

Exception Report

Data File: J:\MS26\DATA\050911\0509F015.D
Lab ID: KWG1103961-4
RunType: MB
Matrix: WATER

Date Acquired: 05/09/2011 14:42
Date Quantitated: 05/09/2011 15:09
Batch ID: KWG1104145
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

P157A
 P1405
 P1407

Primary Review: KB 5/10/11
 Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID:	Tier:	Matrix:	WATER
Prod Code: 8270C SIM 14_DI	Collect Date:	Receive Date:	05/06/2011

Analysis Lot: KWG1104145	Prep Lot: KWG1103961	Report Group:	
Analysis Method: 8270C SIM	Prep Method: EPA 3510C		
Prep Ref: 1015806	Prep Date: 05/04/2011		

Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487
Title:	
Tune Ref: J:\MS26\DATA\050911\0509F005.D	Method ID: MJ402
MB Ref:	Quant based on Method

Data File: J:\MS26\DATA\050911\0509F015.D	Instrument: MS26
Acqu Date: 05/09/2011 14:42	Quant Date: 05/09/2011 15:09
Run Type: MB	Vial: 11
Lab ID: KWG1103961-4	Dilution: 1.0
	Soln Conc. Units: ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	74665	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.90	-0.04	-0.01	96	28937	49.59	99	42-112	OK

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane				88	0		0.16		U

Prep Amount: 100 ml Dilution: 1.0
 Prep Final Vol: 50 ml Unit Factor: 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 †: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ? : Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\050911\0509F015.D
 Acq On : 9 May 2011 2:42 pm
 Sample : KWG1103961-4 | MB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 15:09:31 2011

Vial: 11
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	74665	50.00	ng/ml	0.00

System Monitoring Compounds	R.T.	QIon	Response	Conc	Units	Dev (Min)
2) 1,4-Dioxane-d8	3.90	96	28937	49.59	ng/ml	-0.04
Spiked Amount				50.000		
			Recovery	=	99.18%	

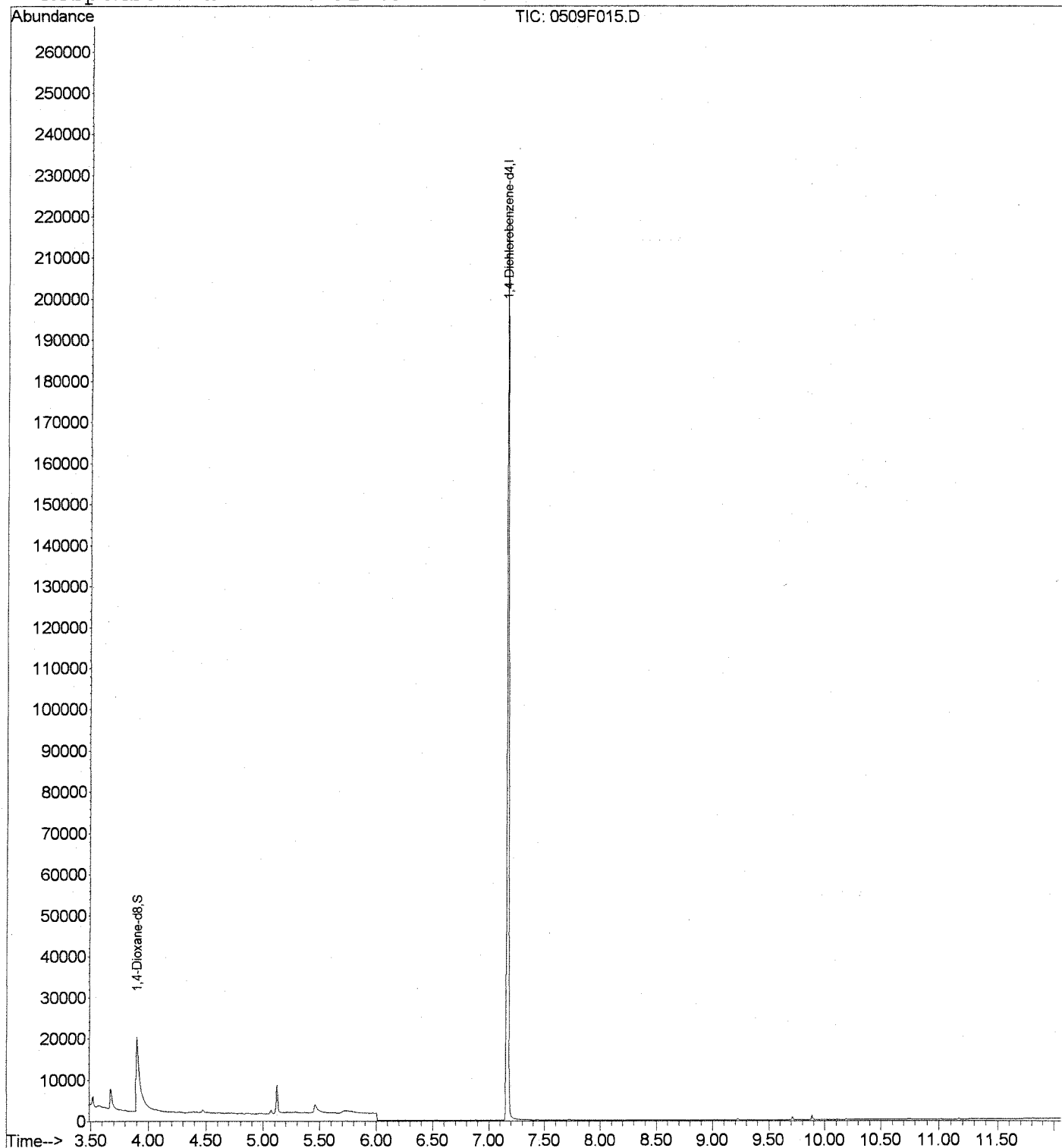
Target Compounds Qvalue

Data File : J:\MS26\DATA\050911\0509F015.D
Acq On : 9 May 2011 2:42 pm
Sample : KWG1103961-4 | MB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 15:09 2011

Vial: 11
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101605
Date Collected: NA
Date Received: NA

1,4-Dioxane by GC/MS

Sample Name: Batch QC
Lab Code: P1101579-005
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	1.1		1.0	0.16	1	05/04/11	05/09/11	KWG1103961	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	87	42-112	05/09/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\050911\0509F019.D
Lab ID: P1101579-005
Run Type: SMPL
Matrix: WATER

Date Acquired: 05/09/2011 16:01
Date Quantitated: 05/09/2011 17:03
Batch ID: KWG1104145
Analysis Method: 8270C SIM
ListJoinID: LJ2865

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
Preparation Holding Time	NA	NA	NA	x	
Pre-Preparation Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Method Blank	NA	NA	NA	x	
MB Surrogate Recovery	NA	NA	NA	x	
Lab Control Spike	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Batch QC:
 P1605
 P1607

Primary Review: KG 5/10/11
 Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID:	Tier: IV	Matrix: WATER
Prod Code: 8270C SIM 14_DI	Collect Date: 04/27/2011	Receive Date: 04/27/2011

Analysis Lot: KWG1104145	Prep Lot: KWG1103961	Report Group: P1101579
Analysis Method: 8270C SIM	Prep Method: EPA 3510C	
Prep Ref: 1015802	Prep Date: 05/04/2011	

Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487
Title: 1,4-Dioxane by GC/MS	Report List ID: LJ2865
Tune Ref: J:\MS26\DATA\050911\0509F005.D	Method ID: MJ402
MB Ref: J:\MS26\DATA\050911\0509F015.D	Quant based on Report List

Data File: J:\MS26\DATA\050911\0509F019.D	Instrument: MS26
Acqu Date: 05/09/2011 16:01	Quant Date: 05/09/2011 17:03
Run Type: SMPL	Vial: 15
Lab ID: P1101579-005	Dilution: 1.0
	Soln Conc. Units: ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	76259	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.90	-0.04	-0.01	96	25837	43.35	87	42-112	OK

Target Compounds

							Final Conc. Units:	ug/L		
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane	3.95	-0.01	0.00	88	1352m	2.23	1.1		

Prep Amount: 100 ml Dilution: 1.0
 Prep Final Vol: 50 ml Unit Factor: 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\050911\0509F019.D
 Acq On : 9 May 2011 4:01 pm
 Sample : P1101579-005
 Misc :

Vial: 15
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

MS Integration Params: RTEINT.P
 Quant Time: May 09 16:18:15 2011

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

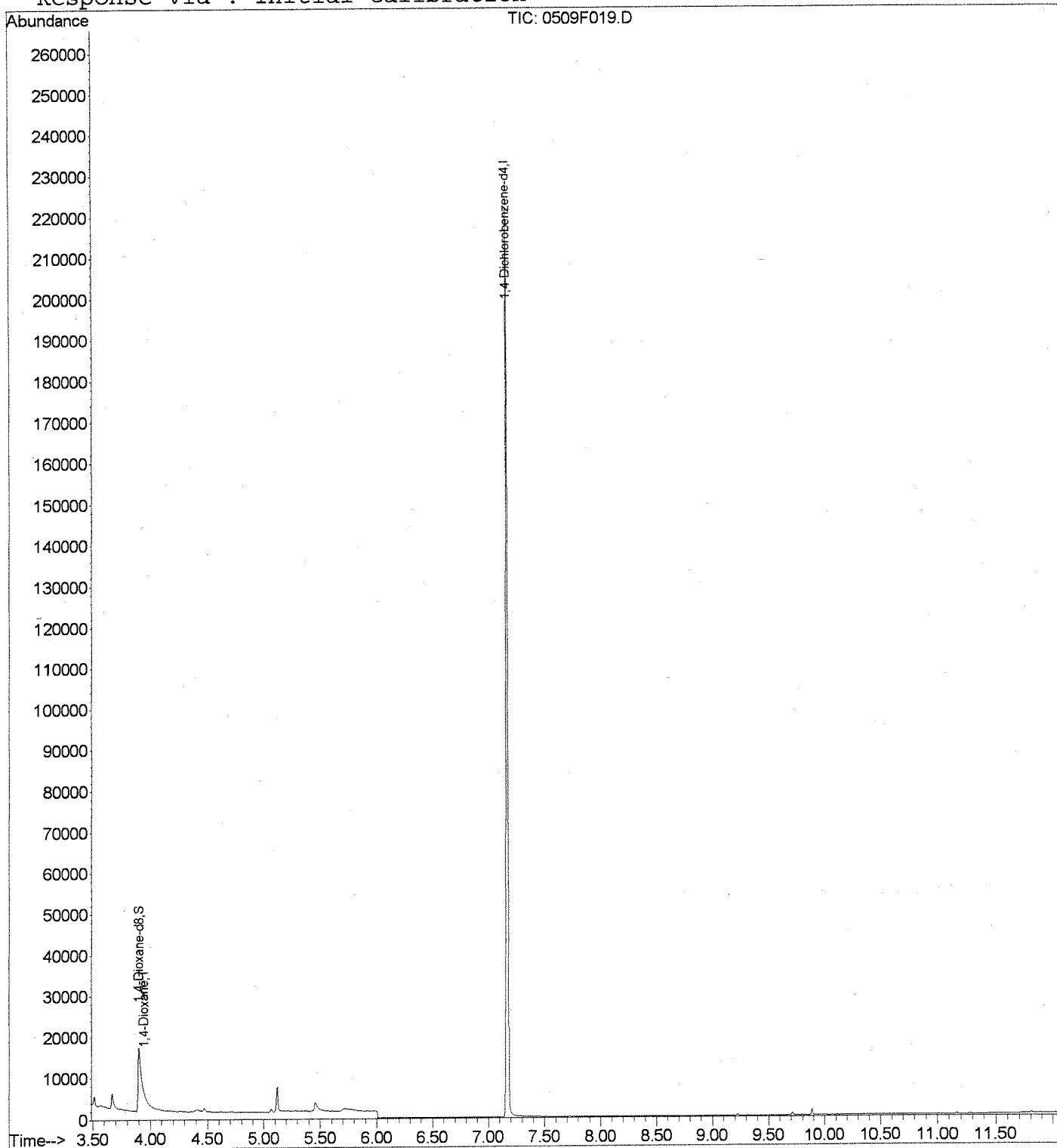
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	76259	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.90	96	25837	43.35	ng/ml	-0.04
Spiked Amount	50.000		Recovery	=	86.70%	
Target Compounds						
3) 1,4-Dioxane	3.95	88	1352m	2.23	ng/ml	Qvalue

