539-07	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
EB-8-050422	2210539-07	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-8-050422	2210539-07	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
EB-8-050422	2210539-07	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
EB-8-050422	2210539-07	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
EB-8-050422	2210539-07	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
EB-8-050422	2210539-07	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
EB-8-050422	2210539-07	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
EB-8-050422	2210539-07	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
EB-8-050422	2210539-07	Toluene-d8 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
EB-8-050422	2210539-07	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-8-050422	2210539-07	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-8-050422	2210539-07	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
EB-8-050422	2210539-07	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-8-050422	2210539-07	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-8-050422	2210539-07	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
EB-8-050422	2210539-07	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L

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Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-8-050422	2210539-07	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-8-050422	2210539-07	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-8-050422	2210539-07	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
EB-8-050422	2210539-07	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
EB-8-050422	2210539-07	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-8-050422	2210539-07	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
EB-8-050422	2210539-07	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
EB-8-050422	2210539-07	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
EB-8-050422	2210539-07	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
EB-8-050422	2210539-07	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
EB-8-050422	2210539-07	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-8-050422	2210539-07	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-8-050422	2210539-07	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-8-050422	2210539-07	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-8-050422	2210539-07	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-8-050422	2210539-07	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-8-050422	2210539-07	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-8-050422	2210539-07	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-8-050422	2210539-07	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-8-050422	2210539-07	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
EB-8-050422	2210539-07	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-8-050422	2210539-07	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
EB-8-050422	2210539-07	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-8-050422	2210539-07	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L

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EB-8-050422	2210539-07	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-8-050422	2210539-07	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-8-050422	2210539-07	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
EB-8-050422	2210539-07	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
EB-8-050422	2210539-07	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
EB-8-050422	2210539-07	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-1	2210539-06	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-17-1	2210539-06	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-17-1	2210539-06	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-17-1	2210539-06	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-1	2210539-06	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-1	2210539-06	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-1	2210539-06	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-1	2210539-06	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-17-1	2210539-06	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-1	2210539-06	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-17-1	2210539-06	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-1	2210539-06	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-1	2210539-06	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-1	2210539-06	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-1	2210539-06	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-17-1	2210539-06	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-1	2210539-06	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-17-1	2210539-06	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-1	2210539-06	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L

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MW-17-1	2210539-06	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-17-1	2210539-06	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-17-1	2210539-06	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-17-1	2210539-06	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-17-1	2210539-06	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-1	2210539-06	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-17-1	2210539-06	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-17-1	2210539-06	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-17-1	2210539-06	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-17-1	2210539-06	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-1	2210539-06	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-1	2210539-06	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-1	2210539-06	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-1	2210539-06	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-1	2210539-06	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-17-1	2210539-06	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-1	2210539-06	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-1	2210539-06	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-1	2210539-06	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-1	2210539-06	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-17-1	2210539-06	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-17-1	2210539-06	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-17-1	2210539-06	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-1	2210539-06	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-1	2210539-06	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L

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MW-17-1	2210539-06	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-1	2210539-06	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-1	2210539-06	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-1	2210539-06	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-1	2210539-06	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-1	2210539-06	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-1	2210539-06	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-1	2210539-06	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-1	2210539-06	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-17-1	2210539-06	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-1	2210539-06	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-17-1	2210539-06	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-17-1	2210539-06	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-17-1	2210539-06	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-1	2210539-06	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-17-1	2210539-06	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-17-1	2210539-06	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-1	2210539-06	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-1	2210539-06	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-17-1	2210539-06	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-1	2210539-06	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-17-1	2210539-06	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-1	2210539-06	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-1	2210539-06	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-1	2210539-06	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L

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MW-17-1	2210539-06	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-17-1	2210539-06	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-17-1	2210539-06	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-17-1	2210539-06	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-17-1	2210539-06	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-1	2210539-06	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-17-1	2210539-06	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-17-1	2210539-06	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-1	2210539-06	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-17-1	2210539-06	Toluene-d8 (Surrogate)	5/10/2022	9.9	Y	y	v s				ug/L
MW-17-1	2210539-06	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-1	2210539-06	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-17-1	2210539-06	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.6	Y	y	v s				ug/L
MW-17-1	2210539-06	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-1	2210539-06	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-1	2210539-06	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-1	2210539-06	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-17-1	2210539-06	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-1	2210539-06	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-17-1	2210539-06	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-17-1	2210539-06	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-17-2	2210539-05	Bromochloromethane	5/9/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-2	2210539-05	Carbon tetrachloride	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-2	2210539-05	Chloromethane	5/9/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-2	2210539-05	Chloroform	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L

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MW-17-2	2210539-05	Chloroethane	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-2	2210539-05	Chlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-2	2210539-05	2-Chlorotoluene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-2	2210539-05	tert-Butylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-2	2210539-05	sec-Butylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-2	2210539-05	n-Butylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-2	2210539-05	Bromomethane	5/9/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-17-2	2210539-05	Bromodichloromethane	5/9/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-17-2	2210539-05	Bromobenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-2	2210539-05	Benzene	5/9/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-2	2210539-05	1,2-Dibromo-3-chloropropane	5/9/2022	1	Y	n	u		1.0	0.89	ug/L
MW-17-2	2210539-05	Bromoform	5/9/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-17-2	2210539-05	t-Amyl Methyl ether	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-2	2210539-05	2-Hexanone	5/9/2022	10	Y	n	u		10	5.0	ug/L
MW-17-2	2210539-05	Hexachloroethane	5/9/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-2	2210539-05	4-Chlorotoluene	5/9/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-17-2	2210539-05	Ethyl methacrylate	5/9/2022	4	Y	n	u		4.0	1.3	ug/L
MW-17-2	2210539-05	Dibromochloromethane	5/9/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-17-2	2210539-05	trans-1,4-Dichloro-2-butene	5/9/2022	5	Y	n	u		5.0	1.8	ug/L
MW-17-2	2210539-05	1,2,3-Trichloropropane	5/9/2022	1	Y	n	u		1.0	0.78	ug/L
MW-17-2	2210539-05	t-Butyl alcohol	5/9/2022	2	Y	n	u		2.0	2.0	ug/L
MW-17-2	2210539-05	Methyl iodide	5/9/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-17-2	2210539-05	Allyl chloride	5/9/2022	5	Y	n	u		5.0	0.47	ug/L
MW-17-2	2210539-05	Acrylonitrile	5/9/2022	5	Y	n	u		5.0	1.5	ug/L
MW-17-2	2210539-05	Acetone	5/9/2022	10	Y	n	u		10	6.6	ug/L

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MW-17-2	2210539-05	Vinyl chloride	5/9/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-2	2210539-05	1,3,5-Trimethylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-2	2210539-05	1,2,4-Trimethylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-2	2210539-05	1,1,2-Trichloro-1,2,2-trifluoroethane	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-2	2210539-05	Carbon disulfide	5/9/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-17-2	2210539-05	o-Xylene	5/9/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-2	2210539-05	Nitrobenzene	5/9/2022	0	Y	y	v				ug/L
MW-17-2	2210539-05	1,1-Dichloropropanone	5/9/2022	0	Y	y	v				ug/L
MW-17-2	2210539-05	2-Nitropropane	5/9/2022	0	Y	y	v				ug/L
MW-17-2	2210539-05	Chloroacetonitrile	5/9/2022	0	Y	y	v				ug/L
MW-17-2	2210539-05	Methyl acrylate	5/9/2022	0	Y	y	v				ug/L
MW-17-2	2210539-05	1-Chlorobutane	5/9/2022	0	Y	y	v				ug/L
MW-17-2	2210539-05	4-Bromofluorobenzene (Surrogate)	5/9/2022	9.6	Y	y	v s				ug/L
MW-17-2	2210539-05	Methacrylonitrile	5/9/2022	10	Y	n	u		10	2.3	ug/L
MW-17-2	2210539-05	1,2-Dichloroethane-d4 (Surrogate)	5/9/2022	9.8	Y	y	v s				ug/L
MW-17-2	2210539-05	Methyl ethyl ketone	5/9/2022	5	Y	n	u		5.0	3.3	ug/L
MW-17-2	2210539-05	p- & m-Xylenes	5/9/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-17-2	2210539-05	Tetrahydrofuran	5/9/2022	20	Y	n	u		20	5.2	ug/L
MW-17-2	2210539-05	Propionitrile	5/9/2022	20	Y	n	u		20	6.2	ug/L
MW-17-2	2210539-05	Pentachloroethane	5/9/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-17-2	2210539-05	Methyl methacrylate	5/9/2022	5	Y	n	u		5.0	1.2	ug/L
MW-17-2	2210539-05	Methyl isobutyl ketone	5/9/2022	5	Y	n	u		5.0	2.4	ug/L
MW-17-2	2210539-05	Diethyl ether	5/9/2022	2	Y	n	u		2.0	0.33	ug/L
MW-17-2	2210539-05	Toluene-d8 (Surrogate)	5/9/2022	9.9	Y	y	v s				ug/L
MW-17-2	2210539-05	1,2-Dichloroethane	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-2	2210539-05	cis-1,3-Dichloropropene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-2	2210539-05	1,1-Dichloropropene	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-2	2210539-05	2,2-Dichloropropane	5/9/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-2	2210539-05	1,3-Dichloropropane	5/9/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-2	2210539-05	1,2-Dichloropropane	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-2	2210539-05	trans-1,2-Dichloroethene	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-2	2210539-05	trans-1,3-Dichloropropene	5/9/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-2	2210539-05	1,1-Dichloroethene	5/9/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-2	2210539-05	1,4-Dichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-2	2210539-05	1,1-Dichloroethane	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-2	2210539-05	Dichlorodifluoromethane	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-2	2210539-05	Trichlorofluoromethane	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-2	2210539-05	1,3-Dichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-17-2	2210539-05	Ethyl t-butyl ether	5/9/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-17-2	2210539-05	Dibromomethane	5/9/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-17-2	2210539-05	1,2-Dibromoethane	5/9/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-17-2	2210539-05	cis-1,2-Dichloroethene	5/9/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-2	2210539-05	1,1,1-Trichloroethane	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-2	2210539-05	1,2-Dichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-2	2210539-05	Ethylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-2	2210539-05	1,1,2-Trichloroethane	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-2	2210539-05	1,2,4-Trichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-2	2210539-05	1,2,3-Trichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-2	2210539-05	Toluene	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-2	2210539-05	Tetrachloroethene	5/9/2022	0.5	Y	n	u		0.50	0.23	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-2	2210539-05	1,1,2,2-Tetrachloroethane	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-2	2210539-05	p-Isopropyltoluene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-2	2210539-05	Styrene	5/9/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-17-2	2210539-05	n-Propylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-17-2	2210539-05	Naphthalene	5/9/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-17-2	2210539-05	Methyl t-butyl ether	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-2	2210539-05	Methylene chloride	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-2	2210539-05	Isopropylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-2	2210539-05	Trichloroethene	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-2	2210539-05	Hexachlorobutadiene	5/9/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-17-2	2210539-05	1,1,1,2-Tetrachloroethane	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-3	2210539-04	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-17-3	2210539-04	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-17-3	2210539-04	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-17-3	2210539-04	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-3	2210539-04	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-3	2210539-04	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-17-3	2210539-04	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-17-3	2210539-04	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-3	2210539-04	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-3	2210539-04	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-3	2210539-04	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-3	2210539-04	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-17-3	2210539-04	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-17-3	2210539-04	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-3	2210539-04	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-3	2210539-04	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-17-3	2210539-04	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-3	2210539-04	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-3	2210539-04	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-3	2210539-04	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-3	2210539-04	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-3	2210539-04	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-17-3	2210539-04	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-17-3	2210539-04	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-3	2210539-04	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-3	2210539-04	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-3	2210539-04	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-3	2210539-04	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-3	2210539-04	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-17-3	2210539-04	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-3	2210539-04	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-17-3	2210539-04	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-17-3	2210539-04	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-17-3	2210539-04	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-17-3	2210539-04	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-17-3	2210539-04	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-17-3	2210539-04	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-17-3	2210539-04	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-17-3	2210539-04	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L

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MW-17-3	2210539-04	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-3	2210539-04	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-17-3	2210539-04	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-17-3	2210539-04	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-17-3	2210539-04	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-17-3	2210539-04	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-17-3	2210539-04	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-17-3	2210539-04	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-17-3	2210539-04	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-17-3	2210539-04	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-17-3	2210539-04	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-17-3	2210539-04	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-17-3	2210539-04	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-17-3	2210539-04	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-17-3	2210539-04	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-3	2210539-04	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-17-3	2210539-04	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
MW-17-3	2210539-04	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-17-3	2210539-04	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-17-3	2210539-04	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-3	2210539-04	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-3	2210539-04	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-3	2210539-04	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-3	2210539-04	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-3	2210539-04	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L

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MW-17-3	2210539-04	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-17-3	2210539-04	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-3	2210539-04	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-3	2210539-04	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-3	2210539-04	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-3	2210539-04	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-3	2210539-04	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-3	2210539-04	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-17-3	2210539-04	Toluene-d8 (Surrogate)	5/10/2022	9.9	Y	y	v s				ug/L
MW-17-3	2210539-04	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-3	2210539-04	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-3	2210539-04	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-3	2210539-04	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-3	2210539-04	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-3	2210539-04	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-3	2210539-04	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-3	2210539-04	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-17-3	2210539-04	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-3	2210539-04	Trichloroethene	5/10/2022	1.7	Y	y	v		0.50	0.19	ug/L
MW-17-3	2210539-04	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-3	2210539-04	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-3	2210539-04	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-3	2210539-04	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-3	2210539-04	Toluene	5/10/2022	0.25	Y	y	v j		0.50	0.17	ug/L
MW-17-3	2210539-04	Tetrachloroethene	5/10/2022	0.23	Y	y	v j		0.50	0.23	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-3	2210539-04	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-4	2210539-03	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-4	2210539-03	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-17-4	2210539-03	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-4	2210539-03	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-17-4	2210539-03	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-4	2210539-03	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-4	2210539-03	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-4	2210539-03	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-4	2210539-03	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-4	2210539-03	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-4	2210539-03	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-4	2210539-03	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-4	2210539-03	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-17-4	2210539-03	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-4	2210539-03	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-4	2210539-03	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-4	2210539-03	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-4	2210539-03	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-4	2210539-03	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-4	2210539-03	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-4	2210539-03	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-4	2210539-03	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-4	2210539-03	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-17-4	2210539-03	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-4	2210539-03	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-17-4	2210539-03	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-4	2210539-03	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-4	2210539-03	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-4	2210539-03	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-17-4	2210539-03	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-4	2210539-03	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-4	2210539-03	Chloroform	5/10/2022	0.56	Y	y	v		0.50	0.14	ug/L
MW-17-4	2210539-03	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-4	2210539-03	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-4	2210539-03	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-17-4	2210539-03	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-17-4	2210539-03	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-4	2210539-03	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-4	2210539-03	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-17-4	2210539-03	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-17-4	2210539-03	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-17-4	2210539-03	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-17-4	2210539-03	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-4	2210539-03	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-17-4	2210539-03	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-17-4	2210539-03	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-17-4	2210539-03	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-17-4	2210539-03	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-17-4	2210539-03	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L

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MW-17-4	2210539-03	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-17-4	2210539-03	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-17-4	2210539-03	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-17-4	2210539-03	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-17-4	2210539-03	Toluene-d8 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-17-4	2210539-03	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
MW-17-4	2210539-03	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-17-4	2210539-03	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-4	2210539-03	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-17-4	2210539-03	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-17-4	2210539-03	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-17-4	2210539-03	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-17-4	2210539-03	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-17-4	2210539-03	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-17-4	2210539-03	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-17-4	2210539-03	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-17-4	2210539-03	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-4	2210539-03	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-4	2210539-03	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-17-4	2210539-03	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-17-4	2210539-03	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-17-4	2210539-03	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-17-4	2210539-03	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-4	2210539-03	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-4	2210539-03	Tetrachloroethene	5/10/2022	0.37	Y	y	v j		0.50	0.23	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-4	2210539-03	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-4	2210539-03	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-4	2210539-03	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-4	2210539-03	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-4	2210539-03	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-17-4	2210539-03	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-4	2210539-03	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-4	2210539-03	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-17-4	2210539-03	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-4	2210539-03	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-4	2210539-03	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-4	2210539-03	Trichloroethene	5/10/2022	0.38	Y	y	v j		0.50	0.19	ug/L
MW-17-4	2210539-03	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-17-4	2210539-03	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-4	2210539-03	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-4	2210539-03	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-17-5	2210539-02	2,2-Dichloropropane	5/9/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-5	2210539-02	1,3-Dichloropropane	5/9/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-5	2210539-02	1,2-Dichloropropane	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-5	2210539-02	trans-1,2-Dichloroethene	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-5	2210539-02	cis-1,2-Dichloroethene	5/9/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-5	2210539-02	1,1-Dichloroethene	5/9/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-5	2210539-02	1,2-Dichloroethane	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-5	2210539-02	1,1-Dichloropropene	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-5	2210539-02	Methyl t-butyl ether	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-5	2210539-02	1,1,1,2-Tetrachloroethane	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-5	2210539-02	Benzene	5/9/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-5	2210539-02	cis-1,3-Dichloropropene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-5	2210539-02	trans-1,3-Dichloropropene	5/9/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-5	2210539-02	Ethylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-5	2210539-02	Hexachlorobutadiene	5/9/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-17-5	2210539-02	Isopropylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-5	2210539-02	n-Propylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-17-5	2210539-02	Methylene chloride	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-5	2210539-02	Naphthalene	5/9/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-17-5	2210539-02	Styrene	5/9/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-17-5	2210539-02	Bromobenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-5	2210539-02	1,1-Dichloroethane	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-5	2210539-02	p-Isopropyltoluene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-5	2210539-02	Chloroform	5/9/2022	1	Y	y	v		0.50	0.14	ug/L
MW-17-5	2210539-02	1,1,2,2-Tetrachloroethane	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-5	2210539-02	Ethyl t-butyl ether	5/9/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-17-5	2210539-02	Bromochloromethane	5/9/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-17-5	2210539-02	Bromoform	5/9/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-17-5	2210539-02	Bromomethane	5/9/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-17-5	2210539-02	n-Butylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-5	2210539-02	sec-Butylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-5	2210539-02	tert-Butylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-17-5	2210539-02	Carbon tetrachloride	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-5	2210539-02	Bromodichloromethane	5/9/2022	0.5	Y	n	u		0.50	0.20	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-5	2210539-02	Chloroethane	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-5	2210539-02	Dichlorodifluoromethane	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-5	2210539-02	Chloromethane	5/9/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-5	2210539-02	2-Chlorotoluene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-5	2210539-02	4-Chlorotoluene	5/9/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-17-5	2210539-02	Dibromochloromethane	5/9/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-17-5	2210539-02	1,2-Dibromo-3-chloropropane	5/9/2022	1	Y	n	u		1.0	0.89	ug/L
MW-17-5	2210539-02	1,2-Dibromoethane	5/9/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-17-5	2210539-02	Dibromomethane	5/9/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-17-5	2210539-02	1,2-Dichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-5	2210539-02	1,3-Dichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-17-5	2210539-02	1,4-Dichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-5	2210539-02	Chlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-5	2210539-02	4-Bromofluorobenzene (Surrogate)	5/9/2022	9.4	Y	y	v s				ug/L
MW-17-5	2210539-02	Methacrylonitrile	5/9/2022	10	Y	n	u		10	2.3	ug/L
MW-17-5	2210539-02	Methyl ethyl ketone	5/9/2022	5	Y	n	u		5.0	3.3	ug/L
MW-17-5	2210539-02	Methyl iodide	5/9/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-17-5	2210539-02	Methyl isobutyl ketone	5/9/2022	5	Y	n	u		5.0	2.4	ug/L
MW-17-5	2210539-02	Methyl methacrylate	5/9/2022	5	Y	n	u		5.0	1.2	ug/L
MW-17-5	2210539-02	Pentachloroethane	5/9/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-17-5	2210539-02	Propionitrile	5/9/2022	20	Y	n	u		20	6.2	ug/L
MW-17-5	2210539-02	Tetrahydrofuran	5/9/2022	20	Y	n	u		20	5.2	ug/L
MW-17-5	2210539-02	2-Hexanone	5/9/2022	10	Y	n	u		10	5.0	ug/L
MW-17-5	2210539-02	Toluene-d8 (Surrogate)	5/9/2022	10	Y	y	v s				ug/L
MW-17-5	2210539-02	p- & m-Xylenes	5/9/2022	0.5	Y	n	u		0.50	0.34	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-5	2210539-02	Chloroacetonitrile	5/9/2022	0	Y	y	v				ug/L
MW-17-5	2210539-02	Methyl acrylate	5/9/2022	0	Y	y	v				ug/L
MW-17-5	2210539-02	1-Chlorobutane	5/9/2022	0	Y	y	v				ug/L
MW-17-5	2210539-02	1,1-Dichloropropanone	5/9/2022	0	Y	y	v				ug/L
MW-17-5	2210539-02	2-Nitropropane	5/9/2022	0	Y	y	v				ug/L
MW-17-5	2210539-02	Nitrobenzene	5/9/2022	0	Y	y	v				ug/L
MW-17-5	2210539-02	Diethyl ether	5/9/2022	2	Y	n	u		2.0	0.33	ug/L
MW-17-5	2210539-02	Tetrachloroethene	5/9/2022	1	Y	y	v		0.50	0.23	ug/L
MW-17-5	2210539-02	o-Xylene	5/9/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-17-5	2210539-02	1,2,3-Trichloropropane	5/9/2022	1	Y	n	u		1.0	0.78	ug/L
MW-17-5	2210539-02	Toluene	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-5	2210539-02	1,2,3-Trichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-5	2210539-02	1,2-Dichloroethane-d4 (Surrogate)	5/9/2022	9.9	Y	y	v s				ug/L
MW-17-5	2210539-02	Hexachloroethane	5/9/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-17-5	2210539-02	1,2,4-Trichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-17-5	2210539-02	1,1,1-Trichloroethane	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-5	2210539-02	1,1,2-Trichloroethane	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-17-5	2210539-02	Trichlorofluoromethane	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-5	2210539-02	1,1,2-Trichloro-1,2,2-trifluoroethane	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-5	2210539-02	1,2,4-Trimethylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-17-5	2210539-02	t-Butyl alcohol	5/9/2022	2	Y	n	u		2.0	2.0	ug/L
MW-17-5	2210539-02	Ethyl methacrylate	5/9/2022	4	Y	n	u		4.0	1.3	ug/L
MW-17-5	2210539-02	trans-1,4-Dichloro-2-butene	5/9/2022	5	Y	n	u		5.0	1.8	ug/L
MW-17-5	2210539-02	Trichloroethene	5/9/2022	1.1	Y	y	v		0.50	0.19	ug/L
MW-17-5	2210539-02	Carbon disulfide	5/9/2022	0.5	Y	n	u		0.50	0.48	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-5	2210539-02	1,3,5-Trimethylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-17-5	2210539-02	t-Amyl Methyl ether	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-17-5	2210539-02	Allyl chloride	5/9/2022	5	Y	n	u		5.0	0.47	ug/L
MW-17-5	2210539-02	Acrylonitrile	5/9/2022	5	Y	n	u		5.0	1.5	ug/L
MW-17-5	2210539-02	Acetone	5/9/2022	10	Y	n	u		10	6.6	ug/L
MW-17-5	2210539-02	Vinyl chloride	5/9/2022	0.5	Y	n	u		0.50	0.18	ug/L
TB-8-050422	2210539-01	trans-1,3-Dichloropropene	5/9/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-8-050422	2210539-01	1,1,1,2-Tetrachloroethane	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-8-050422	2210539-01	trans-1,2-Dichloroethene	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-8-050422	2210539-01	1,2-Dichloropropane	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-8-050422	2210539-01	1,3-Dichloropropane	5/9/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-8-050422	2210539-01	2,2-Dichloropropane	5/9/2022	0.5	Y	n	u		0.50	0.18	ug/L
TB-8-050422	2210539-01	1,1-Dichloropropene	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-8-050422	2210539-01	1,2-Dichloroethane	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-8-050422	2210539-01	cis-1,3-Dichloropropene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-8-050422	2210539-01	1,1-Dichloroethene	5/9/2022	0.5	Y	n	u		0.50	0.27	ug/L
TB-8-050422	2210539-01	cis-1,2-Dichloroethene	5/9/2022	0.5	Y	n	u		0.50	0.27	ug/L
TB-8-050422	2210539-01	Ethylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-8-050422	2210539-01	Hexachlorobutadiene	5/9/2022	0.5	Y	n	u		0.50	0.20	ug/L
TB-8-050422	2210539-01	Isopropylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-8-050422	2210539-01	p-Isopropyltoluene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-8-050422	2210539-01	Methylene chloride	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-8-050422	2210539-01	Methyl t-butyl ether	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-8-050422	2210539-01	Naphthalene	5/9/2022	0.5	Y	n	u		0.50	0.16	ug/L
TB-8-050422	2210539-01	Styrene	5/9/2022	0.5	Y	n	u		0.50	0.12	ug/L

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Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
TB-8-050422	2210539-01	1,1-Dichloroethane	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-8-050422	2210539-01	Bromochloromethane	5/9/2022	0.5	Y	n	u		0.50	0.27	ug/L
TB-8-050422	2210539-01	n-Propylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.12	ug/L
TB-8-050422	2210539-01	Chloroform	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-8-050422	2210539-01	Benzene	5/9/2022	0.5	Y	n	u		0.50	0.11	ug/L
TB-8-050422	2210539-01	Bromobenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-8-050422	2210539-01	Vinyl chloride	5/9/2022	0.5	Y	n	u		0.50	0.18	ug/L
TB-8-050422	2210539-01	Bromodichloromethane	5/9/2022	0.5	Y	n	u		0.50	0.20	ug/L
TB-8-050422	2210539-01	1,1,2,2-Tetrachloroethane	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-8-050422	2210539-01	Bromomethane	5/9/2022	0.5	Y	n	u		0.50	0.20	ug/L
TB-8-050422	2210539-01	n-Butylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-8-050422	2210539-01	sec-Butylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-8-050422	2210539-01	tert-Butylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.18	ug/L
TB-8-050422	2210539-01	Carbon tetrachloride	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-8-050422	2210539-01	Bromoform	5/9/2022	0.5	Y	n	u		0.50	0.46	ug/L
TB-8-050422	2210539-01	Chloroethane	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-8-050422	2210539-01	Dichlorodifluoromethane	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-8-050422	2210539-01	Chloromethane	5/9/2022	0.5	Y	n	u		0.50	0.11	ug/L
TB-8-050422	2210539-01	2-Chlorotoluene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-8-050422	2210539-01	4-Chlorotoluene	5/9/2022	0.5	Y	n	u		0.50	0.093	ug/L
TB-8-050422	2210539-01	Dibromochloromethane	5/9/2022	0.5	Y	n	u		0.50	0.22	ug/L
TB-8-050422	2210539-01	1,2-Dibromo-3-chloropropane	5/9/2022	1	Y	n	u		1.0	0.89	ug/L
TB-8-050422	2210539-01	1,2-Dibromoethane	5/9/2022	0.5	Y	n	u		0.50	0.22	ug/L
TB-8-050422	2210539-01	Dibromomethane	5/9/2022	0.5	Y	n	u		0.50	0.23	ug/L
TB-8-050422	2210539-01	1,2-Dichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L

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Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
TB-8-050422	2210539-01	1,3-Dichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.16	ug/L
TB-8-050422	2210539-01	1,4-Dichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-8-050422	2210539-01	Chlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-8-050422	2210539-01	Tetrachloroethene	5/9/2022	0.5	Y	n	u		0.50	0.23	ug/L
TB-8-050422	2210539-01	Methacrylonitrile	5/9/2022	10	Y	n	u		10	2.3	ug/L
TB-8-050422	2210539-01	Methyl ethyl ketone	5/9/2022	5	Y	n	u		5.0	3.3	ug/L
TB-8-050422	2210539-01	Methyl iodide	5/9/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
TB-8-050422	2210539-01	Methyl isobutyl ketone	5/9/2022	5	Y	n	u		5.0	2.4	ug/L
TB-8-050422	2210539-01	Methyl methacrylate	5/9/2022	5	Y	n	u		5.0	1.2	ug/L
TB-8-050422	2210539-01	Pentachloroethane	5/9/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
TB-8-050422	2210539-01	Propionitrile	5/9/2022	20	Y	n	u		20	6.2	ug/L
TB-8-050422	2210539-01	Tetrahydrofuran	5/9/2022	20	Y	n	u		20	5.2	ug/L
TB-8-050422	2210539-01	2-Hexanone	5/9/2022	10	Y	n	u		10	5.0	ug/L
TB-8-050422	2210539-01	o-Xylene	5/9/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-8-050422	2210539-01	1,2-Dichloroethane-d4 (Surrogate)	5/9/2022	10	Y	y	v s				ug/L
TB-8-050422	2210539-01	Toluene-d8 (Surrogate)	5/9/2022	10	Y	y	v s				ug/L
TB-8-050422	2210539-01	1,2,4-Trimethylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-8-050422	2210539-01	Methyl acrylate	5/9/2022	0	Y	y	v				ug/L
TB-8-050422	2210539-01	2-Nitropropane	5/9/2022	0	Y	y	v				ug/L
TB-8-050422	2210539-01	1,1-Dichloropropanone	5/9/2022	0	Y	y	v				ug/L
TB-8-050422	2210539-01	Nitrobenzene	5/9/2022	0	Y	y	v				ug/L
TB-8-050422	2210539-01	Chloroacetonitrile	5/9/2022	0	Y	y	v				ug/L
TB-8-050422	2210539-01	1-Chlorobutane	5/9/2022	0	Y	y	v				ug/L
TB-8-050422	2210539-01	p- & m-Xylenes	5/9/2022	0.5	Y	n	u		0.50	0.34	ug/L
TB-8-050422	2210539-01	1,2,4-Trichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.15	ug/L

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Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
TB-8-050422	2210539-01	4-Bromofluorobenzene (Surrogate)	5/9/2022	9.8	Y	y	v s				ug/L
TB-8-050422	2210539-01	Hexachloroethane	5/9/2022	0.5	Y	n	u		0.50	0.11	ug/L
TB-8-050422	2210539-01	1,2,3-Trichlorobenzene	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-8-050422	2210539-01	1,1,1-Trichloroethane	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-8-050422	2210539-01	1,1,2-Trichloroethane	5/9/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-8-050422	2210539-01	Trichloroethene	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-8-050422	2210539-01	Trichlorofluoromethane	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-8-050422	2210539-01	1,2,3-Trichloropropane	5/9/2022	1	Y	n	u		1.0	0.78	ug/L
TB-8-050422	2210539-01	1,1,2-Trichloro-1,2,2-trifluoroethane	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-8-050422	2210539-01	1,3,5-Trimethylbenzene	5/9/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-8-050422	2210539-01	Ethyl t-butyl ether	5/9/2022	0.5	Y	n	u		0.50	0.32	ug/L
TB-8-050422	2210539-01	Acrylonitrile	5/9/2022	5	Y	n	u		5.0	1.5	ug/L
TB-8-050422	2210539-01	Allyl chloride	5/9/2022	5	Y	n	u		5.0	0.47	ug/L
TB-8-050422	2210539-01	t-Amyl Methyl ether	5/9/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-8-050422	2210539-01	t-Butyl alcohol	5/9/2022	2	Y	n	u		2.0	2.0	ug/L
TB-8-050422	2210539-01	Carbon disulfide	5/9/2022	0.5	Y	n	u		0.50	0.48	ug/L
TB-8-050422	2210539-01	trans-1,4-Dichloro-2-butene	5/9/2022	5	Y	n	u		5.0	1.8	ug/L
TB-8-050422	2210539-01	Toluene	5/9/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-8-050422	2210539-01	Diethyl ether	5/9/2022	2	Y	n	u		2.0	0.33	ug/L
TB-8-050422	2210539-01	Acetone	5/9/2022	10	Y	n	u		10	6.6	ug/L
TB-8-050422	2210539-01	Ethyl methacrylate	5/9/2022	4	Y	n	u		4.0	1.3	ug/L

Analytical Method EPA-8270C

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-4	2210539-03	Naphthalene-d8 (Surrogate)	5/13/2022	6.3	Y	y	v s				ug/L

