Volatile Organic Compound Analysis Results for Samples Collected in Nuiqsut, Alaska

Sample Location: Nuiqsut Ambient Air Quality Monitoring Station

Date Sample Collected: 5/2/2022

Analysis Conducted by: Atmospheric Analysis & Consulting, Inc.

Analysis Method: EPA Method TO-15

Laboratory Analysis Report

CLIENT : SLR International Corporation
PROJECT NO : 220988
MATRIX : AIR
UNITS : PPB (v/v)

DATE RECEIVED : 05/09/2022
DATE REPORTED : 05/10/2022
ANALYST : MB

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	NUI			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	220988-31014				
Date Sampled	05/02/2022				
Date Analyzed	05/09/2022				
Can Dilution Factor	1.77				
Compound	Result	Qualifier	Analysis DF		
Chlorodifluoromethane	<SRL	U	1	0.89	0.50
Propene	<SRL	U	1	1.77	1.00
Dichlorodifluoromethane	<SRL	U	1	0.89	0.50
Chloromethane	<SRL	U	1	0.89	0.50
Dichlorotetrafluoroethane	<SRL	U	1	0.89	0.50
Vinyl Chloride	<SRL	U	1	0.89	0.50
Methanol	<SRL	U	1	8.87	5.00
1,3-Butadiene	<SRL	U	1	0.89	0.50
Bromomethane	<SRL	U	1	0.89	0.50
Chloroethane	<SRL	U	1	0.89	0.50
Dichlorofluoromethane	<SRL	U	1	0.89	0.50
Ethanol	<SRL	U	1	3.55	2.00
Vinyl Bromide	<SRL	U	1	0.89	0.50
Acetone	<SRL	U	1	3.55	2.00
Trichlorofluoromethane	<SRL	U	1	0.89	0.50
2-Propanol (IPA)	<SRL	U	1	3.55	2.00
Acrylonitrile	<SRL	U	1	3.55	2.00
1,1-Dichloroethene	<SRL	U	1	0.89	0.50
Methylene Chloride (DCM)	<SRL	U	1	1.77	1.00
Allyl Chloride	<SRL	U	1	1.77	1.00
Carbon Disulfide	<SRL	U	1	3.55	2.00
Trichlorotrifluoroethane	<SRL	U	1	0.89	0.50
trans-1,2-Dichloroethene	<SRL	U	1	0.89	0.50
1,1-Dichloroethane	<SRL	U	1	0.89	0.50
Methyl Tert Butyl Ether (MTBE)	<SRL	U	1	0.89	0.50
Vinyl Acetate	<SRL	U	1	1.77	1.00
2-Butanone (MEK)	<SRL	U	1	1.77	1.00
cis-1,2-Dichloroethene	<SRL	U	1	0.89	0.50
Hexane	<SRL	U	1	0.89	0.50
Chloroform	<SRL	U	1	0.89	0.50
Ethyl Acetate	<SRL	U	1	0.89	0.50
Tetrahydrofuran	<SRL	U	1	0.89	0.50
1,2-Dichloroethane	<SRL	U	1	0.89	0.50
1,1,1-Trichloroethane	<SRL	U	1	0.89	0.50
Benzene	<SRL	U	1	0.89	0.50

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Laboratory Analysis Report

CLIENT : SLR International Corporation
PROJECT NO : 220988
MATRIX : AIR
UNITS : PPB (v/v)