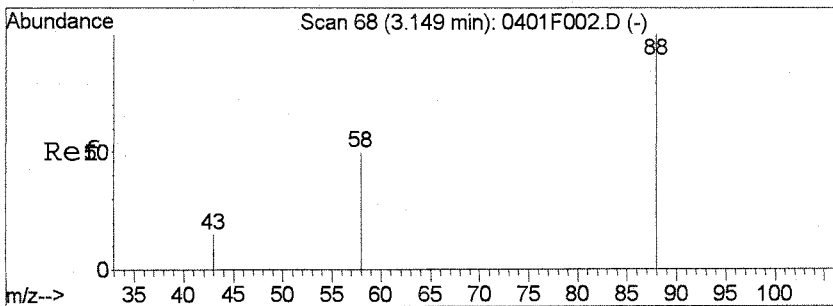
Data File : J:\MS26\DATA\050911\0509F019.D
Acq On : 9 May 2011 4:01 pm
Sample : P1101579-005
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 17:03 2011

Vial: 15
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

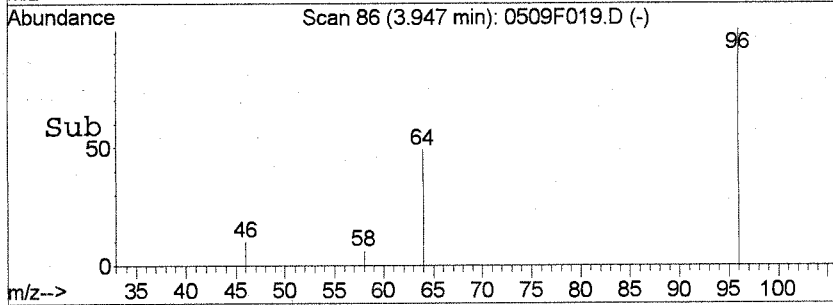
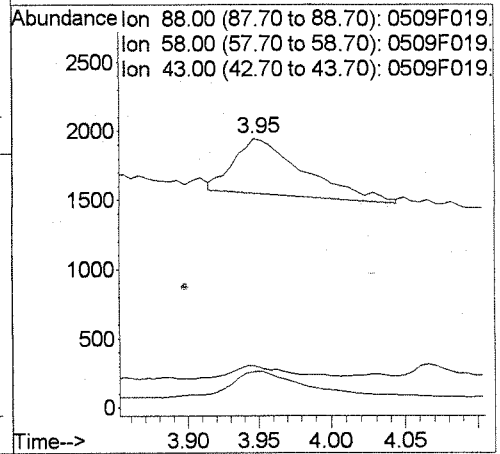
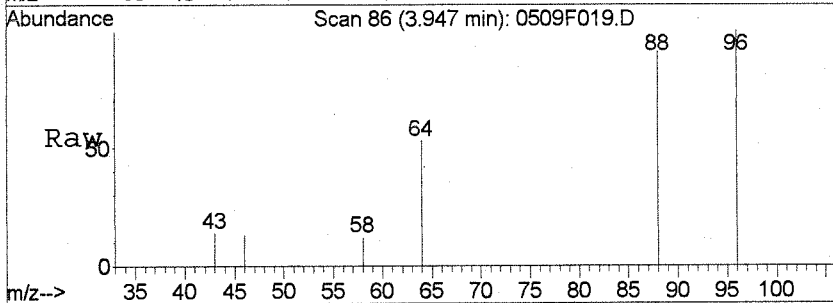
Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration





#3
 1,4-Dioxane
 Concen: 2.23 ng/ml m
 RT: 3.95 min Scan# 86
 Delta R.T. -0.02 min
 Lab File: 0509F019.D
 Acq: 9 May 2011 4:01 pm

Tgt Ion	Resp	Lower	Upper
88	1352		
88	100		
58	13.5	19.3	59.3#
43	15.7	0.0	34.1



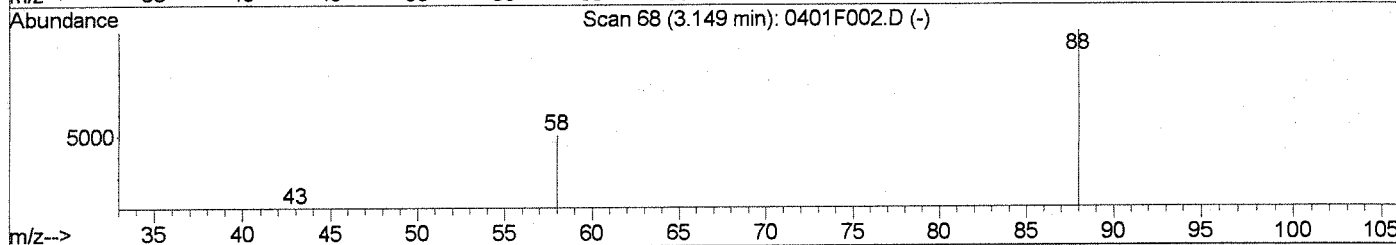
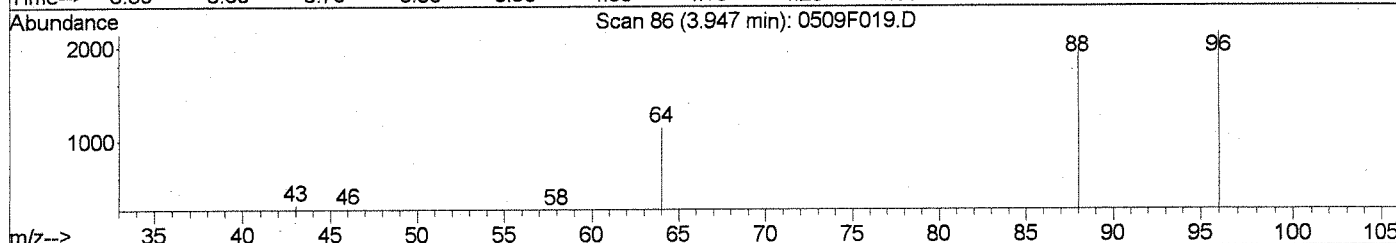
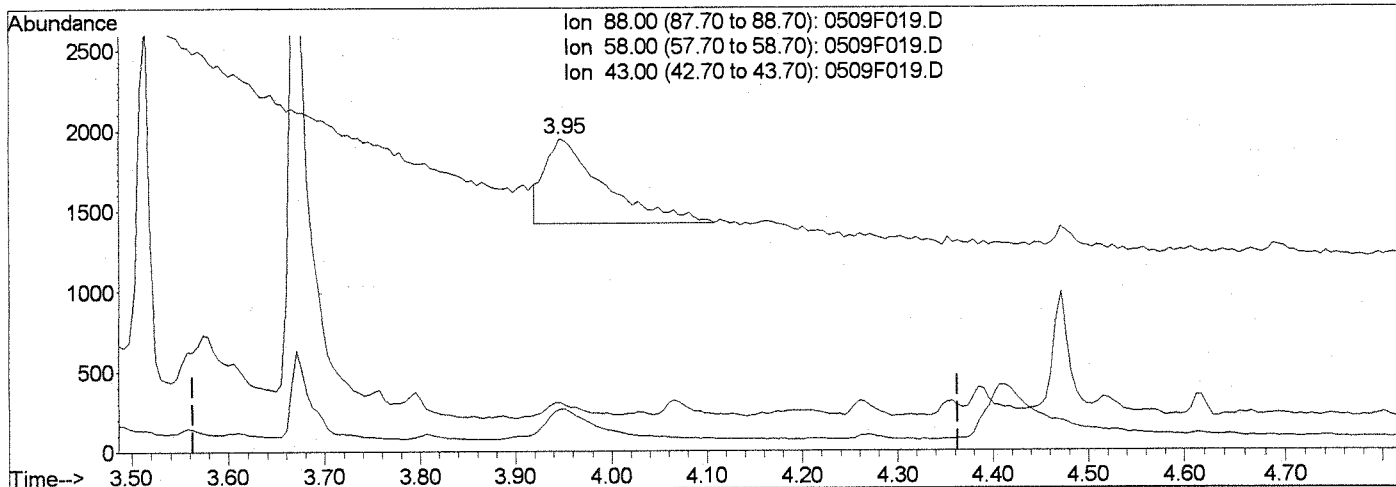
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F019.D
 Acq On : 9 May 2011 4:01 pm
 Sample : P1101579-005
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 16:18 2011

Vial: 15
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F019.D

(3) 1,4-Dioxane (T)

3.95min 3.69ng/ml

response 2235

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	35.31
43.00	14.10	15.08
0.00	0.00	0.00