SDG: 2210539

Analytical Method EPA-8270C

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-4	2210539-03	1,4-Dioxane	5/13/2022	1	Y	n	u		1.0	0.27	ug/L

Analytical Method SM-2320B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	Total Alkalinity as CaCO3	5/10/2022	4.1	Y	n	u		4.1	4.1	mg/L
EB-8-050422	2210539-07	Carbonate	5/10/2022	2.5	Y	n	u		2.5	2.5	mg/L
EB-8-050422	2210539-07	Bicarbonate	5/10/2022	5	Y	n	u		5.0	5.0	mg/L
MW-17-1	2210539-06	Total Alkalinity as CaCO3	5/10/2022	200	Y	y	v		4.1	4.1	mg/L
MW-17-1	2210539-06	Bicarbonate	5/10/2022	240	Y	y	v		5.0	5.0	mg/L
MW-17-1	2210539-06	Carbonate	5/10/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-17-2	2210539-05	Total Alkalinity as CaCO3	5/10/2022	200	Y	y	v		4.1	4.1	mg/L
MW-17-2	2210539-05	Carbonate	5/10/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-17-2	2210539-05	Bicarbonate	5/10/2022	240	Y	y	v		5.0	5.0	mg/L
MW-17-3	2210539-04	Total Alkalinity as CaCO3	5/9/2022	140	Y	y	v		4.1	4.1	mg/L
MW-17-3	2210539-04	Bicarbonate	5/9/2022	160	Y	y	v		5.0	5.0	mg/L
MW-17-3	2210539-04	Carbonate	5/9/2022	4.5	Y	y	v		2.5	2.5	mg/L
MW-17-4	2210539-03	Total Alkalinity as CaCO3	5/9/2022	200	Y	y	v		4.1	4.1	mg/L
MW-17-4	2210539-03	Carbonate	5/9/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-17-4	2210539-03	Bicarbonate	5/9/2022	250	Y	y	v		5.0	5.0	mg/L
MW-17-5	2210539-02	Carbonate	5/9/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-17-5	2210539-02	Total Alkalinity as CaCO3	5/9/2022	190	Y	y	v		4.1	4.1	mg/L
MW-17-5	2210539-02	Bicarbonate	5/9/2022	230	Y	y	v		5.0	5.0	mg/L

Analytical Method SRL 524M

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
EB-8-050422	2210539-07	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L

SDG: 2210539

Analytical Method SRL 524M

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-17-1	2210539-06	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-17-2	2210539-05	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-17-3	2210539-04	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-17-4	2210539-03	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-17-5	2210539-02	1,2,3-Trichloropropane	5/9/2022	0.005	Y	n	u		0.0050	0.0010	ug/L

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SDG: 2210682

Analytical Method EPA-150.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-6-2Q22	2210682-09	pH	5/11/2022	7.6	Y	y	v	J	0.05	0.05	pH Units
DUP-7-2Q22	2210682-10	pH	5/11/2022	7.63	Y	y	v	J	0.05	0.05	pH Units
EB-9-050522	2210682-08	pH	5/11/2022	6.98	Y	y	v	J	0.05	0.05	pH Units
MW-1	2210682-01	pH	5/11/2022	7.88	Y	y	v	J	0.05	0.05	pH Units
MW-15	2210682-07	pH	5/11/2022	7.79	Y	y	v	J	0.05	0.05	pH Units
MW-9	2210682-05	pH	5/11/2022	7.62	Y	y	v	J	0.05	0.05	pH Units

Analytical Method EPA-160.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-6-2Q22	2210682-09	Total Dissolved Solids @ 180 C	5/10/2022	360	Y	y	v		20	10	mg/L
DUP-7-2Q22	2210682-10	Total Dissolved Solids @ 180 C	5/10/2022	350	Y	y	v		20	10	mg/L
EB-9-050522	2210682-08	Total Dissolved Solids @ 180 C	5/10/2022	4	Y	y	v j		6.7	3.3	mg/L
MW-1	2210682-01	Total Dissolved Solids @ 180 C	5/10/2022	380	Y	y	v		20	10	mg/L
MW-15	2210682-07	Total Dissolved Solids @ 180 C	5/10/2022	350	Y	y	v		20	10	mg/L
MW-9	2210682-05	Total Dissolved Solids @ 180 C	5/10/2022	360	Y	y	v		20	10	mg/L

Analytical Method EPA-200.7

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-6-2Q22	2210682-09	Total Recoverable Magnesium	5/13/2022	19	Y	y	v		0.050	0.019	mg/L
DUP-6-2Q22	2210682-09	Total Recoverable Calcium	5/13/2022	62	Y	y	v		0.10	0.014	mg/L
DUP-6-2Q22	2210682-09	Total Recoverable Sodium	5/13/2022	24	Y	y	v		0.50	0.051	mg/L
DUP-6-2Q22	2210682-09	Total Recoverable Iron	5/13/2022	550	Y	y	v		50	30	ug/L
DUP-6-2Q22	2210682-09	Total Recoverable Potassium	5/13/2022	3.1	Y	y	v		1.0	0.10	mg/L
DUP-7-2Q22	2210682-10	Total Recoverable Calcium	5/13/2022	56	Y	y	v		0.10	0.014	mg/L
DUP-7-2Q22	2210682-10	Total Recoverable Magnesium	5/13/2022	17	Y	y	v		0.050	0.019	mg/L

SDG: 2210682

Analytical Method EPA-200.7

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-7-2Q22	2210682-10	Total Recoverable Sodium	5/13/2022	27	Y	y	v		0.50	0.051	mg/L
DUP-7-2Q22	2210682-10	Total Recoverable Potassium	5/13/2022	2.8	Y	y	v		1.0	0.10	mg/L
DUP-7-2Q22	2210682-10	Total Recoverable Iron	5/13/2022	44	Y	y	v j		50	30	ug/L
EB-9-050522	2210682-08	Total Recoverable Calcium	5/13/2022	0.043	Y	y	v j	U	0.10	0.014	mg/L
EB-9-050522	2210682-08	Total Recoverable Magnesium	5/13/2022	0.022	Y	y	v j	U	0.050	0.019	mg/L
EB-9-050522	2210682-08	Total Recoverable Potassium	5/13/2022	1	Y	n	u		1.0	0.10	mg/L
EB-9-050522	2210682-08	Total Recoverable Iron	5/13/2022	50	Y	n	u		50	30	ug/L
EB-9-050522	2210682-08	Total Recoverable Sodium	5/13/2022	0.5	Y	n	u		0.50	0.051	mg/L
MW-1	2210682-01	Total Recoverable Iron	5/13/2022	50	Y	n	u		50	30	ug/L
MW-1	2210682-01	Total Recoverable Potassium	5/13/2022	3	Y	y	v		1.0	0.10	mg/L
MW-1	2210682-01	Total Recoverable Sodium	5/13/2022	29	Y	y	v		0.50	0.051	mg/L
MW-1	2210682-01	Total Recoverable Magnesium	5/13/2022	19	Y	y	v		0.050	0.019	mg/L
MW-1	2210682-01	Total Recoverable Calcium	5/13/2022	66	Y	y	v		0.10	0.014	mg/L
MW-15	2210682-07	Total Recoverable Calcium	5/13/2022	59	Y	y	v		0.10	0.014	mg/L
MW-15	2210682-07	Total Recoverable Potassium	5/13/2022	2.9	Y	y	v		1.0	0.10	mg/L
MW-15	2210682-07	Total Recoverable Sodium	5/13/2022	28	Y	y	v		0.50	0.051	mg/L
MW-15	2210682-07	Total Recoverable Magnesium	5/13/2022	18	Y	y	v		0.050	0.019	mg/L
MW-15	2210682-07	Total Recoverable Iron	5/13/2022	45	Y	y	v j		50	30	ug/L
MW-9	2210682-05	Total Recoverable Magnesium	5/13/2022	19	Y	y	v		0.050	0.019	mg/L
MW-9	2210682-05	Total Recoverable Sodium	5/13/2022	24	Y	y	v		0.50	0.051	mg/L
MW-9	2210682-05	Total Recoverable Calcium	5/13/2022	63	Y	y	v		0.10	0.014	mg/L
MW-9	2210682-05	Total Recoverable Iron	5/13/2022	400	Y	y	v		50	30	ug/L
MW-9	2210682-05	Total Recoverable Potassium	5/13/2022	3.1	Y	y	v		1.0	0.10	mg/L

SDG: 2210682

Analytical Method EPA-200.8

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-6-2Q22	2210682-09	Total Recoverable Lead	5/13/2022	1	Y	n	u		1.0	0.10	ug/L
DUP-6-2Q22	2210682-09	Total Recoverable Chromium	5/13/2022	29	Y	y	v		3.0	0.50	ug/L
DUP-6-2Q22	2210682-09	Total Recoverable Arsenic	5/13/2022	0.97	Y	y	v j		2.0	0.70	ug/L
DUP-7-2Q22	2210682-10	Total Recoverable Lead	5/13/2022	1	Y	n	u		1.0	0.10	ug/L
DUP-7-2Q22	2210682-10	Total Recoverable Chromium	5/13/2022	3.4	Y	y	v		3.0	0.50	ug/L
DUP-7-2Q22	2210682-10	Total Recoverable Arsenic	5/13/2022	0.83	Y	y	v j		2.0	0.70	ug/L
EB-9-050522	2210682-08	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
EB-9-050522	2210682-08	Total Recoverable Chromium	5/12/2022	3	Y	n	u		3.0	0.50	ug/L
EB-9-050522	2210682-08	Total Recoverable Arsenic	5/12/2022	2	Y	n	u		2.0	0.70	ug/L
MW-1	2210682-01	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-1	2210682-01	Total Recoverable Arsenic	5/12/2022	1.4	Y	y	v j		2.0	0.70	ug/L
MW-1	2210682-01	Total Recoverable Chromium	5/12/2022	3	Y	n	u		3.0	0.50	ug/L
MW-15	2210682-07	Total Recoverable Chromium	5/12/2022	3.9	Y	y	v		3.0	0.50	ug/L
MW-15	2210682-07	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-15	2210682-07	Total Recoverable Arsenic	5/13/2022	1.1	Y	y	v j		2.0	0.70	ug/L
MW-9	2210682-05	Total Recoverable Lead	5/12/2022	1	Y	n	u		1.0	0.10	ug/L
MW-9	2210682-05	Total Recoverable Chromium	5/12/2022	28	Y	y	v		3.0	0.50	ug/L
MW-9	2210682-05	Total Recoverable Arsenic	5/12/2022	1.3	Y	y	v j		2.0	0.70	ug/L

Analytical Method EPA-218.6

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-6-2Q22	2210682-09	Hexavalent Chromium	5/17/2022	0.0013	Y	y	v	J	0.0002	0.0000	mg/L
DUP-7-2Q22	2210682-10	Hexavalent Chromium	5/17/2022	######	Y	y	v	J	0.0002	0.0000	mg/L
EB-9-050522	2210682-08	Hexavalent Chromium	5/17/2022	######	Y	y	v j	J	0.0002	0.0000	mg/L
MW-1	2210682-01	Hexavalent Chromium	5/17/2022	######	Y	y	v j	UJ	0.0002	0.0000	mg/L

SDG: 2210682

Analytical Method	EPA-218.6										
Sample ID	**Lab Sample ID**	**Chemical Name**	**Anal Date**	**Result**	**Report**	**Detect**	**Lab Qual**	**Val Qual**	**RL**	**MDL**	**Units**
MW-15	2210682-07	Hexavalent Chromium	5/17/2022	######	Y	y	v	J	0.0002	0.0000	mg/L
MW-9	2210682-05	Hexavalent Chromium	5/17/2022	0.0015	Y	y	v	J	0.0002	0.0000	mg/L

Analytical Method	EPA-300.0										
Sample ID	**Lab Sample ID**	**Chemical Name**	**Anal Date**	**Result**	**Report**	**Detect**	**Lab Qual**	**Val Qual**	**RL**	**MDL**	**Units**
DUP-6-2Q22	2210682-09	Chloride	5/6/2022	34	Y	y	v		0.50	0.13	mg/L
DUP-6-2Q22	2210682-09	Nitrate as N	5/6/2022	5.6	Y	y	v		0.10	0.024	mg/L
DUP-6-2Q22	2210682-09	Sulfate	5/6/2022	56	Y	y	v		1.0	0.14	mg/L
DUP-7-2Q22	2210682-10	Chloride	5/6/2022	23	Y	y	v		0.50	0.13	mg/L
DUP-7-2Q22	2210682-10	Nitrate as N	5/6/2022	1.3	Y	y	v		0.10	0.024	mg/L
DUP-7-2Q22	2210682-10	Sulfate	5/6/2022	49	Y	y	v		1.0	0.14	mg/L
EB-9-050522	2210682-08	Sulfate	5/6/2022	0.22	Y	y	v j	U	1.0	0.14	mg/L
EB-9-050522	2210682-08	Nitrate as N	5/6/2022	0.08	Y	y	v j		0.10	0.024	mg/L
EB-9-050522	2210682-08	Chloride	5/6/2022	0.2	Y	y	v j	U	0.50	0.13	mg/L
MW-1	2210682-01	Chloride	5/6/2022	29	Y	y	v		0.50	0.13	mg/L
MW-1	2210682-01	Nitrate as N	5/6/2022	0.55	Y	y	v		0.10	0.024	mg/L
MW-1	2210682-01	Sulfate	5/6/2022	51	Y	y	v		1.0	0.14	mg/L
MW-10	2210682-06	Sulfate	5/6/2022	32	Y	y	v		1.0	0.14	mg/L
MW-10	2210682-06	Chloride	5/6/2022	11	Y	y	v		0.50	0.13	mg/L
MW-10	2210682-06	Nitrate as N	5/6/2022	1.2	Y	y	v		0.10	0.024	mg/L
MW-15	2210682-07	Chloride	5/6/2022	24	Y	y	v		0.50	0.13	mg/L
MW-15	2210682-07	Nitrate as N	5/6/2022	1.3	Y	y	v		0.10	0.024	mg/L
MW-15	2210682-07	Sulfate	5/6/2022	50	Y	y	v		1.0	0.14	mg/L
MW-5	2210682-03	Nitrate as N	5/6/2022	3.8	Y	y	v		0.10	0.024	mg/L
MW-5	2210682-03	Sulfate	5/6/2022	15	Y	y	v		1.0	0.14	mg/L

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Analytical Method EPA-300.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-5	2210682-03	Chloride	5/6/2022	5.7	Y	y	v		0.50	0.13	mg/L
MW-8	2210682-04	Chloride	5/6/2022	26	Y	y	v		0.50	0.13	mg/L
MW-8	2210682-04	Nitrate as N	5/6/2022	2.7	Y	y	v		0.10	0.024	mg/L
MW-8	2210682-04	Sulfate	5/6/2022	56	Y	y	v		1.0	0.14	mg/L
MW-9	2210682-05	Chloride	5/6/2022	34	Y	y	v		0.50	0.13	mg/L
MW-9	2210682-05	Nitrate as N	5/6/2022	2.4	Y	y	v		0.10	0.024	mg/L
MW-9	2210682-05	Sulfate	5/6/2022	56	Y	y	v		1.0	0.14	mg/L

Analytical Method EPA-314.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-6-2Q22	2210682-09	Perchlorate	5/16/2022	2	Y	n	u		2.0	0.81	ug/L
DUP-7-2Q22	2210682-10	Perchlorate	5/16/2022	2	Y	n	u		2.0	0.81	ug/L
EB-9-050522	2210682-08	Perchlorate	5/16/2022	2	Y	n	u		2.0	0.81	ug/L
MW-1	2210682-01	Perchlorate	5/16/2022	2	Y	n	u		2.0	0.81	ug/L
MW-10	2210682-06	Perchlorate	5/16/2022	2	Y	n	u		2.0	0.81	ug/L
MW-15	2210682-07	Perchlorate	5/16/2022	2	Y	n	u		2.0	0.81	ug/L
MW-5	2210682-03	Perchlorate	5/16/2022	2	Y	n	u		2.0	0.81	ug/L
MW-8	2210682-04	Perchlorate	5/16/2022	7.9	Y	y	v		2.0	0.81	ug/L
MW-9	2210682-05	Perchlorate	5/16/2022	2	Y	n	u		2.0	0.81	ug/L

Analytical Method EPA-353.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-6-2Q22	2210682-09	Nitrite as N	5/7/2022	0.05	Y	n	u		0.050	0.010	mg/L
DUP-7-2Q22	2210682-10	Nitrite as N	5/7/2022	0.05	Y	n	u		0.050	0.010	mg/L
EB-9-050522	2210682-08	Nitrite as N	5/7/2022	0.016	Y	y	v j	U	0.050	0.010	mg/L
MW-1	2210682-01	Nitrite as N	5/7/2022	0.05	Y	n	u		0.050	0.010	mg/L

SDG: 2210682

Analytical Method EPA-353.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-10	2210682-06	Nitrite as N	5/7/2022	0.05	Y	n	u		0.050	0.010	mg/L
MW-15	2210682-07	Nitrite as N	5/7/2022	0.05	Y	n	u		0.050	0.010	mg/L
MW-5	2210682-03	Nitrite as N	5/7/2022	0.05	Y	n	u		0.050	0.010	mg/L
MW-8	2210682-04	Nitrite as N	5/7/2022	0.05	Y	n	u		0.050	0.010	mg/L
MW-9	2210682-05	Nitrite as N	5/7/2022	0.05	Y	n	u		0.050	0.010	mg/L

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-6-2Q22	2210682-09	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
DUP-6-2Q22	2210682-09	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
DUP-6-2Q22	2210682-09	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-6-2Q22	2210682-09	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-6-2Q22	2210682-09	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
DUP-6-2Q22	2210682-09	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
DUP-6-2Q22	2210682-09	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
DUP-6-2Q22	2210682-09	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
DUP-6-2Q22	2210682-09	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
DUP-6-2Q22	2210682-09	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-6-2Q22	2210682-09	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-6-2Q22	2210682-09	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-6-2Q22	2210682-09	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
DUP-6-2Q22	2210682-09	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
DUP-6-2Q22	2210682-09	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
DUP-6-2Q22	2210682-09	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-6-2Q22	2210682-09	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L

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Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-6-2Q22	2210682-09	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
DUP-6-2Q22	2210682-09	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-6-2Q22	2210682-09	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-6-2Q22	2210682-09	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
DUP-6-2Q22	2210682-09	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-6-2Q22	2210682-09	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
DUP-6-2Q22	2210682-09	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-6-2Q22	2210682-09	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-6-2Q22	2210682-09	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-6-2Q22	2210682-09	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-6-2Q22	2210682-09	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-6-2Q22	2210682-09	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
DUP-6-2Q22	2210682-09	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-6-2Q22	2210682-09	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
DUP-6-2Q22	2210682-09	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
DUP-6-2Q22	2210682-09	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
DUP-6-2Q22	2210682-09	Bromomethane	5/10/2022	0.5	Y	n	u	UJ	0.50	0.20	ug/L
DUP-6-2Q22	2210682-09	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-6-2Q22	2210682-09	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-6-2Q22	2210682-09	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
DUP-6-2Q22	2210682-09	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
DUP-6-2Q22	2210682-09	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-6-2Q22	2210682-09	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-6-2Q22	2210682-09	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-6-2Q22	2210682-09	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L

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Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-6-2Q22	2210682-09	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
DUP-6-2Q22	2210682-09	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-6-2Q22	2210682-09	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
DUP-6-2Q22	2210682-09	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
DUP-6-2Q22	2210682-09	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
DUP-6-2Q22	2210682-09	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
DUP-6-2Q22	2210682-09	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
DUP-6-2Q22	2210682-09	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-6-2Q22	2210682-09	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-6-2Q22	2210682-09	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
DUP-6-2Q22	2210682-09	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-6-2Q22	2210682-09	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-6-2Q22	2210682-09	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
DUP-6-2Q22	2210682-09	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
DUP-6-2Q22	2210682-09	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
DUP-6-2Q22	2210682-09	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
DUP-6-2Q22	2210682-09	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
DUP-6-2Q22	2210682-09	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
DUP-6-2Q22	2210682-09	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
DUP-6-2Q22	2210682-09	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
DUP-6-2Q22	2210682-09	Toluene-d8 (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
DUP-6-2Q22	2210682-09	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
DUP-6-2Q22	2210682-09	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
DUP-6-2Q22	2210682-09	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
DUP-6-2Q22	2210682-09	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L

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Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-6-2Q22	2210682-09	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
DUP-6-2Q22	2210682-09	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
DUP-6-2Q22	2210682-09	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-6-2Q22	2210682-09	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
DUP-6-2Q22	2210682-09	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
DUP-6-2Q22	2210682-09	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
DUP-6-2Q22	2210682-09	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-6-2Q22	2210682-09	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.6	Y	y	v s				ug/L
DUP-6-2Q22	2210682-09	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
DUP-6-2Q22	2210682-09	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
DUP-6-2Q22	2210682-09	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
DUP-6-2Q22	2210682-09	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
DUP-6-2Q22	2210682-09	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-6-2Q22	2210682-09	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
DUP-6-2Q22	2210682-09	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
DUP-6-2Q22	2210682-09	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
DUP-6-2Q22	2210682-09	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
DUP-6-2Q22	2210682-09	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
DUP-6-2Q22	2210682-09	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
DUP-6-2Q22	2210682-09	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
DUP-6-2Q22	2210682-09	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
DUP-6-2Q22	2210682-09	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
DUP-6-2Q22	2210682-09	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
DUP-7-2Q22	2210682-10	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-7-2Q22	2210682-10	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L

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DUP-7-2Q22	2210682-10	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
DUP-7-2Q22	2210682-10	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
DUP-7-2Q22	2210682-10	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-7-2Q22	2210682-10	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
DUP-7-2Q22	2210682-10	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
DUP-7-2Q22	2210682-10	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
DUP-7-2Q22	2210682-10	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
DUP-7-2Q22	2210682-10	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-7-2Q22	2210682-10	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-7-2Q22	2210682-10	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-7-2Q22	2210682-10	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-7-2Q22	2210682-10	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
DUP-7-2Q22	2210682-10	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-7-2Q22	2210682-10	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
DUP-7-2Q22	2210682-10	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
DUP-7-2Q22	2210682-10	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
DUP-7-2Q22	2210682-10	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
DUP-7-2Q22	2210682-10	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
DUP-7-2Q22	2210682-10	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
DUP-7-2Q22	2210682-10	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-7-2Q22	2210682-10	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
DUP-7-2Q22	2210682-10	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
DUP-7-2Q22	2210682-10	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
DUP-7-2Q22	2210682-10	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
DUP-7-2Q22	2210682-10	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L

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DUP-7-2Q22	2210682-10	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
DUP-7-2Q22	2210682-10	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
DUP-7-2Q22	2210682-10	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
DUP-7-2Q22	2210682-10	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
DUP-7-2Q22	2210682-10	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
DUP-7-2Q22	2210682-10	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
DUP-7-2Q22	2210682-10	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-7-2Q22	2210682-10	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
DUP-7-2Q22	2210682-10	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-7-2Q22	2210682-10	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-7-2Q22	2210682-10	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
DUP-7-2Q22	2210682-10	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
DUP-7-2Q22	2210682-10	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
DUP-7-2Q22	2210682-10	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
DUP-7-2Q22	2210682-10	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
DUP-7-2Q22	2210682-10	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
DUP-7-2Q22	2210682-10	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
DUP-7-2Q22	2210682-10	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-7-2Q22	2210682-10	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
DUP-7-2Q22	2210682-10	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
DUP-7-2Q22	2210682-10	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-7-2Q22	2210682-10	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-7-2Q22	2210682-10	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-7-2Q22	2210682-10	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-7-2Q22	2210682-10	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L

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DUP-7-2Q22	2210682-10	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
DUP-7-2Q22	2210682-10	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-7-2Q22	2210682-10	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
DUP-7-2Q22	2210682-10	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-7-2Q22	2210682-10	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-7-2Q22	2210682-10	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
DUP-7-2Q22	2210682-10	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
DUP-7-2Q22	2210682-10	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
DUP-7-2Q22	2210682-10	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-7-2Q22	2210682-10	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-7-2Q22	2210682-10	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
DUP-7-2Q22	2210682-10	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
DUP-7-2Q22	2210682-10	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
DUP-7-2Q22	2210682-10	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
DUP-7-2Q22	2210682-10	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
DUP-7-2Q22	2210682-10	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
DUP-7-2Q22	2210682-10	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
DUP-7-2Q22	2210682-10	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
DUP-7-2Q22	2210682-10	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-7-2Q22	2210682-10	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
DUP-7-2Q22	2210682-10	Toluene-d8 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
DUP-7-2Q22	2210682-10	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
DUP-7-2Q22	2210682-10	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
DUP-7-2Q22	2210682-10	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-7-2Q22	2210682-10	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L

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DUP-7-2Q22	2210682-10	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
DUP-7-2Q22	2210682-10	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
DUP-7-2Q22	2210682-10	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.5	Y	y	v s				ug/L
DUP-7-2Q22	2210682-10	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
DUP-7-2Q22	2210682-10	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
DUP-7-2Q22	2210682-10	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
DUP-7-2Q22	2210682-10	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
DUP-7-2Q22	2210682-10	Bromomethane	5/10/2022	0.5	Y	n	u	UJ	0.50	0.20	ug/L
DUP-7-2Q22	2210682-10	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
DUP-7-2Q22	2210682-10	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
DUP-7-2Q22	2210682-10	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
DUP-7-2Q22	2210682-10	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
DUP-7-2Q22	2210682-10	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-9-050522	2210682-08	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.3	Y	y	v s				ug/L
EB-9-050522	2210682-08	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
EB-9-050522	2210682-08	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-9-050522	2210682-08	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-9-050522	2210682-08	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
EB-9-050522	2210682-08	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
EB-9-050522	2210682-08	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
EB-9-050522	2210682-08	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
EB-9-050522	2210682-08	Toluene-d8 (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
EB-9-050522	2210682-08	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
EB-9-050522	2210682-08	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
EB-9-050522	2210682-08	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L

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EB-9-050522	2210682-08	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
EB-9-050522	2210682-08	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
EB-9-050522	2210682-08	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
EB-9-050522	2210682-08	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
EB-9-050522	2210682-08	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
EB-9-050522	2210682-08	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
EB-9-050522	2210682-08	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
EB-9-050522	2210682-08	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-9-050522	2210682-08	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
EB-9-050522	2210682-08	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
EB-9-050522	2210682-08	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-9-050522	2210682-08	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
EB-9-050522	2210682-08	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
EB-9-050522	2210682-08	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
EB-9-050522	2210682-08	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-9-050522	2210682-08	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-9-050522	2210682-08	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-9-050522	2210682-08	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
EB-9-050522	2210682-08	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
EB-9-050522	2210682-08	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-9-050522	2210682-08	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-9-050522	2210682-08	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-9-050522	2210682-08	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-9-050522	2210682-08	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-9-050522	2210682-08	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L

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EB-9-050522	2210682-08	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-9-050522	2210682-08	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
EB-9-050522	2210682-08	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-9-050522	2210682-08	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
EB-9-050522	2210682-08	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
EB-9-050522	2210682-08	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
EB-9-050522	2210682-08	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-9-050522	2210682-08	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-9-050522	2210682-08	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
EB-9-050522	2210682-08	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
EB-9-050522	2210682-08	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
EB-9-050522	2210682-08	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
EB-9-050522	2210682-08	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-9-050522	2210682-08	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-9-050522	2210682-08	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
EB-9-050522	2210682-08	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
EB-9-050522	2210682-08	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
EB-9-050522	2210682-08	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
EB-9-050522	2210682-08	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
EB-9-050522	2210682-08	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
EB-9-050522	2210682-08	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-9-050522	2210682-08	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
EB-9-050522	2210682-08	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-9-050522	2210682-08	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
EB-9-050522	2210682-08	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L

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EB-9-050522	2210682-08	Bromomethane	5/10/2022	0.5	Y	n	u	UJ	0.50	0.20	ug/L
EB-9-050522	2210682-08	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-9-050522	2210682-08	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
EB-9-050522	2210682-08	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
EB-9-050522	2210682-08	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-9-050522	2210682-08	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-9-050522	2210682-08	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-9-050522	2210682-08	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-9-050522	2210682-08	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
EB-9-050522	2210682-08	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
EB-9-050522	2210682-08	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-9-050522	2210682-08	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
EB-9-050522	2210682-08	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-9-050522	2210682-08	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
EB-9-050522	2210682-08	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
EB-9-050522	2210682-08	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
EB-9-050522	2210682-08	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-9-050522	2210682-08	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
EB-9-050522	2210682-08	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
EB-9-050522	2210682-08	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
EB-9-050522	2210682-08	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
EB-9-050522	2210682-08	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-9-050522	2210682-08	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
EB-9-050522	2210682-08	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
EB-9-050522	2210682-08	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L

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EB-9-050522	2210682-08	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
EB-9-050522	2210682-08	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
EB-9-050522	2210682-08	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-1	2210682-01	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-1	2210682-01	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-1	2210682-01	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-1	2210682-01	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-1	2210682-01	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-1	2210682-01	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-1	2210682-01	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-1	2210682-01	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-1	2210682-01	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-1	2210682-01	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-1	2210682-01	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-1	2210682-01	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-1	2210682-01	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-1	2210682-01	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-1	2210682-01	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-1	2210682-01	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-1	2210682-01	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-1	2210682-01	Bromomethane	5/10/2022	0.5	Y	n	u	UJ	0.50	0.20	ug/L
MW-1	2210682-01	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-1	2210682-01	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-1	2210682-01	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-1	2210682-01	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L

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MW-1	2210682-01	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-1	2210682-01	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-1	2210682-01	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-1	2210682-01	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-1	2210682-01	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-1	2210682-01	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-1	2210682-01	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-1	2210682-01	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-1	2210682-01	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-1	2210682-01	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-1	2210682-01	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-1	2210682-01	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-1	2210682-01	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-1	2210682-01	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-1	2210682-01	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-1	2210682-01	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-1	2210682-01	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-1	2210682-01	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-1	2210682-01	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-1	2210682-01	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-1	2210682-01	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-1	2210682-01	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-1	2210682-01	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-1	2210682-01	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-1	2210682-01	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-1	2210682-01	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-1	2210682-01	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-1	2210682-01	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
MW-1	2210682-01	Toluene-d8 (Surrogate)	5/10/2022	9.7	Y	y	v s				ug/L
MW-1	2210682-01	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.4	Y	y	v s				ug/L
MW-1	2210682-01	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-1	2210682-01	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-1	2210682-01	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-1	2210682-01	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-1	2210682-01	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-1	2210682-01	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-1	2210682-01	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-1	2210682-01	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-1	2210682-01	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-1	2210682-01	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-1	2210682-01	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-1	2210682-01	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-1	2210682-01	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-1	2210682-01	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-1	2210682-01	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-1	2210682-01	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-1	2210682-01	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-1	2210682-01	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-1	2210682-01	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-1	2210682-01	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L

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MW-1	2210682-01	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-1	2210682-01	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-1	2210682-01	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-1	2210682-01	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-1	2210682-01	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-1	2210682-01	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-1	2210682-01	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-1	2210682-01	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-1	2210682-01	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-1	2210682-01	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-1	2210682-01	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-1	2210682-01	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-1	2210682-01	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-1	2210682-01	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-1	2210682-01	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-1	2210682-01	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-1	2210682-01	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-1	2210682-01	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-10	2210682-06	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-10	2210682-06	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-10	2210682-06	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-10	2210682-06	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-10	2210682-06	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-10	2210682-06	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-10	2210682-06	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L

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MW-10	2210682-06	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-10	2210682-06	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-10	2210682-06	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-10	2210682-06	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-10	2210682-06	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-10	2210682-06	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-10	2210682-06	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-10	2210682-06	Bromomethane	5/10/2022	0.5	Y	n	u	UJ	0.50	0.20	ug/L
MW-10	2210682-06	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-10	2210682-06	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-10	2210682-06	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-10	2210682-06	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-10	2210682-06	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-10	2210682-06	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-10	2210682-06	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-10	2210682-06	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-10	2210682-06	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-10	2210682-06	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-10	2210682-06	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-10	2210682-06	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-10	2210682-06	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-10	2210682-06	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-10	2210682-06	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-10	2210682-06	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-10	2210682-06	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L