DATE RECEIVED : 05/09/2022
DATE REPORTED : 05/10/2022
ANALYST : MB

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	NUI			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	220988-31014				
Date Sampled	05/02/2022				
Date Analyzed	05/09/2022				
Can Dilution Factor	1.77				
Compound	Result	Qualifier	Analysis DF		
Carbon Tetrachloride	<SRL	U	1	0.89	0.50
Cyclohexane	<SRL	U	1	0.89	0.50
1,2-Dichloropropane	<SRL	U	1	0.89	0.50
Bromodichloromethane	<SRL	U	1	0.89	0.50
1,4-Dioxane	<SRL	U	1	1.77	1.00
Trichloroethene (TCE)	<SRL	U	1	0.89	0.50
2,2,4-Trimethylpentane	<SRL	U	1	0.89	0.50
Heptane	<SRL	U	1	0.89	0.50
cis-1,3-Dichloropropene	<SRL	U	1	0.89	0.50
4-Methyl-2-pentanone (MiBK)	<SRL	U	1	0.89	0.50
trans-1,3-Dichloropropene	<SRL	U	1	0.89	0.50
1,1,2-Trichloroethane	<SRL	U	1	0.89	0.50
Toluene	<SRL	U	1	0.89	0.50
2-Hexanone (MBK)	<SRL	U	1	1.77	1.00
Dibromochloromethane	<SRL	U	1	0.89	0.50
1,2-Dibromoethane	<SRL	U	1	0.89	0.50
Tetrachloroethene (PCE)	<SRL	U	1	0.89	0.50
Chlorobenzene	<SRL	U	1	0.89	0.50
Ethylbenzene	<SRL	U	1	0.89	0.50
m & p-Xylene	<SRL	U	1	1.77	1.00
Bromoform	<SRL	U	1	0.89	0.50
Styrene	<SRL	U	1	0.89	0.50
1,1,2,2-Tetrachloroethane	<SRL	U	1	0.89	0.50
o-Xylene	<SRL	U	1	0.89	0.50
4-Ethyltoluene	<SRL	U	1	0.89	0.50
1,3,5-Trimethylbenzene	<SRL	U	1	0.89	0.50
1,2,4-Trimethylbenzene	<SRL	U	1	0.89	0.50
Benzyl Chloride (a-Chlorotoluene)	<SRL	U	1	0.89	0.50
1,3-Dichlorobenzene	<SRL	U	1	0.89	0.50
1,4-Dichlorobenzene	<SRL	U	1	0.89	0.50
1,2-Dichlorobenzene	<SRL	U	1	0.89	0.50
1,2,4-Trichlorobenzene	<SRL	U	1	0.89	0.50
Hexachlorobutadiene	<SRL	U	1	0.89	0.50
BFB-Surrogate Std. % Recovery		89%			70-130%

U - Compound was not detected at or above the SRL.

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QUALITY CONTROL / QUALITY ASSURANCE REPORT

ANALYSIS DATE : 05/09/2022
MATRIX : High Purity N_2
UNITS : PPB (v/v)

INSTRUMENT ID : GC/MS-04
CALIBRATION STD ID : MS1-030122-01
ANALYST : MB

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Continuing Calibration Verification of the 03/29/2022 Calibration

Analyte Compounds	*Source*[1]	*CCV*[2]	*% Recovery*[3]
4-BFB (surrogate standard)	9.80	10.14	103
Chlorodifluoromethane	10.40	13.12	126
Propene	10.60	13.68	129
Dichlorodifluoromethane	10.40	11.08	107
Dimethyl Ether	10.20	12.44	122
Chloromethane	10.40	12.87	124
Dichlorotetrafluoroethane	10.30	10.59	103
Vinyl Chloride	10.50	11.80	112
Acetaldehyde	21.10	23.30	110
Methanol	18.80	16.39	87
1,3-Butadiene HR	10.60	14.01	132
Bromomethane	10.40	9.15	88
Chloroethane	10.30	9.40	91
Dichlorofluoromethane	10.20	8.70	85
Ethanol	11.20	10.35	92
Vinyl Bromide	10.10	8.27	82
Acrolein	11.10	12.07	109
Acetone	10.60	11.48	108
Trichlorofluoromethane	10.50	9.22	88
2-Propanol (IPA)	11.00	11.02	100
Acrylonitrile	11.20	12.44	111
1,1-Dichloroethene	10.40	10.01	96
Methylene Chloride (DCM)	10.50	10.10	96
TertButanol (TBA)	11.10	10.04	90
Allyl Chloride	10.20	12.60	124
Carbon Disulfide	10.50	10.21	97
Trichlorotrifluoroethane	10.40	9.93	95
trans-1,2-Dichloroethene	10.60	10.50	99
1,1-Dichloroethane	10.50	11.39	108
Methyl Tert Butyl Ether (MTBE)	10.50	10.94	104
Vinyl Acetate HR	11.00	14.42	131
2-Butanone (MEK)	10.60	10.05	95
cis-1,2-Dichloroethene	10.50	10.55	100
Hexane	10.70	10.03	94
Chloroform	10.60	10.86	102
Ethyl Acetate	10.60	12.46	118
Tetrahydrofuran	10.20	10.15	100
1,2-Dichloroethane	10.50	11.98	114
1,1,1-Trichloroethane	10.40	10.36	100
Benzene	10.60	9.92	94
Carbon Tetrachloride	10.20	10.07	99
Cyclohexane	10.50	10.51	100