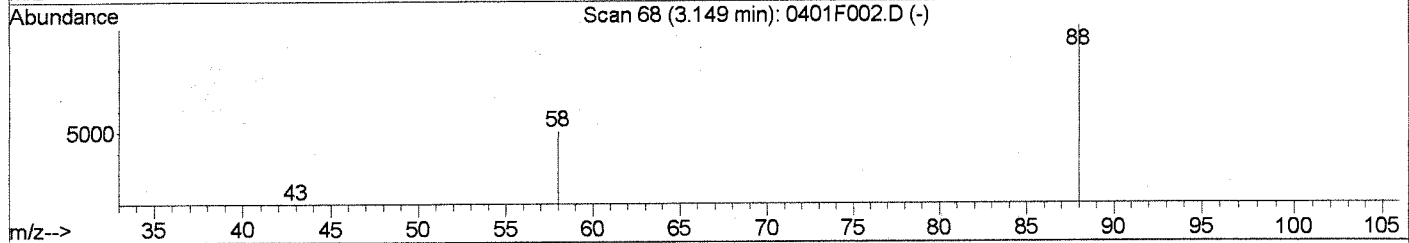
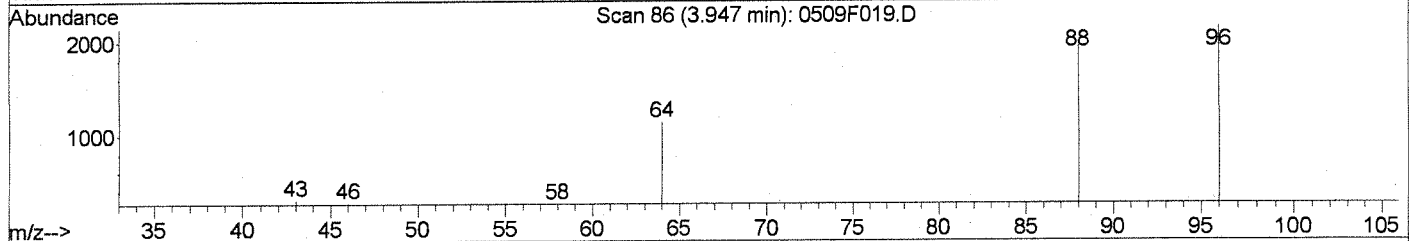
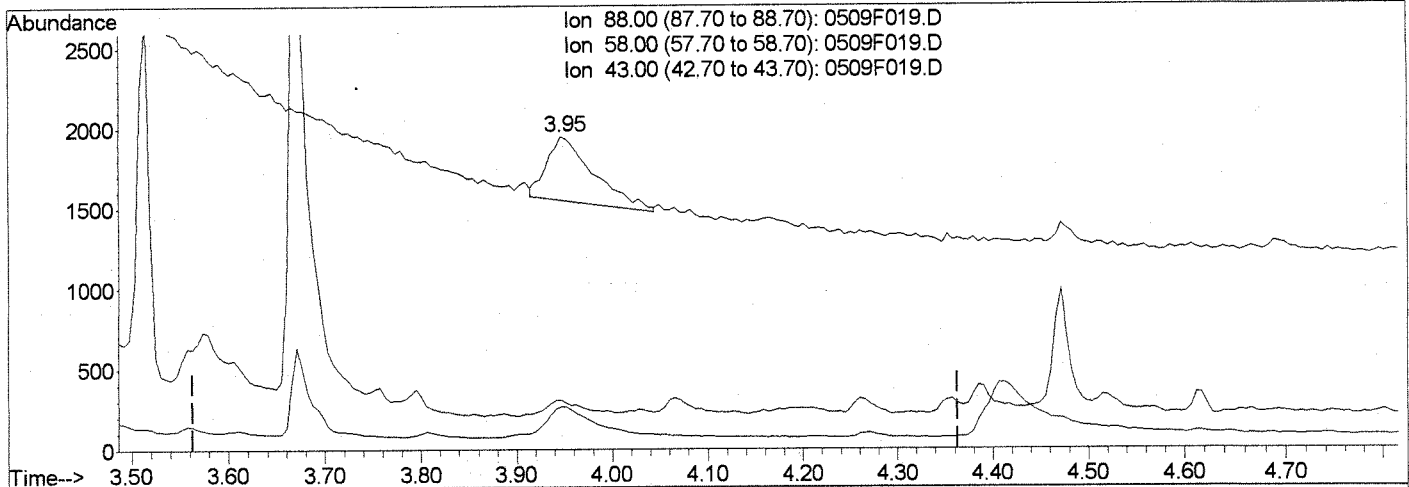
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F019.D
Acq On : 9 May 2011 4:01 pm
Sample : P1101579-005
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 17:03 2011

Vial: 15
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Multiple Level Calibration



TIC: 0509F019.D

(3) 1,4-Dioxane (T)
3.95min 2.23ng/ml m
response 1352

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	13.46#
43.00	14.10	15.72
0.00	0.00	0.00

01
LB 5/10/11
CH 05.10.11

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101605
Date Collected: NA
Date Received: NA

1,4-Dioxane by GC/MS

Sample Name: Batch QCMS
Lab Code: KWG1103961-1
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	26.3		1.0	0.16	1	05/04/11	05/09/11	KWG1103961	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	94	42-112	05/09/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\050911\0509F017.D
Lab ID: KWG1103961-1 -- P1101579-005MS
Run Type: MS
Matrix: WATER

Date Acquired: 05/09/2011 15:21
Date Quantitated: 05/09/2011 15:45
Batch ID: KWG1104145
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Batch QC:
 P1L05
 P1L07

Primary Review: LB 5/10/11
 Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID: Prod Code: 8270C SIM 14_DI	Tier: Collect Date:	Matrix: WATER Receive Date: 05/06/2011
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Analysis Lot: KWG1104145 Analysis Method: 8270C SIM Prep Ref: 1015803	Prep Lot: KWG1103961 Prep Method: EPA 3510C Prep Date: 05/04/2011	Report Group:
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Quant Method: J:\MS26\METHODS\SIM\050911_DX.M Title: Tune Ref: J:\MS26\DATA\050911\0509F005.D MB Ref: J:\MS26\DATA\050911\0509F015.D	Calibration ID: CAL10487 Method ID: MJ402 Quant based on Method
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Data File: J:\MS26\DATA\050911\0509F017.D Acqu Date: 05/09/2011 15:21 Run Type: MS Lab ID: KWG1103961-1 -- P1101579-005MS	Quant Date: 05/09/2011 15:45	Instrument: MS26 Vial: 13 Dilution: 1.0 Soln Conc. Units: ng/ml
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Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	79462	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.89	-0.05	-0.01	96	29261	47.12	94	42-112	OK

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc. Units:	Final Conc	Q	Rpt?
1	1,4-Dioxane	3.92	-0.04	-0.01	88	33163	52.52	ug/L	26.3		

Prep Amount: 100 ml **Dilution:** 1.0
Prep Final Vol: 50 ml **Unit Factor:** 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\050911\0509F017.D
 Acq On : 9 May 2011 3:21 pm
 Sample : KWG1103961-1 | MS P1101579-005MS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 15:45:09 2011

Vial: 13
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

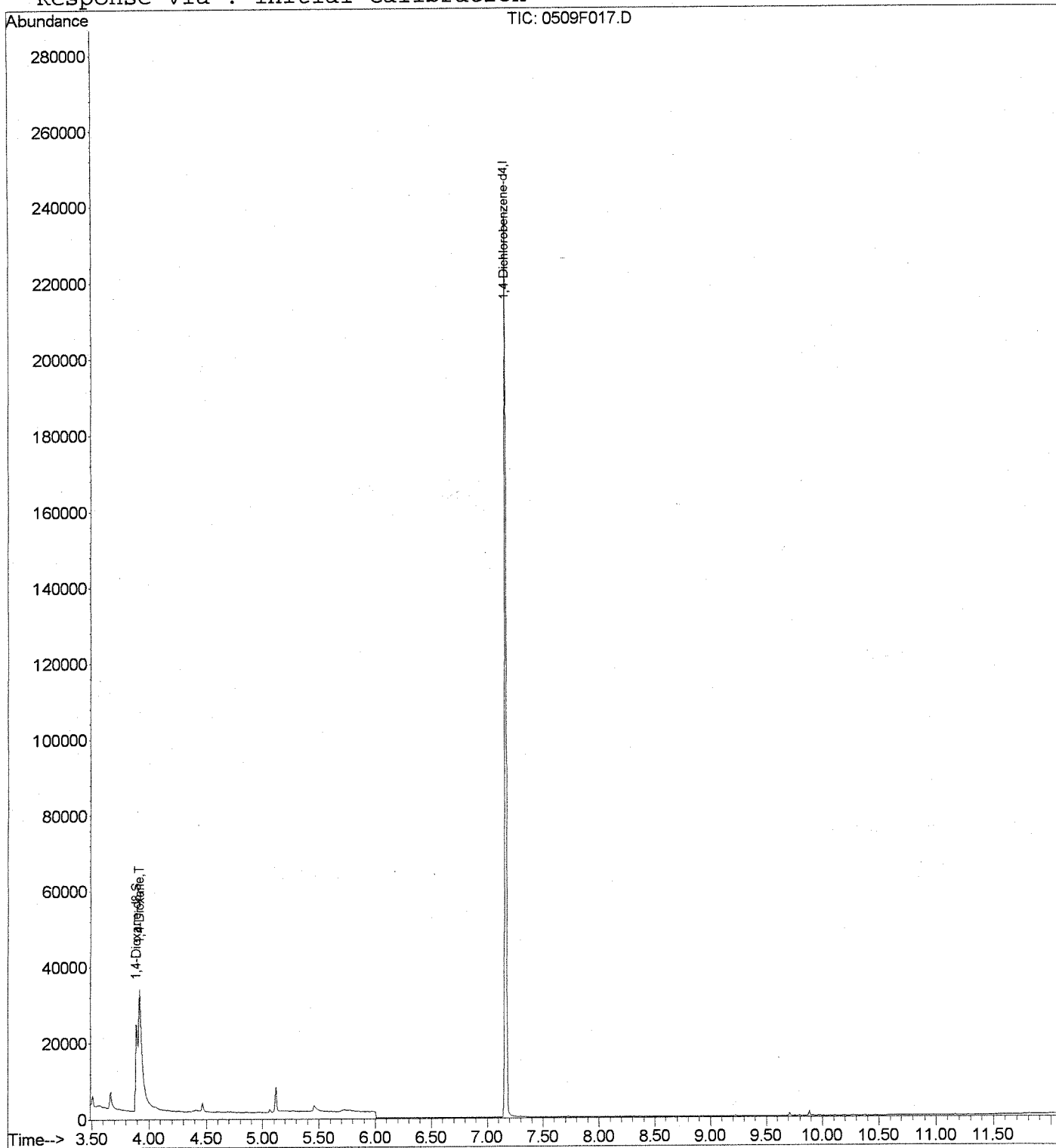
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	79462	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.89	96	29261	47.12	ng/ml	-0.05
Spiked Amount	50.000		Recovery	=	94.24%	
Target Compounds						
3) 1,4-Dioxane	3.92	88	33163	52.52	ng/ml	Qvalue 89

Data File : J:\MS26\DATA\050911\0509F017.D
Acq On : 9 May 2011 3:21 pm
Sample : KWG1103961-1 | MS P1101579-005MS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 15:45 2011

Vial: 13
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101605
Date Collected: NA
Date Received: NA

1,4-Dioxane by GC/MS

Sample Name: Batch QCDMS
Lab Code: KWG1103961-2
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	25.6		1.0	0.16	1	05/04/11	05/09/11	KWG1103961	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	93	42-112	05/09/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\050911\0509F018.D
Lab ID: KWG1103961-2 -- P1101579-005DMS
Run Type: DMS
Matrix: WATER

Date Acquired: 05/09/2011 15:41
Date Quantitated: 05/09/2011 17:03
Batch ID: KWG1104145
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Batch QC:
 P1605
 P1607

Primary Review: LG 5/10/11
 Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID:	Tier:	Matrix:
Prod Code: 8270C SIM 14_DI	Collect Date:	WATER Receive Date: 05/06/2011

Analysis Lot: KWG1104145	Prep Lot: KWG1103961	Report Group:
Analysis Method: 8270C SIM	Prep Method: EPA 3510C	
Prep Ref: 1015804	Prep Date: 05/04/2011	

Quant Method: J:\MS26\METHODS\SIM050911_DX.M	Calibration ID: CAL10487
Title:	
Tune Ref: J:\MS26\DATA\050911\0509F005.D	Method ID: MJ402
MB Ref: J:\MS26\DATA\050911\0509F015.D	Quant based on Method

Data File: J:\MS26\DATA\050911\0509F018.D	Instrument: MS26
Acqu Date: 05/09/2011 15:41	Quant Date: 05/09/2011 17:03
Run Type: DMS	Vial: 14
Lab ID: KWG1103961-2 -- P1101579-005DMS	Dilution: 1.0
	Soln Conc. Units: ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	83825	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.91	-0.03	0.00	96	30548	46.63	93	42-112	OK

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane	3.94	-0.02	0.00	88	34045m	51.11	25.6		