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MW-10	2210682-06	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-10	2210682-06	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-10	2210682-06	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-10	2210682-06	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-10	2210682-06	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-10	2210682-06	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-10	2210682-06	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.3	Y	y	v s				ug/L
MW-10	2210682-06	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-10	2210682-06	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-10	2210682-06	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-10	2210682-06	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-10	2210682-06	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-10	2210682-06	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-10	2210682-06	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-10	2210682-06	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-10	2210682-06	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-10	2210682-06	Toluene-d8 (Surrogate)	5/10/2022	9.7	Y	y	v s				ug/L
MW-10	2210682-06	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-10	2210682-06	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-10	2210682-06	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-10	2210682-06	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-10	2210682-06	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-10	2210682-06	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-10	2210682-06	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-10	2210682-06	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L

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MW-10	2210682-06	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-10	2210682-06	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-10	2210682-06	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-10	2210682-06	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-10	2210682-06	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-10	2210682-06	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-10	2210682-06	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-10	2210682-06	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-10	2210682-06	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-10	2210682-06	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-10	2210682-06	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-10	2210682-06	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-10	2210682-06	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-10	2210682-06	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-10	2210682-06	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-10	2210682-06	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-10	2210682-06	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-10	2210682-06	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-10	2210682-06	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-10	2210682-06	Trichloroethene	5/10/2022	0.77	Y	y	v		0.50	0.19	ug/L
MW-10	2210682-06	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-10	2210682-06	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-10	2210682-06	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-10	2210682-06	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-10	2210682-06	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L

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MW-10	2210682-06	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-10	2210682-06	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-10	2210682-06	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-10	2210682-06	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-10	2210682-06	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-10	2210682-06	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-10	2210682-06	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-10	2210682-06	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-15	2210682-07	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-15	2210682-07	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-15	2210682-07	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-15	2210682-07	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-15	2210682-07	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-15	2210682-07	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-15	2210682-07	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-15	2210682-07	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-15	2210682-07	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-15	2210682-07	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-15	2210682-07	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-15	2210682-07	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-15	2210682-07	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-15	2210682-07	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-15	2210682-07	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-15	2210682-07	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-15	2210682-07	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-15	2210682-07	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-15	2210682-07	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-15	2210682-07	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-15	2210682-07	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-15	2210682-07	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-15	2210682-07	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-15	2210682-07	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-15	2210682-07	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-15	2210682-07	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-15	2210682-07	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-15	2210682-07	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-15	2210682-07	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-15	2210682-07	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-15	2210682-07	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-15	2210682-07	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-15	2210682-07	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-15	2210682-07	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-15	2210682-07	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-15	2210682-07	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-15	2210682-07	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-15	2210682-07	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-15	2210682-07	Toluene-d8 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-15	2210682-07	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
MW-15	2210682-07	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-15	2210682-07	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-15	2210682-07	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-15	2210682-07	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-15	2210682-07	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-15	2210682-07	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-15	2210682-07	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-15	2210682-07	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-15	2210682-07	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-15	2210682-07	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-15	2210682-07	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-15	2210682-07	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-15	2210682-07	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-15	2210682-07	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-15	2210682-07	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-15	2210682-07	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-15	2210682-07	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-15	2210682-07	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-15	2210682-07	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-15	2210682-07	Bromomethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-15	2210682-07	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-15	2210682-07	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-15	2210682-07	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-15	2210682-07	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-15	2210682-07	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-15	2210682-07	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-15	2210682-07	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L

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MW-15	2210682-07	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-15	2210682-07	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-15	2210682-07	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-15	2210682-07	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-15	2210682-07	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-15	2210682-07	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-15	2210682-07	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-15	2210682-07	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-15	2210682-07	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-15	2210682-07	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-15	2210682-07	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-15	2210682-07	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-15	2210682-07	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-15	2210682-07	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-15	2210682-07	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-15	2210682-07	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-15	2210682-07	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-15	2210682-07	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-15	2210682-07	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-15	2210682-07	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-15	2210682-07	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-15	2210682-07	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-15	2210682-07	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-5	2210682-03	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-5	2210682-03	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-5	2210682-03	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-5	2210682-03	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-5	2210682-03	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-5	2210682-03	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-5	2210682-03	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-5	2210682-03	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-5	2210682-03	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-5	2210682-03	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-5	2210682-03	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-5	2210682-03	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-5	2210682-03	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-5	2210682-03	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-5	2210682-03	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-5	2210682-03	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-5	2210682-03	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-5	2210682-03	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-5	2210682-03	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-5	2210682-03	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-5	2210682-03	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.5	Y	y	v s				ug/L
MW-5	2210682-03	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-5	2210682-03	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-5	2210682-03	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-5	2210682-03	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-5	2210682-03	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-5	2210682-03	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-5	2210682-03	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-5	2210682-03	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-5	2210682-03	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-5	2210682-03	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-5	2210682-03	Toluene-d8 (Surrogate)	5/10/2022	9.9	Y	y	v s				ug/L
MW-5	2210682-03	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-5	2210682-03	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-5	2210682-03	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-5	2210682-03	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-5	2210682-03	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-5	2210682-03	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-5	2210682-03	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-5	2210682-03	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-5	2210682-03	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-5	2210682-03	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-5	2210682-03	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-5	2210682-03	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-5	2210682-03	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-5	2210682-03	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-5	2210682-03	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-5	2210682-03	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-5	2210682-03	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-5	2210682-03	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-5	2210682-03	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-5	2210682-03	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-5	2210682-03	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-5	2210682-03	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-5	2210682-03	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-5	2210682-03	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-5	2210682-03	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-5	2210682-03	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-5	2210682-03	Bromomethane	5/10/2022	0.5	Y	n	u	UJ	0.50	0.20	ug/L
MW-5	2210682-03	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-5	2210682-03	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-5	2210682-03	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-5	2210682-03	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-5	2210682-03	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-5	2210682-03	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-5	2210682-03	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-5	2210682-03	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-5	2210682-03	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-5	2210682-03	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-5	2210682-03	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-5	2210682-03	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-5	2210682-03	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-5	2210682-03	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-5	2210682-03	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-5	2210682-03	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-5	2210682-03	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-5	2210682-03	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-5	2210682-03	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-5	2210682-03	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-5	2210682-03	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-5	2210682-03	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-5	2210682-03	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-5	2210682-03	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-5	2210682-03	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-5	2210682-03	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-5	2210682-03	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-5	2210682-03	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-5	2210682-03	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-5	2210682-03	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-5	2210682-03	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-8	2210682-04	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-8	2210682-04	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-8	2210682-04	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-8	2210682-04	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-8	2210682-04	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-8	2210682-04	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-8	2210682-04	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-8	2210682-04	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-8	2210682-04	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-8	2210682-04	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-8	2210682-04	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-8	2210682-04	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-8	2210682-04	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-8	2210682-04	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-8	2210682-04	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-8	2210682-04	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-8	2210682-04	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-8	2210682-04	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-8	2210682-04	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-8	2210682-04	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-8	2210682-04	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-8	2210682-04	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-8	2210682-04	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-8	2210682-04	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-8	2210682-04	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-8	2210682-04	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-8	2210682-04	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-8	2210682-04	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-8	2210682-04	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-8	2210682-04	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-8	2210682-04	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.2	Y	y	v s				ug/L
MW-8	2210682-04	Toluene-d8 (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
MW-8	2210682-04	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-8	2210682-04	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-8	2210682-04	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-8	2210682-04	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-8	2210682-04	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-8	2210682-04	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-8	2210682-04	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-8	2210682-04	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-8	2210682-04	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-8	2210682-04	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-8	2210682-04	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-8	2210682-04	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-8	2210682-04	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-8	2210682-04	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-8	2210682-04	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-8	2210682-04	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-8	2210682-04	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-8	2210682-04	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-8	2210682-04	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-8	2210682-04	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-8	2210682-04	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-8	2210682-04	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-8	2210682-04	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-8	2210682-04	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-8	2210682-04	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-8	2210682-04	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-8	2210682-04	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-8	2210682-04	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-8	2210682-04	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-8	2210682-04	Bromomethane	5/10/2022	0.5	Y	n	u	UJ	0.50	0.20	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-8	2210682-04	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
MW-8	2210682-04	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-8	2210682-04	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-8	2210682-04	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-8	2210682-04	Chloroform	5/10/2022	0.15	Y	y	v j		0.50	0.14	ug/L
MW-8	2210682-04	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-8	2210682-04	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-8	2210682-04	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-8	2210682-04	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-8	2210682-04	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-8	2210682-04	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-8	2210682-04	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-8	2210682-04	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-8	2210682-04	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-8	2210682-04	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-8	2210682-04	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-8	2210682-04	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-8	2210682-04	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-8	2210682-04	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-8	2210682-04	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-8	2210682-04	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-8	2210682-04	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-8	2210682-04	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-8	2210682-04	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-8	2210682-04	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-8	2210682-04	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-8	2210682-04	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-8	2210682-04	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-9	2210682-05	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
MW-9	2210682-05	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-9	2210682-05	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-9	2210682-05	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-9	2210682-05	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-9	2210682-05	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-9	2210682-05	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-9	2210682-05	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-9	2210682-05	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-9	2210682-05	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-9	2210682-05	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-9	2210682-05	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-9	2210682-05	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-9	2210682-05	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-9	2210682-05	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-9	2210682-05	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-9	2210682-05	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-9	2210682-05	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-9	2210682-05	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-9	2210682-05	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-9	2210682-05	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
MW-9	2210682-05	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L

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MW-9	2210682-05	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-9	2210682-05	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-9	2210682-05	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-9	2210682-05	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
MW-9	2210682-05	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
MW-9	2210682-05	Bromomethane	5/10/2022	0.5	Y	n	u	UJ	0.50	0.20	ug/L
MW-9	2210682-05	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-9	2210682-05	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-9	2210682-05	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-9	2210682-05	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-9	2210682-05	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
MW-9	2210682-05	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-9	2210682-05	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-9	2210682-05	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-9	2210682-05	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-9	2210682-05	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
MW-9	2210682-05	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-9	2210682-05	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
MW-9	2210682-05	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
MW-9	2210682-05	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-9	2210682-05	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-9	2210682-05	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
MW-9	2210682-05	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-9	2210682-05	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
MW-9	2210682-05	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L

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MW-9	2210682-05	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
MW-9	2210682-05	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
MW-9	2210682-05	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
MW-9	2210682-05	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
MW-9	2210682-05	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
MW-9	2210682-05	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
MW-9	2210682-05	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
MW-9	2210682-05	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
MW-9	2210682-05	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L
MW-9	2210682-05	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
MW-9	2210682-05	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
MW-9	2210682-05	Toluene-d8 (Surrogate)	5/10/2022	9.9	Y	y	v s				ug/L
MW-9	2210682-05	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.6	Y	y	v s				ug/L
MW-9	2210682-05	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
MW-9	2210682-05	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
MW-9	2210682-05	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
MW-9	2210682-05	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
MW-9	2210682-05	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
MW-9	2210682-05	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
MW-9	2210682-05	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
MW-9	2210682-05	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-9	2210682-05	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
MW-9	2210682-05	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
MW-9	2210682-05	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-9	2210682-05	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L

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MW-9	2210682-05	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-9	2210682-05	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
MW-9	2210682-05	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-9	2210682-05	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-9	2210682-05	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
MW-9	2210682-05	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-9	2210682-05	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
MW-9	2210682-05	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
MW-9	2210682-05	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
MW-9	2210682-05	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
MW-9	2210682-05	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
MW-9	2210682-05	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
MW-9	2210682-05	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
MW-9	2210682-05	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
MW-9	2210682-05	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
MW-9	2210682-05	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
MW-9	2210682-05	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
MW-9	2210682-05	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
TB-9-05052022	2210682-02	cis-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-9-05052022	2210682-02	1,1,1,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-9-05052022	2210682-02	Styrene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
TB-9-05052022	2210682-02	n-Propylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.12	ug/L
TB-9-05052022	2210682-02	Naphthalene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
TB-9-05052022	2210682-02	Methyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-9-05052022	2210682-02	Methylene chloride	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L

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TB-9-05052022	2210682-02	p-Isopropyltoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-9-05052022	2210682-02	Isopropylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-9-05052022	2210682-02	Hexachlorobutadiene	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L
TB-9-05052022	2210682-02	1,3-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.16	ug/L
TB-9-05052022	2210682-02	trans-1,3-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-9-05052022	2210682-02	Toluene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-9-05052022	2210682-02	1,1-Dichloropropene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-9-05052022	2210682-02	2,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
TB-9-05052022	2210682-02	1,2-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-9-05052022	2210682-02	cis-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
TB-9-05052022	2210682-02	1,1-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
TB-9-05052022	2210682-02	1,2-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-9-05052022	2210682-02	1,1-Dichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-9-05052022	2210682-02	Dichlorodifluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-9-05052022	2210682-02	1,4-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-9-05052022	2210682-02	Ethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-9-05052022	2210682-02	1,3,5-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-9-05052022	2210682-02	Hexachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
TB-9-05052022	2210682-02	Ethyl t-butyl ether	5/10/2022	0.5	Y	n	u		0.50	0.32	ug/L
TB-9-05052022	2210682-02	Ethyl methacrylate	5/10/2022	4	Y	n	u		4.0	1.3	ug/L
TB-9-05052022	2210682-02	Diethyl ether	5/10/2022	2	Y	n	u		2.0	0.33	ug/L
TB-9-05052022	2210682-02	trans-1,4-Dichloro-2-butene	5/10/2022	5	Y	n	u		5.0	1.8	ug/L
TB-9-05052022	2210682-02	Carbon disulfide	5/10/2022	0.5	Y	n	u		0.50	0.48	ug/L
TB-9-05052022	2210682-02	t-Butyl alcohol	5/10/2022	2	Y	n	u		2.0	2.0	ug/L
TB-9-05052022	2210682-02	t-Amyl Methyl ether	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L

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TB-9-05052022	2210682-02	Allyl chloride	5/10/2022	5	Y	n	u		5.0	0.47	ug/L
TB-9-05052022	2210682-02	Acrylonitrile	5/10/2022	5	Y	n	u		5.0	1.5	ug/L
TB-9-05052022	2210682-02	1,1,2,2-Tetrachloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-9-05052022	2210682-02	Vinyl chloride	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
TB-9-05052022	2210682-02	Tetrachloroethene	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
TB-9-05052022	2210682-02	1,2,4-Trimethylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-9-05052022	2210682-02	1,1,2-Trichloro-1,2,2-trifluoroethane	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-9-05052022	2210682-02	1,2,3-Trichloropropane	5/10/2022	1	Y	n	u		1.0	0.78	ug/L
TB-9-05052022	2210682-02	Trichlorofluoromethane	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-9-05052022	2210682-02	Trichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-9-05052022	2210682-02	1,1,2-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-9-05052022	2210682-02	1,1,1-Trichloroethane	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-9-05052022	2210682-02	1,2,4-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-9-05052022	2210682-02	1,2,3-Trichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.19	ug/L
TB-9-05052022	2210682-02	trans-1,2-Dichloroethene	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-9-05052022	2210682-02	Acetone	5/10/2022	10	Y	n	u		10	6.6	ug/L
TB-9-05052022	2210682-02	1,3-Dichloropropane	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-9-05052022	2210682-02	Methyl ethyl ketone	5/10/2022	5	Y	n	u		5.0	3.3	ug/L
TB-9-05052022	2210682-02	Methyl iodide	5/10/2022	2	Y	n	u	UJ	2.0	1.1	ug/L
TB-9-05052022	2210682-02	Methyl isobutyl ketone	5/10/2022	5	Y	n	u		5.0	2.4	ug/L
TB-9-05052022	2210682-02	Methyl methacrylate	5/10/2022	5	Y	n	u		5.0	1.2	ug/L
TB-9-05052022	2210682-02	Pentachloroethane	5/10/2022	2	Y	n	u	UJ	2.0	0.63	ug/L
TB-9-05052022	2210682-02	Propionitrile	5/10/2022	20	Y	n	u		20	6.2	ug/L
TB-9-05052022	2210682-02	Tetrahydrofuran	5/10/2022	20	Y	n	u		20	5.2	ug/L
TB-9-05052022	2210682-02	p- & m-Xylenes	5/10/2022	0.5	Y	n	u		0.50	0.34	ug/L

SDG: 2210682

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
TB-9-05052022	2210682-02	Methacrylonitrile	5/10/2022	10	Y	n	u		10	2.3	ug/L
TB-9-05052022	2210682-02	1,2-Dichloroethane-d4 (Surrogate)	5/10/2022	10	Y	y	v s				ug/L
TB-9-05052022	2210682-02	o-Xylene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L
TB-9-05052022	2210682-02	2-Hexanone	5/10/2022	10	Y	n	u		10	5.0	ug/L
TB-9-05052022	2210682-02	Chloroacetonitrile	5/10/2022	0	Y	y	v				ug/L
TB-9-05052022	2210682-02	2-Nitropropane	5/10/2022	0	Y	y	v				ug/L
TB-9-05052022	2210682-02	Nitrobenzene	5/10/2022	0	Y	y	v				ug/L
TB-9-05052022	2210682-02	1-Chlorobutane	5/10/2022	0	Y	y	v				ug/L
TB-9-05052022	2210682-02	1,1-Dichloropropanone	5/10/2022	0	Y	y	v				ug/L
TB-9-05052022	2210682-02	Methyl acrylate	5/10/2022	0	Y	y	v				ug/L
TB-9-05052022	2210682-02	4-Bromofluorobenzene (Surrogate)	5/10/2022	9.6	Y	y	v s				ug/L
TB-9-05052022	2210682-02	Toluene-d8 (Surrogate)	5/10/2022	9.8	Y	y	v s				ug/L
TB-9-05052022	2210682-02	1,2-Dichlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.21	ug/L
TB-9-05052022	2210682-02	4-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.093	ug/L
TB-9-05052022	2210682-02	Dibromomethane	5/10/2022	0.5	Y	n	u		0.50	0.23	ug/L
TB-9-05052022	2210682-02	1,2-Dibromoethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
TB-9-05052022	2210682-02	1,2-Dibromo-3-chloropropane	5/10/2022	1	Y	n	u		1.0	0.89	ug/L
TB-9-05052022	2210682-02	Dibromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.22	ug/L
TB-9-05052022	2210682-02	Benzene	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
TB-9-05052022	2210682-02	2-Chlorotoluene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-9-05052022	2210682-02	Chloromethane	5/10/2022	0.5	Y	n	u		0.50	0.11	ug/L
TB-9-05052022	2210682-02	Chloroform	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-9-05052022	2210682-02	Chloroethane	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-9-05052022	2210682-02	Chlorobenzene	5/10/2022	0.5	Y	n	u		0.50	0.14	ug/L
TB-9-05052022	2210682-02	Bromodichloromethane	5/10/2022	0.5	Y	n	u		0.50	0.20	ug/L

SDG: 2210682

Analytical Method EPA-524.2

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
TB-9-05052022	2210682-02	Bromobenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-9-05052022	2210682-02	Bromochloromethane	5/10/2022	0.5	Y	n	u		0.50	0.27	ug/L
TB-9-05052022	2210682-02	Carbon tetrachloride	5/10/2022	0.5	Y	n	u		0.50	0.17	ug/L
TB-9-05052022	2210682-02	Bromoform	5/10/2022	0.5	Y	n	u		0.50	0.46	ug/L
TB-9-05052022	2210682-02	Bromomethane	5/10/2022	0.5	Y	n	u	UJ	0.50	0.20	ug/L
TB-9-05052022	2210682-02	n-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.15	ug/L
TB-9-05052022	2210682-02	tert-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.18	ug/L
TB-9-05052022	2210682-02	sec-Butylbenzene	5/10/2022	0.5	Y	n	u		0.50	0.13	ug/L

Analytical Method SM-2320B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-6-2Q22	2210682-09	Total Alkalinity as CaCO3	5/11/2022	180	Y	y	v		4.1	4.1	mg/L
DUP-6-2Q22	2210682-09	Bicarbonate	5/11/2022	210	Y	y	v		5.0	5.0	mg/L
DUP-6-2Q22	2210682-09	Carbonate	5/11/2022	2.5	Y	n	u		2.5	2.5	mg/L
DUP-7-2Q22	2210682-10	Total Alkalinity as CaCO3	5/11/2022	190	Y	y	v		4.1	4.1	mg/L
DUP-7-2Q22	2210682-10	Carbonate	5/11/2022	2.5	Y	n	u		2.5	2.5	mg/L
DUP-7-2Q22	2210682-10	Bicarbonate	5/11/2022	230	Y	y	v		5.0	5.0	mg/L
EB-9-050522	2210682-08	Bicarbonate	5/11/2022	6.6	Y	y	v		5.0	5.0	mg/L
EB-9-050522	2210682-08	Carbonate	5/11/2022	2.5	Y	n	u		2.5	2.5	mg/L
EB-9-050522	2210682-08	Total Alkalinity as CaCO3	5/11/2022	5.4	Y	y	v		4.1	4.1	mg/L
MW-1	2210682-01	Bicarbonate	5/11/2022	270	Y	y	v		5.0	5.0	mg/L
MW-1	2210682-01	Carbonate	5/11/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-1	2210682-01	Total Alkalinity as CaCO3	5/11/2022	220	Y	y	v		4.1	4.1	mg/L
MW-15	2210682-07	Bicarbonate	5/11/2022	240	Y	y	v		5.0	5.0	mg/L
MW-15	2210682-07	Carbonate	5/11/2022	2.5	Y	n	u		2.5	2.5	mg/L

SDG: 2210682

Analytical Method SM-2320B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
MW-15	2210682-07	Total Alkalinity as CaCO3	5/11/2022	190	Y	y	v		4.1	4.1	mg/L
MW-9	2210682-05	Bicarbonate	5/11/2022	220	Y	y	v		5.0	5.0	mg/L
MW-9	2210682-05	Carbonate	5/11/2022	2.5	Y	n	u		2.5	2.5	mg/L
MW-9	2210682-05	Total Alkalinity as CaCO3	5/11/2022	180	Y	y	v		4.1	4.1	mg/L

Analytical Method SRL 524M

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	RL	MDL	Units
DUP-6-2Q22	2210682-09	1,2,3-Trichloropropane	5/10/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
DUP-7-2Q22	2210682-10	1,2,3-Trichloropropane	5/10/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
EB-9-050522	2210682-08	1,2,3-Trichloropropane	5/10/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-1	2210682-01	1,2,3-Trichloropropane	5/10/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-15	2210682-07	1,2,3-Trichloropropane	5/10/2022	0.005	Y	n	u		0.0050	0.0010	ug/L
MW-9	2210682-05	1,2,3-Trichloropropane	5/10/2022	0.005	Y	n	u		0.0050	0.0010	ug/L

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Tidewater, Inc.
3761 Attucks Drive
Powell, OH 43065
ATTN: Mr. David Conner
David.Conner@tideh2o.net

November 2, 2022

SUBJECT: NASA JPL, 2Q2022 - Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on June 9, 2022. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #54411:

SDG #	Fraction
2209623, 2209731, 2209865, 2209976, 2210072	Volatiles, 1,2,3-Trichloropropane, 1,4-Dioxane, Metals, Wet Chemistry

The data validation was performed under Level III &IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017)
- USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017)

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

1,593 pages-ADV

Attachment 1

90/10 III/IV (client select) EDD

LDC# 54411 (Tidewater - Powell, OH / NASA JPL, 2Q2022)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (524.2)		1,2,3-TCP (524M)		1,4-Dioxane (8270C)		Metals (200.7 /200.8)		Alk. (2320B)		Cl,SO_4 NO_3-N (300.0)		NO_2-N (353.2)		O-PO_4-P (365.1)		Cr(VI) (218.6)		CLO_4 (314.0)		TDS (160.1)		pH (150.1)											
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	2209623	06/09/22	06/30/22	13	0	12	0	1	0	12	0	12	0	12	0	12	0	1	0	12	0	12	0	12	0	12	0										
A	2209623	06/09/22	06/30/22	1	0	1	0	0	0	1	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	1	0										
B	2209731	06/09/22	06/30/22	10	0	9	0	-	-	9	0	9	0	9	0	9	0	-	-	9	0	9	0	9	0	9	0										
B	2209731	06/09/22	06/30/22	1	0	1	0	-	-	1	0	1	0	1	0	1	0	-	-	1	0	1	0	1	0	1	0										
C	2209865	06/09/22	06/30/22	11	0	10	0	-	-	10	0	10	0	10	0	10	0	-	-	10	0	10	0	10	0	10	0										
D	2209976	06/09/22	06/30/22	9	0	8	0	1	0	8	0	8	0	8	0	8	0	1	0	8	0	8	0	8	0	8	0										
D	2209976	06/09/22	06/30/22	1	0	1	0	0	0	1	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	1	0										
E	2210072	06/09/22	06/30/22	7	0	6	0	-	-	6	0	6	0	6	0	6	0	-	-	6	0	6	0	6	0	6	0										
E	2210072	06/09/22	06/30/22	1	0	1	0	-	-	1	0	1	0	1	0	1	0	-	-	1	0	1	0	1	0	1	0										
Total	T/PG			54	0	49	0	2	0	49	0	49	0	49	0	49	0	2	0	49	0	49	0	49	0	49	0	0	0	0	0	0	0	0	0	0	499

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS/MSD, and DUPs

V:\LOGIN\Tidewater\NASA JPL\54411ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: July 26, 2022

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209623

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-1-042522	2209623-01	Water	04/25/22
MW-23-5	2209623-02	Water	04/25/22
MW-23-4	2209623-03	Water	04/25/22
MW-23-3	2209623-04	Water	04/25/22
MW-23-2	2209623-05	Water	04/25/22
DUP-1-22Q2	2209623-06	Water	04/25/22
MW-23-1	2209623-07	Water	04/25/22
MW-24-4	2209623-08	Water	04/25/22
MW-24-5	2209623-09	Water	04/25/22
MW-24-3**	2209623-10**	Water	04/25/22
MW-24-2	2209623-11	Water	04/25/22
MW-24-1	2209623-12	Water	04/25/22
EB-1-042522	2209623-13	Water	04/25/22
SB-1-042522	2209623-14	Water	04/25/22
MW-24-2MS	2209623-11MS	Water	04/25/22
MW-24-2MSD	2209623-11MSD	Water	04/25/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990 with the following exceptions:

Date	Analyte	r^2	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	0.989 (≥0.990)	All samples in SDG 2209623	UJ (all non-detects)	P

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	38.7	All samples in SDG 2209623	UJ (all non-detects)	P

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
04/26/22	Methyl iodide	37.7	All samples in SDG 2209623	UJ (all non-detects)	P

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample TB-1-042522 was identified as a trip blank. No contaminants were found.

Sample EB-1-042522 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-1-042522	04/25/22	Toluene	0.41 ug/L	MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-22Q2 MW-23-1 MW-24-4 MW-24-5 MW-24-3** MW-24-2 MW-24-1

Sample SB-1-042522 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
SB-1-042522	04/25/22	Toluene	0.41 ug/L	MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-22Q2 MW-23-1 MW-24-4 MW-24-5 MW-24-3** MW-24-2 MW-24-1

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-23-2 and DUP-1-22Q2 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-23-2	DUP-1-22Q2	
Chloroform	0.39	0.38	3
1,1-Dichloroethane	0.16	0.15U	Not calculable
Tetrachloroethene	0.29	0.23	23
Trichloroethene	0.63	0.62	2

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All analyte quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to initial calibration r^2, ICV %D, and continuing calibration %D, data were qualified as estimated in fourteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Volatiles - Data Qualification Summary - SDG 2209623

Sample	Analyte	Flag	A or P	Reason
TB-1-042522 MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-22Q2 MW-23-1 MW-24-4 MW-24-5 MW-24-3** MW-24-2 MW-24-1 EB-1-042522 SB-1-042522	Methyl iodide	UJ (all non-detects)	P	Initial calibration (r^2)
TB-1-042522 MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-22Q2 MW-23-1 MW-24-4 MW-24-5 MW-24-3** MW-24-2 MW-24-1 EB-1-042522 SB-1-042522	Methyl iodide	UJ (all non-detects)	P	Initial calibration verification (%D)
TB-1-042522 MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-22Q2 MW-23-1 MW-24-4 MW-24-5 MW-24-3** MW-24-2 MW-24-1 EB-1-042522 SB-1-042522	Methyl iodide	UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 2Q2022
Volatiles - Laboratory Blank Data Qualification Summary - SDG 2209623

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
Volatiles - Field Blank Data Qualification Summary - SDG 2209623

No Sample Data Qualified in this SDG

LDC #: 54411A1a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/22
SDG #: 2209623 Level III/IV Page: 1 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer:
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW SW	%RSD ≤ 20, r² ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks SW	~~ND~~	TB* = 1 EB = 13 SB = 14
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	
X.	Field duplicates	SW	D = 5, 6
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	TB-1-042522	2209623-01	Water	04/25/22
2	MW-23-5	2209623-02	Water	04/25/22
3	MW-23-4	2209623-03	Water	04/25/22
4	MW-23-3	2209623-04	Water	04/25/22
5	MW-23-2	2209623-05	Water	04/25/22
6	DUP-1-22Q2	2209623-06	Water	04/25/22
7	MW-23-1	2209623-07	Water	04/25/22
8	MW-24-4	2209623-08	Water	04/25/22
9	MW-24-5	2209623-09	Water	04/25/22
10	MW-24-3**	2209623-10**	Water	04/25/22
11	MW-24-2	2209623-11	Water	04/25/22
12	MW-24-1	2209623-12	Water	04/25/22
13	EB-1-042522	2209623-13	Water	04/25/22
14	SB-1-042522	2209623-14	Water	04/25/22

LDC #: 54411A1a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/22
SDG #: 2209623 Level III/IV Page: 2 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: FT
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
15	MW-24-2MS	2209623-11MS	Water	04/25/22
16	MW-24-2MSD	2209623-11MSD	Water	04/25/22
17				
18				
19				

Notes:

	B137883- BLK1						

LDC #: 54411A1a

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: A

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	.	✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?		✓		
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓		.	
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54411A1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15, 20, 15 RSD% and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit:_____)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	4/4/22	ICAL-V5	Methyl Iodide		0.989 (I 0.990)	All	J/UJ/~~A~~ P ND

LDC #: 54411A1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?

