Columbia Analytical Services

MDL Study Report

Analytical Method: NCASI MeOH-94.03 / HAPS 99.01 / IMP.308 / IMP 98.01
Extraction Method: METHOD
Matrix: WATER
Instrument: HP G1530A GC31
Column: DB-624
MDL Study ID: MDL2507

File ID	Data File	Data Path	AcqDate	File ID	Data File	Data Path	AcqDate
A	SIG20007.D	J:\GC31\DATA\040909\	04/09/2009 14:52	E	SIG20012.D	J:\GC31\DATA\040909\	04/09/2009 16:26
B	SIG20009.D	J:\GC31\DATA\040909\	04/09/2009 15:30	F	SIG20013.D	J:\GC31\DATA\040909\	04/09/2009 16:45
C	SIG20010.D	J:\GC31\DATA\040909\	04/09/2009 15:48	G	SIG20014.D	J:\GC31\DATA\040909\	04/09/2009 17:04
D	SIG20011.D	J:\GC31\DATA\040909\	04/09/2009 16:07				

Analyte Name	MDL 1		MDL 2		MDL 3		MDL 4		MDL 5		MDL 6		MDL 7		MDL 8	
	File	Value	File	Value	File	Value	File	Value	File	Value	File	Value	File	Value	File	Value
Acetaldehyde	A	0.420	B	0.325	C	0.352	D	0.344	E	0.409	F	0.403	G	0.352		
Methanol	A	0.525	B	0.431	C	0.410	D	0.399	E	0.455	F	0.453	G	0.434		
Methyl Ethyl Ketone	A	0.357	B	0.296	C	0.401	D	0.356	E	0.356	F	0.337	G	0.360		
Propionaldehyde	A	0.320	B	0.323	C	0.354	D	0.335	E	0.382	F	0.405	G	0.345		

Analyte Name	True Value	Mean	Standard Deviation	T-Value	MDL Value	Units	%RSD	Average Recovery	MDL Evaluation
Acetaldehyde	0.500	0.372	0.0375	3.143	0.12	ug/mL	10	74	Valid MDL Data
Methanol	0.500	0.444	0.0413	3.143	0.13	ug/mL	9	89	Valid MDL Data
Methyl Ethyl Ketone	0.500	0.352	0.0313	3.143	0.098	ug/mL	9	70	Valid MDL Data
Propionaldehyde	0.500	0.352	0.0314	3.143	0.099	ug/mL	9	70	Valid MDL Data

Supervisor Approval: _____

QA/QC Approval: _____

Printed: 04/10/2009 10:01:53
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Columbia Analytical Services

DOD MDL Study Report

MDL Study ID: MDL2507

Analytical Method: NCASI MeOH-94.03
Extraction Method: METHOD
Matrix: WATER
Instrument: HP G1530A **Column:** DB-624

File ID	Data File	Data Path	AcqDate
A	SIG20007.D	J:\GC31\DATA\040909\	04/09/2009 14:52
B	SIG20009.D	J:\GC31\DATA\040909\	04/09/2009 15:30
C	SIG20010.D	J:\GC31\DATA\040909\	04/09/2009 15:48
D	SIG20011.D	J:\GC31\DATA\040909\	04/09/2009 16:07
E	SIG20012.D	J:\GC31\DATA\040909\	04/09/2009 16:26
F	SIG20013.D	J:\GC31\DATA\040909\	04/09/2009 16:45
G	SIG20014.D	J:\GC31\DATA\040909\	04/09/2009 17:04

Analyte Name	MDL 1		MDL 2		MDL 3		MDL 4		MDL 5		MDL 6		MDL 7		MDL 8	
	File	Value	File	Value	File	Value	File	Value	File	Value	File	Value	File	Value	File	Value
Acetaldehyde	A	0.420	B	0.325	C	0.352	D	0.344	E	0.409	F	0.403	G	0.352		
Methanol	A	0.525	B	0.431	C	0.410	D	0.399	E	0.455	F	0.453	G	0.434		
Methyl Ethyl Ketone	A	0.357	B	0.296	C	0.401	D	0.356	E	0.356	F	0.337	G	0.360		
Propionaldehyde	A	0.320	B	0.323	C	0.354	D	0.335	E	0.382	F	0.405	G	0.345		