Prep Amount: 100 ml Dilution: 1.0
 Prep Final Vol: 50 ml Unit Factor: 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\050911\0509F018.D
 Acq On : 9 May 2011 3:41 pm
 Sample : KWG1103961-2 | DMS P1101579-005DMS
 Misc :

Vial: 14
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

MS Integration Params: RTEINT.P
 Quant Time: May 09 16:09:47 2011

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	83825	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.91	96	30548	46.63	ng/ml	-0.02
Spiked Amount	50.000		Recovery	=	93.26%	
Target Compounds						
3) 1,4-Dioxane	3.94	88	34045m	51.11	ng/ml	Qvalue

Data File : J:\MS26\DATA\050911\0509F018.D

Vial: 14

Acq On : 9 May 2011 3:41 pm

Operator: KBailey

Sample : KWG1103961-2 | DMS P1101579-005DMS

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 17:03 2011

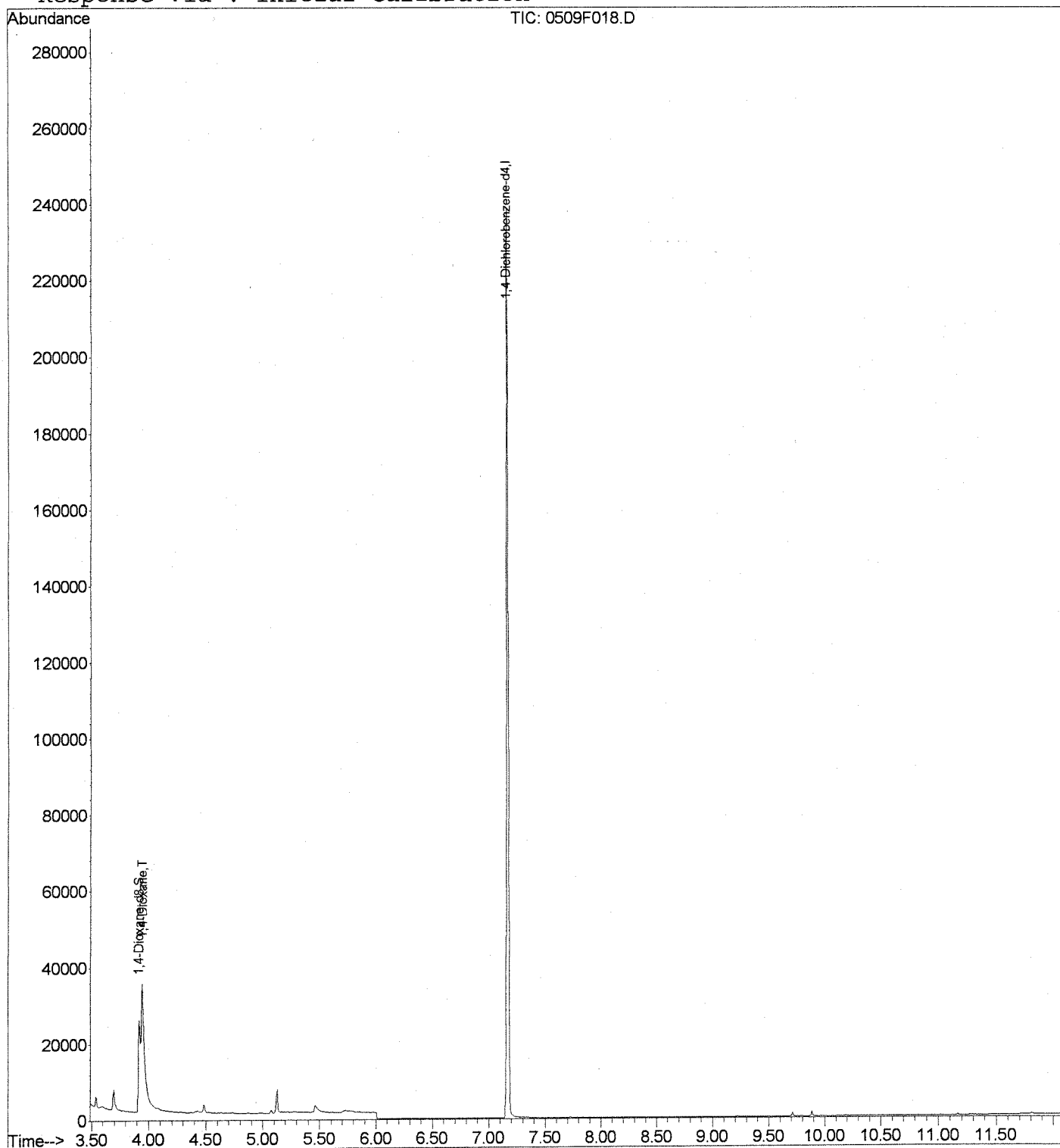
Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:26:14 2011

Response via : Initial Calibration



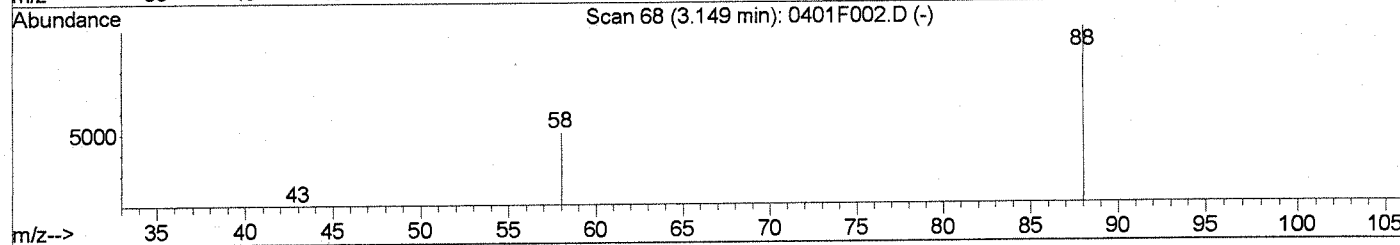
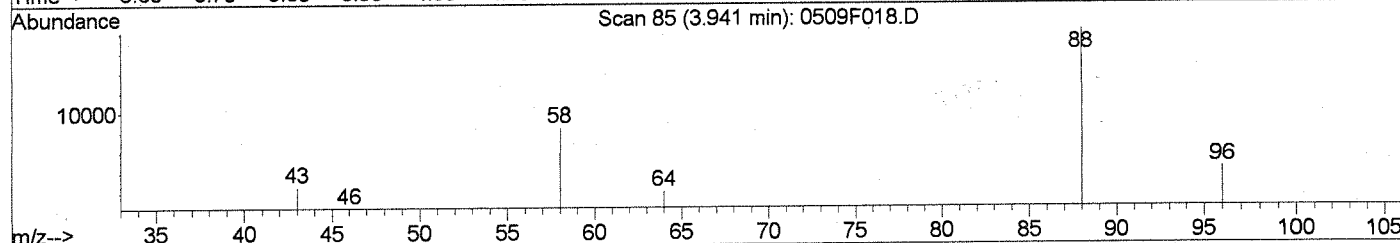
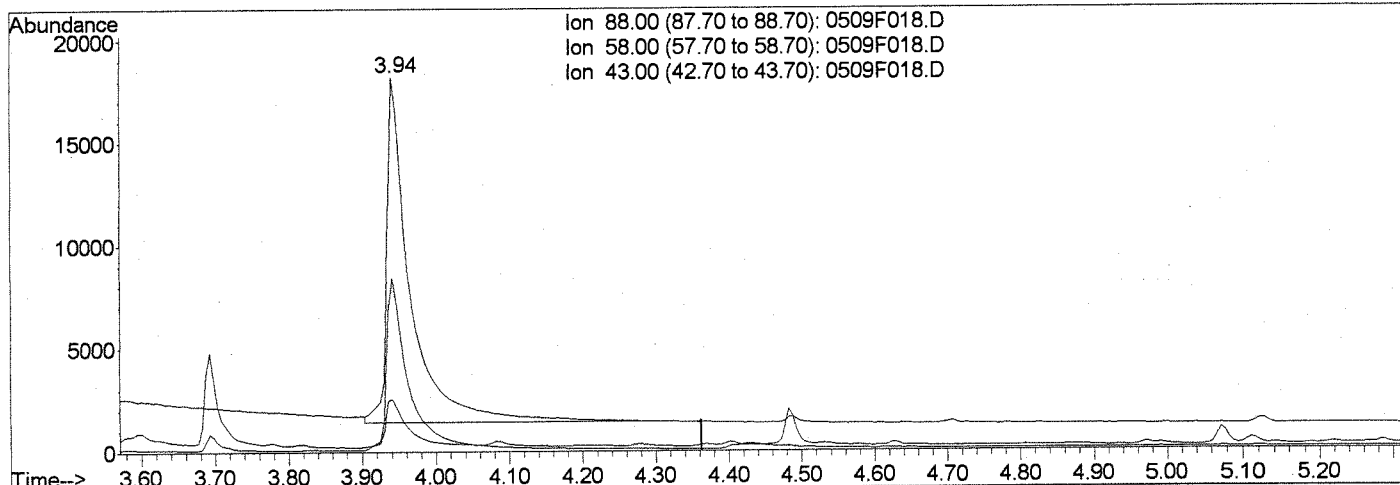
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F018.D
 Acq On : 9 May 2011 3:41 pm
 Sample : KWG1103961-2 | DMS P1101579-005DMS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 16:09 2011

Vial: 14
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F018.D

(3) 1,4-Dioxane (T)

3.94min 56.32ng/ml

response 37510

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	49.65
43.00	14.10	13.77
0.00	0.00	0.00