Y N N/A Were all %D within the validation criteria of ≤20 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0% / 30%)	Associated Samples	Qualifications
	4/4/22 1446	ICV-X5	Methyl Iodide	38.7	All	J/UJ/A P ND

LDC #: 54411A1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤~~20 %~~D and ≥0.05 RRF ? 30%

#	Date	Standard ID	Compound	Finding %D (Limit: <~~20.0%~~) 30%	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	4/26/22 0607	CCV - Y5	Methyl Iodide	37.7 (≤30%)		All	J/UJ/~~A~~ P ND

LDC #: 54411A1a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 4/25/12
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: EB Associated Samples: 2 → 12 (ND)

Compound	Blank ID	Sample Identification								
	13	5X								
CC	0.36	1.8								

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 4/25/12
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: SB Associated Samples: ~~13 X~~ 2-12

Compound	Blank ID	Sample Identification								
	14			T3						
CC	0.41			0.36J						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC#:_54411A1a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:__FT____

METHOD: GCMS VOA (EPA Method 524.2)

Compound	Concentration (ug/L)		RPD
	5	6	
K	0.39	0.38	3
I	0.16	0.15U	NC
AA	0.29	0.23	23
S	0.63	0.62	2

METHOD: GCMS 524.2

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

RRF = (Ax)(Cis)/(Ais)(Cx)
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

Where:
Ax = Area of compound
Cx = Concentration of compound
S = Standard deviation of the RRFs
X = Mean of the RRFs
Ais = Area of associated internal standard
Cis = Concentration of internal Standard

#	Standard ID	Calibration Date	Compound	Reported (RRF 10 std)	Recalculated (RRF 10 std)	Reported AverageRRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
	ICAL MSV5	4/4/2022	I	0.8519021	0.8519021	0.8428623	0.8428623	4.57114	4.57114
			CC	0.8205145	0.8205145	0.8119389	0.8119389	9.41256	9.41256
			BB	0.5189625	0.5189625	0.5220887	0.5220887	10.54667	10.54667

LDC #: 54411A1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV	4/26/22 0542	I (1st internal standard)	0.8428623	0.8526255	0.8526255	1.2	1.2
			CC (2nd internal standard)	0.8119389	0.7577576	0.7577576	6.7	6.7
			BB (3rd internal standard)	0.5220887	0.5374535	0.5374535	2.9	2.9
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411 A1a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #7

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane	10.0				
1,2-Dichloroethane-d4	↓	9.41	94.1	94.1	0
Toluene-d8		9.85	98.5	98.5	↓
Bromofluorobenzene		9.13	91.3	91.3	

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID: 10

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4	10.0	9.77	97.7	97.7	0
Toluene-d8	↓	9.85	98.5	98.5	↓
Bromofluorobenzene		9.16	91.6	91.6	

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 54411 A1a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD sample: 15 +16

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
✓	25.0	25.0	ND	23.390	F1 24.030 96.1	93.6	93.6	96.1	96.1	2.70	2.70
P				22.790	93.0 23.250	91.2	91.2	93.0	93.0	2.00	2.0
DD				23.330	94.4 23.600	93.3	93.3	94.4	94.4	1.15	1.15
D				24.740	99.9 24.980	99.0	99.0	99.9	99.9	0.965	0.965
HHH	↓	↓	↓	22.490	92. 23.0	90.0	90.0	92.3	92.3	2.55	2.55

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411A1a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: B137883 LCS

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
V	25.0	~~25.0~~ NA	23.590	NA	944	~~94~~ 94.4				
P	↓	↓	22.740	↓	910	91.0				
DD			22.920		917	91.7				
D			24.990		100	100				
HHH	↓	↓	22.310	↓	89.2	89.2	NA			

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411A1a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FM

METHOD: GC/MS 524.2

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. ~~#5~~ 10, ~~K~~ I

Conc. = $\frac{(4331)(10.0)}{FM\ \cancel{288}(287234)(0.84284623)}$

= 0.17889 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	~~#5~~	~~K~~	~~0.39~~	0.17889	
	10	I	0.18		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: July 26, 2022

Parameters: 1,2,3-Trichloropropane

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209623

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-23-5	2209623-02	Water	04/25/22
MW-23-4	2209623-03	Water	04/25/22
MW-23-3	2209623-04	Water	04/25/22
MW-23-2	2209623-05	Water	04/25/22
DUP-1-22Q2	2209623-06	Water	04/25/22
MW-23-1	2209623-07	Water	04/25/22
MW-24-4	2209623-08	Water	04/25/22
MW-24-5	2209623-09	Water	04/25/22
MW-24-3**	2209623-10**	Water	04/25/22
MW-24-2	2209623-11	Water	04/25/22
MW-24-1	2209623-12	Water	04/25/22
EB-1-042522	2209623-13	Water	04/25/22
SB-1-042522	2209623-14	Water	04/25/22
MW-24-2MS	2209623-11MS	Water	04/25/22
MW-24-2MSD	2209623-11MSD	Water	04/25/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,2,3-Trichloropropane by Environmental Protection Agency (EPA) Method 524 Modified

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB-1-042522 was identified as an equipment blank. No contaminants were found.

Sample SB-1-042522 was identified as a source blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-23-2 and DUP-1-22Q2 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All analyte quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

Manual integrations were reviewed and were considered acceptable. The laboratory provided before and after integration printouts.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Data Qualification Summary - SDG 2209731

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Laboratory Blank Data Qualification Summary - SDG 2209731

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Field Blank Data Qualification Summary - SDG 2209731

No Sample Data Qualified in this SDG

LDC #: 54411A1b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/22
SDG #: 2209623 Level III/IV Page: 1 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer:
2nd Reviewer:

METHOD: GC/MS 1,2,3-Trichloropropane (EPA Method 524M)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤20 ICV ≤30
IV.	Continuing calibration	A	CCV ≤30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=12 SB=13
VII.	Surrogate spikes	N	not required
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D=4.5
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation. MI
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-23-5	2209623-02	Water	04/25/22
2	MW-23-4	2209623-03	Water	04/25/22
3	MW-23-3	2209623-04	Water	04/25/22
4	MW-23-2	2209623-05	Water	04/25/22
5	DUP-1-22Q2	2209623-06	Water	04/25/22
6	MW-23-1	2209623-07	Water	04/25/22
7	MW-24-4	2209623-08	Water	04/25/22
8	MW-24-5	2209623-09	Water	04/25/22
9	MW-24-3**	2209623-10**	Water	04/25/22
10	MW-24-2	2209623-11	Water	04/25/22
11	MW-24-1	2209623-12	Water	04/25/22
12	EB-1-042522	2209623-13	Water	04/25/22
13	SB-1-042522	2209623-14	Water	04/25/22
14	MW-24-2MS	2209623-11MS	Water	04/25/22

LDC #: 54411A1b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/22
SDG #: 2209623 Level III/IV Page: 2 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: CF
2nd Reviewer:

METHOD: GC/MS 1,2,3-Trichloropropane (EPA Method 524M)

	Client ID	Lab ID	Matrix	Date
15	MW-24-2MSD	2209623-11MSD	Water	04/25/22
16				
17				
18				

Notes:

	~~B138643~~						
	B138048						

LDC #: 54411A1b

VALIDATION FINDINGS CHECKLIST

Reviewer: MT

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?	✓			
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?			✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓		•	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?	✓		✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54411 A1b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50U std)	Recalc RRF (50U std)	Reported Average RRF (initial)	Recalc Average RRF (initial)	Reported %RSD	Recalc %RSD
1	ICAL Y16	4/27/22	XX (1st internal standard)	1.29844	1.29844	1.18951	1.18951	12.64788	12.64788
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						

LDC #: 54411A1b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	4/27/22 1243 CCV	4/27/22	XX (1st internal standard)	1.18951	1.155352	1.155352	2.9	2.9
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
2	4/28/22 0004 CCV	4/28/22	XX (1st internal standard)	↓	1.180758	1.180758	0.7	0.7
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411A16

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC)

MSC = Matrix spike concentration; MSDC = Matrix spike duplicate concentration

MS/MSD sample: 14 + 15

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
XX	0.050	0.050	ND	0.0525	0.0491	105	105	98.3	98.3	6.67	6.67

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411 A1b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: B138048-BS1

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
XX	0.05	NA	0.05284	NA	106	106	NA			

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411 A1b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: [illegible]

METHOD: GC MS 524M

(Y) N N/A Were all reported results recalculated and verified for all level IV samples?
(Y) N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. B138048-BS1 XX

Conc. = $\frac{(17058)(50)}{(13569)(1.18951)(1000)}$

= 0.05284 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	BS1	XX	0.05284	0.05284	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2020

LDC Report Date: July 26, 2022

Parameters: 1,4-Dioxane

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 2209623

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-24-1	2209623-12	Water	04/25/22

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270C

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2020
1,4-Dioxane - Data Qualification Summary - SDG 2209623

No Sample Data Qualified in this SDG

NASA JPL, 2Q2020
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG 2209623

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,4-Dioxane - Field Blank Data Qualification Summary - SDG 2209623

No Sample Data Qualified in this SDG

LDC #: 54411A2c **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/22
SDG #: 2209623 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer:
2nd Reviewer:

METHOD: GC/MS 1,4-Dioxane (EPA SW-846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A /A	%RSD ≤ 20 r² ICV ≤ 20
IV.	Continuing calibration	A	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	A	LCSD
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	MW-24-1	2209623-12	Water	04/25/22
2				
3				
4				
5				
6				
7				
8				
9				

Notes:

	B138836						

LDC Report# 54411A4a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 14, 2022

Parameters: Metals

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209623

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-23-5	2209623-02	Water	04/25/22
MW-23-4	2209623-03	Water	04/25/22
MW-23-3	2209623-04	Water	04/25/22
MW-23-2	2209623-05	Water	04/25/22
DUP-1-2Q22	2209623-06	Water	04/25/22
MW-23-1	2209623-07	Water	04/25/22
MW-24-4	2209623-08	Water	04/25/22
MW-24-5	2209623-09	Water	04/25/22
MW-24-3**	2209623-10**	Water	04/25/22
MW-24-2	2209623-11	Water	04/25/22
MW-24-1	2209623-12	Water	04/25/22
EB-1-042522	2209623-13	Water	04/25/22
SB-1-042522	2209623-14	Water	04/25/22
MW-24-3MS	2209623-10MS	Water	04/25/22
MW-24-3MSD	2209623-10MSD	Water	04/25/22
MW-24-3DUP	2209623-10DUP	Water	04/25/22
MW-24-2MS	2209623-11MS	Water	04/25/22
MW-24-2MSD	2209623-11MSD	Water	04/25/22
MW-24-2DUP	2209623-11DUP	Water	04/25/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Calcium, Chromium, Iron, Lead, Magnesium, Potassium, and Sodium by Environmental Protection Agency (EPA) Methods 200.7 and 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
04/27/22	2207953-CCVI (15:54)	Chromium	89 (90-110)	MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-2Q22 MW-23-1 MW-24-4 MW-24-5 MW-24-3**	J (all detects) UJ (all non-detects)	A

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis was not required by the method.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Calcium	0.023617 mg/L	MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-2Q22 MW-23-1 MW-24-4 MW-24-5 MW-24-2

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Calcium	0.027498 mg/L	MW-24-3** MW-24-1 EB-1-042522 SB-1-042522
ICB/CCB	Sodium Potassium	0.070875 mg/L 0.11728 mg/L	EB-1-042522 SB-1-042522

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-1-042522	Calcium	0.042 mg/L	0.042U mg/L
SB-1-042522	Calcium	0.021 mg/L	0.021U mg/L

VI. Field Blanks

Sample EB-1-042522 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-1-042522	04/25/22	Calcium Sodium	0.042 mg/L 0.077 mg/L	MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-2Q22 MW-23-1 MW-24-4 MW-24-5 MW-24-3** MW-24-2 MW-24-1

Sample SB-1-042522 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
SB-1-042522	04/25/22	Calcium	0.021 mg/L	MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-2Q22 MW-23-1 MW-24-4 MW-24-5 MW-24-3** MW-24-2 MW-24-1

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. For MW-24-2MS/MSD, no data were qualified for calcium and sodium percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples MW-23-2 and DUP-1-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-23-2	DUP-1-2Q22	
Iron	30U ug/L	33 ug/L	Not calculable
Arsenic	1.2 ug/L	0.70U ug/L	Not calculable
Chromium	1.2 ug/L	1.5 ug/L	22
Calcium	120 mg/L	120 mg/L	0
Magnesium	40 mg/L	39 mg/L	3
Sodium	33 mg/L	33 mg/L	0
Potassium	2.5 mg/L	2.5 mg/L	0

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to instrument calibration %R, data were qualified as estimated in nine samples.

Due to laboratory blank contamination, data were qualified as not detected in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Metals - Data Qualification Summary - SDG 2209623

Sample	Analyte	Flag	A or P	Reason
MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-2Q22 MW-23-1 MW-24-4 MW-24-5 MW-24-3**	Chromium	J (all detects) UJ (all non-detects)	A	Instrument calibration (%R)

NASA JPL, 2Q2022
Metals - Laboratory Blank Data Qualification Summary - SDG 2209623

Sample	Analyte	Modified Final Concentration	A or P
EB-1-042522	Calcium	0.042U mg/L	A
SB-1-042522	Calcium	0.021U mg/L	A

NASA JPL, 2Q2022
Metals - Field Blank Data Qualification Summary - SDG 2209623

No Sample Data Qualified in this SDG

LDC #: 54411A4a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/5/22
SDG #: 2209623 Level III/IV Page: 1 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Metals (EPA Method 200.7/200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	~~A~~ SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB = 12, SB = 13
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD; (17,18) Ca & Na > 4x Spike
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	(4,5)
XII.	Internal Standard (ICP-MS)	A	Not reviewed for level III validation
XIII.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-23-5	2209623-02	Water	04/25/22
2	MW-23-4	2209623-03	Water	04/25/22
3	MW-23-3	2209623-04	Water	04/25/22
4	MW-23-2	2209623-05	Water	04/25/22
5	DUP-1-~~2202~~ 2021	2209623-06	Water	04/25/22
6	MW-23-1	2209623-07	Water	04/25/22
7	MW-24-4	2209623-08	Water	04/25/22
8	MW-24-5	2209623-09	Water	04/25/22
9	MW-24-3**	2209623-10**	Water	04/25/22
10	MW-24-2	2209623-11	Water	04/25/22
11	MW-24-1	2209623-12	Water	04/25/22
12	EB-1-042522	2209623-13	Water	04/25/22
13	SB-1-042522	2209623-14	Water	04/25/22
14	MW-24-3MS	2209623-10MS	Water	04/25/22
15	MW-24-3MSD	2209623-10MSD	Water	04/25/22

LDC #: 54411A4a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/5/22
SDG #: 2209623 Level III/IV Page: 2 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: MM
2nd Reviewer:

METHOD: Metals (EPA Method 200.7/200.8)

	Client ID	Lab ID	Matrix	Date
16	MW-24-3DUP	2209623-10DUP	Water	04/25/22
17	MW-24-2MS	2209623-11MS	Water	04/25/22
18	MW-24-2MSD	2209623-11MSD	Water	04/25/22
19	MW-24-2DUP	2209623-11DUP	Water	04/25/22
20				
21				
22				

Notes:

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
Were all water samples preserved to a pH of <2.	Yes			
II. ICP-MS Tune				
Were mass resolutions within 0.1 amu for all isotopes in the tuning solution?	Yes			
Were %RSDs of isoptoes in the tuning solution ≤5%?	Yes			
III. Calibration				
Were all instuments calibrated daily?	Yes			
Were the proper standards used?	Yes			
Were all initial and continuing calibration verifications within the 90-110% (80-120% for mercury) QC limits?		No		
Were the low level standard checks within 70-130%?	Yes			
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?	Yes			
Was there contamination in the initial and continuing calibration blanks?	Yes			
V. Interference Check Sample				
Were the interference check samples performed daily?	Yes			
Were the AB solution recoveries within 80-120%?	Yes			
VI. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries with the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	Yes			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	Yes			
VII. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
VIII. Internal Standards				
Were all percent recoveries within the 30-120% (60-125% for EPA Method 200.8) QC limits?	Yes			
If the recoveries were outside the limits, was a reanalysis performed?	Yes			
IX. Serial Dilution				
Were all percent differences <10%?	Yes			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			NA	
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	
XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?	Yes			
Were target analytes detected in the field duplicates?	Yes			
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-13	As,Ca,Cr,Fe,Pb,Mg,Na,K
QC:	
14-19	Ca,Fe,Mg,Na,K
17-19	As,Cr,Pb

Analysis Method

ICP	Ca,Fe,Mg,Na,K
ICP-MS	As,Cr,Pb
CVAA	

Calibration

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

All initial calibration verifications (ICVs) and continuing calibration verifications (CCVs) were performed at the required frequency and were within the acceptance limits with the following exceptions:

Date	Time	Calibration ID	Analyte	%R	%R Limits	Associated Samples	Qualification	Det/ND
4/27/2022	15:54	2207953-CCVI	Cr	89	90-110	1-9	J/UJ/A	Det/ND

Comments:

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-8,10

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	No Qual								
Ca	0.023617		0.11809									

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 9,11-13

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	12	13							
Ca	0.027498		0.13749	0.042	0.021							

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 12-13

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	No Qual								
Na		0.070875	0.35438									
K		0.11728	0.5864									

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is established at 5X the highest ICB, CCB, or PB concentration.

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Blank units: mg/L
Sampling Date: 4/25/2022

Associated sample units: mg/L
Associated Samples: 1-11

			Sample Identification									
Analyte	Blank ID	Action Level	No Qual									
	12											
Ca	0.042	0.21										
Na	0.077	0.385										

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Blank units: mg/L
Sampling Date: 4/25/2022

Associated sample units: mg/L
Associated Samples: 1-11

			Sample Identification									
Analyte	Blank ID	Action Level	No Qual									
	13											
Ca	0.021	0.105										

Comments: The action level, when applicable, is establised at 5X the highest concentration.

Field Duplicates

Method: Metals

Analyte	Concentration (ug/L)		RPD	Qualifiers (Parents Only)
	4	5		
Iron	30 U	33	NC	
Arsenic	1.2	0.70 U	NC	
Chromium	1.2	1.5	22	
Calcium (mg/L)	120	120	0	
Magnesium (mg/L)	40	39	3	
Sodium (mg/L)	33	33	0	
Potassium (mg/L)	2.5	2.5	0	

VALIDATION FINDINGS CHECKLIST
Calibration Calculation Verification

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

An intial calibration verification (ICV), continuing calibration verification (CCV), low level calibration check (LLCC), and interference check sample (ICSAB) percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis

True = concentration of each analyte in the source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalcuated %R	Reported %R	Acceptable (Y/N)
ICV	ICP	Ca	101.07	100	101.07	101	Y
CCV	ICP	Fe	10.287	10	102.87	103	Y
LLCC	ICP	Na	0.51527	0.5	103.054	103	Y
ICSAB	ICP	Mg	472.3	500	94.46	94.5	Y
ICV	ICP-MS	As	122.56	125	98.048	98	Y
CCV	ICP-MS	Pb	97.175	100	97.175	97.2	Y
LLCC	ICP-MS	Cr	2.812	3	93.73333333	93.7	Y
ICSAB	ICP-MS						
ICV	CVAA						
CCV	CVAA						

ICP-MS Tune	QC Parameter	Mass	Actual	Required
4/27/2022	Mass Axis	9	9.012	± 0.1 amu
4/27/2022	%RSD	24	2	≤ 5%

VALIDATION FINDINGS CHECKLIST

Quality Control Sample Recalculations

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Percent recoveries (%R) for the laboratory control sample (LCS), matrix spike (MS), and post digestion spike (PDS) were recalculated using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis. For the MS calculation, Found = SSR (Spiked Sample Result) - SR (Sample Result)

True = concentration of each analyte in the source

The sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = (Absolute value(S-D)x 200) / (S+D)

S = Original sample concentration

D = Duplicate sample concentration

The serial dilution percent difference (%D) was recalculated using the following formula.

%D = (Absolute value (I - SDR)) x 100 / (I)

I = Initial sample result

SDR = Serial dilution result (with a 5x dilution applied)

Sample ID	Type of Analysis	Element	Found/S/I	True/D/SDR	Recalcuated %R/RPD/%D	Reported %R/RPD/%D	Acceptable (Y/N)
B138027-BS1	LCS	Pb	104.24	100	104.24	104	Y
17	MS	As	112.379	100	112.379	112	Y
16	Duplicate	Fe	108.2	122.5	12.39705245	12.4	Y
17PDS	PDS	Ca	10.937	10	109.37	109	Y
14SD	Serial dilution	K	2.3672	2.514	5.83929992	5.84	Y

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Analytes were recalculated and verified using the following equation:
Concentration = (Result from raw data x Final volume x Dilution factor) / (Initial volume)

Sample ID	Analyte	Raw Data (ppb)	Dilution	Initial Volume (mL)	Final Volume (mL)	Reported Result (ug/L)	Recalcuated Result (ug/L)	Acceptable (Y/N)
9	Fe	0.1225	1	50	50	120	122.5	Y
9	As	1.744	1	50	50	1.7	1.744	Y

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 14, 2022

Parameters: Wet Chemistry

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209623

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-23-5	2209623-02	Water	04/25/22
MW-23-4	2209623-03	Water	04/25/22
MW-23-3	2209623-04	Water	04/25/22
MW-23-2	2209623-05	Water	04/25/22
DUP-1-2Q22	2209623-06	Water	04/25/22
MW-23-1	2209623-07	Water	04/25/22
MW-24-4	2209623-08	Water	04/25/22
MW-24-5	2209623-09	Water	04/25/22
MW-24-3**	2209623-10**	Water	04/25/22
MW-24-2	2209623-11	Water	04/25/22
MW-24-1	2209623-12	Water	04/25/22
EB-1-042522	2209623-13	Water	04/25/22
SB-1-042522	2209623-14	Water	04/25/22
MW-24-2MS	2209623-11MS	Water	04/25/22
MW-24-2MSD	2209623-11MSD	Water	04/25/22
MW-24-2DUP	2209623-11DUP	Water	04/25/22
MW-24-1MS	2209623-12MS	Water	04/25/22
MW-24-1MSD	2209623-12MSD	Water	04/25/22
MW-24-1DUP	2209623-12DUP	Water	04/25/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by EPA Method 218.6
Nitrite as Nitrogen by EPA Method 353.2
Ortho-Phosphate as Phosphorus by EPA Method 365.1
Perchlorate by EPA Method 314.0
pH by EPA 150.1
Total Dissolved Solids by EPA Method 160.1

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
MW-23-5	pH	57 hours	48 hours	J (all detects)	P
MW-23-4 MW-23-3 MW-23-2 DUP-1-2Q22	pH	56 hours	48 hours	J (all detects)	P
MW-23-1	pH	55 hours	48 hours	J (all detects)	P
MW-24-4 MW-24-5	pH	54 hours	48 hours	J (all detects)	P
MW-24-3**	pH	53 hours	48 hours	J (all detects)	P
MW-24-2 MW-24-1	pH	52 hours	48 hours	J (all detects)	P
EB-1-042522 SB-1-042522	pH	51 hours	48 hours	J (all detects)	P
MW-23-2 MW-23-1	Hexavalent chromium	191 hours	24 hours	J (all detects)	P
MW-24-3**	Hexavalent chromium	189 hours	24 hours	J (all detects)	P
SB-1-042522	Hexavalent chromium	187 hours	24 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
05/03/22	2208631-CCV1	Perchlorate	89.4 (90-110)	MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-2Q22 MW-23-1 MW-24-4 MW-24-5 MW-24-3** MW-24-2	J (all detects) UJ (all non-detects)	A
05/03/22	2208631-CCV3	Perchlorate	87.6 (90-110)	EB-1-042522	UJ (all non-detects)	A
05/04/22	2208631-CCV4	Perchlorate	87.9 (90-110)	EB-1-042522	UJ (all non-detects)	A

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Chloride Sulfate Hexavalent chromium	0.179 mg/L 0.248 mg/L 0.000083 mg/L	MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-2Q22 MW-23-1 MW-24-4 MW-24-5 MW-24-3** MW-24-2
PB (prep blank)	Chloride Sulfate	0.131 mg/L 0.227 mg/L	MW-24-1 EB-1-042522 SB-1-042522
ICB/CCB	Chloride Sulfate	0.142 mg/L 0.238 mg/L	MW-24-1 EB-1-042522 SB-1-042522

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-23-5	Hexavalent chromium	0.00014 mg/L	0.00014U mg/L
MW-24-4	Hexavalent chromium	0.00016 mg/L	0.00016U mg/L
MW-24-3**	Hexavalent chromium	0.00011 mg/L	0.00011U mg/L
EB-1-042522	Sulfate	0.22 mg/L	0.22U mg/L

V. Field Blanks

Sample EB-1-042522 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-1-042522	04/25/22	Total dissolved solids Hexavalent chromium Sulfate	4 mg/L 0.000062 mg/L 0.22 mg/L	MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-2Q22 MW-23-1 MW-24-4 MW-24-5 MW-24-3** MW-24-2 MW-24-1

Sample SB-1-042522 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
SB-1-042522	04/25/22	Total dissolved solids Hexavalent chromium	3.3 mg/L 0.000049 mg/L	MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-2Q22 MW-23-1 MW-24-4 MW-24-5 MW-24-3** MW-24-2 MW-24-1

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-23-5	Hexavalent chromium	0.00014 mg/L	0.00014U mg/L
MW-24-4	Hexavalent chromium	0.00016 mg/L	0.00016U mg/L
MW-24-3**	Hexavalent chromium	0.00011 mg/L	0.00011U mg/L
MW-24-1	Hexavalent chromium	0.00022 mg/L	0.00022U mg/L

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples MW-23-2 and DUP-1-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-23-2	DUP-1-2Q22	
pH	7.9 SU	7.92 SU	0
Total dissolved solids	750 mg/L	730 mg/L	3
Hexavalent chromium	0.0017 mg/L	0.0019 mg/L	11
Chloride	110 mg/L	110 mg/L	0
Nitrate as N	14 mg/L	14 mg/L	0

Analyte	Concentration		RPD
	MW-23-2	DUP-1-2Q22	
Sulfate	160 mg/L	160 mg/L	0
Perchlorate	3.6 mg/L	3.8 mg/L	5
Alkalinity	230 mg/L	230 mg/L	0

X Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time and continuing calibration %R, data were qualified as estimated in thirteen samples.

Due to laboratory blank contamination, data were qualified as not detected in four samples.

Due to equipment blank contamination, data were qualified as not detected in four samples.

Due to source blank contamination, data were qualified as not detected in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Wet Chemistry - Data Qualification Summary - SDG 2209623

Sample	Analyte	Flag	A or P	Reason
MW-23-5 MW-23-4 MW-23-3 DUP-1-2Q22 MW-24-4 MW-24-5 MW-24-2 MW-24-1 EB-1-042522	pH	J (all detects)	P	Technical holding times
MW-23-2 MW-23-1 MW-24-3** SB-1-042522	pH Hexavalent chromium	J (all detects) J (all detects)	P	Technical holding times
MW-23-5 MW-23-4 MW-23-3 MW-23-2 DUP-1-2Q22 MW-23-1 MW-24-4 MW-24-5 MW-24-3** MW-24-2 EB-1-042522	Perchlorate	J (all detects) UJ (all non-detects)	A	Continuing calibration (%R)

NASA JPL, 2Q2022
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 2209623

Sample	Analyte	Modified Final Concentration	A or P
MW-23-5	Hexavalent chromium	0.00014U mg/L	A
MW-24-4	Hexavalent chromium	0.00016U mg/L	A
MW-24-3**	Hexavalent chromium	0.00011U mg/L	A
EB-1-042522	Sulfate	0.22U mg/L	A

NASA JPL, 2Q2022
Wet Chemistry - Field Blank Data Qualification Summary - SDG 2209623

Sample	Analyte	Modified Final Concentration	A or P
MW-23-5	Hexavalent chromium	0.00014U mg/L	A

Sample	Analyte	Modified Final Concentration	A or P
MW-24-4	Hexavalent chromium	0.00016U mg/L	A
MW-24-3**	Hexavalent chromium	0.00011U mg/L	A
MW-24-1	Hexavalent chromium	0.00022U mg/L	A

LDC #: 54411A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/6/11
SDG #: 2209623 Level III/IV Page: 1 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer:

METHOD: (Analyte) Alkalinity (SM2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA Method 218.6), ortho-Phosphate-P (EPA Method 365.1), Perchlorate (EPA Method 314.0), pH (EPA Method 150.1), TDS (EPA Method 160.1)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/SW	
II	Initial calibration	A	
III.	Calibration verification	SW	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	EB=12, SB=13
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	SW	(4,5)
X.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-23-5	2209623-02	Water	04/25/22
2	MW-23-4	2209623-03	Water	04/25/22
3	MW-23-3	2209623-04	Water	04/25/22
4	MW-23-2	2209623-05	Water	04/25/22
5	DUP-1-~~2202~~ 2022	2209623-06	Water	04/25/22
6	MW-23-1	2209623-07	Water	04/25/22
7	MW-24-4	2209623-08	Water	04/25/22
8	MW-24-5	2209623-09	Water	04/25/22
9	MW-24-3**	2209623-10**	Water	04/25/22
10	MW-24-2	2209623-11	Water	04/25/22
11	MW-24-1	2209623-12	Water	04/25/22
12	EB-1-042522	2209623-13	Water	04/25/22
13	SB-1-042522	2209623-14	Water	04/25/22
14	MW-24-2MS	2209623-11MS	Water	04/25/22
15	MW-24-2MSD	2209623-11MSD	Water	04/25/22
16	MW-24-2DUP	2209623-11DUP	Water	04/25/22

LDC #: 54411A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/10/22
SDG #: 2209623 Level III/IV Page: 2 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: (Analyte) Alkalinity (SM2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA Method 218.6), ortho-Phosphate-P (EPA Method 365.1), Perchlorate (EPA Method 314.0), pH (EPA Method 150.1), TDS (EPA Method 160.1)

	Client ID	Lab ID	Matrix	Date
17	MW-24-1MS	2209623-12MS	Water	04/25/22
18	MW-24-1MSD	2209623-12MSD	Water	04/25/22
19	MW-24-1DUP	2209623-12DUP	Water	04/25/22
20				
21				
22				

Notes:

METHOD: Inorganics				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
II. Calibration				
Were all instruments calibrated at the required frequency?	Yes			
Were the proper number of standards used?	Yes			
Were all initial and continuing calibration verifications within the QC limits?	Yes			
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
Were balance checks performed as required?			NA	
III. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?	Yes			
Was there contamination in the initial and continuing calibration blanks?	Yes			
IV. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries within the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	Yes			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	Yes			
V. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	

XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?	Yes			
Were target analytes detected in the field duplicates?	Yes			
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-13	pH,TDS,Cr(VI),CLO4,Cl,NO3-N,SO4,NO2-N,Alkalinity
11	Ortho-PO4
QC:	
16	pH,TDS,Alkalinity
14-16	Cr(VI),CLO4
14-19	Cl,NO3-N,NO2-N,SO4
17-19	Ortho-PO4

Holding Time

METHOD: Inorganics

All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 150.1 Analyte: pH Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
1	4/25/2022 8:50	4/27/2022 17:49	57	J/UJ/P	Det
2	4/25/2022 9:20	4/27/2022 18:00	56	J/UJ/P	Det
3	4/25/2022 10:00	4/27/2022 18:09	56	J/UJ/P	Det
4	4/25/2022 10:15	4/27/2022 19:01	56	J/UJ/P	Det
5	4/25/2022 10:30	4/27/2022 19:11	56	J/UJ/P	Det
6	4/25/2022 11:30	4/27/2022 19:19	55	J/UJ/P	Det
7	4/25/2022 12:45	4/27/2022 19:28	54	J/UJ/P	Det
8	4/25/2022 13:15	4/27/2022 19:36	54	J/UJ/P	Det
9	4/25/2022 14:00	4/27/2022 19:46	53	J/UJ/P	Det
10	4/25/2022 14:30	4/27/2022 18:45	52	J/UJ/P	Det
11	4/25/2022 15:30	4/27/2022 19:55	52	J/UJ/P	Det
12	4/25/2022 16:50	4/27/2022 20:04	51	J/UJ/P	Det
13	4/25/2022 17:00	4/27/2022 20:11	51	J/UJ/P	Det

METHOD: Inorganics

All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 218.6 Analyte: Cr(VI) Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
4	4/25/2022 10:15	5/3/2022 9:58	191	J/R/P	Det
6	4/25/2022 11:30	5/3/2022 10:36	191	J/R/P	Det
9	4/25/2022 14:00	5/3/2022 11:24	189	J/R/P	Det
13	4/25/2022 17:00	5/3/2022 12:31	187	J/R/P	Det

Calibration

METHOD: Inorganics

All initial calibration verifications (ICVs) and continuing calibration verifications (CCVs) were performed at the required frequency and were within the acceptance limits with the following exceptions:

Date	Time	Calibration ID	Analyte	%R	%R Limits	Associated Samples	Qualification	Det/ND
5/3/2022	17:47	2208631-CCV1	CLO4	89.4	90-110	1-10	J/UJ/A	Det/ND
5/3/2022	23:09	2208631-CCV3	CLO4	87.6	90-110	12	J/UJ/A	ND
5/4/2022	3:33	2208631-CCV4	CLO4	87.9	90-110	12	J/UJ/A	ND

Comments:

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-10

				Sample Identification							
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	1	7	9					
Cl		0.179									
SO4		0.248									
Cr(VI)		0.000083		0.00014	0.00016	0.00011					

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 11-13

				Sample Identification							
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	12							
Cl	0.131		0.655								
SO4	0.227		1.135	0.22							

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 11-13

				Sample Identification							
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	12							
Cl		0.142									
SO4		0.238		0.22							

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is establised at 5X the highest ICB, CCB, or PB concentration.

Field Blanks

METHOD: Inorganics

Blank units: mg/L Associated sample units: mg/L

Sampling Date: 4/25/2022 Associated Samples:1-11

			Sample Identification								
Analyte	Blank ID	Action Level	1	7	9	11					
	12										
TDS	4										
Cr(VI)	0.000062		0.00014	0.00016	0.00011	0.00022					
SO4	0.22										

METHOD: Inorganics

Blank units: mg/L Associated sample units: mg/L

Sampling Date: 4/25/2022 Associated Samples:1-11

			Sample Identification								
Analyte	Blank ID	Action Level	1	7	9	11					
	13										
TDS	3.3										
Cr(VI)	0.000049		0.00014	0.00016	0.00011	0.00022					

Comments: The action level, when applicable, is establised at 5X the highest concentration.