Analyte Name	True Value	Mean	Standard Deviation	T-Value	MDL Value	Units	%RSD	Average Recovery	MDL Evaluation
Acetaldehyde	0.500	0.372	0.0375	3.143	0.12	ug/mL	10	74	Valid MDL Data
Methanol	0.500	0.444	0.0413	3.143	0.13	ug/mL	9	89	Valid MDL Data
Methyl Ethyl Ketone	0.500	0.352	0.0313	3.143	0.098	ug/mL	9	70	Valid MDL Data
Propionaldehyde	0.500	0.352	0.0314	3.143	0.099	ug/mL	9	70	Valid MDL Data

Supervisor Approval: 4/14/09

QA/QC Approval:

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MDL Check Sample Summary			
MDL Study Information		MDL Check Sample Information	
Analytical Method:	NCASI MeOH 94.03/HAPS 99.01/IMP 308/IMP 98.01	Analytical Method:	NCASI MeOH 94.03/HAPS 99.01/IMP 308/IMP 98.01
Preparation Method:	Method	Preparation Method:	Method
Matrix:	Water	Matrix:	Water
Instrument I.D.:	GC31	Instrument I.D.:	GC31
Date:	4/9/2009	Date:	4/9/2009
	Units: ug/mL		
Analyte	MDL Study Result	Spike Level	MDL Check Sample Result
Acetaldehyde	0.12	0.25	0.18
Methanol	0.13	0.25	0.23
Propionaldehyde	0.10	0.25	0.15
Methyl Ethyl Ketone	0.10	0.25	0.18

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Limit of Quantitation - LOQ Verification

ALS - Kelso

Analytical Method: NCASI 99.01
Extr./Dig. Method: Method
Matrix: Water
Units: ug/mL

Instrument: GC31
Analyst(s): Taylor Pottschmidt

Analyte	Sample ID	K2109297-023			
	Date Analyzed:	9/15/2021			
	Spike Level	Result	Avg Percent Recovery	% Rec Limits	% RSD Limits
Acetalaldehyde	1.000	1.165	117	50-150	30
Methanol	1.000	1.283	128	50-150	30
Propionaldehtde	1.000	1.011	101	50-150	30
Methyl Ethyl Ketone	1.000	1.262	126	50-150	30
	Supervisor Approval:	JW 10/05/2021			

Method Detection Limit - LOD Verification

ALS - Kelso

Analytical Method:	NCASI 99.01	Instrument:	GC31
Extr./Dig. Method:	Method	Analyst(s):	Taylor Pottschmidt
Matrix:	Water		
Units:	ug/mL		

Analyte	MDL	Sample ID:	K2109298-023
		Date Analyzed:	9/15/2021
			Is s/n >3?
		Spike Level	Y/N
Acetaldehyde	0.15	0.5	Y
Methanol	0.17	0.5	Y
Propionaldehyde	0.16	0.5	Y
Methyl Ethyl Ketone	0.17	0.5	Y
		Supervisor Approval:	JW 10/05/2021

Limit of Quantitation - LOQ Verification

ALS - Kelso

Analytical Method: NCASI 94.03
Extr./Dig. Method: Method
Matrix: Water
Units: mg/L

Instrument: GC31
Analyst(s): Taylor Pottschmidt

	Sample ID	K2109297-023			
	Date Analyzed:	9/15/2021			
Analyte	Spike Level	Result	Avg Percent Recovery	% Rec Limits	% RSD Limits
Methanol	1.000	1.283	128	50-150	30
	Supervisor Approval:	JW 10/05/2021			

Method Detection Limit - LOD Verification

ALS - Kelso

Analytical Method:	NCASI 94.03	Instrument:	GC31
Extr./Dig. Method:	Method	Analyst(s):	Taylor Pottschmidt
Matrix:	Water		
Units:	mg/L		

		Sample ID:	K2109298-023
		Date Analyzed:	9/15/2021
			Is s/n >3?
Analyte	MDL	Spike Level	Y/N
Methanol	0.17	0.5	Y
		Supervisor Approval:	JW 10/05/2021