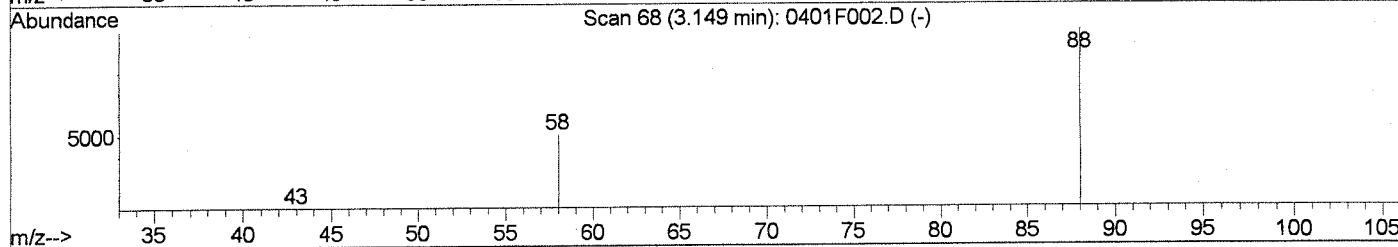
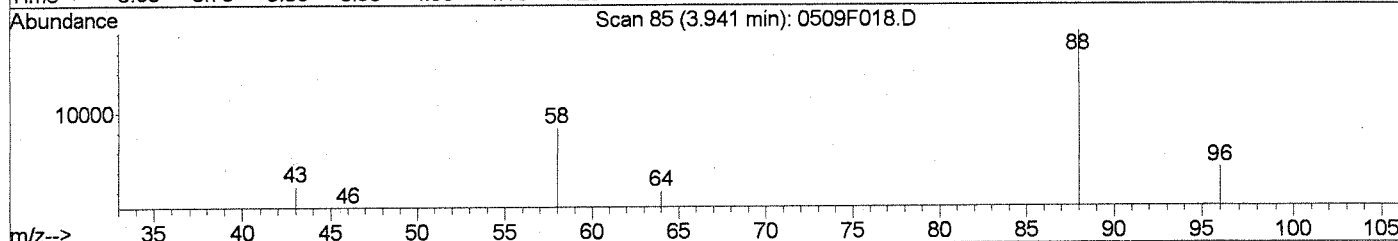
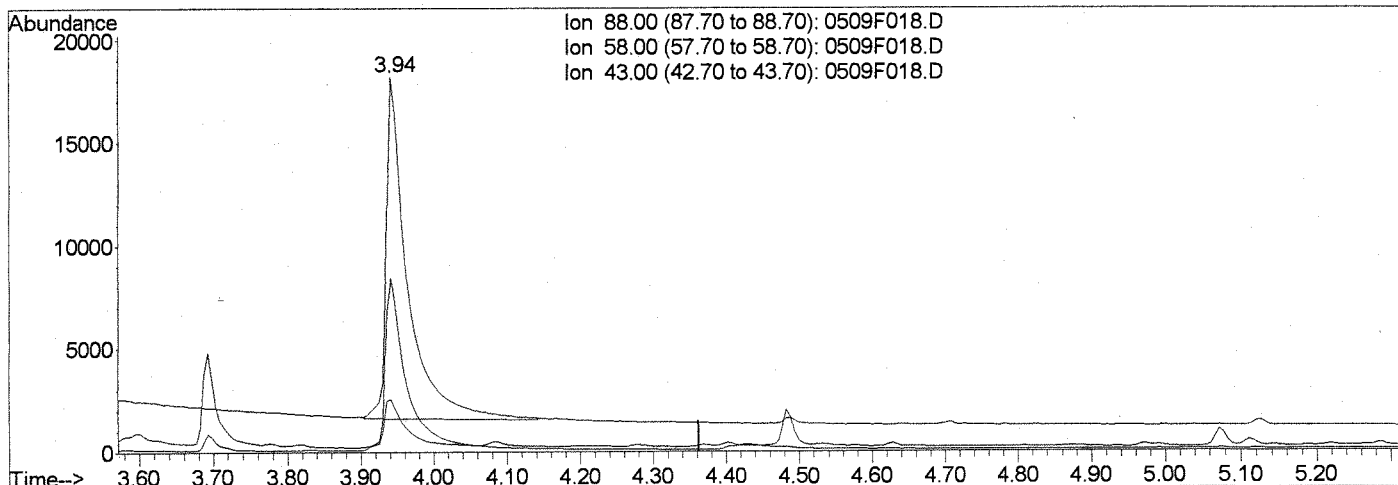
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F018.D
 Acq On : 9 May 2011 3:41 pm
 Sample : KWG1103961-2 | DMS P1101579-005DMS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 17:03 2011

Vial: 14
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F018.D

(3) 1,4-Dioxane (T)		
3.94min	51.11ng/ml m	
response	34045	
Ion	Exp%	Act%
88.00	100	100
58.00	39.30	46.26
43.00	14.10	14.00
0.00	0.00	0.00

01
 KB 5/10/11
 CH 05.10.11

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101605
Date Collected: NA
Date Received: NA

1,4-Dioxane by GC/MS

Sample Name: Lab Control Sample
Lab Code: KWG1103961-3
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	25.1		1.0	0.16	1	05/04/11	05/09/11	KWG1103961	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	92	42-112	05/09/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\050911\0509F016.D
Lab ID: KWG1103961-3
RunType: LCS
Matrix: WATER

Date Acquired: 05/09/2011 15:02
Date Quantitated: 05/09/2011 15:45
Batch ID: KWG1104145
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

P 1579
 P 1205
 P 1207

Primary Review: LB 5/10/11
 Secondary Review: CA 05.10.11

Quantitation Report

Bottle ID:	Tier:	Matrix:	WATER
Prod Code: 8270C SIM 14_DI	Collect Date:	Receive Date:	05/06/2011

Analysis Lot: KWG1104145	Prep Lot: KWG1103961	Report Group:
Analysis Method: 8270C SIM	Prep Method: EPA 3510C	
Prep Ref: 1015805	Prep Date: 05/04/2011	

Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487
Title:	
Tune Ref: J:\MS26\DATA\050911\0509F005.D	Method ID: MJ402
MB Ref: J:\MS26\DATA\050911\0509F015.D	Quant based on Method

Data File: J:\MS26\DATA\050911\0509F016.D	Instrument: MS26
Acqu Date: 05/09/2011 15:02	Quant Date: 05/09/2011 15:45
Run Type: LCS	Vial: 12
Lab ID: KWG1103961-3	Dilution: 1.0
	Soln Conc. Units: ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	77544	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.89	-0.05	-0.01	96	28015	46.23	92	42-112	OK

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc. Units: ug/L	Q	Rpt?
1	1,4-Dioxane	3.93	-0.03	0.00	88	30891	50.14	25.1		

Prep Amount: 100 ml Dilution: 1.0
 Prep Final Vol: 50 ml Unit Factor: 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\050911\0509F016.D
 Acq On : 9 May 2011 3:02 pm
 Sample : KWG1103961-3 | LCS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 15:45:02 2011

Vial: 12
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	77544	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.89	96	28015	46.23	ng/ml	-0.04
Spiked Amount	50.000		Recovery	=	92.46%	
Target Compounds						
3) 1,4-Dioxane	3.93	88	30891	50.14	ng/ml	88

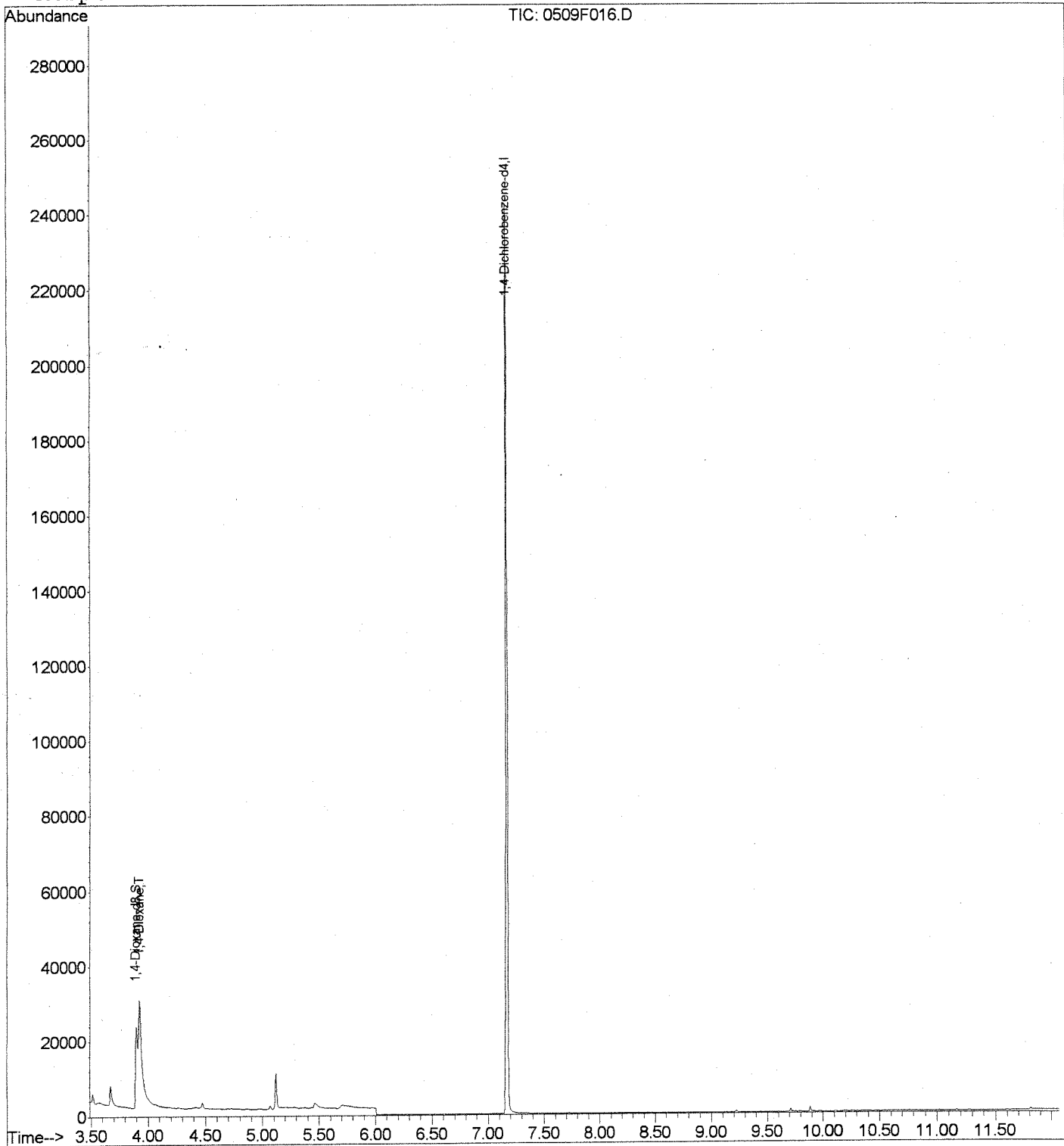
Quantitation Report (QT Reviewed)

Data File : J:\MS26\DATA\050911\0509F016.D
Acq On : 9 May 2011 3:02 pm
Sample : KWG1103961-3 | LCS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 15:45 2011

Vial: 12
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Organic Analysis:
1,4-Dioxane by GC/MS

Validation Package

Standards Data

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101605
Date Analyzed: 05/09/2011
Time Analyzed: 11:15

**Tune Summary
 1,4-Dioxane by GC/MS**

File ID: J:\MS26\DATA\050911\0509F005.D
Instrument ID: MS26
Column:

Analysis Method: 8270C SIM
Analysis Lot: KWG1104145

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	12.7	700992	PASS
68	69	0	2	1.4	13150	PASS
69	198	0	100	17.7	972672	PASS
70	69	0	2	0.5	5066	PASS
127	198	10	80	36.3	1997824	PASS
197	198	0	2	0.0	0	PASS
198	442	30	100	69.9	5508096	PASS
199	198	5	9	6.8	373632	PASS
275	198	10	60	28.3	1558528	PASS
365	442	1	50	2.5	200064	PASS
441	443	0	100	70.8	1123328	PASS
442	442	100	100	100.0	7877632	PASS
443	442	15	24	20.1	1586688	PASS

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
Continuing Calibration Verification	KWG1104145-2	J:\MS26\DATA\050911A\0509F010.D	05/09/2011	13:02	
Method Blank	KWG1103961-4	J:\MS26\DATA\050911\0509F015.D	05/09/2011	14:42	
Lab Control Sample	KWG1103961-3	J:\MS26\DATA\050911\0509F016.D	05/09/2011	15:02	
Batch QCMS	KWG1103961-1	J:\MS26\DATA\050911\0509F017.D	05/09/2011	15:21	
Batch QCDMS	KWG1103961-2	J:\MS26\DATA\050911\0509F018.D	05/09/2011	15:41	
Batch QC	P1101579-005	J:\MS26\DATA\050911\0509F019.D	05/09/2011	16:01	
MW-4-1	P1101605-005	J:\MS26\DATA\050911\0509F020.D	05/09/2011	16:21	

Results flagged with an asterisk (*) indicate the analysis performed outside specified tune window

Exception Report

Data File: J:\MS26\DATA\050911\0509F005.D
Lab ID: KWG1104145-1
Run Type: TUNE
Matrix: WATER