Field Duplicates

METHOD: Inorganics

Analyte	Concentration (mg/L)		RPD
	4	5	
pH (S.U.)	7.9	7.92	0
Total Dissolved Solids	750	730	3
Hexavalent Chromium	0.0017	0.0019	11
Chloride	110	110	0
Nitrate as N	14	14	0
Sulfate	160	160	0
Perchlorate	3.6	3.8	5
Alkalinity	230	230	0

Initial and Continuing Calibration Calculation Verification

METHOD: Inorganics

The correlation coefficient (r) for the calibration of Cl were recalculated.
Calibration date:
An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:
%R = (Found/True) x 100
Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of Analysis	Analyte	Standard	Concentration (mg/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial Calibration	Cl	s1	0.085	0.025	1.000000	0.99637	Y
		s2	0.5	0.093			
		s3	4.164	0.804			
		s4	18.112	3.531			
		s5	50.71	10.316			
		s6	102.892	22.387			
		s7	198.761	48.402			
		s8					
		s9					
		s10					
		s11					
		s12					

Type of Analysis	Analyte	Found (mg/L)	True (mg/L)		Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Calibration verification	Cr(VI)	26.118	25		104.472	104	Y
Calibration verification	NO3-N	5.082	5		101.64	102	Y
Calibration verification	SO4	99.287	100		99.287	99.3	Y

Quality Control Sample Recalculations

METHOD: Inorganics

Percent recoveries (%R) for the laboratory control sample (LCS) and matrix spike (MS) were recalcuated using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis. For the MS calculation, Found = SSR (Spiked Sample Result) - SR (Sample Result)

True = concentration of each analyte in the source

The sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = (Absolute value(S-D)x 200) / (S+D)

S = Original sample concentration

D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found/S	True/D	Recalculated %R/RPD	Reported %R/RPD	Acceptable (Y/N)
B138084-BS1	LCS	TDS	595	586	101.5358362	102	Y
17	MS	NO2-N	0.52017	0.52632	98.83150935	98.8	Y
16	Duplicate	pH	8.18	8.19	0.12217471	0.122	Y

Sample Calculation Verification

METHOD: Inorganics

Analytes were recalculated and verified using the following equation:

Concentration = (Result from raw data x Final volume x Dilution factor) / (Percent solids (if applicable) x Initial weight or volume)

Sample ID	Analyte	Raw Data (mg/L)	Dilution	Initial Volume (mL)	Final Volume (mL)	Reported Result (mg/L)	Recalculated Result (mg/L)	Acceptable (Y/N)
9	pH (S.U.)	8.33	1	50	50	8.33	8.33	Y
9	TDS	202	2	100	100	400	404	Y
9	Cr(VI)	0.111623312	1	20	20	0.00011	0.000111623	Y
9	Cl	57.58347262	1	20	20	58	57.58347262	Y
9	CLO4	ND	ND			ND	ND	Y
9	NO2-N	ND	ND			ND	ND	Y
9	Alkailinty	192.62	1	50	50	190	192.62	Y

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: July 26, 2022

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209731

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-2-042622	2209731-01	Water	04/26/22
MW-14-5**	2209731-02**	Water	04/26/22
MW-14-4	2209731-03	Water	04/26/22
MW-14-3	2209731-04	Water	04/26/22
DUP-2-2Q22	2209731-05	Water	04/26/22
MW-14-2	2209731-06	Water	04/26/22
MW-21-5	2209731-07	Water	04/26/22
MW-21-4	2209731-08	Water	04/26/22
MW-21-3	2209731-09	Water	04/26/22
MW-21-2	2209731-10	Water	04/26/22
EB-2-042622	2209731-11	Water	04/26/22
MW-14-4MS	2209731-03MS	Water	04/26/22
MW-14-4 MSD	2209731-03MSD	Water	04/26/22
MW-21-2MS	2209731-10MS	Water	04/26/22
MW-21-2MSD	2209731-10MSD	Water	04/26/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990 with the following exceptions:

Date	Analyte	r^2	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	0.989 (≥0.990)	All samples in SDG 2209731	UJ (all non-detects)	P

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	38.7	All samples in SDG 2209731	UJ (all non-detects)	P

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all analytes.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample TB-2-042622 was identified as a trip blank. No contaminants were found.

Sample EB-2-042622 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration
EB-2-042622	Toluene	0.39 ug/L

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-14-3 and DUP-2-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-14-3	DUP-2-2Q22	
Chloroform	0.49	0.38	25
1,1-Dichloroethane	0.35	0.22	46
Tetrachloroethene	0.75	0.41	59

Analyte	Concentration (ug/L)		RPD
	MW-14-3	DUP-2-2Q22	
Trichloroethene	1.0	0.63	45

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All analyte quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to initial calibration r^2 and ICV %D, data were qualified as estimated in eleven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Volatiles - Data Qualification Summary - SDG 2209731

Sample	Analyte	Flag	A or P	Reason
TB-2-042622 MW-14-5** MW-14-4 MW-14-3 DUP-2-2Q22 MW-14-2 MW-21-5 MW-21-4 MW-21-3 MW-21-2 EB-2-042622	Methyl iodide	UJ (all non-detects)	P	Initial calibration (r^2)
TB-2-042622 MW-14-5** MW-14-4 MW-14-3 DUP-2-2Q22 MW-14-2 MW-21-5 MW-21-4 MW-21-3 MW-21-2 EB-2-042622	Methyl iodide	UJ (all non-detects)	P	Initial calibration verification (%D)

NASA JPL, 2Q2022
Volatiles - Laboratory Blank Data Qualification Summary - SDG 2209731

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
Volatiles - Field Blank Data Qualification Summary - SDG 2209731

No Sample Data Qualified in this SDG

LDC #: 54411B1a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/22
SDG #: 2209731 Level III/IV Page: 1 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer:
2nd Reviewer

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW/SW	%RSD ≤ 20, r² IOA ≤ 30
IV.	Continuing calibration	A SW	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	TB = 1* EB = 11 SB = SB-1-042522 (2209623)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	SW	D = 4,5
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1 1	TB-2-042622	2209731-01	Water	04/26/22
2 1	MW-14-5**	2209731-02**	Water	04/26/22
3 1	MW-14-4	2209731-03	Water	04/26/22
4 1	MW-14-3	2209731-04	Water	04/26/22
5 1	DUP-2-2Q22	2209731-05	Water	04/26/22
6 1	MW-14-2	2209731-06	Water	04/26/22
7 1	MW-21-5	2209731-07	Water	04/26/22
8 1	MW-21-4	2209731-08	Water	04/26/22
9 1	MW-21-3	2209731-09	Water	04/26/22
10 2	MW-21-2	2209731-10	Water	04/26/22
11 1	EB-2-042622	2209731-11	Water	04/26/22
12 1	MW-14-4MS	2209731-03MS	Water	04/26/22
13 1	MW-14-4 MSD	2209731-03MSD	Water	04/26/22
14 1	MW-21-2MS	2209731-10MS	Water	04/26/22

LDC #: 54411B1a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/22
SDG #: 2209731 Level III/IV Page: 2 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: FJ
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
15 2/	MW-21-2MSD	2209731-10MSD	Water	04/26/22
16				
17				
18				

Notes:

	B137999						
	B138000						

LDC #: 54411B1a

VALIDATION FINDINGS CHECKLIST

Reviewer: FJ

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?	✓			
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54411 B1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15, 20, 15 RSD% and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit:_____)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	4/4/22	ICAL -Y5	Methyl Iodide		0.989 (>0.990)	All	J/UJ/P ND

LDC #: 54411B1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 8260.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?

Y N N/A Were all %D within the validation criteria of ≤ ~~20~~ %D? 30%

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0% / (30%))	Associated Samples	Qualifications
	4/4/22 0951	ICV-Y5	Methyl Iodide	38.7 (≤ 30%)	All	J/UJ/P ND

LDC #: 54411B1a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

SB = SB-1-042522

(Y) N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 04/25/22
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: SB Associated Samples: 11

Compound	Blank ID	Sample Identification								
	SB		11							
CC	0.41		0.39U							

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 04/26/22
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: EB Associated Samples: 2-PID (ND)

Compound	Blank ID	Sample Identification								
	11									
CC	0.39									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC #: 54411B1a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

METHOD: GC/MS (EPA Method 524.2)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ng/L)		RPD (≤ %)	QUAL
	4	5		
K	0.49	0.38	25	
I	0.35	0.22	46	
AA	0.75	0.41	59	
S	1.0	0.63	45	

Compound	Concentration ( )		RPD (≤ %)	QUAL

Compound	Concentration ( )		RPD (≤ %)	QUAL

Compound	Concentration ( )		RPD (≤ %)	QUAL

LDC #: 54411B1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: ____FT___

METHOD: GCMS 524.2

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

RRF = (Ax)(Cis)/(Ais)(Cx)
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

Where:
Ax = Area of compound
Cx = Concentration of compound
S = Standard deviation of the RRFs
X = Mean of the RRFs
Ais = Area of associated internal standard
Cis = Concentration of internal Standard

#	Standard ID	Calibration Date	Compound	Reported (RRF 10 std)	Recalculated (RRF 10 std)	Reported AverageRRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
	ICAL MSV5	4/4/2022	I	0.8519021	0.8519021	0.8428623	0.8428623	4.57114	4.57114
			CC	0.8205145	0.8205145	0.8119389	0.8119389	9.41256	9.41256
			BB	0.5189625	0.5189625	0.5220887	0.5220887	10.54667	10.54667

LDC #: 54411 B1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV-V5	4/27/22 0551	I (1st internal standard)	0.842823	0.84267 85	0.84267	0.02	0.02
			CC (2nd internal standard)	0.819389	0.76175 22	0.76175	6.2	6.2
			BB (3rd internal standard)	0.5220887	0.55 74039	0.5574	6.8	6.8
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411B1a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 10

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4	10.0	9.7	97	97	0
Toluene-d8	↓	9.79	97.9	98	↓
Bromofluorobenzene	↓	9.61	96.1	96	↓

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 54411 B1a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC)

MSC = Matrix spike concentration; MSDC = Matrix spike duplicate concentration

MS/MSD sample: 12 + 13

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
V	25.0	25.0	ND	22.8	22.89	91.2	91.2	91.6	91.6	0.394	0.394
P				23.77	23.2	95.1	95.1	92.8	92.8	2.43	2.43
DD				22.29	22.74	89.2	89.2	91.0	91.0	2.00	2.06
D				22.94	23.8	91.8	91.8	95.2	95.2	3.68	3.68
HHH				21.880	22.340	87.5	87.5	89.4	89.4	2.08	2.08

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411B1a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: B137999 LCS

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Y	25.0	NA	25.170	NA	101	101				
P	↓	↓	25.130	↓	101	101				
PD			24.370		97.5	97.5				
D			23.970		95.9	95.9				
HHH	↓	↓	23.180	↓	92.7	92.7	NA			

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411B1a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [illegible]

METHOD: GC MS 524.2

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. B1 37999.LCS CC

Conc. = $\frac{(837916)\ (10)}{(424862)\ (0.8119389)}$

=

24.29 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	LCS	CC	24.29	24.29	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: July 26, 2022

Parameters: 1,2,3-Trichloropropane

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209731

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-14-5**	2209731-02**	Water	04/26/22
MW-14-4	2209731-03	Water	04/26/22
MW-14-3	2209731-04	Water	04/26/22
DUP-2-2Q22	2209731-05	Water	04/26/22
MW-14-2	2209731-06	Water	04/26/22
MW-21-5	2209731-07	Water	04/26/22
MW-21-4	2209731-08	Water	04/26/22
MW-21-3	2209731-09	Water	04/26/22
MW-21-2	2209731-10	Water	04/26/22
EB-2-042622	2209731-11	Water	04/26/22
MW-14-4MS	2209731-03MS	Water	04/26/22
MW-14-4 MSD	2209731-03MSD	Water	04/26/22
MW-21-2MS	2209731-10MS	Water	04/26/22
MW-21-2MSD	2209731-10MSD	Water	04/26/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,2,3-Trichloropropane by Environmental Protection Agency (EPA) Method 524 Modified

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB-2-042622 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-14-3 and DUP-2-2Q22 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All analyte quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

Manual integrations were reviewed and were considered acceptable. The laboratory provided before and after integration printouts.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Data Qualification Summary - SDG 2209623

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Laboratory Blank Data Qualification Summary - SDG 2209623

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Field Blank Data Qualification Summary - SDG 2209623

No Sample Data Qualified in this SDG

LDC #: 54411B1b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/22
SDG #: 2209731 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS 1,2,3-Trichloropropane (EPA Method 524M)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=10 SB = SB-1-042522 (2209623
VII.	Surrogate spikes	N	Not required
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D=3,4
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation. MI
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-14-5**	2209731-02**	Water	04/26/22
2	MW-14-4	2209731-03	Water	04/26/22
3	MW-14-3 D	2209731-04	Water	04/26/22
4	DUP-2-2Q22 D	2209731-05	Water	04/26/22
5	MW-14-2	2209731-06	Water	04/26/22
6	MW-21-5	2209731-07	Water	04/26/22
7	MW-21-4	2209731-08	Water	04/26/22
8	MW-21-3	2209731-09	Water	04/26/22
9	MW-21-2	2209731-10	Water	04/26/22
10	EB-2-042622	2209731-11	Water	04/26/22
11	MW-14-4MS	2209731-03MS	Water	04/26/22
12	MW-14-4 MSD	2209731-03MSD	Water	04/26/22
13	MW-21-2MS	2209731-10MS	Water	04/26/22
14	MW-21-2MSD	2209731-10MSD	Water	04/26/22

B138049 B138050

LDC #: 54411B1b

VALIDATION FINDINGS CHECKLIST

Reviewer: 17

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?	✓			
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?			✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54411 B1b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50.0 std)	Recalc RRF (50.0 std)	Reported Average RRF (initial)	Recalc Average RRF (initial)	Reported %RSD	Recalc %RSD
1	ICAL Y16	4/27/22	XX (1st internal standard)	1.29844	1.29844	1.18951	1.18951	12.64788	12.64788
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						

LDC #: 54411B1b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	ccv 1	4/27/22 1243	XX (1st internal standard)	1.18951	1.155352	1.155352	2.9	2.9
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
2	ccv 3	4/28/22 0004	XX (1st internal standard)	↓	1.180758	1.180758	0.7	0.7
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411B16

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC)

MSC = Matrix spike concentration; MSDC = Matrix spike duplicate concentration

MS/MSD sample: 11 + 12

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
XX	0.05	0.05	ND	0.042760	0.046780	85.5	85.5	93.6	93.6	8.98	8.98

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411B1b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: BI38049

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
XX	0.0500	NA	0.040120	NA	80.2	80.2	NA	—		

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411B1b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JT

METHOD: GC MS 524 M

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. B138049-BS1 XX

Conc. = $\frac{(12557)(50.0)}{(13155)(1.1895)(1000)}$

= 0.040120 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Qualification
	BS1	XX	0.040120	8.	
				0.040120	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 14, 2022

Parameters: Metals

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209731

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-14-5**	2209731-02**	Water	04/26/22
MW-14-4	2209731-03	Water	04/26/22
MW-14-3	2209731-04	Water	04/26/22
DUP-2-2Q22	2209731-05	Water	04/26/22
MW-14-2	2209731-06	Water	04/26/22
MW-21-5	2209731-07	Water	04/26/22
MW-21-4	2209731-08	Water	04/26/22
MW-21-3	2209731-09	Water	04/26/22
MW-21-2	2209731-10	Water	04/26/22
EB-2-042622	2209731-11	Water	04/26/22
MW-14-5MS	2209731-02MS	Water	04/26/22
MW-14-5MSD	2209731-02MSD	Water	04/26/22
MW-14-5DUP	2209731-02DUP	Water	04/26/22
MW-21-2MS	2209731-10MS	Water	04/26/22
MW-21-2MSD	2209731-10MSD	Water	04/26/22
MW-21-2DUP	2209731-10DUP	Water	04/26/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Calcium, Chromium, Iron, Lead, Magnesium, Potassium, and Sodium by Environmental Protection Agency (EPA) Methods 200.7 and 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis was not required by the method.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB-2-042622 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-2-042622	04/26/22	Calcium Magnesium	0.15 mg/L 0.058 mg/L	MW-14-5** MW-14-4 MW-14-3 DUP-2-2Q22 MW-14-2 MW-21-5 MW-21-4 MW-21-3 MW-21-2

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples MW-14-3 and DUP-2-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-14-3	DUP-2-2Q22	
Iron	50 ug/L	48 ug/L	4
Calcium	120 mg/L	120 mg/L	0
Magnesium	44 mg/L	44 mg/L	0
Sodium	43 mg/L	42 mg/L	2
Potassium	2.9 mg/L	2.9 mg/L	0

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2022
Metals - Data Qualification Summary - SDG 2209731

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
Metals - Laboratory Blank Data Qualification Summary - SDG 2209731

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
Metals - Field Blank Data Qualification Summary - SDG 2209731

No Sample Data Qualified in this SDG

LDC #: 54411B4a

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

SDG #: 2209731

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Date: 10/7/22

Page: 1 of 2

Reviewer: JM

2nd Reviewer:

METHOD: Metals (EPA Method 200.7/200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	A	
VI.	Field Blanks	SW	EB=1D
VII.	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	(3,4)
XII.	Internal Standard (ICP-MS)	A	Not reviewed for level III validation
XIII.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-14-5**	2209731-02**	Water	04/26/22
2	MW-14-4	2209731-03	Water	04/26/22
3	MW-14-3	2209731-04	Water	04/26/22
4	DUP-2-2Q22	2209731-05	Water	04/26/22
5	MW-14-2	2209731-06	Water	04/26/22
6	MW-21-5	2209731-07	Water	04/26/22
7	MW-21-4	2209731-08	Water	04/26/22
8	MW-21-3	2209731-09	Water	04/26/22
9	MW-21-2	2209731-10	Water	04/26/22
10	EB-2-042622	2209731-11	Water	04/26/22
11	MW-14-5MS	2209731-02MS	Water	04/26/22
12	MW-14-5MSD	2209731-02MSD	Water	04/26/22
13	MW-14-5DUP	2209731-02DUP	Water	04/26/22
14	MW-21-2MS	2209731-10MS	Water	04/26/22
15	MW-21-2MSD	2209731-10MSD	Water	04/26/22

LDC #: 54411B4a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/7/22
SDG #: 2209731 Level III/IV Page: 1 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer:

METHOD: Metals (EPA Method 200.7/200.8)

	Client ID	Lab ID	Matrix	Date
16	MW-21-2DUP	2209731-10DUP	Water	04/26/22
17				
18				
19				

Notes:

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
Were all water samples preserved to a pH of <2.	Yes			
II. ICP-MS Tune				
Were mass resolutions within 0.1 amu for all isotopes in the tuning solution?	Yes			
Were %RSDs of isoptoes in the tuning solution ≤5%?	Yes			
III. Calibration				
Were all instuments calibrated daily?	Yes			
Were the proper standards used?	Yes			
Were all initial and continuing calibration verifications within the 90-110% (80-120% for mercury) QC limits?	Yes			
Were the low level standard checks within 70-130%?	Yes			
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?		No		
Was there contamination in the initial and continuing calibration blanks?		No		
V. Interference Check Sample				
Were the interference check samples performed daily?	Yes			
Were the AB solution recoveries within 80-120%?	Yes			
VI. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries with the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	Yes			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	Yes			
VII. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
VIII. Internal Standards				
Were all percent recoveries within the 30-120% (60-125% for EPA Method 200.8) QC limits?	Yes			
If the recoveries were outside the limits, was a reanalysis performed?	Yes			
IX. Serial Dilution				
Were all percent differences <10%?	Yes			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			NA	
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	
XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?	Yes			
Were target analytes detected in the field duplicates?	Yes			
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-10	As,Ca,Cr,Fe,Pb,Mg,Na,K
QC:	
11-13	Ca,Fe,Mg,Na,K
14-16	As,Cr,Pb

Analysis Method

ICP	Ca,Fe,Mg,Na,K
ICP-MS	As,Cr,Pb
CVAA	

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Blank units: mg/L
Associated sample units: mg/L
Sampling Date: 4/26/2022
Associated Samples: 1-9

			Sample Identification									
Analyte	Blank ID	Action Level	No Qual									
	10											
Ca	0.15											
Mg	0.058											

Comments: The action level, when applicable, is estabilised at 5X the highest concentration.

Field Duplicates

Method: Metals

Analyte	Concentration (mg/L)		RPD
	3	4	
Iron (ug/L)	50	48	4
Calcium	120	120	0
Magnesium	44	44	0
Sodium	43	42	2
Potassium	2.9	2.9	0

VALIDATION FINDINGS CHECKLIST
Calibration Calculation Verification

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
An intial calibration verification (ICV), continuing calibration verification (CCV), low level calibration check (LLCC), and interference check sample (ICSAB) percent recovery (%R) was recalculated for each type of analysis using the following formula:
%R = (Found/True) x 100 Found = concentration of each analyte measured in the analysis
True = concentration of each analyte in the source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalcuated %R	Reported %R	Acceptable (Y/N)
ICV	ICP	Ca	98.085	100	98.085	98.1	Y
CCV	ICP	Fe	9.841	10	98.41	98.4	Y
LLCC	ICP	Na	0.51527	0.5	103.054	103	Y
ICSAB	ICP	Mg	524.63	500	104.926	105	Y
ICV	ICP-MS	As	124.5	125	99.6	99.6	Y
CCV	ICP-MS	Pb	104.75	100	104.75	105	Y
LLCC	ICP-MS	Cr	2.918	3	97.26666667	97.3	Y
ICSAB	ICP-MS						
ICV	CVAA						
CCV	CVAA						

ICP-MS Tune	QC Parameter	Mass	Actual	Required
4/29/2022	Mass Axis	9	9.012	± 0.1 amu
4/29/2022	%RSD	24	1.2	≤ 5%

VALIDATION FINDINGS CHECKLIST

Quality Control Sample Recalculations

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Percent recoveries (%R) for the laboratory control sample (LCS), matrix spike (MS), and post digestion spike (PDS) were recalculated using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis. For the MS calculation, Found = SSR (Spiked Sample Result) - SR (Sample Result)

True = concentration of each analyte in the source

The sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = (Absolute value(S-D)x 200) / (S+D)

S = Original sample concentration

D = Duplicate sample concentration

The serial dilution percent difference (%D) was recalculated using the following formula.

%D = (Absolute value (I - SDR)) x 100 / (I)

I = Initial sample result

SDR = Serial dilution result (with a 5x dilution applied)

Sample ID	Type of Analysis	Element	Found/S/I	True/D/SDR	Recalcuated %R/RPD/%D	Reported %R/RPD/%D	Acceptable (Y/N)
B138319-BS1	LCS	Pb	101.5	100	101.5	101	Y
14	MS	As	119.08	100	119.08	119	Y
13	Duplicate	Fe	60.14	68.002	12.27076212	12.3	Y
11PDS	PDS	Ca	9.468	10	94.68	94.7	Y
11SD	Serial dilution	K	1.8567	1.8956	2.052120701	2.05	Y

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Analytes were recalculated and verified using the following equation:
Concentration = (Result from raw data x Final volume x Dilution factor) / (Initial volume)

Sample ID	Analyte	Raw Data (ppb)	Dilution	Initial Volume (mL)	Final Volume (mL)	Reported Result (ug/L)	Recalcuated Result (ug/L)	Acceptable (Y/N)
9	Fe	0.068	1	50	50	68	68	Y
9	As	0.929	1	50	50	0.93	0.929	Y

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 14, 2022

Parameters: Wet Chemistry

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209731

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-14-5**	2209731-02**	Water	04/26/22
MW-14-4	2209731-03	Water	04/26/22
MW-14-3	2209731-04	Water	04/26/22
DUP-2-2Q22	2209731-05	Water	04/26/22
MW-14-2	2209731-06	Water	04/26/22
MW-21-5	2209731-07	Water	04/26/22
MW-21-4	2209731-08	Water	04/26/22
MW-21-3	2209731-09	Water	04/26/22
MW-21-2	2209731-10	Water	04/26/22
EB-2-042622	2209731-11	Water	04/26/22
MW-14-4MS	2209731-03MS	Water	04/26/22
MW-14-4 MSD	2209731-03MSD	Water	04/26/22
MW-14-4DUP	2209731-03DUP	Water	04/26/22
MW-21-2MS	2209731-10MS	Water	04/26/22
MW-21-2MSD	2209731-10MSD	Water	04/26/22
MW-21-2DUP	2209731-10DUP	Water	04/26/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by EPA Method 218.6
Nitrite as Nitrogen by EPA Method 353.2
Perchlorate by EPA Method 314.0
pH by EPA 150.1
Total Dissolved Solids by EPA Method 160.1

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
MW-14-5**	pH	57 hours	48 hours	J (all detects)	P
MW-14-4 MW-14-2	pH	55 hours	48 hours	J (all detects)	P
MW-14-3 DUP-2-2Q22	pH	56 hours	48 hours	J (all detects)	P
MW-21-5 MW-21-3	pH	53 hours	48 hours	J (all detects)	P
MW-21-4	pH	54 hours	48 hours	J (all detects)	P
MW-21-2 EB-2-042622	pH	52 hours	48 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Hexavalent chromium	0.000051 mg/L	MW-14-5** MW-14-4 MW-14-3 DUP-2-2Q22 MW-14-2 MW-21-5 MW-21-4 MW-21-3 MW-21-2 EB-2-042622
PB (prep blank)	Chloride Sulfate	0.15 mg/L 0.307 mg/L	MW-21-2
PB (prep blank)	Chloride Sulfate	0.13 mg/L 0.24 mg/L	MW-14-5** MW-14-4 MW-14-3 DUP-2-2Q22 MW-14-2 MW-21-5 MW-21-4 MW-21-3 EB-2-042622
ICB/CCB	Hexavalent chromium	0.064 mg/L	MW-14-5** MW-14-4 MW-14-3 DUP-2-2Q22 MW-14-2 MW-21-5 MW-21-4 MW-21-3 MW-21-2 EB-2-042622
ICB/CCB	Chloride Sulfate	0.138 mg/L 0.26 mg/L	MW-14-5** MW-14-4 MW-14-3 DUP-2-2Q22 MW-14-2
ICB/CCB	Chloride Sulfate	0.131 mg/L 0.254 mg/L	MW-21-5 MW-21-4 MW-21-3 EB-2-042622
ICB/CCB	Chloride Sulfate	0.244 mg/L 0.304 mg/L	MW-21-2

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-21-2	Hexavalent chromium	0.0001 mg/L	0.0001U mg/L
EB-2-042622	Hexavalent chromium Chloride Sulfate	0.00025 mg/L 0.14 mg/L 0.24 mg/L	0.00025U mg/L 0.14U mg/L 0.24U mg/L
MW-21-4	Hexavalent chromium	0.00028 mg/L	0.00028U mg/L
MW-21-3	Hexavalent chromium	0.00028 mg/L	0.00028U mg/L

V. Field Blanks

Sample EB-2-042622 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-2-042622	04/26/22	Total dissolved solids Hexavalent chromium Chloride Sulfate	4 mg/L 0.00025 mg/L 0.14 mg/L 0.24 mg/L	MW-14-5** MW-14-4 MW-14-3 DUP-2-2Q22 MW-14-2 MW-21-5 MW-21-4 MW-21-3 MW-21-2

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-14-4	Hexavalent chromium	0.00045 mg/L	0.00045U mg/L
MW-14-3	Hexavalent chromium	0.00048 mg/L	0.00048U mg/L
DUP-2-2Q22	Hexavalent chromium	0.00036 mg/L	0.00036U mg/L
MW-21-4	Hexavalent chromium	0.00028 mg/L	0.00028U mg/L
MW-21-3	Hexavalent chromium	0.00028 mg/L	0.00028U mg/L
MW-21-2	Hexavalent chromium	0.0001 mg/L	0.0001U mg/L

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples MW-14-3 and DUP-2-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-14-3	DUP-2-2Q22	
pH	8.18 SU	8.05 SU	2
Total dissolved solids	740 mg/L	740 mg/L	0
Hexavalent chromium	0.00048 mg/L	0.00036 mg/L	29
Chloride	110 mg/L	110 mg/L	0
Nitrate as N	14 mg/L	14 mg/L	0
Sulfate	170 mg/L	170 mg/L	0
Perchlorate	4.2 mg/L	3.7 mg/L	13
Alkalinity	230 mg/L	230 mg/L	0

X Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, data were qualified as estimated in ten samples.

Due to laboratory blank contamination, data were qualified as not detected in four samples.

Due to equipment blank contamination, data were qualified as not detected in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Wet Chemistry - Data Qualification Summary - SDG 2209731

Sample	Analyte	Flag	A or P	Reason
MW-14-5** MW-14-4 MW-14-2 MW-14-3 DUP-2-2Q22 MW-21-5 MW-21-3 MW-21-4 MW-21-2 EB-2-042622	pH	J (all detects)	P	Technical holding times

NASA JPL, 2Q2022
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 2209731

Sample	Analyte	Modified Final Concentration	A or P
MW-21-2	Hexavalent chromium	0.0001U mg/L	A
EB-2-042622	Hexavalent chromium Chloride Sulfate	0.00025U mg/L 0.14U mg/L 0.24U mg/L	A
MW-21-4	Hexavalent chromium	0.00028U mg/L	A
MW-21-3	Hexavalent chromium	0.00028U mg/L	A

NASA JPL, 2Q2022
Wet Chemistry - Field Blank Data Qualification Summary - SDG 2209731

Sample	Analyte	Modified Final Concentration	A or P
MW-14-4	Hexavalent chromium	0.00045U mg/L	A
MW-14-3	Hexavalent chromium	0.00048U mg/L	A
DUP-2-2Q22	Hexavalent chromium	0.00036U mg/L	A
MW-21-4	Hexavalent chromium	0.00028U mg/L	A
MW-21-3	Hexavalent chromium	0.00028U mg/L	A
MW-21-2	Hexavalent chromium	0.0001U mg/L	A

LDC #: 54411B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/7/22
SDG #: 2209731 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer: Q

METHOD: (Analyte) Alkalinity (SM2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA Method 218.6), Perchlorate (EPA Method 314.0), pH (EPA Method 150.1), TDS (EPA Method 160.1)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	EB=10
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	SW	(3,4)
X.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XI	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-14-5**	2209731-02**	Water	04/26/22
2	MW-14-4	2209731-03	Water	04/26/22
3	MW-14-3	2209731-04	Water	04/26/22
4	DUP-2-2Q22	2209731-05	Water	04/26/22
5	MW-14-2	2209731-06	Water	04/26/22
6	MW-21-5	2209731-07	Water	04/26/22
7	MW-21-4	2209731-08	Water	04/26/22
8	MW-21-3	2209731-09	Water	04/26/22
9	MW-21-2	2209731-10	Water	04/26/22
10	EB-2-042622	2209731-11	Water	04/26/22
11	MW-14-4MS	2209731-03MS	Water	04/26/22
12	MW-14-4 MSD	2209731-03MSD	Water	04/26/22
13	MW-14-4DUP	2209731-03DUP	Water	04/26/22
14	MW-21-2MS	2209731-10MS	Water	04/26/22
15	MW-21-2MSD	2209731-10MSD	Water	04/26/22
16	MW-21-2DUP	2209731-10DUP	Water	04/26/22

METHOD: Inorganics				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
II. Calibration				
Were all instruments calibrated at the required frequency?	Yes			
Were the proper number of standards used?	Yes			
Were all initial and continuing calibration verifications within the QC limits?	Yes			
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
Were balance checks performed as required?			NA	
III. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?	Yes			
Was there contamination in the initial and continuing calibration blanks?	Yes			
IV. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries within the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	Yes			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	Yes			
V. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	

XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?	Yes			
Were target analytes detected in the field duplicates?	Yes			
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-10	pH,TDS,Cr(VI),CLO4,Cl,NO3-N,SO4,NO2-N,Alkalinity
QC:	
13,16	pH,Alkalinity
14-16	Cr(VI),CLO4
11-16	Cl,NO3-N,NO2-N,SO4
16	TDS

METHOD: Inorganics
All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 150.1 Analyte: pH Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
1	4/26/2022 7:45	4/28/2022 17:25	57	J/UJ/P	Det
2	4/26/2022 8:30	4/28/2022 16:10	55	J/UJ/P	Det
3	4/26/2022 9:30	4/28/2022 17:32	56	J/UJ/P	Det
4	4/26/2022 9:45	4/28/2022 18:23	56	J/UJ/P	Det
5	4/26/2022 10:45	4/28/2022 18:30	55	J/UJ/P	Det
6	4/26/2022 12:45	4/28/2022 18:37	53	J/UJ/P	Det
7	4/26/2022 12:15	4/28/2022 18:44	54	J/UJ/P	Det
8	4/26/2022 13:15	4/28/2022 18:52	53	J/UJ/P	Det
9	4/26/2022 13:45	4/28/2022 18:09	52	J/UJ/P	Det
10	4/26/2022 14:45	4/28/2022 19:01	52	J/UJ/P	Det

Laboratory Blank Contamination (PB/ICB/CCB) Reviewer: Jada Morales

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-10

				Sample Identification							
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	9	10						
Cr(VI)	0.000051		0.00026	0.0001	0.00025						
			0								

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 9

				Sample Identification							
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	No Qual							
Cl	0.15		0.75								
SO4	0.307		1.535								

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-8,10

				Sample Identification							
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	10							
Cl	0.13		0.65	0.14							
SO4	0.24		1.2	0.24							

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is establised at 5X the highest ICB, CCB, or PB concentration.