Atmospheric Analysis & Consulting, Inc

Detection Limit Study

ASTM D-5504 / SCAQMD 307.91

Calculation Date: 03/09/2021

Analyst: DL **Instrument:** SCD #10 **Matrix:** Air **Units:** ppbV

DL_s **Low Level Spikes**

#replicates: 9

Student's t-value: 2.896

$DL_s = t \times S_s$

						Initial						
		(Need at least 3 separate dates)			Date Prepared	03/05/21	03/05/21	03/05/21	03/08/21	03/08/21	03/09/21	03/09/21
		(Need at least 3 separate dates)			Date Analyzed	03/05/21	03/05/21	03/05/21	03/08/21	03/08/21	03/09/21	03/09/21
Analyte	**Spike Concentration**	**Mean Result**	**% Rec***	**Std Dev (S_s)**	**DL_s**	**DL#1**	**DL#2**	**DL#3**	**DL#4**	**DL#5**	**DL#6**	**DL#7**
Hydrogen Sulfide	5.2300	5.0276	96	0.3096	0.8965	5.440	4.523	4.838	4.971	5.304	4.822	5.396
Methyl Mercaptan	5.7325	6.9028	120	0.4537	1.3138	7.014	6.914	7.234	7.173	7.300	7.251	6.315
Dimethyl Sulfide	5.0975	6.1668	121	0.3222	0.9330	5.940	6.597	6.508	5.959	6.370	5.606	6.255

**Must be 70-130%*

Atmospheric Analysis & Consulting, Inc

Detection Limit Study

ASTM D-5504 / SCAQMD 307.91

Calculation Date: 03/09/2021

Analyst: DL **Instrument:** SCD #10 **Matrix:** Air **Units:** ppbV

DL and LOQ

DL -Detection Limit (The greater of DL_s and DL_b)
LOQ - Limit of Quantification

Analyte	DL_s	DL_b	DL	LOQ
Hydrogen Sulfide	0.90	NA	0.90	10.5
Methyl Mercaptan	1.31	NA	1.31	10.5
Dimethyl Sulfide	0.93	NA	0.93	11.0

LOQ Ongoing Verification

	Quarter 1		Quarter 2		Quarter 3		Quarter 4	
Date:	06/09/21		09/13/21		01/00/00		01/00/00	
	LOQ_v-1	% Rec*	LOQ_v-2	% Rec*	LOQ_v-3	% Rec*	LOQ_v-4	% Rec*
	5.12	98	4.83	92				
	6.93	121	5.99	105				
	5.95	117	6.32	124				

**Must be 70-130%*

***Ongoing verification numbers are adjusted to new standard values based on component ratios*

Analyst (sign & date):_____ QA Manager (sign & date):_____ Lab Manager (sign & date):_____

Atmospheric Analysis & Consulting, Inc

Detection Limit Study

ASTM D-5504 / SCAQMD 307.91

Calculation Date: 07/06/2021

Analyst: DL **Instrument:** GCBTU-SCD **Matrix:** Air **Units:** ppbV

DL_s **Low Level Spikes**

#replicates: 7

Student's t-value: 3.143

$DL_s = t \times S_s$

						Initial						
		(Need at least 3 separate dates)			Date Prepared	07/06/21			07/07/21		07/07/21	07/08/21
		(Need at least 3 separate dates)			Date Analyzed	07/06/21			07/07/21		07/07/21	07/08/21
Analyte	**Spike Concentration**	**Mean Result**	**% Rec***	**Std Dev (S_s)**	**DL_s**	**DL#1**	**DL#2**	**DL#3**	**DL#4**	**DL#5**	**DL#6**	**DL#7**
Hydrogen Sulfide	10.460	9.957	95	0.4332	1.362	10.264	10.380	9.578	10.180	10.180	9.177	9.937
Methyl Mercaptan	10.950	10.259	94	0.4146	1.303	10.457	10.342	10.149	9.803	10.053	9.957	11.054
Dimethyl Sulfide	10.715	9.759	91	0.3280	1.031	9.894	9.741	10.086	9.196	9.904	10.047	9.445

**Must be 70-130%*

Atmospheric Analysis & Consulting, Inc

Detection Limit Study

ASTM D-5504 / SCAQMD 307.91

Calculation Date: 07/06/2021

Analyst: DL **Instrument:** GCBTU-SCD **Matrix:** Air **Units:** ppbV

DL and LOQ

DL -Detection Limit (The greater of DL_s and DL_b)
LOQ - Limit of Quantification

Analyte	DL_s	DL_b	DL	LOQ
Hydrogen Sulfide	1.36	NA	1.36	NA
Methyl Mercaptan	1.30	NA	1.30	NA
Dimethyl Sulfide	1.03	NA	1.03	NA

LOQ Ongoing Verification

	Quarter 1		Quarter 2		Quarter 3		Quarter 4	
Date:	01/00/00		01/00/00		01/00/00		01/00/00	
	LOQ_v-1	% Rec*	LOQ_v-2	% Rec*	LOQ_v-3	% Rec*	LOQ_v-4	% Rec*

**Must be 70-130%*

Analyst (sign & date):_____ QA Manager (sign & date):_____ Lab Manager (sign & date):_____