Date Acquired: 05/09/2011 11:15
Date Quantitated:
Batch ID: KWG1104145
Analysis Method: DFTPP
ListJoinID: LJ1965

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Ion Ratio	NA	NA	NA	x	

Primary Review: LB 5/10/11

Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID: Prod Code: 8270C SIM 14_DI	Tier: Collect Date:	Matrix: WATER Receive Date: 05/10/2011
Analysis Lot: KWG1104145 Analysis Method: DFTPP Prep Ref:	Prep Lot: Prep Method: Prep Date:	Report Group:
Quant Method: J:\MS26\METHODS\SIMA_DFTPP.M Title: Tune Ref: MB Ref:	Calibration ID: CAL10487 Report List ID: LJ1965 Method ID: MJ190 Quant based on Report List	
Data File: J:\MS26\DATA\050911\0509F005.D Acqu Date: 05/09/2011 11:15 Run Type: TUNE Lab ID: KWG1104145-1	Quant Date:	Instrument: MS26 Vial: 1 Dilution: 1.0 Soln Conc. Units:

Tune Results

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	12.7	700992	Pass
68	69	0	2	1.4	13150	Pass
69	198	0	100	17.7	972672	Pass
70	69	0	2	0.5	5066	Pass
127	198	10	80	36.3	1997824	Pass
197	198	0	2	0.0	0	Pass
198	442	30	100	69.9	5508096	Pass
199	198	5	9	6.8	373632	Pass
275	198	10	60	28.3	1558528	Pass
365	442	1	50	2.5	200064	Pass
441	443	0.01	100	70.8	1123328	Pass
442	442	100	100	100.0	7877632	Pass
443	442	15	24	20.1	1586688	Pass

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

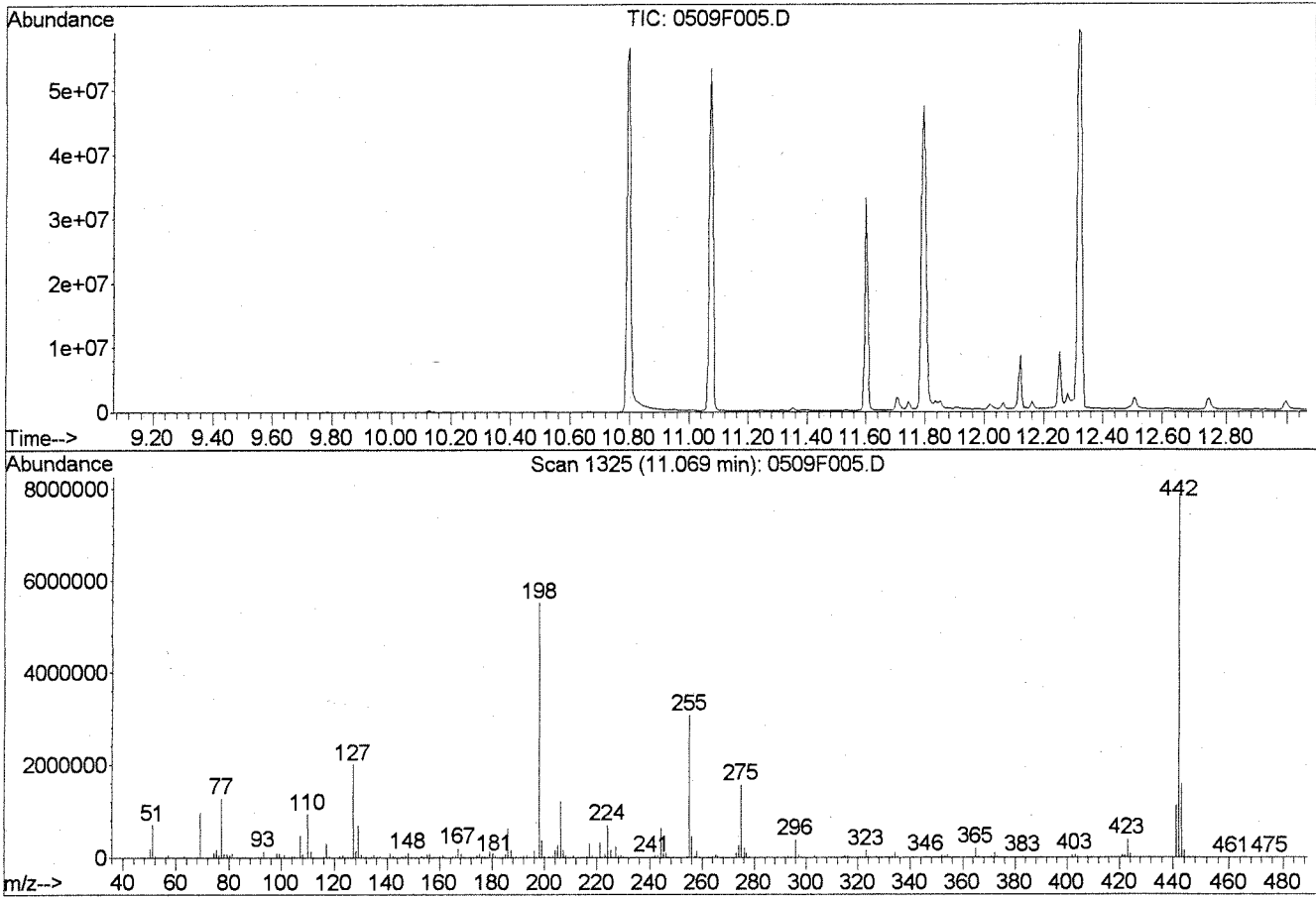
D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

DFTPP

Data File : J:\MS26\DATA\050911\0509F005.D
 Acq On : 9 May 2011 11:15 am
 Sample : 10ug/mL DFTPP | SVM34-33F
 Misc :
 MS Integration Params: rteint.p
 Method : J:\MS26\METHODS\SIM\A_DFTPP.M (RTE Integrator)
 Title : dftpp tune mix

Vial: 1
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00



Spectrum Information: Scan 1325

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	12.7	700992	PASS
68	69	0.00	2	1.4	13150	PASS
69	198	0.00	100	17.7	972672	PASS
70	69	0.00	2	0.5	5066	PASS
127	198	10	80	36.3	1997824	PASS
197	198	0.00	2	0.0	0	PASS
198	442	30	100	69.9	5508096	PASS
199	198	5	9	6.8	373632	PASS
275	198	10	60	28.3	1558528	PASS
365	442	1	50	2.5	200064	PASS
441	443	0.01	100	70.8	1123328	PASS
442	442	30	100	100.0	7877632	PASS
443	442	15	24	20.1	1586688	PASS

LB
 5/10/11
 CH 05/10/11

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
50.10	175744	61.10	9076	72.10	684	83.10	22992
51.10	700992	62.10	11282	73.00	6516	84.00	2283
52.10	35816	63.10	33064	74.10	92872	85.10	16584
53.20	1660	64.10	4802	75.10	158656	86.10	23512
54.00	206	65.10	19008	76.10	57568	87.10	11469
55.10	4620	66.00	1436	77.10	1275392	88.10	5655
56.10	20432	67.10	1532	78.10	85416	89.10	2049
57.10	52136	68.10	13150	79.10	69640	90.10	748
58.00	2316	69.00	972672	80.10	55336	91.10	20104
59.10	671	70.10	5066	81.10	82528	92.10	21040
60.00	1086	71.10	3191	82.10	21000	93.10	133760

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
94.10	9002	105.00	33480	116.10	23712	127.10	1997824
95.10	5186	106.10	10305	117.00	311872	128.10	145920
96.10	8648	107.10	464576	118.10	24432	129.10	695488
97.20	4742	108.10	73896	119.10	4496	130.10	60976
98.10	104632	109.10	12483	120.10	6355	131.10	12409
99.10	85880	110.00	935744	121.00	2248	132.10	8242
100.10	8736	111.10	135424	122.00	28304	132.90	3695
101.00	57824	112.10	17488	123.10	47232	134.10	19000
102.00	3428	113.10	5707	124.00	21672	135.10	58984
103.10	16928	114.10	1498	125.10	22248	136.10	21792
104.00	33208	115.00	2220	126.10	5253	137.10	28872

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
138.10	6356	149.10	21408	160.00	27552	171.00	8490
139.00	3889	150.10	6395	161.10	47376	172.00	17232
140.00	7545	151.10	11578	162.00	13040	173.10	22032
141.00	85744	151.90	8398	163.10	4006	174.10	42288
142.10	29288	153.00	28504	164.00	4599	175.10	81264
143.00	21792	154.10	22976	165.00	34784	176.10	25232
144.00	5918	155.10	54680	166.10	28944	177.00	34312
145.00	6165	156.10	83888	167.10	196224	178.00	10661
146.10	14761	157.10	18992	168.10	86648	179.00	143296
147.10	45120	158.00	16257	169.10	18456	180.10	105424
148.00	94488	159.00	13164	170.00	6344	181.10	51984

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
182.10	7779	193.10	54272	206.10	1212416	219.10	3402
183.10	5240	194.10	11832	207.10	163136	221.10	312576
184.10	11434	195.10	7602	208.10	36088	223.00	70152
185.10	71120	196.10	139840	209.00	11104	224.10	696768
186.10	621952	198.00	5508096	211.00	45936	225.10	175744
187.10	175616	199.00	373632	213.00	3013	226.00	17760
188.10	17128	200.00	29040	214.00	1209	227.00	241088
189.00	31152	201.60	24672	215.00	10591	228.00	37952
190.10	5072	203.00	28320	216.00	24008	229.00	58712
191.10	16100	204.10	156416	217.00	303872	230.00	10364
192.10	48024	205.10	274688	218.00	40896	231.10	25608

LB
5/10/11

04 05 10 11

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
232.10	5831	243.10	41064	254.00	14230	265.00	59384
233.00	4850	244.10	636288	255.00	3073536	265.90	30712
234.00	15479	245.10	88480	256.00	457216	267.00	2334
235.00	20808	246.00	98752	257.10	34264	267.90	14490
236.00	13169	247.00	20184	258.00	150784	268.90	1366
237.00	21880	248.00	5311	259.00	24240	269.90	7072
238.00	3265	249.00	21888	260.00	4355	271.00	5192
239.00	10927	250.00	3815	261.10	5748	272.00	8114
240.00	7773	251.00	4575	262.00	1214	273.00	98288
241.00	15098	252.10	4798	263.10	1351	274.00	263936
242.00	38320	253.00	10498	263.90	16329	275.00	1558528

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
276.10	212416	287.10	382	298.10	4030	308.00	6187
277.00	107512	288.10	1444	299.00	1199	309.10	3898
278.00	18200	289.00	4600	299.90	452	310.10	6102
279.00	3914	290.00	4222	301.00	5986	311.00	1534
280.10	906	291.00	2804	302.10	6855	312.00	1665
281.00	948	292.10	5797	303.10	46608	313.10	4237
282.00	2769	293.00	29104	304.10	14524	314.10	20048
283.00	13477	294.00	7352	305.00	1752	315.00	42928
284.00	9076	295.00	6824	305.90	420	316.10	28368
285.10	21248	296.00	385152	306.90	697	317.10	5455
286.10	4317	297.10	53152	307.10	695	318.00	453