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-10

				Sample Identification							
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	7	8	9	10				
Cr(VI)		0.064	0.00032	0.00028	0.00028	0.0001	0.00025				
			0								

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-5

				Sample Identification							
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**								
Cl		0.138	0.00069								
SO4		0.26	1.3								

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 6-8,10

				Sample Identification							
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	10							
Cl		0.131	0.00066								
SO4		0.254	1.27	0.24							

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is establised at 5X the highest ICB, CCB, or PB concentration.

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 9

				Sample Identification							
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	No Qual							
Cl		0.244	0.00122								
SO4		0.304	1.52								

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is establised at 5X the highest ICB, CCB, or PB concentration.

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Jada Morales

METHOD: Inorganics

Blank units: mg/L Associated sample units: mg/L
Sampling Date: 4/26/2022 Associated Samples:1-9

			Sample Identification								
Analyte	Blank ID	Action Level	2	3	4	7	8	9			
	10										
TDS	4										
Cr(VI)	0.00025		0.00045	0.00048	0.00036	0.00028	0.00028	0.0001			
Cl	0.14										
SO4	0.24										

Comments: The action level, when applicable, is establised at 5X the highest concentration.

Field Duplicates

METHOD: Inorganics

Analyte	Concentration (mg/L)		RPD
	3	4	
pH (S.U.)	8.18	8.05	2
Total Dissolved Solids	740	740	0
Hexavalent Chromium	0.00048	0.00036	29
Chloride	110	110	0
Nitrate as N	14	14	0
Sulfate	170	170	0
Perchlorate	4.2	3.7	13
Alkalinity	230	230	0

METHOD: Inorganics

The correlation coefficient (r) for the calibration of NO2-N were recalculated.
Calibration date:
An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:
%R = (Found/True) x 100
Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of Analysis	Analyte	Standard	Concentration (mg/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial Calibration	NO2-N	s1	0.01907	0.02516	1.000000	0.999963	Y
		s2	0.05335	0.043			
		s3	0.10177	0.06819			
		s4	0.49728	0.27401			
		s5	1.00103	0.53615			
		s6					
		s7					
		s8					
		s9					
		s10					
		s11					
		s12					

Type of Analysis	Analyte	Found (mg/L)	True (mg/L)		Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Calibration verification	Cr(VI)	25.479	25		101.916	102	Y
Calibration verification	NO3-N	5.068	5		101.36	101	Y
Calibration verification	SO4	100.04	100		100.04	100	Y

Quality Control Sample Recalculations

METHOD: Inorganics

Percent recoveries (%R) for the laboratory control sample (LCS) and matrix spike (MS) were recalcuated using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis. For the MS calculation, Found = SSR (Spiked Sample Result) - SR (Sample Result)

True = concentration of each analyte in the source

The sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = (Absolute value(S-D)x 200) / (S+D)

S = Original sample concentration

D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found/S	True/D	Recalculated %R/RPD	Reported %R/RPD	Acceptable (Y/N)
B138318-BS1	LCS	TDS	590	586	100.6825939	101	Y
14	MS	NO2-N	0.527784	0.52632	100.2781578	100	Y
13	Duplicate	pH	8.23	8.22	0.121580547	0.122	Y

Sample Calculation Verification

METHOD: Inorganics

Analytes were recalculated and verified using the following equation:

Concentration = (Result from raw data x Final volume x Dilution factor) / (Percent solids (if applicable) x Initial weight or volume)

Sample ID	Analyte	Raw Data (mg/L)	Dilution	Initial Volume (mL)	Final Volume (mL)	Reported Result (mg/L)	Recalculated Result (mg/L)	Acceptable (Y/N)
1	pH (S.U.)	8.42	1	50	50	8.42	8.42	Y
1	TDS	106	2	100	100	210	212	Y
1	Cr(VI)	2.255354201	1	20	20	0.0023	0.002255354	Y
1	Cl	9.333103087	1	20	20	10	9.333103087	Y
1	CLO4	ND	ND			ND	ND	Y
1	NO2-N	ND	ND			ND	ND	Y
1	Alkailinty	135.72	1	50	50	140	135.72	Y

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: July 26, 2022

Parameters: Volatiles

Validation Level: Level III

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209865

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-3-042722	2209865-01	Water	04/27/22
MW-19-5	2209865-02	Water	04/27/22
MW-19-4	2209865-03	Water	04/27/22
MW-19-3	2209865-04	Water	04/27/22
MW-19-2	2209865-05	Water	04/27/22
MW-19-1	2209865-06	Water	04/27/22
MW-04-5	2209865-07	Water	04/27/22
MW-4-4	2209865-08	Water	04/27/22
DUP-3-2Q22	2209865-09	Water	04/27/22
MW-4-3	2209865-10	Water	04/27/22
EB-3-042722	2209865-11	Water	04/27/22
MW-19-3MS	2209865-04MS	Water	04/27/22
MW-19-3MSD	2209865-04MSD	Water	04/27/22

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990 with the following exceptions:

Date	Analyte	r^2	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	0.989 (≥0.990)	All samples in SDG 2209865	UJ (all non-detects)	P

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	38.7	All samples in SDG 2209865	UJ (all non-detects)	P

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
05/02/22 (08:04)	Hexachloromethane	35.3	All samples in SDG 2209865	UJ (all non-detects)	P
05/02/22 (08:29)	Methyl iodide	35.6	All samples in SDG 2209865	UJ (all non-detects)	P

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample TB-3-042722 was identified as a trip blank. No contaminants were found.

Sample EB-3-042722 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-4-4 and DUP-3-2Q22 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All analyte quantitations met validation criteria for samples which underwent Level IV

validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to initial calibration r^2, ICV %D, and continuing calibration %D, data were qualified as estimated in eleven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Volatiles - Data Qualification Summary - SDG 2209865

Sample	Analyte	Flag	A or P	Reason
TB-3-042722 MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1 MW-04-5 MW-4-4 DUP-3-2Q22 MW-4-3 EB-3-042722	Methyl iodide	UJ (all non-detects)	P	Initial calibration (r^2)
TB-3-042722 MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1 MW-04-5 MW-4-4 DUP-3-2Q22 MW-4-3 EB-3-042722	Methyl iodide	UJ (all non-detects)	P	Initial calibration verification (%D)
TB-3-042722 MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1 MW-04-5 MW-4-4 DUP-3-2Q22 MW-4-3 EB-3-042722	Hexachloroethane Methyl iodide	UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 2Q2022
Volatiles - Laboratory Blank Data Qualification Summary - SDG 2209865

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
Volatiles - Field Blank Data Qualification Summary - SDG 2209865

No Sample Data Qualified in this SDG

LDC #: 54411C1a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/22
SDG #: 2209865 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer:
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW/SW	%D PSD ≤ 20, r² ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks	A	* *
VI.	Field blanks	SW	EB = 11 TB = 1 ~~SB = SB-1-042522 (2209623)~~
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D = 8, 9
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; * ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	TB-3-042722	2209865-01	Water	04/27/22
2	MW-19-5	2209865-02	Water	04/27/22
3	MW-19-4	2209865-03	Water	04/27/22
4	MW-19-3	2209865-04	Water	04/27/22
5	MW-19-2	2209865-05	Water	04/27/22
6	MW-19-1	2209865-06	Water	04/27/22
7	MW-04-5	2209865-07	Water	04/27/22
8	MW-4-4 D	2209865-08	Water	04/27/22
9	DUP-3-2Q22 D	2209865-09	Water	04/27/22
10	MW-4-3	2209865-10	Water	04/27/22
11	EB-3-042722	2209865-11	Water	04/27/22
12	MW-19-3MS	2209865-04MS	Water	04/27/22
13	MW-19-3MSD	2209865-04MSD	Water	04/27/22
14	B138523			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54411C1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?

Y (N) N/A Were all %D within the validation criteria of ≤20 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0% /(30%))	Associated Samples	Qualifications
	4/4/22 0951	ICV-Y5	Methyl Iodide	38.7 (≤30%)	All	J/UJ/P ND

LDC #: 54411 c/a

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15, 20, 15 RSD% and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: _____)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	4/4/22	ICAL-Y5	Methyl Iodide		0.989 (ICAL90)	All	J/UJ/P ND

INICAL.wpd

LDC #: 54411C1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y N N/A Were all %D and RRFs within the validation criteria of ~~≤20%~~ 30%D and ≥0.05 RRF ? 30

#	Date	Standard ID	Compound	Finding %D (Limit: ~~≤20.0%~~ 30)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	5/2/22 0804	CCV-Y5	Hexachloroethane	35.3 (≤ 30%)		All	J/UJ/P NP
	5/2/22 0829	↓	Methyl Iodide	35.6 (≤ 30%)		All	J/UJ/P NP

CONCAL.wpd

LDC #:_____

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page:__of__
Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

SB = SB-1-042522

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 4/25/22
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: SB Associated Samples: 11 (ND)

Compound	Blank ID	Sample Identification								
	SB									
cc	0.41									

Blank units:_____ **Associated sample units:**_____
Sampling date:_____
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:_____ Associated Samples:_____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: July 26, 2022

Parameters: 1,2,3-Trichloropropane

Validation Level: Level III

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209865

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-19-5	2209865-02	Water	04/27/22
MW-19-4	2209865-03	Water	04/27/22
MW-19-3	2209865-04	Water	04/27/22
MW-19-2	2209865-05	Water	04/27/22
MW-19-1	2209865-06	Water	04/27/22
MW-04-5	2209865-07	Water	04/27/22
MW-4-4	2209865-08	Water	04/27/22
DUP-3-2Q22	2209865-09	Water	04/27/22
MW-4-3	2209865-10	Water	04/27/22
EB-3-042722	2209865-11	Water	04/27/22
MW-19-3MS	2209865-04MS	Water	04/27/22
MW-19-3MSD	2209865-04MSD	Water	04/27/22

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,2,3-Trichloropropane by Environmental Protection Agency (EPA) Method 524 Modified

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB-3-042722 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-4-4 and DUP-3-2Q22 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Data Qualification Summary - SDG 2209865

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Laboratory Blank Data Qualification Summary - SDG 2209865

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Field Blank Data Qualification Summary - SDG 2209865

No Sample Data Qualified in this SDG

LDC #: 54411C1b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/22
SDG #: 2209865 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: AP
2nd Reviewer:

METHOD: GC/MS 1,2,3-Trichloropropane (EPA Method 524M)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%D RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = 10 ~~SB = SB-1-042522~~
VII.	Surrogate spikes	N	not required ~~(2209623)~~
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D = 7, 8
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	MW-19-5	2209865-02	Water	04/27/22
2	MW-19-4	2209865-03	Water	04/27/22
3	MW-19-3	2209865-04	Water	04/27/22
4	MW-19-2	2209865-05	Water	04/27/22
5	MW-19-1	2209865-06	Water	04/27/22
6	MW-04-5	2209865-07	Water	04/27/22
7	MW-4-4	2209865-08	Water	04/27/22
8	DUP-3-2Q22	2209865-09	Water	04/27/22
9	MW-4-3	2209865-10	Water	04/27/22
10	EB-3-042722	2209865-11	Water	04/27/22
11	MW-19-3MS	2209865-04MS	Water	04/27/22
12	MW-19-3MSD	2209865-04MSD	Water	04/27/22
13				
14	BI38643-BLK1			

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 14, 2022

Parameters: Metals

Validation Level: Level III

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209865

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-19-5	2209865-02	Water	04/27/22
MW-19-4	2209865-03	Water	04/27/22
MW-19-3	2209865-04	Water	04/27/22
MW-19-2	2209865-05	Water	04/27/22
MW-19-1	2209865-06	Water	04/27/22
MW-04-5	2209865-07	Water	04/27/22
MW-4-4	2209865-08	Water	04/27/22
DUP-3-2Q22	2209865-09	Water	04/27/22
MW-4-3	2209865-10	Water	04/27/22
EB-3-042722	2209865-11	Water	04/27/22
MW-19-3MS	2209865-04MS	Water	04/27/22
MW-19-3MSD	2209865-04MSD	Water	04/27/22
MW-19-3DUP	2209865-04DUP	Water	04/27/22
MW-04-5MS	2209865-07MS	Water	04/27/22
MW-04-5MSD	2209865-07MSD	Water	04/27/22
MW-04-5DUP	2209865-07DUP	Water	04/27/22
MW-4-4MS	2209865-08MS	Water	04/27/22
MW-4-4MSD	2209865-08MSD	Water	04/27/22
MW-4-4DUP	2209865-08DUP	Water	04/27/22
MW-4-3MS	2209865-10MS	Water	04/27/22
MW-4-3MSD	2209865-10MSD	Water	04/27/22
MW-4-3DUP	2209865-10DUP	Water	04/27/22

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Calcium, Chromium, Iron, Lead, Magnesium, Potassium, and Sodium by Environmental Protection Agency (EPA) Methods 200.7 and 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis was not required by the method.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Calcium Magnesium Sodium	0.047799 mg/L 0.02732 mg/L 0.068877 mg/L	MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1
PB (prep blank)	Calcium Magnesium	0.043187 mg/L 0.026753 mg/L	MW-04-5
PB (prep blank)	Calcium Magnesium	0.015118 mg/L 0.032002 mg/L	MW-4-4 DUP-3-2Q22 MW-4-3 EB-3-042722
ICB/CCB	Magnesium	0.023117 mg/L	MW-4-4
ICB/CCB	Magnesium	0.022233 mg/L	DUP-3-2Q22 MW-4-3 EB-3-042722
ICB/CCB	Calcium Magnesium	0.015812 mg/L 0.025569 mg/L	MW-04-5

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-3-042722	Calcium	0.051 mg/L	0.051U mg/L

VI. Field Blanks

Sample EB-3-042722 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-3-042722	04/27/22	Calcium Sodium	0.051 mg/L 0.21 mg/L	MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1 MW-04-5 MW-4-4 DUP-3-2Q22 MW-4-3

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
MW-04-5MS/MSD (MW-04-5)	Sodium	68.2 (75-125)	-	J (all detects)	A

For MW-04-5MS/MSD, no data were qualified for calcium percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

For MW-4-4MS/MSD, no data were qualified for calcium and iron percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
EB-3-042722	Magnesium	10.1 (≤10)	MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1	J (all detects)	A

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples MW-4-4 and DUP-3-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-4-4	DUP-3-2Q22	
Iron	9200 ug/L	6100 ug/L	41
Arsenic	3.8 ug/L	3.3 ug/L	14
Chromium	13 ug/L	10 ug/L	26
Calcium	56 mg/L	53 mg/L	6
Magnesium	20 mg/L	20 mg/L	0

Analyte	Concentration		RPD
	MW-4-4	DUP-3-2Q22	
Sodium	34 mg/L	33 mg/L	3
Potassium	2.1 mg/L	1.9 mg/L	10

XII. Internal Standards (ICP-MS)

Raw data were not reviewed for Level III validation.

XIII. Target Analyte Quantitation

Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R and serial dilution %D, data were qualified as estimated in six samples.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Metals - Data Qualification Summary - SDG 2209865

Sample	Analyte	Flag	A or P	Reason
MW-04-5	Sodium	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1	Magnesium	J (all detects)	A	Serial dilution (%D)

NASA JPL, 2Q2022
Metals - Laboratory Blank Data Qualification Summary - SDG 2209865

Sample	Analyte	Modified Final Concentration	A or P
EB-3-042722	Calcium	0.051U mg/L	A

NASA JPL, 2Q2022
Metals - Field Blank Data Qualification Summary - SDG 2209865

No Sample Data Qualified in this SDG

LDC #: 54411C4a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/10/22
SDG #: 2209865 Level III Page: 1 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer:

METHOD: Metals (EPA Method 200.7/200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB=10
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD;
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	SW	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	(7,8)
XII.	Internal Standard (ICP-MS)	N	
XIII.	Target Analyte Quantitation	N	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	MW-19-5	2209865-02	Water	04/27/22
2	MW-19-4	2209865-03	Water	04/27/22
3	MW-19-3	2209865-04	Water	04/27/22
4	MW-19-2	2209865-05	Water	04/27/22
5	MW-19-1	2209865-06	Water	04/27/22
6	MW-04-5	2209865-07	Water	04/27/22
7	MW-4-4	2209865-08	Water	04/27/22
8	DUP-3-2Q22	2209865-09	Water	04/27/22
9	MW-4-3	2209865-10	Water	04/27/22
10	EB-3-042722	2209865-11	Water	04/27/22
11	MW-19-3MS	2209865-04MS	Water	04/27/22
12	MW-19-3MSD	2209865-04MSD	Water	04/27/22
13	MW-19-3DUP	2209865-04DUP	Water	04/27/22
14	MW-04-5MS	2209865-07MS	Water	04/27/22
15	MW-04-5MSD	2209865-07MSD	Water	04/27/22

LDC #: 54411C4a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/10/22
SDG #: 2209865 Level III Page: 2 of 2
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 200.7/200.8)

	Client ID	Lab ID	Matrix	Date
16	MW-04-5DUP	2209865-07DUP	Water	04/27/22
17	MW-4-4MS	2209865-08MS	Water	04/27/22
18	MW-4-4MSD	2209865-08MSD	Water	04/27/22
19	MW-4-4DUP	2209865-08DUP	Water	04/27/22
20	MW-4-3MS	2209865-10MS	Water	04/27/22
21	MW-4-3MSD	2209865-10MSD	Water	04/27/22
22	MW-4-3DUP	2209865-10DUP	Water	04/27/22
23				
24				
25				

Notes:

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-10	As,Ca,Cr,Fe,Pb,Mg,Na,K
QC:	
11-19	Ca,Fe,Mg,Na,K
11-13,20-22	As,Cr,Pb

Analysis Method

ICP	Ca,Fe,Mg,Na,K
ICP-MS	As,Cr,Pb
CVAA	

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-5

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	No Qual								
Ca	0.047799		0.239									
Mg	0.02732		0.1366									
Na	0.068877		0.34439									

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 6

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	No Qual								
Ca	0.043187		0.21594									
Mg	0.026753		0.13377									

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 7-10

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	10								
Ca	0.015118		0.07559	0.051								
Mg	0.032002		0.16001									

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is established at 5X the highest ICB, CCB, or PB concentration.

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 7

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	No Qual								
Mg		0.023117	0.11559									

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 8-10

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	No Qual								
Mg		0.022233	0.11117									

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 6

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	No Qual								
Ca		0.015812	0.07906									
Mg		0.025569	0.12785									

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is established at 5X the highest ICB, CCB, or PB concentration.

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Blank units: mg/L
Sampling Date: 4/27/2022

Associated sample units: mg/L
Associated Samples: 1-9

			Sample Identification									
Analyte	Blank ID	Action Level	No Qual									
	10											
Ca	0.051	0.255										
Na	0.21	1.05										

Comments: The action level, when applicable, is estabilised at 5X the highest concentration.

VALIDATION FINDINGS WORKSHEETS
Matrix Spike/Matrix Spike Duplicates

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

MS/MSD analysis was performed by the laboratory. All MS/MSD percent recoveries (%R) and relative percent differences (RPDs) were within the acceptable limits with the following exceptions:

MS/MSD ID	Matrix	Analyte	MS %R	MSD %R	%R Limit	RPD	RPD Limit	Associated Samples	Qualification	Det/ND
14-15	Water	Na	68.2		75-125			6	J/UJ/A	Det

Comments: 14-15: Ca > 4x spike; 17-18: Ca,Fe > 4x spike

Serial Dilutions

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/

Serial dilution analysis was performed by the laboratory. All serial dilution percent differences (%D) were within 10%D with the following exceptions:

Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualification	Det/ND
11	Water	Mg	10.1	1-5	J/UJ/A	Det

Comments:

Field Duplicates

Method: Metals

Analyte	Concentration (mg/L)		RPD
	7	8	
Iron (ug/L)	9200	6100	41
Arsenic (ug/L)	3.8	3.3	14
Chromium (ug/L)	13	10	26
Calcium	56	53	6
Magnesium	20	20	0
Sodium	34	33	3
Potassium	2.1	1.9	10

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 14, 2022

Parameters: Wet Chemistry

Validation Level: Level III

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209865

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-19-5	2209865-02	Water	04/27/22
MW-19-4	2209865-03	Water	04/27/22
MW-19-3	2209865-04	Water	04/27/22
MW-19-2	2209865-05	Water	04/27/22
MW-19-1	2209865-06	Water	04/27/22
MW-04-5	2209865-07	Water	04/27/22
MW-4-4	2209865-08	Water	04/27/22
DUP-3-2Q22	2209865-09	Water	04/27/22
MW-4-3	2209865-10	Water	04/27/22
EB-3-042722	2209865-11	Water	04/27/22
MW-19-3MS	2209865-04MS	Water	04/27/22
MW-19-3MSD	2209865-04MSD	Water	04/27/22
MW-19-3DUP	2209865-04DUP	Water	04/27/22

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by EPA Method 218.6
Nitrite as Nitrogen by EPA Method 353.2
Perchlorate by EPA Method 314.0
pH by EPA 150.1
Total Dissolved Solids by EPA Method 160.1

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
MW-19-5 MW-19-4	pH	123 hours	48 hours	J (all detects)	P
MW-19-3 MW-19-2	pH	121 hours	48 hours	J (all detects)	P
MW-19-1	pH	120 hours	48 hours	J (all detects)	P
MW-04-5	pH	118 hours	48 hours	J (all detects)	P
MW-4-4 DUP-3-2Q22 MW-4-3 EB-3-042722	pH	117 hours	48 hours	J (all detects)	P
MW-19-4 MW-19-2	Hexavalent chromium	149 hours	24 hours	J (all detects)	P
MW-19-1	Hexavalent chromium	147 hours	24 hours	J (all detects)	P
MW-04-5 MW-4-4 DUP-3-2Q22 EB-3-042722	Hexavalent chromium	145 hours	24 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
05/09/22	2208974-CCV1	Perchlorate	89.6 (90-110)	MW-19-5 MW-19-3	J (all detects)	A

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
05/10/22	2208974-CCV4	Perchlorate	87 (90-110)	MW-04-5 DUP-3-2Q22	J (all detects)	A
05/10/22	2208974-CCV5	Perchlorate	88.8 (90-110)	MW-19-2	J (all detects)	A
05/10/22	2208974-CCV6	Perchlorate	88.7 (90-110)	MW-19-2	J (all detects)	A

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Hexavalent chromium Sulfate	0.000051 mg/L 0.314 mg/L	MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1 MW-04-5 MW-4-4 DUP-3-2Q22 MW-4-3 EB-3-042722
ICB/CCB	Sulfate	0.301 mg/L	MW-19-5 MW-19-4 MW-19-3 MW-19-2
ICB/CCB	Sulfate	0.318 mg/L	MW-19-1 MW-04-5 MW-4-4 DUP-3-2Q22 MW-4-3 EB-3-042722

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-04-5	Hexavalent chromium	0.000045 mg/L	0.000045U mg/L
MW-4-4	Hexavalent chromium	0.00013 mg/L	0.00013U mg/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
DUP-3-2Q22	Hexavalent chromium	0.000054 mg/L	0.000054U mg/L
MW-4-3	Hexavalent chromium	0.00024 mg/L	0.00024U mg/L
EB-3-042722	Hexavalent chromium Sulfate	0.000055 mg/L 0.31 mg/L	0.000055U mg/L 0.31U mg/L

V. Field Blanks

Sample EB-3-042722 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-3-042722	04/27/22	Total dissolved solids Hexavalent chromium Sulfate	4 mg/L 0.000055 mg/L 0.31 mg/L	MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1 MW-04-5 MW-4-4 DUP-3-2Q22 MW-4-3

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-04-5	Hexavalent chromium	0.000045 mg/L	0.000045U mg/L
MW-4-4	Hexavalent chromium	0.00013 mg/L	0.00013U mg/L
DUP-3-2Q22	Hexavalent chromium	0.000054 mg/L	0.000054U mg/L
MW-4-3	Hexavalent chromium	0.00024 mg/L	0.00024U mg/L

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples MW-4-4 and DUP-3-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-4-4	DUP-3-2Q22	
pH	8.02 SU	8.02 SU	0
Total dissolved solids	360 mg/L	370 mg/L	3
Hexavalent chromium	0.00013 mg/L	0.000054 mg/L	83
Chloride	51 mg/L	54 mg/L	6
Nitrate as N	5.8 mg/L	5.8 mg/L	0
Sulfate	46 mg/L	49 mg/L	6
Perchlorate	2.1 mg/L	1.9 mg/L	10
Alkalinity	170 mg/L	170 mg/L	0

X Target Analyte Quantitation

Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time and continuing calibration %R, data were qualified as estimated in ten samples.

Due to laboratory blank contamination, data were qualified as not detected in five samples.

Due to equipment blank contamination, data were qualified as not detected in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Wet Chemistry - Data Qualification Summary - SDG 2209865

Sample	Analyte	Flag	A or P	Reason
MW-19-5 MW-19-3 MW-4-3	pH	J (all detects)	P	Technical holding times
MW-19-4 MW-19-2 MW-19-1 MW-04-5 MW-4-4 DUP-3-2Q22 EB-3-042722	pH Hexavalent chromium	J (all detects)	P	Technical holding times
MW-19-5 MW-19-3 MW-04-5 DUP-3-2Q22 MW-19-2	Perchlorate	J (all detects)	A	Continuing calibration (%R)

NASA JPL, 2Q2022
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 2209865

Sample	Analyte	Modified Final Concentration	A or P
MW-04-5	Hexavalent chromium	0.000045U mg/L	A
MW-4-4	Hexavalent chromium	0.00013U mg/L	A
DUP-3-2Q22	Hexavalent chromium	0.000054U mg/L	A
MW-4-3	Hexavalent chromium	0.00024U mg/L	A
EB-3-042722	Hexavalent chromium Sulfate	0.000055U mg/L 0.31U mg/L	A

NASA JPL, 2Q2022
Wet Chemistry - Field Blank Data Qualification Summary - SDG 2209865

Sample	Analyte	Modified Final Concentration	A or P
MW-04-5	Hexavalent chromium	0.000045U mg/L	A
MW-4-4	Hexavalent chromium	0.00013U mg/L	A

Sample	Analyte	Modified Final Concentration	A or P
DUP-3-2Q22	Hexavalent chromium	0.000054U mg/L	A
MW-4-3	Hexavalent chromium	0.00024U mg/L	A

LDC #: 54411C6 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/10/22
SDG #: 2209865 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer:
2nd Reviewer:

METHOD: (Analyte) Alkalinity (SM2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA Method 218.6), Perchlorate (EPA Method 314.0), pH (EPA Method 150.1), TDS (EPA Method 160.1)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/SW	
II	Initial calibration	A	
III.	Calibration verification	SW	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	EB=ID
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	SW	(7,8)
X.	Target Analyte Quantitation	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	MW-19-5	2209865-02	Water	04/27/22
2	MW-19-4	2209865-03	Water	04/27/22
3	MW-19-3	2209865-04	Water	04/27/22
4	MW-19-2	2209865-05	Water	04/27/22
5	MW-19-1	2209865-06	Water	04/27/22
6	MW-04-5	2209865-07	Water	04/27/22
7	MW-4-4	2209865-08	Water	04/27/22
8	DUP-3-2Q22	2209865-09	Water	04/27/22
9	MW-4-3	2209865-10	Water	04/27/22
10	EB-3-042722	2209865-11	Water	04/27/22
11	MW-19-3MS	2209865-04MS	Water	04/27/22
12	MW-19-3MSD	2209865-04MSD	Water	04/27/22
13	MW-19-3DUP	2209865-04DUP	Water	04/27/22
14				
15				

Notes:

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-10	pH,TDS,Cr(VI),CLO4,Cl,NO3-N,SO4,NO2-N,Alkalinity
QC:	
13	pH,Alkalinity,TDS
11-13	Cr(VI),Cl,CLO4,NO3-N,NO2-N,SO4

METHOD: Inorganics
All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 150.1 Analyte: pH Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
1	4/27/2022 7:35	5/2/2022 11:01	123	J/UJ/P	Det
2	4/27/2022 8:10	5/2/2022 11:09	123	J/UJ/P	Det
3	4/27/2022 8:40	5/2/2022 10:34	121	J/UJ/P	Det
4	4/27/2022 9:35	5/2/2022 11:17	121	J/UJ/P	Det
5	4/27/2022 11:10	5/2/2022 11:25	120	J/UJ/P	Det
6	4/27/2022 13:20	5/2/2022 11:33	118	J/UJ/P	Det
7	4/27/2022 13:45	5/2/2022 11:41	117	J/UJ/P	Det
8	4/27/2022 14:00	5/2/2022 11:51	117	J/UJ/P	Det
9	4/27/2022 14:35	5/2/2022 12:00	117	J/UJ/P	Det
10	4/27/2022 14:50	5/2/2022 12:45	117	J/UJ/P	Det

METHOD: Inorganics
All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 218.6 Analyte: Hexavalent Chromium Holding Time: 24 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from**	**Qualifier**	**Det/ND**
2	4/27/2022 8:10	5/3/2022 13:48	149	J/R/P	Det
4	4/27/2022 9:35	5/3/2022 14:36	149	J/R/P	Det
5	4/27/2022 11:10	5/3/2022 14:45	147	J/R/P	Det
6	4/27/2022 13:20	5/3/2022 15:14	145	J/R/P	Det
7	4/27/2022 13:45	5/3/2022 15:24	145	J/R/P	Det
8	4/27/2022 14:00	5/3/2022 15:33	145	J/R/P	Det
10	4/27/2022 14:50	5/3/2022 15:53	145	J/R/P	Det

Calibration

METHOD: Inorganics

All initial calibration verifications (ICVs) and continuing calibration verifications (CCVs) were performed at the required frequency and were within the acceptance limits with the following exceptions:

Date	Time	Calibration ID	Analyte	%R	%R Limits	Associated Samples	Qualification	Det/ND
5/9/2022	16:59	2208974-CCV1	CLO4	89.6	90-110	1,3	J/UJ/A	Det
5/10/2022	2:27	2208974-CCV4	CLO4	87	90-110	6,8	J/UJ/A	Det
5/10/2022	4:45	2208974-CCV5	CLO4	88.8	90-110	4	J/UJ/A	Det
5/10/2022	11:11	2208974-CCV6	CLO4	88.7	90-110	4	J/UJ/A	Det

Comments:

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: Jada Morales

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-10

				Sample Identification							
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	6	7	8	9	10			
Cr(VI)	0.000051		0.00026	0.000045	0.00013	0.000054	0.00024	0.000055			
SO4	0.314		1.57					0.31			

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-4

				Sample Identification							
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	No Qual							
SO4		0.301									

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 5-10

				Sample Identification							
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	10							
SO4		0.318		0.31							

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is estabilised at 5X the highest ICB, CCB, or PB concentration.

Field Blanks

METHOD: Inorganics

Blank units: mg/L Associated sample units: mg/L

Sampling Date: 4/27/2022 Associated Samples:1-9

			Sample Identification								
Analyte	Blank ID	Action Level	6	7	8	9					
	10										
TDS	4										
Cr(VI)	0.000055		0.000045	0.00013	0.000054	0.00024					
SO4	0.31										

Comments: The action level, when applicable, is establised at 5X the highest concentration.