Analyte Compounds (Continued)	*Source*[1]	*CCV*[2]	*% Recovery*[3]
1,2-Dichloropropane	10.50	10.83	103
Bromodichloromethane	10.40	9.88	95
1,4-Dioxane	10.40	7.46	72
Trichloroethene (TCE)	10.40	9.40	90
2,2,4-Trimethylpentane	10.00	11.29	113
Methyl Methacrylate	11.00	10.14	92
Heptane	10.50	9.61	92
cis-1,3-Dichloropropene	10.40	9.82	94
4-Methyl-2-pentanone (MiBK)	10.40	10.37	100
trans-1,3-Dichloropropene	10.50	10.24	98
1,1,2-Trichloroethane	10.50	9.47	90
Toluene	10.60	9.67	91
2-Hexanone (MBK)	10.50	10.11	96
Dibromochloromethane	10.30	9.22	90
1,2-Dibromoethane	10.60	9.51	90
Tetrachloroethene (PCE)	10.40	8.54	82
Chlorobenzene	10.60	9.83	93
Ethylbenzene	10.50	10.09	96
m & p-Xylene	21.00	21.33	102
Bromoform	10.50	9.82	94
Styrene	10.50	11.08	106
1,1,2,2-Tetrachloroethane	10.50	10.69	102
o-Xylene	10.50	11.04	105
1,2,3-Trichloropropane	11.00	11.62	106
Isopropylbenzene (Cumene)	10.30	10.93	106
α-Pinene	10.70	10.96	102
2-Chlorotoluene	10.30	10.57	103
n-Propylbenzene	10.10	10.73	106
4-Ethyltoluene	10.30	11.07	107
1,3,5-Trimethylbenzene	10.30	10.75	104
β-Pinene	11.00	11.27	102
1,2,4-Trimethylbenzene	10.30	11.44	111
Benzyl Chloride (a-Chlorotoluene)	10.40	10.04	97
1,3-Dichlorobenzene	10.40	10.82	104
1,4-Dichlorobenzene	10.30	10.78	105
Sec-ButylBenzene	10.10	11.14	110
1,2-Dichlorobenzene	10.60	11.00	104
n-ButylBenzene	10.20	10.96	107
1,2-Dibromo-3-Chloropropane	10.10	9.08	90
1,2,4-Trichlorobenzene	11.00	9.67	88
Naphthalene	11.50	9.92	86
Hexachlorobutadiene	11.00	10.29	94

[1] Concentration of analyte compound in certified source standard.

[2] Measured result from daily Continuing Calibration Verification (CCV).

[3] The acceptable range for analyte recovery is 100±30%.

HR - Recovery for this compound was high. Results should be considered biased high.

QUALITY CONTROL / QUALITY ASSURANCE REPORT

ANALYSIS DATE : 05/09/2022
MATRIX : High Purity N_2
UNITS : PPB (v/v)

INSTRUMENT ID : GC/MS-04
CALIBRATION STD ID : MS1-030122-01
ANALYST : MB

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Laboratory Control Spike Analysis

