



Glycols by GC/FID

Case Narrative

Colorado Oil & Gas Conservation Commission

Complaint 200294386

Work Order Number: 1102061

1. This report consists of 2 water samples. The samples were received cool and intact by ALS on 02/05/2011.
2. The water samples were prepared for analysis by derivatization and extraction into hexane prior to injection. The preparation of waters follows SOP 444 Revision 2.
3. The extracts were then analyzed using gas chromatography (GC) with a DB-5MS column and a flame ionization detector (FID) according to SOP 444 Revision 2 generally based on SW-846 Method 8000C and Method 8015D. All positive results were quantitated using the responses from the initial calibration curve using the external standard technique.
4. All continuing calibration criteria were met with the following exceptions:

Sequence 02/08/11
-Continuing calibration (data file 02762) – tetraethylene glycol was out low.

The target compound was not detected in the samples, so no further action was taken. Reporting limits are supported.
5. The method blank associated with this project was below the method detection limit for glycols.
6. All laboratory control sample and laboratory control sample duplicate recoveries and RPDs were within the acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All samples were extracted and analyzed within the established holding times.



9. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in SOP 939 Revision 4.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Mindy Norton
Mindy Norton
Organics Primary Data Reviewer

02-16-11
Date

Dan Shenneman
Dan Shenneman
Organics Final Data Reviewer

02-16-11
Date



ALS
Data Qualifier Flags
Chromatography and Mass Spectrometry

- U or ND:** This flag indicates that the compound was analyzed for but not detected.
- J:** This flag indicates an estimated value. This flag is used as follows : (1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the reporting limit (RL) but greater than the method detection limit (MDL); (3) when the data indicate the presence of a compound that meets the identification criteria, and the result is less than the RL but greater than the MDL; and (4) the reported value is estimated.
- B:** This flag is used when the analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user. This flag shall be used for a tentatively identified compound (TIC) as well as for a positively identified target compound.
- E:** This flag identifies compounds whose concentration exceeds the upper level of the calibration range.
- A:** This flag indicates that a tentatively identified compound is a suspected aldol-condensation product.
- X:** This flag indicates that the analyte was diluted below an accurate quantitation level.
- *:** This flag indicates that a spike recovery is outside the control criteria.
- +:** This flag indicates that the relative percent difference (RPD) exceeds the control criteria.

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Sample Number(s) Cross-Reference Table

OrderNum: 1102061

Client Name: Colorado Oil & Gas Conservation Commission

Client Project Name: Complaint 200294386

Client Project Number:

Client PO Number: OE PHA 11000000014

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Dahl WW PM	1102061-1		WATER	03-Feb-11	14:56
Trip Blank	1102061-2		WATER	03-Feb-11	6:30
Dahl WW AM	1102061-3		WATER	03-Feb-11	11:59



CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CUGCCWorkorder No: 1102061Project Manager: AWInitials: CDTDate: 2-5-11

1. Does this project require any special handling in addition to standard Paragon procedures?		YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES	NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?		<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<input checked="" type="radio"/> YES	NO
9. Are all aqueous non-preserved samples pH 4-9 ?	N/A	YES	<input checked="" type="radio"/> NO
10. Is there sufficient sample for the requested analyses?		<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?		<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?		<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)		<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	N/A	YES	<input checked="" type="radio"/> NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES	NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source: note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES	NO
17. Were the samples shipped on ice ?		<input checked="" type="radio"/> YES	NO
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: <u>#2</u> <input checked="" type="radio"/> <u>#4</u>	RAD ONLY	<input checked="" type="radio"/> YES
Cooler #: <u>1</u>			
Temperature (°C): <u>3.8°</u>			
No. of custody seals on cooler: <u>2</u>			
External µR/hr reading: <u>12</u>			
Background µR/hr reading: <u>11</u>			
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO <input type="radio"/> NA (If no, see Form 008.)			

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

Headspace: 1102061-2-1
 - 2-2
 - 3-1
 - 3-2 } > GREEN PEA

Sample 1102061-3-4 and 1102061-3-5 received @ pH 2.5

If applicable, was the client contacted? YES / NO ☒ NO Contact: _____ Date/Time: _____Project Manager Signature / Date: AW 2/7/11

Glycols by GC/FID

Method SW8015GLYCOLD

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1102061

Client Name: Colorado Oil & Gas Conservation Commission

ClientProject ID: Complaint 200294386

Lab ID: HC110208-7MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 07-Feb-11

Date Analyzed: 08-Feb-11

Prep Method: METHOD

Prep Batch: HC110208-7

QCBatchID: HC110208-7-1

Run ID: HC110208-7

Cleanup: NONE

Basis: N/A

File Name: 02754.dat

Sample Aliquot: 2 ml

Final Volume: 2.01 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	Reporting Limit	Result Qualifier	EPA Qualifier
107-21-1	ETHYLENE GLYCOL	1	5000	5000	U	
57-55-6	PROPYLENE GLYCOL	1	5000	5000	U	
111-46-6	DIETHYLENE GLYCOL	1	5000	5000	U	
112-27-6	TRIETHYLENE GLYCOL	1	5000	5000	U	
112-60-7	TETRAETHYLENE GLYCOL	1	5000	5000	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
504-63-2	1,3-PROPANEDIOL	9020		10000	90	60 - 140

Data Package ID: HCE1102061-1

Date Printed: Tuesday, February 15, 2011

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Glycols by GC/FID

Method SW8015GLYCOLD

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1102061

Client Name: Colorado Oil & Gas Conservation Commission

ClientProject ID: Complaint 200294386

Field ID:	Dahl WW PM
Lab ID:	1102061-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 03-Feb-11