Field Duplicates

METHOD: Inorganics

Analyte	Concentration (mg/L)		RPD
	7	8	
pH (S.U.)	8.02	8.02	0
Total Dissolved Solids	360	370	3
Hexavalent Chromium	0.00013	0.000054	83
Chloride	51	54	6
Nitrate as N	5.8	5.8	0
Sulfate	46	49	6
Perchlorate	2.1	1.9	10
Alkalinity	170	170	0

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: July 26, 2022

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209976

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-4-042822	2209976-01	Water	04/28/22
MW-4-2**	2209976-02**	Water	04/28/22
MW-4-1	2209976-03	Water	04/28/22
MW-11-4	2209976-04	Water	04/28/22
MW-11-5	2209976-05	Water	04/28/22
MW-11-3	2209976-06	Water	04/28/22
MW-11-2	2209976-07	Water	04/28/22
Dup-4-2Q22	2209976-08	Water	04/28/22
MW-11-1	2209976-09	Water	04/28/22
EB-4-042822	2209976-10	Water	04/28/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990 with the following exceptions:

Date	Analyte	r^2	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	0.989 (≥0.990)	All samples in SDG 2209976	UJ (all non-detects)	P

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	38.7	All samples in SDG 2209976	UJ (all non-detects)	P

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
05/02/22	Pentachloroethane	77.4	All samples in SDG 2209976	UJ (all non-detects)	P

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample TB-4-042822 was identified as a trip blank. No contaminants were found.

Sample EB-4-042822 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-11-2 and Dup-4-2Q22 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All analyte quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to initial calibration r^2, ICV %D, and continuing calibration %D, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Volatiles - Data Qualification Summary - SDG 2209976

Sample	Analyte	Flag	A or P	Reason
TB-4-042822 MW-4-2** MW-4-1 MW-11-4 MW-11-5 MW-11-3 MW-11-2 Dup-4-2Q22 MW-11-1 EB-4-042822	Methyl iodide	UJ (all non-detects)	P	Initial calibration (r^2)
TB-4-042822 MW-4-2** MW-4-1 MW-11-4 MW-11-5 MW-11-3 MW-11-2 Dup-4-2Q22 MW-11-1 EB-4-042822	Methyl iodide	UJ (all non-detects)	P	Initial calibration verification (%D)
TB-4-042822 MW-4-2** MW-4-1 MW-11-4 MW-11-5 MW-11-3 MW-11-2 Dup-4-2Q22 MW-11-1 EB-4-042822	Pentachloroethane	UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 2Q2022
Volatiles - Laboratory Blank Data Qualification Summary - SDG 2209976

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
Volatiles - Field Blank Data Qualification Summary - SDG 2209976

No Sample Data Qualified in this SDG

LDC #: 54411D1a

SDG #: 2209976

Laboratory: BC Laboratories, Inc., Bakersfield, CA

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 7/21/22

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW/SW	% RSD ≤ 20, r² ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks	A	* *
VI.	Field blanks	SW	TB = 1 EB = 10 ~~SB = SB-1-042522 (2209623~~
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	
X.	Field duplicates	ND	D = 7, 8
XI.	Internal standards	A	LCS
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; * ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	TB-4-042822	2209976-01	Water	04/28/22
2	MW-4-2**	2209976-02**	Water	04/28/22
3	MW-4-1	2209976-03	Water	04/28/22
4	MW-11-4	2209976-04	Water	04/28/22
5	MW-11-5	2209976-05	Water	04/28/22
6	MW-11-3	2209976-06	Water	04/28/22
7	MW-11-2	2209976-07	Water	04/28/22
8	Dup-4-2Q22	2209976-08	Water	04/28/22
9	MW-11-1	2209976-09	Water	04/28/22
10	EB-4-042822	2209976-10	Water	04/28/22
11				
12	B1 38S24			
13				
14				

LDC #: 34411D/a

VALIDATION FINDINGS CHECKLIST

Reviewer: FJ

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?		✓		
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?		✓		
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 34411D1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15, 20, 15 RSD% and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit:_____)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	4/4/22	ICAL-Y5	Methyl Iodide		0.989 (≥0.990)	All	J/UJ/P MD

INICAL.wpd

LDC #: 54411 D1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~ 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was an initial calibration verification standard analyzed after ~~each~~ ICAL for each instrument?

Y N N/A Were all %D within the validation criteria of ≤20 %D? (30%)

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0% (30%))	Associated Samples	Qualifications
	4/4/22 0951	ICV-V5	Methyl Iodide	38.7 (≤30%)	All	J/UJ/P MD

LDC #: 34411 D1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y N N/A Were all %D and RRFs within the validation criteria of ≤~~20 %D~~ and ≥0.05 RRF ? 30

#	Date	Standard ID	Compound	Finding %D (Limit: ~~≤20.0%~~ 30)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	5/2/22 2019	CCV4-V5	Pentachloroethane	77.4 (≤30%)		All	J/UJ/P ND

LDC #: 54411D1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: ____FT___

METHOD: GCMS 524.2

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

RRF = (Ax)(Cis)/(Ais)(Cx)
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

Where:
Ax = Area of compound
Cx = Concentration of compound
S = Standard deviation of the RRFs
X = Mean of the RRFs
Ais = Area of associated internal standard
Cis = Concentration of internal Standard

#	Standard ID	Calibration Date	Compound	Reported (RRF 10 std)	Recalculated (RRF 10 std)	Reported AverageRRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
	ICAL MSV5	4/4/2022	I	0.8519021	0.8519021	0.8428623	0.8428623	4.57114	4.57114
			CC	0.8205145	0.8205145	0.8119389	0.8119389	9.41256	9.41256
			BB	0.5189625	0.5189625	0.5220887	0.5220887	10.54667	10.54667

LDC #: 54110/a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV-V5	3/2/22 1951	I (1st internal standard)	0.842823	0.845619	0.8455619	0.3	0.3
			CC (2nd internal standard)	0.8119389	0.7631533	0.7631533	6.0	6.0
			BB (3rd internal standard)	0.5220887	0.5176028	0.5176028	0.9	0.9
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411D1a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 2

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4	10.0	9.94	99.4	99.4	0
Toluene-d8	↓	9.86	98.6	98.6	↓
Bromofluorobenzene	↓	9.25	92.5	92.5	↓

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 54411D1a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: 5138524 - LCS

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
V	25.0	NA	23.22	NA	92.9	92.9				
P	|	|	23.96		95.8	95.8				
DD	|	|	23.040	|	92.2	92.2				
D	|	|	25.390	|	102	102				
HHH	↓	↓	22.690	↓	90.8	90.8	NA			

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411D1a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: F7

METHOD: GC/MS 524.2

(Y) N N/A Were all reported results recalculated and verified for all level IV samples?
(Y) N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #2 , K

Conc. = $\frac{(28243)(10.0)}{(268902)(0.7567993)}$

=

1.38783 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	#2	K	1.4	1.387	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: July 26, 2022

Parameters: 1,2,3-Trichloropropane

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209976

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-4-2**	2209976-02**	Water	04/28/22
MW-4-1	2209976-03	Water	04/28/22
MW-11-4	2209976-04	Water	04/28/22
MW-11-5	2209976-05	Water	04/28/22
MW-11-3	2209976-06	Water	04/28/22
MW-11-2	2209976-07	Water	04/28/22
Dup-4-2Q22	2209976-08	Water	04/28/22
MW-11-1	2209976-09	Water	04/28/22
EB-4-042822	2209976-10	Water	04/28/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,2,3-Trichloropropane by Environmental Protection Agency (EPA) Method 524 Modified

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB-4-042822 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-11-2 and Dup-4-2Q22 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All analyte quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

Manual integrations were reviewed and were considered acceptable. The laboratory provided before and after integration printouts.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Data Qualification Summary - SDG 2209976

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Laboratory Blank Data Qualification Summary - SDG 2209976

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Field Blank Data Qualification Summary - SDG 2209976

No Sample Data Qualified in this SDG

LDC #: 54411D1b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/22
SDG #: 2209976 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer:
2nd Reviewer:

METHOD: GC/MS 1,2,3-Trichloropropane (EPA Method 524M)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%D RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=9 ~~SB= SB-1-042522~~
VII.	Surrogate spikes	N	not required ~~(2209623)~~
VIII.	Matrix spike/Matrix spike duplicates	N	cs
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D=6,7
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation. MI
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-4-2**	2209976-02**	Water	04/28/22
2	MW-4-1	2209976-03	Water	04/28/22
3	MW-11-4	2209976-04	Water	04/28/22
4	MW-11-5	2209976-05	Water	04/28/22
5	MW-11-3	2209976-06	Water	04/28/22
6	MW-11-2	2209976-07	Water	04/28/22
7	Dup-4-2Q22	2209976-08	Water	04/28/22
8	MW-11-1	2209976-09	Water	04/28/22
9	EB-4-042822	2209976-10	Water	04/28/22
10				

Notes:

	B138539-BLK1						

LDC #: 54411D1b

VALIDATION FINDINGS CHECKLIST

Reviewer: A

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?	✓			
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?			✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54411D1b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (500 std)	Recalc RRF (B01 std)	Reported Average RRF (initial)	Recalc Average RRF (initial)	Reported %RSD	Recalc %RSD
1	ICAL V16	4/27/22	XX (1st internal standard)	1.29844	1.29844	1.18951	1.18951	12.6478	12.6478
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						

LDC #: 54111D1b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV2	4/29/22 1547	XX (1st internal standard)	1.18951	1.198966	1.198966	0.8	0.8
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411D1b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: B138539-BS1

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
XX	0.05	NA	0.0414	NA	82.8	82.8				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411D1b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT

METHOD: GC MS

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. B138539-BS1 XX

Conc. = $\frac{(10989)(50.0)}{(11156)(1.18951)(1000)}$

=

= 0.04140 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	BS1	XX	0.0414	0.04140	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2020

LDC Report Date: July 26, 2022

Parameters: 1,4-Dioxane

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 2209976

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-4-1	2209976-03	Water	04/28/22

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270C

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2020
1,4-Dioxane - Data Qualification Summary - SDG 2209976

No Sample Data Qualified in this SDG

NASA JPL, 2Q2020
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG 2209976

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Field Blank Data Qualification Summary - SDG 2209976

No Sample Data Qualified in this SDG

LDC #: 54411D2c

SDG #: 2209976

Laboratory: BC Laboratories, Inc., Bakersfield, CA

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 7/24/22

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: GC/MS 1,4-Dioxane (EPA SW-846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%R ICV ≤ 20
IV.	Continuing calibration	A	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	MW-4-1	2209976-03	Water	04/28/22
2				
3				
4				
5				
6				
7				
8				
9				

Notes:

	B139528						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 14, 2022

Parameters: Metals

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209976

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-4-2**	2209976-02**	Water	04/28/22
MW-4-1	2209976-03	Water	04/28/22
MW-11-4	2209976-04	Water	04/28/22
MW-11-5	2209976-05	Water	04/28/22
MW-11-3	2209976-06	Water	04/28/22
MW-11-2	2209976-07	Water	04/28/22
Dup-4-2Q22	2209976-08	Water	04/28/22
MW-11-1	2209976-09	Water	04/28/22
EB-4-042822	2209976-10	Water	04/28/22
MW-4-2MS	2209976-02MS	Water	04/28/22
MW-4-2MSD	2209976-02MSD	Water	04/28/22
MW-4-2DUP	2209976-02DUP	Water	04/28/22
EB-4-042822MS	2209976-10MS	Water	04/28/22
EB-4-042822MSD	2209976-10MSD	Water	04/28/22
EB-4-042822DUP	2209976-10DUP	Water	04/28/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Calcium, Chromium, Iron, Lead, Magnesium, Potassium, and Sodium by Environmental Protection Agency (EPA) Methods 200.7 and 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis was not required by the method.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Sodium	0.051993 mg/L	MW-4-2** MW-4-1

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

Sample EB-4-042822 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-4-042822	04/28/22	Chromium Calcium Sodium	0.55 mg/L 0.053 mg/L 0.17 mg/L	MW-4-2** MW-4-1 MW-11-4 MW-11-5 MW-11-3 MW-11-2 Dup-4-2Q22 MW-11-1

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. For MW-4-2MS/MSD, no data were qualified for calcium percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples MW-11-2 and Dup-4-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-11-2	Dup-4-2Q22	
Iron	210 ug/L	210 ug/L	0

Analyte	Concentration		RPD
	MW-11-2	Dup-4-2Q22	
Arsenic	1.0 ug/L	1.0 ug/L	0
Calcium	46 mg/L	48 mg/L	4
Magnesium	18 mg/L	19 mg/L	5
Sodium	23 mg/L	23 mg/L	0
Potassium	3.0 mg/L	3.1 mg/L	3

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2022
Metals - Data Qualification Summary - SDG 2209976

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
Metals - Laboratory Blank Data Qualification Summary - SDG 2209976

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
Metals - Field Blank Data Qualification Summary - SDG 2209976

No Sample Data Qualified in this SDG

LDC #: 54411D4a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/11/22
SDG #: 2209976 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer:

METHOD: Metals (EPA Method 200.7/200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB=9
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD; (10,11) Ca>4xSpike
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	(6,7)
XII.	Internal Standard (ICP-MS)	A	Not reviewed for level III validation
XIII.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-4-2**	2209976-02**	Water	04/28/22
2	MW-4-1	2209976-03	Water	04/28/22
3	MW-11-4	2209976-04	Water	04/28/22
4	MW-11-5	2209976-05	Water	04/28/22
5	MW-11-3	2209976-06	Water	04/28/22
6	MW-11-2	2209976-07	Water	04/28/22
7	Dup-4-2Q22	2209976-08	Water	04/28/22
8	MW-11-1	2209976-09	Water	04/28/22
9	EB-4-042822	2209976-10	Water	04/28/22
10	MW-4-2MS	2209976-02MS	Water	04/28/22
11	MW-4-2MSD	2209976-02MSD	Water	04/28/22
12	MW-4-2DUP	2209976-02DUP	Water	04/28/22
13	EB-4-042822MS	2209976-10MS	Water	04/28/22
14	EB-4-042822MSD	2209976-10MSD	Water	04/28/22
15	EB-4-042822DUP	2209976-10DUP	Water	04/28/22

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
Were all water samples preserved to a pH of <2.	Yes			
II. ICP-MS Tune				
Were mass resolutions within 0.1 amu for all isotopes in the tuning solution?	Yes			
Were %RSDs of isoptoes in the tuning solution ≤5%?	Yes			
III. Calibration				
Were all instuments calibrated daily?	Yes			
Were the proper standards used?	Yes			
Were all initial and continuing calibration verifications within the 90-110% (80-120% for mercury) QC limits?	Yes			
Were the low level standard checks within 70-130%?	Yes			
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?		No		
Was there contamination in the initial and continuing calibration blanks?	Yes			
V. Interference Check Sample				
Were the interference check samples performed daily?	Yes			
Were the AB solution recoveries within 80-120%?	Yes			
VI. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries with the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	Yes			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	Yes			
VII. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
VIII. Internal Standards				
Were all percent recoveries within the 30-120% (60-125% for EPA Method 200.8) QC limits?	Yes			
If the recoveries were outside the limits, was a reanalysis performed?	Yes			
IX. Serial Dilution				
Were all percent differences <10%?	Yes			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			NA	
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	
XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?	Yes			
Were target analytes detected in the field duplicates?	Yes			
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-9	As,Ca,Cr,Fe,Pb,Mg,Na,K
QC:	
10-12	Ca,Fe,Mg,Na,K
13-15	As,Cr,Pb

Analysis Method

ICP	Ca,Fe,Mg,Na,K
ICP-MS	As,Cr,Pb
CVAA	

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: Jada Morales

Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-2

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	No Qual								
Na		0.051993	0.25997									

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is established at 5X the highest ICB, CCB, or PB concentration.

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Blank units: mg/L
Associated sample units: mg/L
Sampling Date: 4/28/2022
Associated Samples: 1-8

			Sample Identification									
Analyte	Blank ID	Action Level	No Qual									
	9											
Cr	0.55											
Ca	0.053											
Na	0.17											

Comments: The action level, when applicable, is establised at 5X the highest concentration.

Field Duplicates

Method: Metals

Analyte	Concentration (mg/L)		RPD
	6	7	
Iron (ug/L)	210	210	0
Arsenic (ug/L)	1.0	1.0	0
Calcium	46	48	4
Magnesium	18	19	5
Sodium	23	23	0
Potassium	3.0	3.1	3

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

An intial calibration verification (ICV), continuing calibration verification (CCV), low level calibration check (LLCC), and interference check sample (ICSAB) percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis

True = concentration of each analyte in the source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalcuated %R	Reported %R	Acceptable (Y/N)
ICV	ICP	Ca	104.49	100	104.49	104	Y
CCV	ICP	Fe	10.085	10	100.85	101	Y
LLCC	ICP	Na	0.52596	0.5	105.192	105	Y
ICSAB	ICP	Mg	494.07	500	98.814	98.8	Y
ICV	ICP-MS	As	120.3	125	96.24	96.2	Y
CCV	ICP-MS	Pb	101.94	100	101.94	102	Y
LLCC	ICP-MS	Cr	2.798	3	93.26666667	93.3	Y
ICSAB	ICP-MS						
ICV	CVAA						
CCV	CVAA						

ICP-MS Tune	QC Parameter	Mass	Actual	Required
5/3/2022	Mass Axis	7	7.016	± 0.1 amu
5/3/2022	%RSD	24	1.8	≤ 5%

VALIDATION FINDINGS CHECKLIST

Quality Control Sample Recalculations

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Percent recoveries (%R) for the laboratory control sample (LCS), matrix spike (MS), and post digestion spike (PDS) were recalculated using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis. For the MS calculation, Found = SSR (Spiked Sample Result) - SR (Sample Result)

True = concentration of each analyte in the source

The sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = (Absolute value(S-D)x 200) / (S+D)

S = Original sample concentration

D = Duplicate sample concentration

The serial dilution percent difference (%D) was recalculated using the following formula.

%D = (Absolute value (I - SDR)) x 100 / (I)

I = Initial sample result

SDR = Serial dilution result (with a 5x dilution applied)

Sample ID	Type of Analysis	Element	Found/S/I	True/D/SDR	Recalcuated %R/RPD/%D	Reported %R/RPD/%D	Acceptable (Y/N)
B138687-BS1	LCS	Pb	102.16	100	102.16	102	Y
13	MS	As	96.621	100	96.621	96.6	Y
12	Duplicate	Fe	1598.2	1659.6	3.769414943	3.77	Y
10PDS	PDS	Ca	9.836	10	98.36	98.4	Y
10SD	Serial dilution	K	2.3883	2.5317	5.66417822	5.67	Y

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Analytes were recalculated and verified using the following equation:
Concentration = (Result from raw data x Final volume x Dilution factor) / (Initial volume)

Sample ID	Analyte	Raw Data (ppb)	Dilution	Initial Volume (mL)	Final Volume (mL)	Reported Result (ug/L)	Recalcuated Result (ug/L)	Acceptable (Y/N)
1	Fe	1.598	1	50	50	1600	1598	Y
1	Cr	1.15	1	50	50	1.2	1.15	Y

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 14, 2022

Parameters: Wet Chemistry

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2209976

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-4-2**	2209976-02**	Water	04/28/22
MW-4-1	2209976-03	Water	04/28/22
MW-11-4	2209976-04	Water	04/28/22
MW-11-5	2209976-05	Water	04/28/22
MW-11-3	2209976-06	Water	04/28/22
MW-11-2	2209976-07	Water	04/28/22
Dup-4-2Q22	2209976-08	Water	04/28/22
MW-11-1	2209976-09	Water	04/28/22
EB-4-042822	2209976-10	Water	04/28/22
MW-4-2MS	2209976-02MS	Water	04/28/22
MW-4-2MSD	2209976-02MSD	Water	04/28/22
MW-4-2DUP	2209976-02DUP	Water	04/28/22
MW-11-3DUP	2209976-06DUP	Water	04/28/22
MW-11-1MS	2209976-09MS	Water	04/28/22
MW-11-1MSD	2209976-09MSD	Water	04/28/22
MW-11-1DUP	2209976-09DUP	Water	04/28/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by EPA Method 218.6
Nitrite as Nitrogen by EPA Method 353.2
Ortho-Phosphate as Phosphorus by EPA Method 365.1
Perchlorate by EPA Method 314.0
pH by EPA 150.1
Total Dissolved Solids by EPA Method 160.1

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
MW-4-2**	pH	155 hours	48 hours	J (all detects)	P
MW-4-1	pH	153 hours	48 hours	J (all detects)	P
MW-11-4	pH	152 hours	48 hours	J (all detects)	P
MW-11-5	pH	151 hours	48 hours	J (all detects)	P
MW-11-3 MW-11-2 Dup-4-2Q22	pH	150 hours	48 hours	J (all detects)	P
MW-11-1 EB-4-042822	pH	149 hours	48 hours	J (all detects)	P
MW-11-3	Hexavalent chromium	142 hours	24 hours	J (all detects)	P
EB-4-042822	Hexavalent chromium	144 hours	24 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
05/10/22	2209067-CCV1	Perchlorate	89.4 (90-110)	MW-4-1 MW-11-4	UJ (all non-detects)	A
05/11/22	2209067-CCV4	Perchlorate	87.6 (90-110)	MW-4-2**	J (all detects)	A

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Sulfate	0.236 mg/L	MW-4-2** MW-4-1 MW-11-4 MW-11-5 MW-11-3 MW-11-2 Dup-4-2Q22 EB-4-042822
PB (prep blank)	Chloride Nitrite as N	0.21 mg/L 0.010945 mg/L	MW-4-2** MW-4-1 MW-11-4 MW-11-5 MW-11-3 MW-11-2 Dup-4-2Q22 MW-11-1 EB-4-042822
ICB/CCB	Hexavalent chromium	0.000084 mg/L	EB-4-042822
ICB/CCB	Chloride Nitrite as N	0.224 mg/L 0.010257 mg/L	MW-4-2** MW-4-1 MW-11-4 MW-11-5 MW-11-3 MW-11-2 Dup-4-2Q22 MW-11-1 EB-4-042822
ICB/CCB	Sulfate	0.23 mg/L	MW-4-2** MW-4-1 MW-11-4 MW-11-5 MW-11-3 MW-11-2 Dup-4-2Q22 EB-4-042822

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-4-2**	Nitrite as N	0.039 mg/L	0.039U mg/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-4-1	Nitrite as N	0.011 mg/L	0.011U mg/L
MW-11-4	Nitrite as N	0.013 mg/L	0.013U mg/L
MW-11-5	Nitrite as N	0.010 mg/L	0.010U mg/L
MW-11-3	Nitrite as N	0.014 mg/L	0.014U mg/L
MW-11-2	Nitrite as N	0.010 mg/L	0.010U mg/L
Dup-4-2Q22	Nitrite as N	0.012 mg/L	0.012U mg/L
MW-11-1	Nitrite as N	0.019 mg/L	0.019U mg/L
EB-4-042822	Hexavalent chromium	0.000075 mg/L	0.000075U mg/L

V. Field Blanks

Sample EB-4-042822 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-4-042822	04/27/22	Total dissolved solids Hexavalent chromium	4 mg/L 0.000075 mg/L	MW-4-2** MW-4-1 MW-11-4 MW-11-5 MW-11-3 MW-11-2 Dup-4-2Q22 MW-11-1

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-4-2**	Hexavalent chromium	0.000089 mg/L	0.000089U mg/L
MW-4-1	Hexavalent chromium	0.00018 mg/L	0.00018U mg/L
MW-11-4	Hexavalent chromium	0.00013 mg/L	0.00013U mg/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-11-3	Hexavalent chromium	0.000094 mg/L	0.000094U mg/L
MW-11-2	Hexavalent chromium	0.000091 mg/L	0.000091U mg/L
Dup-4-2Q22	Hexavalent chromium	0.000072 mg/L	0.000072U mg/L
MW-11-1	Hexavalent chromium	0.00016 mg/L	0.00016U mg/L

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples MW-11-2 and Dup-4-2Q22 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-11-2	Dup-4-2Q22	
pH	8.33	8.29	0
Total dissolved solids	290	290	0
Hexavalent chromium	0.000091	0.000072	23
Chloride	15	15	0
Sulfate	34	34	0

Analyte	Concentration		RPD
	MW-11-2	Dup-4-2Q22	
Nitrate as N	0.01	0.012	18
Alkalinity	190	190	0

X Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time and continuing calibration %R, data were qualified as estimated in nine samples.

Due to laboratory blank contamination, data were qualified as not detected in nine samples.

Due to equipment blank contamination, data were qualified as not detected in seven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Wet Chemistry - Data Qualification Summary - SDG 2209976

Sample	Analyte	Flag	A or P	Reason
MW-4-2** MW-4-1 MW-11-4 MW-11-5 MW-11-2 Dup-4-2Q22 MW-11-1	pH	J (all detects)	P	Technical holding times
MW-11-3 EB-4-042822	pH Hexavalent chromium	J (all detects) J (all detects)	P	Technical holding times
MW-4-1 MW-11-4 MW-4-2**	Perchlorate	J (all detects) UJ (all non-detects)	A	Continuing calibration (%R)

NASA JPL, 2Q2022
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 2209976

Sample	Analyte	Modified Final Concentration	A or P
MW-4-2**	Nitrite as N	0.039U mg/L	A
MW-4-1	Nitrite as N	0.011U mg/L	A
MW-11-4	Nitrite as N	0.013U mg/L	A
MW-11-5	Nitrite as N	0.010U mg/L	A
MW-11-3	Nitrite as N	0.014U mg/L	A
MW-11-2	Nitrite as N	0.010U mg/L	A
Dup-4-2Q22	Nitrite as N	0.012U mg/L	A
MW-11-1	Nitrite as N	0.019U mg/L	A
EB-4-042822	Hexavalent chromium	0.000075U mg/L	A

NASA JPL, 2Q2022
Wet Chemistry - Field Blank Data Qualification Summary - SDG 2209976

Sample	Analyte	Modified Final Concentration	A or P
MW-4-2**	Hexavalent chromium	0.000089U mg/L	A
MW-4-1	Hexavalent chromium	0.00018U mg/L	A
MW-11-4	Hexavalent chromium	0.00013U mg/L	A
MW-11-3	Hexavalent chromium	0.000094U mg/L	A
MW-11-2	Hexavalent chromium	0.000091U mg/L	A
Dup-4-2Q22	Hexavalent chromium	0.000072U mg/L	A
MW-11-1	Hexavalent chromium	0.00016U mg/L	A

LDC #: 54411D6 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/11/22
SDG #: 2209976 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer: CJ

METHOD: (Analyte) Alkalinity (SM2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA Method 218.6), ortho-Phosphate-P (EPA Method 365.1), Perchlorate (EPA Method 314.0), pH (EPA Method 150.1), TDS (EPA Method 160.1)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, SW	
II	Initial calibration	A	
III.	Calibration verification	SW	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	EB=9
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	SW	(6,7)
X.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XI	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-4-2**	2209976-02**	Water	04/28/22
2	MW-4-1	2209976-03	Water	04/28/22
3	MW-11-4	2209976-04	Water	04/28/22
4	MW-11-5	2209976-05	Water	04/28/22
5	MW-11-3	2209976-06	Water	04/28/22
6	MW-11-2	2209976-07	Water	04/28/22
7	Dup-4-2Q22	2209976-08	Water	04/28/22
8	MW-11-1	2209976-09	Water	04/28/22
9	EB-4-042822	2209976-10	Water	04/28/22
10	MW-4-2MS	2209976-02MS	Water	04/28/22
11	MW-4-2MSD	2209976-02MSD	Water	04/28/22
12	MW-4-2DUP	2209976-02DUP	Water	04/28/22
13	MW-11-3DUP	2209976-06DUP	Water	04/28/22
14	MW-11-1MS	2209976-09MS	Water	04/28/22
15	MW-11-1MSD	2209976-09MSD	Water	04/28/22
16	MW-11-1DUP	2209976-09DUP	Water	04/28/22

METHOD: Inorganics				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
II. Calibration				
Were all instruments calibrated at the required frequency?	Yes			
Were the proper number of standards used?	Yes			
Were all initial and continuing calibration verifications within the QC limits?	Yes			
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
Were balance checks performed as required?			NA	
III. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?	Yes			
Was there contamination in the initial and continuing calibration blanks?	Yes			
IV. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries within the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	Yes			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	Yes			
V. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	

XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?	Yes			
Were target analytes detected in the field duplicates?	Yes			
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-9	pH,TDS,Cr(VI),CLO4,Cl,NO2-N,Alkalinity
1-7,9	NO3-N,SO4
8	Orthophosphate-P
QC:	
13	pH,Alkalinity,TDS
10-12	Cr(VI),Cl,CLO4,NO3-N,NO2-N,SO4
14-16	Orthophosphate-P

METHOD: Inorganics

All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 150.1 Analyte: pH Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
1	4/28/2022 7:15	5/4/2022 18:31	155	J/UJ/P	Det
2	4/28/2022 8:45	5/4/2022 18:40	153	J/UJ/P	Det
3	4/28/2022 10:45	5/4/2022 18:47	152	J/UJ/P	Det
4	4/28/2022 11:45	5/4/2022 18:54	151	J/UJ/P	Det
5	4/28/2022 12:35	5/4/2022 19:24	150	J/UJ/P	Det
6	4/28/2022 13:10	5/4/2022 19:36	150	J/UJ/P	Det
7	4/28/2022 13:25	5/4/2022 19:43	150	J/UJ/P	Det
8	4/28/2022 14:25	5/4/2022 19:50	149	J/UJ/P	Det
9	4/28/2022 14:40	5/4/2022 19:59	149	J/UJ/P	Det

METHOD: Inorganics

All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 218.6 Analyte: Hexavalent Chromium Holding Time: 24 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from**	**Qualifier**	**Det/ND**
5	4/28/2022 12:35	5/4/2022 11:12	142	J/R/P	Det
9	4/28/2022 14:40	5/4/2022 15:22	144	J/R/P	Det

Calibration

METHOD: Inorganics

All initial calibration verifications (ICVs) and continuing calibration verifications (CCVs) were performed at the required frequency and were within the acceptance limits with the following exceptions:

Date	Time	Calibration ID	Analyte	%R	%R Limits	Associated Samples	Qualification	Det/ND
5/10/2022	16:11	2209067-CCV1	CLO4	88.6	90-110	2,3	J/UJ/A	ND
5/11/2022	2:08	2209067-CCV4	CLO4	85.3	90-110	1	J/UJ/A	Det

Comments:

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: Jada Morales

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-7,9

				Sample Identification							
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	NO Qual							
SO4	0.236		1.18								

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-9

				Sample Identification							
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	1	2	3	4	5	6	7	8
Cl	0.21		1.05								
NO2-N	0.010945		0.05473	0.039	0.011	0.013	0.010	0.014	0.010	0.012	0.019

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 9

				Sample Identification							
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	No Qual							
Cr(VI)		0.000084									

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is establised at 5X the highest ICB, CCB, or PB concentration.

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Jada Morales

METHOD: Inorganics

Blank units: mg/L Associated sample units: mg/L
Sampling Date: 4/28/2022 Associated Samples:1-8

			Sample Identification							
Analyte	Blank ID	Action Level	1	2	3	5	6	7	8	
	9									
TDS	4	20								
Cr(VI)	0.000075	0.000375	0.000089	0.00018	0.00013	0.000094	0.000091	0.000072	0.00016	
		0								
		0								

Comments: The action level, when applicable, is establised at 5X the highest concentration.