System Monitoring Compounds	*Sample Concentration*	*Spike Added*	*LCS[1] Recovery*	*LCSD[1] Recovery*	*LCS[1] % Recovery[2]*	*LCSD[1] % Recovery[2]*	*RPD[3]*
4-BFB (surrogate standard)	0.0	9.80	10.14	10.03	103	102	1.1
1,1-Dichloroethene	0.0	10.40	10.01	10.24	96	98	2.3
Methylene Chloride (DCM)	0.0	10.50	10.10	10.07	96	96	0.3
Benzene	0.0	10.60	9.92	9.97	94	94	0.5
Trichloroethene (TCE)	0.0	10.40	9.40	9.48	90	91	0.8
Toluene	0.0	10.60	9.67	9.67	91	91	0.0
Tetrachloroethene (PCE)	0.0	10.40	8.54	8.62	82	83	0.9
Chlorobenzene	0.0	10.60	9.83	9.93	93	94	1.0
Ethylbenzene	0.0	10.50	10.09	10.20	96	97	1.1
m & p-Xylene	0.0	21.00	21.33	21.58	102	103	1.2
o-Xylene	0.0	10.50	11.04	11.18	105	106	1.3

[1] Laboratory Control Spike (LCS) / Laboratory Control Spike Duplicate (LCSD)

[2] The acceptable range for analyte recovery is 100±30%.

[3] Relative Percent Difference (RPD) between LCS recovery and LCSD recovery (acceptable range is <25%).

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QUALITY CONTROL / QUALITY ASSURANCE REPORT

ANALYSIS DATE : 05/09/2022 | **INSTRUMENT ID : GC/MS-04**
MATRIX : High Purity He or N_2 | **ANALYST : MB**
UNITS : PPB (v/v)

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Method Blank Analysis

Analyte Compounds	*MB 050922*	*Reporting Limit (RL)*
4-BFB (surrogate standard)	89%	100±30%
Chlorodifluoromethane	<RL	0.5
Propene	<RL	1.0
Dichlorodifluoromethane	<RL	0.5
Dimethyl Ether	<RL	0.5
Chloromethane	<RL	0.5
Dichlorotetrafluoroethane	<RL	0.5
Vinyl Chloride	<RL	0.5
Acetaldehyde	<RL	5.0
Methanol	<RL	5.0
1,3-Butadiene	<RL	0.5
Bromomethane	<RL	0.5
Chloroethane	<RL	0.5
Dichlorofluoromethane	<RL	0.5
Ethanol	<RL	2.0
Vinyl Bromide	<RL	0.5
Acrolein	<RL	1.0
Acetone	<RL	2.0
Trichlorofluoromethane	<RL	0.5
2-Propanol (IPA)	<RL	2.0
Acrylonitrile	<RL	2.0
1,1-Dichloroethene	<RL	0.5
Methylene Chloride (DCM)	<RL	1.0
TertButanol (TBA)	<RL	0.5
Allyl Chloride	<RL	1.0
Carbon Disulfide	<RL	2.0
Trichlorotrifluoroethane	<RL	0.5
trans-1,2-Dichloroethene	<RL	0.5
1,1-Dichloroethane	<RL	0.5
Methyl Tert Butyl Ether (MTBE)	<RL	0.5
Vinyl Acetate	<RL	1.0
2-Butanone (MEK)	<RL	1.0
cis-1,2-Dichloroethene	<RL	0.5
Hexane	<RL	0.5
Chloroform	<RL	0.5
Ethyl Acetate	<RL	0.5
Tetrahydrofuran	<RL	0.5
1,2-Dichloroethane	<RL	0.5
1,1,1-Trichloroethane	<RL	0.5
Benzene	<RL	0.5
Carbon Tetrachloride	<RL	0.5
Cyclohexane	<RL	0.5