Date Extracted: 07-Feb-11

Date Analyzed: 08-Feb-11

Prep Method: METHOD

Prep Batch: HC110208-7

QCBatchID: HC110208-7-1

Run ID: HC110208-7

Cleanup: NONE

Basis: As Received

File Name: 02757.dat

Sample Aliquot: 2 ml

Final Volume: 2.01 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
107-21-1	ETHYLENE GLYCOL	1	5000	5000	U	
57-55-6	PROPYLENE GLYCOL	1	5000	5000	U	
111-46-6	DIETHYLENE GLYCOL	1	5000	5000	U	
112-27-6	TRIETHYLENE GLYCOL	1	5000	5000	U	
112-60-7	TETRAETHYLENE GLYCOL	1	5000	5000	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
504-63-2	1,3-PROPANEDIOL	10600		10000	106	60 - 140

Data Package ID: HCE1102061-1

Glycols by GC/FID

Method SW8015GLYCOLD

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1102061

Client Name: Colorado Oil & Gas Conservation Commission

ClientProject ID: Complaint 200294386

Field ID:	Dahl WW AM
Lab ID:	1102061-3

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 03-Feb-11

Date Extracted: 07-Feb-11

Date Analyzed: 09-Feb-11

Prep Method: METHOD

Prep Batch: HC110208-7

QCBatchID: HC110208-7-1

Run ID: HC110208-7

Cleanup: NONE

Basis: As Received

File Name: 02759.dat

Sample Aliquot: 2 ml

Final Volume: 2.01 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
107-21-1	ETHYLENE GLYCOL	1	5000	5000	U	
57-55-6	PROPYLENE GLYCOL	1	2100	5000	J	
111-46-6	DIETHYLENE GLYCOL	1	5000	5000	U	
112-27-6	TRIETHYLENE GLYCOL	1	5000	5000	U	
112-60-7	TETRAETHYLENE GLYCOL	1	5000	5000	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
504-63-2	1,3-PROPANEDIOL	10700		10000	107	60 - 140

Data Package ID: HCE1102061-1

Glycols by GC/FID

Method SW8015GLYCOLD

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1102061

Client Name: Colorado Oil & Gas Conservation Commission

ClientProject ID: Complaint 200294386

Lab ID: HC110208-7LCS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 02/07/2011
Date Analyzed: 02/08/2011
Prep Method: METHOD

Prep Batch: HC110208-7
QCBatchID: HC110208-7-1
Run ID: HC110208-7
Cleanup: NONE
Basis: N/A
File Name: 02755.dat

Sample Aliquot: 2 ml
Final Volume: 2.02 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
107-21-1	ETHYLENE GLYCOL	10000	9430	5050		94	50 - 150%
57-55-6	PROPYLENE GLYCOL	10000	9660	5050		97	50 - 150%
111-46-6	DIETHYLENE GLYCOL	10000	9460	5050		95	50 - 150%
112-27-6	TRIETHYLENE GLYCOL	10000	9240	5050		92	50 - 150%
112-60-7	TETRAETHYLENE GLYCOL	10000	8140	5050		81	50 - 150%

Lab ID: HC110208-7LCSD

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 02/07/2011
Date Analyzed: 02/08/2011
Prep Method: METHOD

Prep Batch: HC110208-7
QCBatchID: HC110208-7-1
Run ID: HC110208-7
Cleanup: NONE
Basis: N/A
File Name: 02756.dat

Sample Aliquot: 2 ml
Final Volume: 2.02 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
107-21-1	ETHYLENE GLYCOL	10000	10600	5050		106	30	12
57-55-6	PROPYLENE GLYCOL	10000	11000	5050		110	30	13
111-46-6	DIETHYLENE GLYCOL	10000	10900	5050		109	30	14
112-27-6	TRIETHYLENE GLYCOL	10000	10800	5050		108	30	16
112-60-7	TETRAETHYLENE GLYCOL	10000	9600	5050		96	30	16

Surrogate Recovery LCS/LCSD

CASNO	Target Analyte	Spike Added	LCS % Rec.	LCS Flag	LCSD % Rec.	LCSD Flag	Control Limits
504-63-2	1,3-PROPANEDIOL	10000	93		106		60 - 140

Data Package ID: HCE1102061-1

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Glycols by GC/FID

Method SW8015GLYCOLD

Matrix Spike

Lab Name: ALS Environmental -- FC

Work Order Number: 1102061

Client Name: Colorado Oil & Gas Conservation Commission

ClientProject ID: Complaint 200294386

Field ID: Dahl WW PM

LabID: 1102061-1MS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 03-Feb-11

Date Extracted: 07-Feb-11

Date Analyzed: 08-Feb-11

Prep Batch: HC110208-7

QCBatchID: HC110208-7-1

Run ID: HC110208-7

Cleanup: NONE

Basis: As Received

Sample Aliquot: 2 ml

Final Volume: 2.02 ml

Result Units: UG/L

File Name: 02758.dat

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
107-21-1	ETHYLENE GLYCOL	5000	U	9730		5050	10000	97	50 - 150%
57-55-6	PROPYLENE GLYCOL	5000	U	10600		5050	10000	106	50 - 150%
111-46-6	DIETHYLENE GLYCOL	5000	U	9610		5050	10000	96	50 - 150%
112-27-6	TRIETHYLENE GLYCOL	5000	U	9410		5050	10000	94	50 - 150%
112-60-7	TETRAETHYLENE GLYCOL	5000	U	8560		5050	10000	86	50 - 150%

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
504-63-2	1,3-PROPANEDIOL	9450		10000	95	60 - 140

Data Package ID: HCE1102061-1

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