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
319.00	892	330.10	823	342.10	4747	354.10	51624
319.90	1534	331.00	562	343.00	709	355.10	9842
321.00	14730	332.00	10118	344.10	194	356.00	1059
322.00	6633	333.00	13546	345.10	275	357.10	559
323.10	155200	334.10	94632	346.00	36384	358.00	1167
324.10	30440	335.10	26248	347.00	6600	359.00	4007
325.10	2768	336.10	3662	348.00	968	360.00	872
326.00	3322	337.10	357	350.00	1134	361.10	877
327.00	27848	338.90	2300	351.00	2721	362.40	152
328.10	14191	340.10	2342	352.00	49672	363.10	465
329.00	2792	341.00	19096	353.10	33536	364.00	1713

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
365.00	200064	377.00	2907	390.00	14038	403.10	56624
366.00	30624	378.00	476	391.00	9254	404.10	21000
367.00	2358	379.10	223	392.10	7346	405.00	3137
369.00	169	380.80	209	393.10	895	406.00	249
370.00	5178	382.00	422	395.00	927	408.00	544
371.00	13788	383.00	26472	395.90	504	409.00	407
372.10	94496	384.00	7987	396.90	1324	410.00	2120
373.10	24680	385.00	2088	397.90	177	411.00	422
374.10	2996	385.90	367	398.30	208	415.00	2812
375.00	290	387.80	285	401.00	5642	416.10	464
375.90	212	389.00	862	402.00	39496	419.00	373

Lo
5/10/11

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
420.00	596	441.10	1123328				
421.00	52856	442.10	7877632				
422.00	44800	443.10	1586688				
423.00	397248	444.10	152320				
424.10	79880	445.10	9102				
425.10	7945	445.90	497				
426.00	625	460.90	163				
427.00	384	475.10	206				
438.10	158						
439.10	657						
439.90	755						

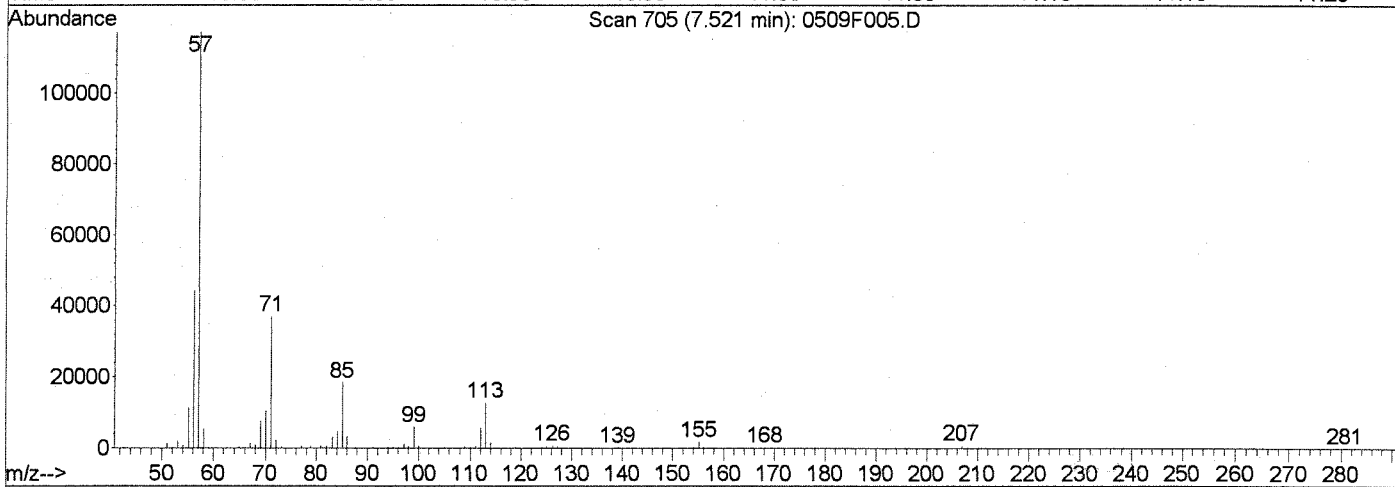
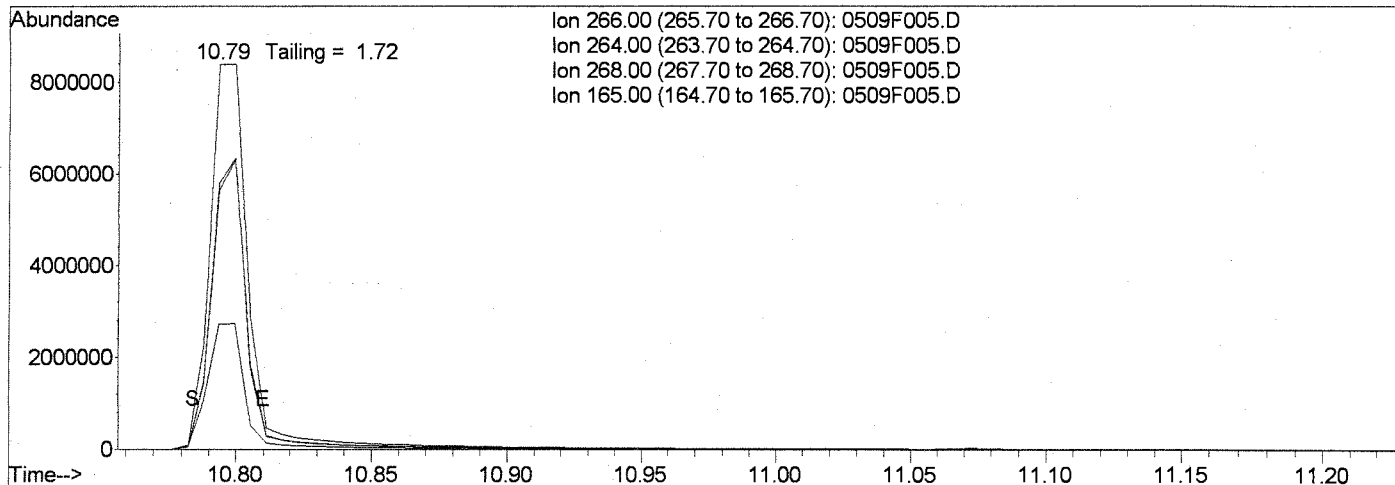
LB
5/10/11
04 05-10-11

Quantitation Report

Data File : J:\MS26\DATA\050911\0509F005.D
Acq On : 9 May 2011 11:15 am
Sample : 10ug/mL DFTPP | SVM34-33F
Misc :
MS Integration Params: rteint.p

Vial: 1
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Method : J:\MS26\METHODS\SIM\A_DFTPP.M (RTE Integrator)
Title : dftpp tune mix
Last Update : Tue Nov 30 13:38:58 2010
Response via : Initial Calibration



TIC: 0509F005.D

(1) Pentachlorophenol		
Exp R.T. 7.52min		
response 0		
Ion	Exp%	Act%
266.00	100	0
264.00	63.70	0.00
268.00	63.30	0.00
165.00	71.50	0.00

Handwritten notes: LB, 5/10/11, CH 05/10/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101605
Calibration Date: 05/09/2011

**Initial Calibration Summary
 1,4-Dioxane by GC/MS**

Calibration ID: CAL10487
Instrument ID: MS26

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS26\DATA\050911\0509F007.D	E	J:\MS26\DATA\050911\0509F011.D
B	J:\MS26\DATA\050911\0509F008.D	F	J:\MS26\DATA\050911\0509F012.D
C	J:\MS26\DATA\050911\0509F009.D	G	J:\MS26\DATA\050911\0509F013.D
D	J:\MS26\DATA\050911\0509F010.D		

Analyte Name	Level			Level			Level			Level			Level		
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF
1,4-Dioxane	A	2.0	0.359	B	4.0	0.357	C	10	0.368	D	20	0.389	E	50	0.426
	F	100	0.432	G	200	0.450									
1,4-Dioxane-d8	A	2.0	0.369	B	4.0	0.357	C	10	0.368	D	20	0.403	E	50	0.403
	F	100	0.417	G	200	0.419									

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101605
Calibration Date: 05/09/2011

**Initial Calibration Summary
 1,4-Dioxane by GC/MS**

Calibration ID: CAL10487
Instrument ID: MS26

Column: MS

Analyte Name	Compound Type	Calibration Evaluation					RRF Evaluation		
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
1,4-Dioxane	MS	AverageRF	% RSD	9.6		≤ 15	0.397		0.01
1,4-Dioxane-d8	SURR	AverageRF	% RSD	6.6		≤ 15	0.391		0.01

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101605
Calibration Date: 05/09/2011
Date Analyzed: 05/09/2011

Second Source Calibration Verification
1,4-Dioxane by GC/MS

Calibration Type: Internal Standard
Analysis Method: 8270C SIM

Calibration ID: CAL10487
Units: ng/ml

File ID: J:\MS26\DATA\050911\0509F014.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
1,4-Dioxane	20	22	0.397	0.445	12	NA	± 20 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Injection Log

Directory: J:\MS26\DATA\050911

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	0509F001.d	1.	PR		9 May 2011 09:4
2	1	0509F002.d	1.	PR		9 May 2011 10:0
3	1	0509F003.d	1.	10ug/mL DFTPP SVM34-33F	NR	9 May 2011 10:2
4	1	0509F004.d	1.	10ug/mL DFTPP SVM34-33F		9 May 2011 10:4
5	1	0509F005.d	1.	10ug/mL DFTPP SVM34-33F	OK - NEW TUNE	9 May 2011 11:1
6	2	0509F006.d	1.	IB		9 May 2011 11:4
7	3	0509F007.d	1.	2.0ng/mL ICAL 1,4-Dioxane SVM34-56B		9 May 2011 12:0
8	4	0509F008.d	1.	4.0ng/mL ICAL 1,4-Dioxane SVM34-56C		9 May 2011 12:2
9	5	0509F009.d	1.	10ng/mL ICAL 1,4-Dioxane SVM34-56D		9 May 2011 12:4
10	6	0509F010.d	1.	20ng/mL ICAL 1,4-Dioxane SVM34-56E		9 May 2011 13:0
11	7	0509F011.d	1.	50ng/mL ICAL 1,4-Dioxane SVM34-56F		9 May 2011 13:2
12	8	0509F012.d	1.	100ng/mL ICAL 1,4-Dioxane SVM34-56G		9 May 2011 13:4
13	9	0509F013.d	1.	200ng/mL ICAL 1,4-Dioxane SVM34-56H		9 May 2011 14:0
14	10	0509F014.d	1.	20ng/mL ICV 1,4-Dioxane SVM34-57L		9 May 2011 14:2
15	11	0509F015.d	1.	KWG1103961-4 MB		9 May 2011 14:4
16	12	0509F016.d	1.	KWG1103961-3 LCS		9 May 2011 15:0
17	13	0509F017.d	1.	KWG1103961-1 MS P1101579-005MS		9 May 2011 15:2
18	14	0509F018.d	1.	KWG1103961-2 DMS P1101579-005DMS		9 May 2011 15:4
19	15	0509F019.d	1.	P1101579-005		9 May 2011 16:0
20	16	0509F020.d	1.	P1101605-005		9 May 2011 16:2
21	17	0509F021.d	1.	P1101607-001		9 May 2011 16:4

Run # 245353

CAL10487

LB 5110111

04 05'10'11

Exception Report

Data File: J:\MS26\DATA\050911\0509F005.D
Lab ID: KWG1104145-1
RunType: TUNE
Matrix: WATER

Date Acquired: 05/09/2011 11:15
Date Quantitated:
Batch ID: KWG1104145
Analysis Method: DFTPP
ListJoinID: LJ1965