Field Duplicates

METHOD: Inorganics

Analyte	Concentration (mg/L)		RPD
	6	7	
pH (S.U.)	8.33	8.29	0
Total Dissolved Solids	290	290	0
Hexavalent Chromium	0.000091	0.000072	23
Chloride	15	15	0
Sulfate	34	34	0
Nitrite as N	0.01	0.012	18
Alkalinity	190	190	0

Initial and Continuing Calibration Calculation Verification

METHOD: Inorganics

The correlation coefficient (r) for the calibration of Cl were recalculated.
Calibration date:
An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:
%R = (Found/True) x 100
Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of Analysis	Analyte	Standard	Concentration (mg/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial Calibration	Cl	s1	0.578	0.109	1.000000	0.999102	Y
		s2	4.241	0.898			
		s3	18.166	3.965			
		s4	50.711	11.554			
		s5	102.901	24.943			
		s6	198.883	53.553			
		s7					
		s8					
		s9					
		s10					
		s11					
		s12					

Type of Analysis	Analyte	Found (mg/L)	True (mg/L)		Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Calibration verification	Cr(VI)	25.969	25		103.876	104	Y
Calibration verification	NO3-N	5.062	5		101.24	101	Y
Calibration verification	SO4	98.898	100		98.898	98.9	Y

Quality Control Sample Recalculations

METHOD: Inorganics

Percent recoveries (%R) for the laboratory control sample (LCS) and matrix spike (MS) were recalcuated using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis. For the MS calculation, Found = SSR (Spiked Sample Result) - SR (Sample Result)

True = concentration of each analyte in the source

The sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = (Absolute value(S-D)x 200) / (S+D)

S = Original sample concentration

D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found/S	True/D	Recalculated %R/RPD	Reported %R/RPD	Acceptable (Y/N)
B138741-BS1	LCS	TDS	585	586	99.82935154	99.8	Y
10	MS	NO2-N	0.522735	0.52632	99.31885545	99.3	Y
13	Duplicate	pH	8.66	8.64	0.231213873	0.231	Y

Sample Calculation Verification

METHOD: Inorganics

Analytes were recalculated and verified using the following equation:

Concentration = (Result from raw data x Final volume x Dilution factor) / (Percent solids (if applicable) x Initial weight or volume)

Sample ID	Analyte	Raw Data (mg/L)	Dilution	Initial Volume (mL)	Final Volume (mL)	Reported Result (mg/L)	Recalculated Result (mg/L)	Acceptable (Y/N)
1	pH (S.U.)	8.08	1	50	50	8.08	8.08	Y
1	TDS	155	3.33	100	100	520	516.15	Y
1	Cr(VI)	0.088574251	1	20	20	0.000089	8.85743E-05	Y
1	Cl	77.2733	1	20	20	78	77.2733	Y
1	CLO4	9.230769231	5	20	20	46	46.15384615	Y
1	NO2-N	0.03855	1	20	20	0.039	0.03855	Y
1	Alkailinty	214.99	1	50	50	210	214.99	Y

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-9

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	1	2	3	4	5	6	7	8	9
Cl		0.224										0.13
NO2-N		0.010257		0.039	0.011	0.013	0.010	0.014	0.010	0.012	0.019	0.01

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-7,9

				Sample Identification							
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	9							
SO4		0.23		0.14							

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is establised at 5X the highest ICB, CCB, or PB concentration.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: July 26, 2022

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210072

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-5-042922	2210072-01	Water	04/29/22
MW-22-5	2210072-02	Water	04/29/22
MW-22-4	2210072-03	Water	04/29/22
MW-22-3	2210072-04	Water	04/29/22
MW-22-2	2210072-05	Water	04/29/22
MW-22-1	2210072-06	Water	04/29/22
MW-26-2**	2210072-07**	Water	04/29/22
EB-5-042922	2210072-08	Water	04/29/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990 with the following exceptions:

Date	Analyte	r^2	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	0.989 (≥0.990)	All samples in SDG 2210072	UJ (all non-detects)	P

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	38.7	All samples in SDG 2210072	UJ (all non-detects)	P

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all analytes with the following exceptions:

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990 with the following exceptions:

Date	Analyte	r^2	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	0.989 (≥0.990)	All samples in SDG 2210072	UJ (all non-detects)	P

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
04/04/22	Methyl iodide	38.7	All samples in SDG 2210072	UJ (all non-detects)	P

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
05/02/22 (08:04)	Hexachloroethane	35.3	TB-5-042922 MW-22-5 MW-22-4 MW-22-3 MW-22-2 MW-22-1 MW-26-2**	UJ (all non-detects)	P
05/02/22 (08:29)	Methyl iodide	35.6	TB-5-042922 MW-22-5 MW-22-4 MW-22-3 MW-22-2 MW-22-1 MW-26-2**	UJ (all non-detects)	P
05/02/22 (20:19)	Pentachloroethane	77.4	EB-5-042922	UJ (all non-detects)	P

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample TB-5-042922 was identified as a trip blank. No contaminants were found.

Sample EB-4-042822 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

NASA JPL, 2Q2022
Volatiles - Data Qualification Summary - SDG 2210072

Sample	Analyte	Flag	A or P	Reason
TB-5-042922 MW-22-5 MW-22-4 MW-22-3 MW-22-2 MW-22-1 MW-26-2** EB-5-042922	Methyl iodide	UJ (all non-detects)	P	Initial calibration (r^2)
TB-5-042922 MW-22-5 MW-22-4 MW-22-3 MW-22-2 MW-22-1 MW-26-2** EB-5-042922	Methyl iodide	UJ (all non-detects)	P	Initial calibration verification (%D)
TB-5-042922 MW-22-5 MW-22-4 MW-22-3 MW-22-2 MW-22-1 MW-26-2**	Hexachloroethane Methyl iodide	UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)
EB-5-042922	Pentachloroethane	UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 2Q2022
Volatiles - Laboratory Blank Data Qualification Summary - SDG 2210072

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
Volatiles - Field Blank Data Qualification Summary - SDG 2210072

No Sample Data Qualified in this SDG

LDC #: 54411E1a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/22
SDG #: 2210072 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: [illegible]
2nd Reviewer [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW/SW	%RSD ≤ 20, r² ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks	A	* *
VI.	Field blanks	SW	TB = 1 EB = 8 ~~SB = SB-1-042822~~ (~~2209623~~)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	2209865-04MSD
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	TB-5-042*922	2210072-01	Water	04/29/22
2	MW-22-5	2210072-02	Water	04/29/22
3	MW-22-4	2210072-03	Water	04/29/22
4	MW-22-3	2210072-04	Water	04/29/22
5	MW-22-2	2210072-05	Water	04/29/22
6	MW-22-1	2210072-06	Water	04/29/22
7	MW-26-2**	2210072-07**	Water	04/29/22
8	EB-5-042922	2210072-08	Water	04/29/22
9				

Notes:

	B138523-BK1						

LDC #: 54411E1a

VALIDATION FINDINGS CHECKLIST

Reviewer: FT

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓	✓		
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?		✓		
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?	NA		✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54411E1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 7
Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15, 20, 15 RSD% and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit:)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	4/4/22	ICAL -Y5	Methyl Iodide		0.989 (≥0.990)	All	J/UJ/P ND

LDC #: 54411E1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?

Y N N/A Were all %D within the validation criteria of ≤20 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0% (30%))	Associated Samples	Qualifications
	4/4/22 0951	ICV-Y5	Methyl Iodide	38.7 (≤30%)	All	J/UJ/P ND

LDC #: 34411E1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method ~~8260~~) 524.2

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y N N/A Were all %D and RRFs within the validation criteria of ≤~~20.0~~ 30%D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤~~20.0~~ 30)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	5/2/22 0804	CCV1-V5	Hexachloroethane	35.3 (≤30%)		1-7 B138523-BLK1	J/UJ/P ND
	5/2/22 0829	CCV2-V5	Methyl Iodide	35.6 (≤30)		↓	J/UJ/P ND
	5/2/22 2019	CCV4-V5	Pentachloroethane	77.4 (≤30)		8 2208165-CCB2	J/UJ/P ND

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: GCMS 524.2

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

RRF = (Ax)(Cis)/(Ais)(Cx)
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

Where:
Ax = Area of compound
Cx = Concentration of compound
S = Standard deviation of the RRFs
X = Mean of the RRFs
Ais = Area of associated internal standard
Cis = Concentration of internal Standard

#	Standard ID	Calibration Date	Compound	Reported (RRF 10 std)	Recalculated (RRF 10 std)	Reported AverageRRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
	ICAL MSV5	4/4/2022	I	0.8519021	0.8519021	0.8428623	0.8428623	4.57114	4.57114
			CC	0.8205145	0.8205145	0.8119389	0.8119389	9.41256	9.41256
			BB	0.5189625	0.5189625	0.5220887	0.5220887	10.54667	10.54667

LDC #: 54411E1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	ccv	5/2/22 0804	I (1st internal standard)	0.8428623	0.8099605	0.8099605	3.9	3.9
			CC (2nd internal standard)	0.8119389	0.720635	0.720635	10.5	10.5
			BB (3rd internal standard)	0.5220887	0.4753666	0.4753666	8.9	8.9
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411E1a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #7

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4	10.0	10.28	103	103	0
Toluene-d8	↓	9.95	99.5	99.5	↓
Bromofluorobenzene	↓	9.49	94.9	94.9	↓

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 54411E1a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: B138523 LCS

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
V	25.0	NA	24.250	NA	97.0	97.0				
P	↓	↓	24.720	↓	98.9	98.9				
DD			24.200		96.8	96.8				
D			26.630		107	107				
HH			24.640		98.6	98.6				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411E1a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: EV

METHOD: GC/MS

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #7 , K

Conc. = $\frac{(45696)(10.0)}{(263902)(0.7567993)}$

=

2.28799 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	#7	K	2.3	2.28799	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: July 26, 2022

Parameters: 1,2,3-Trichloropropane

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210072

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-22-5	2210072-02	Water	04/29/22
MW-22-4	2210072-03	Water	04/29/22
MW-22-3	2210072-04	Water	04/29/22
MW-22-2	2210072-05	Water	04/29/22
MW-22-1	2210072-06	Water	04/29/22
MW-26-2**	2210072-07**	Water	04/29/22
EB-5-042922	2210072-08	Water	04/29/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,2,3-Trichloropropane by Environmental Protection Agency (EPA) Method 524 Modified

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB-5-042922 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Targe Analyte Quantitation

All analyte quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

Manual integrations were reviewed and were considered acceptable. The laboratory provided before and after integration printouts.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Data Qualification Summary - SDG 2210072

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Laboratory Blank Data Qualification Summary - SDG 2210072

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
1,2,3-Trichloropropane - Field Blank Data Qualification Summary - SDG 2210072

No Sample Data Qualified in this SDG

LDC #: 54411E1b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/14/22
SDG #: 2210072 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS 1,2,3-Trichloropropane (EPA Method 524M)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=7 ~~SB = SB-1-042522~~
VII.	Surrogate spikes	N	not required ~~(2209623)~~
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	A	Not reviewed for Level III validation.
XIII.	Target analyte identification	A	Not reviewed for Level III validation. MI
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-22-5	2210072-02	Water	04/29/22
2	MW-22-4	2210072-03	Water	04/29/22
3	MW-22-3	2210072-04	Water	04/29/22
4	MW-22-2	2210072-05	Water	04/29/22
5	MW-22-1	2210072-06	Water	04/29/22
6	MW-26-2**	2210072-07**	Water	04/29/22
7	EB-5-042922	2210072-08	Water	04/29/22
8				
9				

Notes:

	B138643.BLK1						

LDC #: 94116h

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: FA

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IIIa. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 30%?	✓			
V.Laboratory blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?			✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			

X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	✓			
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Target Analytes quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target analyte identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
Were manual integrations reviewed and found acceptable?	✓			
Did the laboratory provide before and after integration printouts?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 54411E1b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50U std)	Recalc RRF (50U std)	Reported Average RRF (initial)	Recalc Average RRF (initial)	Reported %RSD	Recalc %RSD
1	ICAL V16	4/27/22	XX (1st internal standard)	1.29844	1.29844	1.18951	1.18951	12.6478	12.6478
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						

LDC #: 54411E1b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	ccv2	5/3/22 1225	XX (1st internal standard)	1.18951	0.995635	0.995635	16.3	16.3
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
2	ccv3	5/3/22 1805	XX (1st internal standard)	↓	1.035188	1.035188	13.0	13.0
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411F16

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA

Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC)

LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: BI38643-BS1

Compound	Spike Added (ng/L)		Spiked Sample Concentration (ng/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
XX	0.0500	NA	0.04278	NA	85.6	85.6	NA	—		

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 54411E1b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: FJ

METHOD: GC/MS

(Y) N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. B138643-BS1 XX

Conc. = $\frac{(12127)(50)}{(11915)(1.1895)(1000)}$

=

0.04278 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	BS1	XX	0.04278U	0.04278U	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 14, 2022

Parameters: Metals

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210072

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-22-5	2210072-02	Water	04/29/22
MW-22-4	2210072-03	Water	04/29/22
MW-22-3	2210072-04	Water	04/29/22
MW-22-2	2210072-05	Water	04/29/22
MW-22-1	2210072-06	Water	04/29/22
MW-26-2**	2210072-07**	Water	04/29/22
EB-5-042922	2210072-08	Water	04/29/22
MW-26-2MS	2210072-07MS	Water	04/29/22
MW-26-2MSD	2210072-07MSD	Water	04/29/22
MW-26-2DUP	2210072-07DUP	Water	04/29/22
EB-5-042922MS	2210072-08MS	Water	04/29/22
EB-5-042922MSD	2210072-08MSD	Water	04/29/22
EB-5-042922DUP	2210072-08DUP	Water	04/29/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Calcium, Chromium, Iron, Lead, Magnesium, Potassium, and Sodium by Environmental Protection Agency (EPA) Methods 200.7 and 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis was not required by the method.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Arsenic	0.744 mg/L	MW-22-2 MW-22-1 MW-26-2** EB-5-042922
PB (prep blank)	Sodium	0.060518 mg/L	MW-22-5 MW-22-4 MW-22-3 MW-22-2 MW-22-1 MW-26-2** EB-5-042922

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-22-1	Arsenic	0.75 mg/L	0.75U mg/L
EB-5-042922	Sodium	0.2 mg/L	0.2U mg/L

VI. Field Blanks

Sample EB-5-042922 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-5-042922	04/29/22	Calcium Magnesium Sodium	0.062 mg/L 0.021 mg/L 0.02 mg/L	MW-22-5 MW-22-4 MW-22-3 MW-22-2 MW-22-1 MW-26-2**

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to laboratory blank contamination, data were qualified as not detected in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Metals - Data Qualification Summary - SDG 2210072

No Sample Data Qualified in this SDG

NASA JPL, 2Q2022
Metals - Laboratory Blank Data Qualification Summary - SDG 2210072

Sample	Analyte	Modified Final Concentration	A or P
MW-22-1	Arsenic	0.75U mg/L	A
EB-5-042922	Sodium	0.2U mg/L	A

NASA JPL, 2Q2022
Metals - Field Blank Data Qualification Summary - SDG 2210072

No Sample Data Qualified in this SDG

LDC #: 54411E4a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/11/22
SDG #: 2210072 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JM
2nd Reviewer:

METHOD: Metals (EPA Method 200.7/200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB=7
VII.	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	A	Not reviewed for level III validation
XIII.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-22-5	2210072-02	Water	04/29/22
2	MW-22-4	2210072-03	Water	04/29/22
3	MW-22-3	2210072-04	Water	04/29/22
4	MW-22-2	2210072-05	Water	04/29/22
5	MW-22-1	2210072-06	Water	04/29/22
6	MW-26-2**	2210072-07**	Water	04/29/22
7	EB-5-042922	2210072-08	Water	04/29/22
8	MW-26-2MS	2210072-07MS	Water	04/29/22
9	MW-26-2MSD	2210072-07MSD	Water	04/29/22
10	MW-26-2DUP	2210072-07DUP	Water	04/29/22
11	EB-5-042922MS	2210072-08MS	Water	04/29/22
12	EB-5-042922MSD	2210072-08MSD	Water	04/29/22
13	EB-5-042922DUP	2210072-08DUP	Water	04/29/22
14				

Notes:

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
Were all water samples preserved to a pH of <2.	Yes			
II. ICP-MS Tune				
Were mass resolutions within 0.1 amu for all isotopes in the tuning solution?	Yes			
Were %RSDs of isoptoes in the tuning solution ≤5%?	Yes			
III. Calibration				
Were all instuments calibrated daily?	Yes			
Were the proper standards used?	Yes			
Were all initial and continuing calibration verifications within the 90-110% (80-120% for mercury) QC limits?	Yes			
Were the low level standard checks within 70-130%?	Yes			
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?	Yes			
Was there contamination in the initial and continuing calibration blanks?	Yes			
V. Interference Check Sample				
Were the interference check samples performed daily?	Yes			
Were the AB solution recoveries within 80-120%?	Yes			
VI. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries with the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	Yes			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	Yes			
VII. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)				
Validation Area	**Yes**	**No**	**NA**	**Comments**
VIII. Internal Standards				
Were all percent recoveries within the 30-120% (60-125% for EPA Method 200.8) QC limits?	Yes			
If the recoveries were outside the limits, was a reanalysis performed?	Yes			
IX. Serial Dilution				
Were all percent differences <10%?	Yes			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			NA	
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	
XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?			NA	
Were target analytes detected in the field duplicates?			NA	
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-7	As,Ca,Cr,Fe,Pb,Mg,Na,K
QC:	
11-13	Ca,Fe,Mg,Na,K
9-11	As,Cr,Pb

Analysis Method

ICP	Ca,Fe,Mg,Na,K
ICP-MS	As,Cr,Pb
CVAA	

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: Jada Morales

Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 4-7

				Sample Identification								
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	5								
As		0.744	3.72	0.75								

Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-7

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	7								
Na	0.060518		0.30259	0.2								

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is established at 5X the highest ICB, CCB, or PB concentration.

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Blank units: mg/L
Associated sample units: mg/L
Sampling Date: 4/29/2022
Associated Samples: 1-6

			Sample Identification									
Analyte	Blank ID	Action Level	No Qual									
	7											
Ca	0.062	0.31										
Mg	0.021	0.105										
Na	0.2	1										

Comments: The action level, when applicable, is estabilised at 5X the highest concentration.

VALIDATION FINDINGS CHECKLIST
Calibration Calculation Verification

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

An intial calibration verification (ICV), continuing calibration verification (CCV), low level calibration check (LLCC), and interference check sample (ICSAB) percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis
True = concentration of each analyte in the source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalcuated %R	Reported %R	Acceptable (Y/N)
ICV	ICP	Ca	97.166	100	97.166	97.2	Y
CCV	ICP	Fe	10.341	10	103.41	103	Y
LLCC	ICP	Na	0.50936	0.5	101.872	102	Y
ICSAB	ICP	Mg	489.84	500	97.968	98	Y
ICV	ICP-MS	As	120.48	125	96.384	96.4	Y
CCV	ICP-MS	Pb	108.41	100	108.41	108	Y
LLCC	ICP-MS	Cr	3.029	3	100.9666667	101	Y
ICSAB	ICP-MS						
ICV	CVAA						
CCV	CVAA						

ICP-MS Tune	QC Parameter	Mass	Actual	Required
5/5/2022	Mass Axis	7	7.016	± 0.1 amu
5/5/2022	%RSD	114.9	0.9	≤ 5%

VALIDATION FINDINGS CHECKLIST

Quality Control Sample Recalculations

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)

Percent recoveries (%R) for the laboratory control sample (LCS), matrix spike (MS), and post digestion spike (PDS) were recalculated using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis. For the MS calculation, Found = SSR (Spiked Sample Result) - SR (Sample Result)

True = concentration of each analyte in the source

The sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = (Absolute value(S-D)x 200) / (S+D)

S = Original sample concentration

D = Duplicate sample concentration

The serial dilution percent difference (%D) was recalculated using the following formula.

%D = (Absolute value (I - SDR)) x 100 / (I)

I = Initial sample result

SDR = Serial dilution result (with a 5x dilution applied)

Sample ID	Type of Analysis	Element	Found/S/I	True/D/SDR	Recalcuated %R/RPD/%D	Reported %R/RPD/%D	Acceptable (Y/N)
B138685-BS1	LCS	Pb	105.61	100	105.61	106	Y
11	MS	Fe	1007.2	1000	100.72	101	Y
13	Duplicate	Mg	0.25492	0.21115	18.78258631	18.8	Y
8PDS	PDS	As	98.532	100	98.532	98.5	Y
8SD	Serial dilution	K	ND	ND	ND	ND	Y

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: Jada Morales

METHOD: Trace Metals (EPA SW 846 Methods 6010/6020/7000)
Analytes were recalculated and verified using the following equation:
Concentration = (Result from raw data x Final volume x Dilution factor) / (Initial volume)

Sample ID	Analyte	Raw Data (ppb)	Dilution	Initial Volume (mL)	Final Volume (mL)	Reported Result (ug/L)	Recalcuated Result (ug/L)	Acceptable (Y/N)
6	Fe	0.098	1	50	50	98	98	Y
6	Cr	1.22	1	50	50	1.2	1.22	Y

LDC Report# 54411E6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 2Q2022

LDC Report Date: October 14, 2022

Parameters: Wet Chemistry

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc., Bakersfield, CA

Sample Delivery Group (SDG): 2210072

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-22-5	2210072-02	Water	04/29/22
MW-22-4	2210072-03	Water	04/29/22
MW-22-3	2210072-04	Water	04/29/22
MW-22-2	2210072-05	Water	04/29/22
MW-22-1	2210072-06	Water	04/29/22
MW-26-2**	2210072-07**	Water	04/29/22
EB-5-042922	2210072-08	Water	04/29/22
MW-22-2DUP	2210072-05DUP	Water	04/29/22
MW-22-1DUP	2210072-06DUP	Water	04/29/22
MW-26-2MS	2210072-07MS	Water	04/29/22
MW-26-2MSD	2210072-07MSD	Water	04/29/22
MW-26-2DUP	2210072-07DUP	Water	04/29/22

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by EPA Method 218.6
Nitrite as Nitrogen by EPA Method 353.2
Perchlorate by EPA Method 314.0
pH by EPA 150.1
Total Dissolved Solids by EPA Method 160.1

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
MW-22-5 MW-22-4	pH	153 hours	48 hours	J (all detects)	P
MW-22-3	pH	141 hours	48 hours	J (all detects)	P
MW-22-2	pH	152 hours	48 hours	J (all detects)	P
MW-22-1	pH	151 hours	48 hours	J (all detects)	P
MW-26-2** EB-5-042922	pH	149 hours	48 hours	J (all detects)	P
MW-22-3	Hexavalent chromium	106 hours	24 hours	J (all detects)	P
MW-26-2**	Hexavalent chromium	103 hours	24 hours	J (all detects)	P
EB-5-042922	Hexavalent chromium	102 hours	24 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
05/10/22	2209067-CCV1	Perchlorate	88.6 (90-110)	MW-22-5 MW-22-4 MW-22-3 MW-22-2	J (all detects)	A

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Sulfate	0.233 mg/L	MW-22-5 MW-22-4 MW-22-3 MW-22-2 MW-22-1 MW-26-2** EB-5-042922
ICB/CCB	Sulfate	0.246 mg/L	MW-22-5 MW-22-4 MW-22-3 MW-22-2 MW-22-1 MW-26-2** EB-5-042922

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-5-042922	Sulfate	0.23 mg/L	0.23U mg/L

V. Field Blanks

Sample EB-5-042922 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB-5-042922	04/29/22	Hexavalent chromium Sulfate	0.00004 mg/L 0.23 mg/L	MW-22-5 MW-22-4 MW-22-3 MW-22-2 MW-22-1 MW-26-2**

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-22-5	Hexavalent chromium	0.00019 mg/L	0.00019U mg/L
MW-22-1	Hexavalent chromium	0.00016 mg/L	0.00016U mg/L

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X Target Analyte Quantitation

All target analyte quantitations were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time and continuing calibration %R, data were qualified as estimated in seven samples.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

Due to equipment blank contamination, data were qualified as not detected in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

NASA JPL, 2Q2022
Wet Chemistry - Data Qualification Summary - SDG 2210072

Sample	Analyte	Flag	A or P	Reason
MW-22-5 MW-22-4 MW-22-2 MW-22-1	pH	J (all detects)	P	Technical holding times
MW-22-3 MW-26-2** EB-5-042922	pH Hexavalent chromium	J (all detects) J (all detects)	P	Technical holding times
MW-22-5 MW-22-4 MW-22-3 MW-22-2	Perchlorate	J (all detects)	A	Continuing calibration (%R)

NASA JPL, 2Q2022
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 2210072

Sample	Analyte	Modified Final Concentration	A or P
EB-5-042922	Sulfate	0.23U mg/L	A

NASA JPL, 2Q2022
Wet Chemistry - Field Blank Data Qualification Summary - SDG 2210072

Sample	Analyte	Modified Final Concentration	A or P
MW-22-5	Hexavalent chromium	0.00019U mg/L	A
MW-22-1	Hexavalent chromium	0.00016U mg/L	A

LDC #: 54411E6 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/12/22
SDG #: 2210072 Level III/IV Page: 1 of 1
Laboratory: BC Laboratories, Inc., Bakersfield, CA Reviewer: JA
2nd Reviewer:

METHOD: (Analyte) Alkalinity (SM2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA Method 218.6), Perchlorate (EPA Method 314.0), pH (EPA Method 150.1), TDS (EPA Method 160.1)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/SW	
II	Initial calibration	A	
III.	Calibration verification	SW	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	EB=7
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	N	
X.	Target Analyte Quantitation	A	Not reviewed for Level III validation.
XI	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-22-5	2210072-02	Water	04/29/22
2	MW-22-4	2210072-03	Water	04/29/22
3	MW-22-3	2210072-04	Water	04/29/22
4	MW-22-2	2210072-05	Water	04/29/22
5	MW-22-1	2210072-06	Water	04/29/22
6	MW-26-2**	2210072-07**	Water	04/29/22
7	EB-5-042922	2210072-08	Water	04/29/22
8	MW-22-2DUP	2210072-05DUP	Water	04/29/22
9	MW-22-1DUP	2210072-06DUP	Water	04/29/22
10	MW-26-2MS	2210072-07MS	Water	04/29/22
11	MW-26-2MSD	2210072-07MSD	Water	04/29/22
12	MW-26-2DUP	2210072-07DUP	Water	04/29/22
13				
14				
15				

Notes:

METHOD: Inorganics				
Validation Area	**Yes**	**No**	**NA**	**Comments**
I. Technical holding times				
Were all technical holding times met?	Yes			
II. Calibration				
Were all instruments calibrated at the required frequency?	Yes			
Were the proper number of standards used?	Yes			
Were all initial and continuing calibration verifications within the QC limits?	Yes			
Were all initial calibration correlation coefficients within limits as specifed by the method?	Yes			
Were balance checks performed as required?			NA	
III. Blanks				
Was a method blank associated with every sample in this SDG?	Yes			
Was there contamination in the method blanks?	Yes			
Was there contamination in the initial and continuing calibration blanks?	Yes			
IV. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates				
Were MS/MSD recoveries within the QC limits? (If the sample concentration exceeded the spike concentration by a factor of 4, no action was taken.)	Yes			
Were the MS/MSD or laboratory duplicate relative percent differences (RPDs) within the QC limits?	Yes			
V. Laboratory Control Samples				
Was a LCS analyzed for each batch in the SDG?	Yes			
Were the LCS recoveries and RPDs (if applicable) within QC limits?	Yes			
X. Sample Result Verification				
Were all reporting limits adjusted to reflect sample dilutions?	Yes			
Were all soil samples dry weight corrected?			NA	

XI. Overall Assessment of Data				
Was the overall assessment of the data found to be acceptable?	Yes			
XII. Field Duplicates				
Were field duplicates identifed in this SDG?			NA	
Were target analytes detected in the field duplicates?			NA	
XIII. Field Blanks				
Were field blanks identified in this SDG?	Yes			
Were target analytes detected in the field blanks?	Yes			

Sample Specific Element Reference Reviewer: Jada Morales

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-7	pH,TDS,Cr(VI),CLO4,Cl,NO3-N,SO4,NO2-N,Alkalinity
QC:	
8	Ph,Alkalinity
10-12	Cl,NO3-N,NO2-N,SO4
9	TDS

METHOD: Inorganics

All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 150.1 Analyte: pH Holding Time: 48 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from Collection to Analysis**	**Qualifier**	**Det/ND**
1	4/29/2022 8:45	5/5/2022 18:08	153	J/UJ/P	Det
2	4/29/2022 9:20	5/5/2022 18:17	153	J/UJ/P	Det
3	4/29/2022 9:48	5/5/2022 7:00	141	J/UJ/P	Det
4	4/29/2022 10:30	5/5/2022 18:51	152	J/UJ/P	Det
5	4/29/2022 11:15	5/5/2022 19:07	151	J/UJ/P	Det
6	4/29/2022 13:20	5/5/2022 19:15	149	J/UJ/P	Det
7	4/29/2022 14:00	5/5/2022 19:24	149	J/UJ/P	Det

METHOD: Inorganics

All samples were properly preserved and within the requried holding time with the following exceptions:

		Method: 218.6 Analyte: Hexavalent Chromium Holding Time: 24 Hours			
Sample ID	**Sampling Date**	**Analysis Date**	**Total Time from**	**Qualifier**	**Det/ND**
3	4/29/2022 9:48	5/3/2022 19:58	106	J/R/P	Det
6	4/29/2022 13:20	5/3/2022 20:27	103	J/R/P	Det
7	4/29/2022 14:00	5/3/2022 20:36	102	J/R/P	Det

Calibration

METHOD: Inorganics

All initial calibration verifications (ICVs) and continuing calibration verifications (CCVs) were performed at the required frequency and were within the acceptance limits with the following exceptions:

Date	Time	Calibration ID	Analyte	%R	%R Limits	Associated Samples	Qualification	Det/ND
5/10/2022	16:11	2209067-CCV1	CLO4	88.6	90-110	1-4	J/UJ/A	Det

Comments:

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: Jada Morales

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-7

				Sample Identification							
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (units)**	**Action Level**	7							
SO4	0.233		1.165	0.23							
			0								

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1-7

				Sample Identification							
Analyte	**PB (units)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	7							
SO4		0.246		0.23							

Comments: The listed analyte concentrtaion is the highest ICB or CCB detected in the analysis. The action level, when applicable, is establised at 5X the highest ICB, CCB, or PB concentration.

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Jada Morales

METHOD: Inorganics

Blank units: mg/L Associated sample units: mg/L
Sampling Date: 4/29/2022 Associated Samples: 1-6

			Sample Identification								
Analyte	Blank ID	Action Level	1	5							
	7										
Cr(VI)	0.00004	0.0002	0.00019	0.00016							
SO4	0.23	1.15									

Comments: The action level, when applicable, is establised at 5X the highest concentration.

METHOD: Inorganics

The correlation coefficient (r) for the calibration of Cr(VI) were recalculated.
Calibration date:
An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:
%R = (Found/True) x 100
Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of Analysis	Analyte	Standard	Concentration (mg/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial Calibration	Cr(VI)	s1	0.202	0.065	0.999991	0.999973	Y
		s2	2.017	0.62			
		s3	9.828	3.006			
		s4	25.174	7.694			
		s5	49.977	15.182			
		s6					
		s7					
		s8					
		s9					
		s10					
		s11					
		s12					

Type of Analysis	Analyte	Found (mg/L)	True (mg/L)		Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Calibration verification	Cl	52.711	50		105.422	105	Y
Calibration verification	NO3-N	5.07	5		101.4	101	Y
Calibration verification	SO4	102.12	100		102.12	101	Y

Quality Control Sample Recalculations

METHOD: Inorganics

Percent recoveries (%R) for the laboratory control sample (LCS) and matrix spike (MS) were recalcuated using the following formula:

%R = (Found/True) x 100

Found = concentration of each analyte measured in the analysis. For the MS calculation, Found = SSR (Spiked Sample Result) - SR (Sample Result)

True = concentration of each analyte in the source

The sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = (Absolute value(S-D)x 200) / (S+D)

S = Original sample concentration

D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found/S	True/D	Recalculated %R/RPD	Reported %R/RPD	Acceptable (Y/N)
B138974-BS1	LCS	TDS	565	586	96.41638225	96.4	Y
10	MS	NO2-N	0.517307	0.52632	98.2875437	98.3	Y
8	Duplicate	pH	8.34	8.31	0.36036036	0.36	Y

Sample Calculation Verification

METHOD: Inorganics

Analytes were recalculated and verified using the following equation:

Concentration = (Result from raw data x Final volume x Dilution factor) / (Percent solids (if applicable) x Initial weight or volume)

Sample ID	Analyte	Raw Data (mg/L)	Dilution	Initial Volume (mL)	Final Volume (mL)	Reported Result (mg/L)	Recalculated Result (mg/L)	Acceptable (Y/N)
6	pH (S.U.)	8.34	1	50	50	8.34	8.34	Y
6	TDS	141	3.33	100	100	460	469.53	Y
6	Cr(VI)	0.730655252	1	20	20	0.00073	0.000730655	Y
6	Cl	67.19518079	1	20	20	68	67.19518079	Y
6	CLO4	2.307692308	1	20	20	2.4	2.307692308	Y
6	NO2-N	0.025	1	20	20	0.025	0.025	Y
6	Alkailinty	189.92	1	50	50	190	189.92	Y