Analyte Compounds (Continued)	*MB 050922*	*Reporting Limit (RL)*
1,2-Dichloropropane	<RL	0.5
Bromodichloromethane	<RL	0.5
1,4-Dioxane	<RL	1.0
Trichloroethene (TCE)	<RL	0.5
2,2,4-Trimethylpentane	<RL	0.5
Methyl Methacrylate	<RL	0.5
Heptane	<RL	0.5
cis-1,3-Dichloropropene	<RL	0.5
4-Methyl-2-pentanone (MiBK)	<RL	0.5
trans-1,3-Dichloropropene	<RL	0.5
1,1,2-Trichloroethane	<RL	0.5
Toluene	<RL	0.5
2-Hexanone (MBK)	<RL	1.0
Dibromochloromethane	<RL	0.5
1,2-Dibromoethane	<RL	0.5
Tetrachloroethene (PCE)	<RL	0.5
Chlorobenzene	<RL	0.5
Ethylbenzene	<RL	0.5
m & p-Xylene	<RL	1.0
Bromoform	<RL	0.5
Styrene	<RL	0.5
1,1,2,2-Tetrachloroethane	<RL	0.5
o-Xylene	<RL	0.5
1,2,3-Trichloropropane	<RL	0.5
Isopropylbenzene (Cumene)	<RL	0.5
α-Pinene	<RL	0.5
2-Chlorotoluene	<RL	0.5
n-Propylbenzene	<RL	0.5
4-Ethyltoluene	<RL	0.5
1,3,5-Trimethylbenzene	<RL	0.5
β-Pinene	<RL	0.5
1,2,4-Trimethylbenzene	<RL	0.5
Benzyl Chloride (a-Chlorotoluene)	<RL	0.5
1,3-Dichlorobenzene	<RL	0.5
1,4-Dichlorobenzene	<RL	0.5
Sec-ButylBenzene	<RL	0.5
1,2-Dichlorobenzene	<RL	0.5
n-ButylBenzene	<RL	0.5
1,2-Dibromo-3-Chloropropane	<RL	0.5
1,2,4-Trichlorobenzene	<RL	0.5
Naphthalene	<RL	1.0
Hexachlorobutadiene	<RL	0.5

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QUALITY CONTROL / QUALITY ASSURANCE REPORT

ANALYSIS DATE : 05/09/2022
MATRIX : Air
UNITS : PPB (v/v)

INSTRUMENT ID : GC/MS-04
ANALYST : MB
DILUTION FACTOR[1] : x1.77

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Duplicate Analysis of AAC Sample ID: 220988-31014

Analyte Compounds	*Sample*	*Duplicate*	*RPD[2]*
4-BFB (surrogate standard)	8.89	8.79	1.1
Chlorodifluoromethane	<SRL	<SRL	*NA*
Propene J	1.79	*1.58*	12.6
Dichlorodifluoromethane	<SRL	<SRL	*NA*
Dimethyl Ether	<SRL	<SRL	*NA*
Chloromethane	<SRL	<SRL	*NA*
Dichlorotetrafluoroethane	<SRL	<SRL	*NA*
Vinyl Chloride	<SRL	<SRL	*NA*
Acetaldehyde	<SRL	<SRL	*NA*
Methanol	<SRL	<SRL	*NA*
1,3-Butadiene	<SRL	<SRL	*NA*
Bromomethane	<SRL	<SRL	*NA*
Chloroethane	<SRL	<SRL	*NA*
Dichlorofluoromethane	<SRL	<SRL	*NA*
Ethanol	<SRL	<SRL	*NA*
Vinyl Bromide	<SRL	<SRL	*NA*
Acrolein	<SRL	<SRL	*NA*
Acetone	<SRL	<SRL	*NA*
Trichlorofluoromethane	<SRL	<SRL	*NA*
2-Propanol (IPA)	<SRL	<SRL	*NA*
Acrylonitrile	<SRL	<SRL	*NA*
1,1-Dichloroethene	<SRL	<SRL	*NA*
Methylene Chloride (DCM)	<SRL	<SRL	*NA*
TertButanol (TBA)	<SRL	<SRL	*NA*
Allyl Chloride	<SRL	<SRL	*NA*
Carbon Disulfide	<SRL	<SRL	*NA*
Trichlorotrifluoroethane	<SRL	<SRL	*NA*
trans-1,2-Dichloroethene	<SRL	<SRL	*NA*
1,1-Dichloroethane	<SRL	<SRL	*NA*
Methyl Tert Butyl Ether (MTBE)	<SRL	<SRL	*NA*
Vinyl Acetate	<SRL	<SRL	*NA*
2-Butanone (MEK)	<SRL	<SRL	*NA*
cis-1,2-Dichloroethene	<SRL	<SRL	*NA*
Hexane	<SRL	<SRL	*NA*
Chloroform	<SRL	<SRL	*NA*
Ethyl Acetate	<SRL	<SRL	*NA*
Tetrahydrofuran	<SRL	<SRL	*NA*
1,2-Dichloroethane	<SRL	<SRL	*NA*
1,1,1-Trichloroethane	<SRL	<SRL	*NA*
Benzene	<SRL	<SRL	*NA*
Carbon Tetrachloride	<SRL	<SRL	*NA*
Cyclohexane	<SRL	<SRL	*NA*

Analyte Compounds (Continued)	*Sample*	*Duplicate*	*RPD[2]*
1,2-Dichloropropane	<SRL	<SRL	*NA*
Bromodichloromethane	<SRL	<SRL	*NA*
1,4-Dioxane	<SRL	<SRL	*NA*
Trichloroethene (TCE)	<SRL	<SRL	*NA*
2,2,4-Trimethylpentane	<SRL	<SRL	*NA*
Methyl Methacrylate	<SRL	<SRL	*NA*
Heptane	<SRL	<SRL	*NA*
cis-1,3-Dichloropropene	<SRL	<SRL	*NA*
4-Methyl-2-pentanone (MiBK)	<SRL	<SRL	*NA*
trans-1,3-Dichloropropene	<SRL	<SRL	*NA*
1,1,2-Trichloroethane	<SRL	<SRL	*NA*
Toluene	<SRL	<SRL	*NA*
2-Hexanone (MBK)	<SRL	<SRL	*NA*
Dibromochloromethane	<SRL	<SRL	*NA*
1,2-Dibromoethane	<SRL	<SRL	*NA*
Tetrachloroethene (PCE)	<SRL	<SRL	*NA*
Chlorobenzene	<SRL	<SRL	*NA*
Ethylbenzene	<SRL	<SRL	*NA*
m & p-Xylene	<SRL	<SRL	*NA*
Bromoform	<SRL	<SRL	*NA*
Styrene	<SRL	<SRL	*NA*
1,1,2,2-Tetrachloroethane	<SRL	<SRL	*NA*
o-Xylene	<SRL	<SRL	*NA*
1,2,3-Trichloropropane	<SRL	<SRL	*NA*
Isopropylbenzene (Cumene)	<SRL	<SRL	*NA*
α-Pinene	<SRL	<SRL	*NA*
2-Chlorotoluene	<SRL	<SRL	*NA*
n-Propylbenzene	<SRL	<SRL	*NA*
4-Ethyltoluene	<SRL	<SRL	*NA*
1,3,5-Trimethylbenzene	<SRL	<SRL	*NA*
β-Pinene	<SRL	<SRL	*NA*
1,2,4-Trimethylbenzene	<SRL	<SRL	*NA*
Benzyl Chloride (a-Chlorotoluene)	<SRL	<SRL	*NA*
1,3-Dichlorobenzene	<SRL	<SRL	*NA*
1,4-Dichlorobenzene	<SRL	<SRL	*NA*
Sec-ButylBenzene	<SRL	<SRL	*NA*
1,2-Dichlorobenzene	<SRL	<SRL	*NA*
n-ButylBenzene	<SRL	<SRL	*NA*
1,2-Dibromo-3-Chloropropane	<SRL	<SRL	*NA*
1,2,4-Trichlorobenzene	<SRL	<SRL	*NA*
Naphthalene	<SRL	<SRL	*NA*
Hexachlorobutadiene	<SRL	<SRL	*NA*

[1] Dilution factor is the product of the Canister Dilution Factor and the Analysis Dilution Factor.

[2] Relative Percent Difference (RPD) between Sample analysis and Duplicate analysis (acceptable range is <25%).

SRL - Sample Reporting Limit (minimum)

J - Estimated value between the detection limit and the minimum reporting limit, shown for duplication purposes only.