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Ion Ratio	NA	NA	NA	x	

Primary Review: LG 5/10/11
Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID:	Tier:	Matrix:
Prod Code: 8270C SIM 14_DI	Collect Date:	Receive Date: 05/10/2011

Analysis Lot: KWG1104145	Prep Lot:	Report Group:
Analysis Method: DFTPP	Prep Method:	
Prep Ref:	Prep Date:	

Quant Method: J:\MS26\METHODS\SIM\A_DFTPP.M	Calibration ID: CAL10487
Title:	Report List ID: LJ1965
Tune Ref:	Method ID: MJ190
MB Ref:	Quant based on Report List

Data File: J:\MS26\DATA\050911\0509F005.D	Instrument: MS26
Acqu Date: 05/09/2011 11:15	Quant Date:
Run Type: TUNE	Vial: 1
Lab ID: KWG1104145-1	Dilution: 1.0
	Soln Conc. Units:

Tune Results

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	12.7	700992	Pass
68	69	0	2	1.4	13150	Pass
69	198	0	100	17.7	972672	Pass
70	69	0	2	0.5	5066	Pass
127	198	10	80	36.3	1997824	Pass
197	198	0	2	0.0	0	Pass
198	442	30	100	69.9	5508096	Pass
199	198	5	9	6.8	373632	Pass
275	198	10	60	28.3	1558528	Pass
365	442	1	50	2.5	200064	Pass
441	443	0.01	100	70.8	1123328	Pass
442	442	100	100	100.0	7877632	Pass
443	442	15	24	20.1	1586688	Pass

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

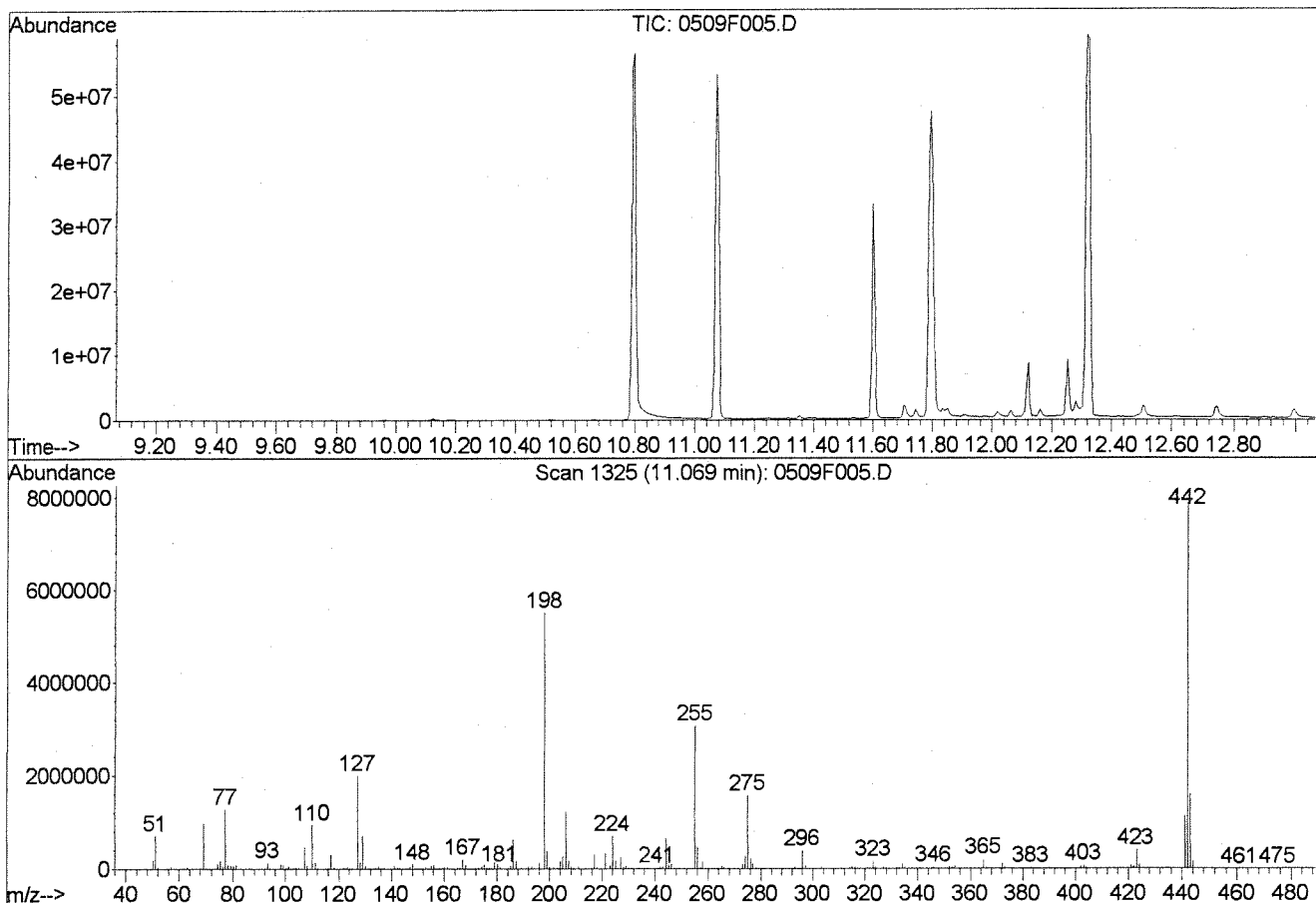
D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

DFTPP

Data File : J:\MS26\DATA\050911\0509F005.D
 Acq On : 9 May 2011 11:15 am
 Sample : 10ug/mL DFTPP | SVM34-33F
 Misc :
 MS Integration Params: rteint.p
 Method : J:\MS26\METHODS\SIM\A_DFTPP.M (RTE Integrator)
 Title : dftpp tune mix

Vial: 1
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00



Spectrum Information: Scan 1325

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	12.7	700992	PASS
68	69	0.00	2	1.4	13150	PASS
69	198	0.00	100	17.7	972672	PASS
70	69	0.00	2	0.5	5066	PASS
127	198	10	80	36.3	1997824	PASS
197	198	0.00	2	0.0	0	PASS
198	442	30	100	69.9	5508096	PASS
199	198	5	9	6.8	373632	PASS
275	198	10	60	28.3	1558528	PASS
365	442	1	50	2.5	200064	PASS
441	443	0.01	100	70.8	1123328	PASS
442	442	30	100	100.0	7877632	PASS
443	442	15	24	20.1	1586688	PASS

LB
 511011
 CH 05/10/11

Scan 1325 (11.069 min): 0509F005.D

10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
50.10	175744	61.10	9076	72.10	684	83.10	22992
51.10	700992	62.10	11282	73.00	6516	84.00	2283
52.10	35816	63.10	33064	74.10	92872	85.10	16584
53.20	1660	64.10	4802	75.10	158656	86.10	23512
54.00	206	65.10	19008	76.10	57568	87.10	11469
55.10	4620	66.00	1436	77.10	1275392	88.10	5655
56.10	20432	67.10	1532	78.10	85416	89.10	2049
57.10	52136	68.10	13150	79.10	69640	90.10	748
58.00	2316	69.00	972672	80.10	55336	91.10	20104
59.10	671	70.10	5066	81.10	82528	92.10	21040
60.00	1086	71.10	3191	82.10	21000	93.10	133760

Scan 1325 (11.069 min): 0509F005.D

10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
94.10	9002	105.00	33480	116.10	23712	127.10	1997824
95.10	5186	106.10	10305	117.00	311872	128.10	145920
96.10	8648	107.10	464576	118.10	24432	129.10	695488
97.20	4742	108.10	73896	119.10	4496	130.10	60976
98.10	104632	109.10	12483	120.10	6355	131.10	12409
99.10	85880	110.00	935744	121.00	2248	132.10	8242
100.10	8736	111.10	135424	122.00	28304	132.90	3695
101.00	57824	112.10	17488	123.10	47232	134.10	19000
102.00	3428	113.10	5707	124.00	21672	135.10	58984
103.10	16928	114.10	1498	125.10	22248	136.10	21792
104.00	33208	115.00	2220	126.10	5253	137.10	28872

Scan 1325 (11.069 min): 0509F005.D

10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
138.10	6356	149.10	21408	160.00	27552	171.00	8490
139.00	3889	150.10	6395	161.10	47376	172.00	17232
140.00	7545	151.10	11578	162.00	13040	173.10	22032
141.00	85744	151.90	8398	163.10	4006	174.10	42288
142.10	29288	153.00	28504	164.00	4599	175.10	81264
143.00	21792	154.10	22976	165.00	34784	176.10	25232
144.00	5918	155.10	54680	166.10	28944	177.00	34312
145.00	6165	156.10	83888	167.10	196224	178.00	10661
146.10	14761	157.10	18992	168.10	86648	179.00	143296
147.10	45120	158.00	16257	169.10	18456	180.10	105424
148.00	94488	159.00	13164	170.00	6344	181.10	51984

Scan 1325 (11.069 min): 0509F005.D

10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
182.10	7779	193.10	54272	206.10	1212416	219.10	3402
183.10	5240	194.10	11832	207.10	163136	221.10	312576
184.10	11434	195.10	7602	208.10	36088	223.00	70152
185.10	71120	196.10	139840	209.00	11104	224.10	696768
186.10	621952	198.00	5508096	211.00	45936	225.10	175744
187.10	175616	199.00	373632	213.00	3013	226.00	17760
188.10	17128	200.00	29040	214.00	1209	227.00	241088
189.00	31152	201.60	24672	215.00	10591	228.00	37952
190.10	5072	203.00	28320	216.00	24008	229.00	58712
191.10	16100	204.10	156416	217.00	303872	230.00	10364
192.10	48024	205.10	274688	218.00	40896	231.10	25608

LB
5/10/11
04 05 10 11

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
232.10	5831	243.10	41064	254.00	14230	265.00	59384
233.00	4850	244.10	636288	255.00	3073536	265.90	30712
234.00	15479	245.10	88480	256.00	457216	267.00	2334
235.00	20808	246.00	98752	257.10	34264	267.90	14490
236.00	13169	247.00	20184	258.00	150784	268.90	1366
237.00	21880	248.00	5311	259.00	24240	269.90	7072
238.00	3265	249.00	21888	260.00	4355	271.00	5192
239.00	10927	250.00	3815	261.10	5748	272.00	8114
240.00	7773	251.00	4575	262.00	1214	273.00	98288
241.00	15098	252.10	4798	263.10	1351	274.00	263936
242.00	38320	253.00	10498	263.90	16329	275.00	1558528

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
276.10	212416	287.10	382	298.10	4030	308.00	6187
277.00	107512	288.10	1444	299.00	1199	309.10	3898
278.00	18200	289.00	4600	299.90	452	310.10	6102
279.00	3914	290.00	4222	301.00	5986	311.00	1534
280.10	906	291.00	2804	302.10	6855	312.00	1665
281.00	948	292.10	5797	303.10	46608	313.10	4237
282.00	2769	293.00	29104	304.10	14524	314.10	20048
283.00	13477	294.00	7352	305.00	1752	315.00	42928
284.00	9076	295.00	6824	305.90	420	316.10	28368
285.10	21248	296.00	385152	306.90	697	317.10	5455
286.10	4317	297.10	53152	307.10	695	318.00	453

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
319.00	892	330.10	823	342.10	4747	354.10	51624
319.90	1534	331.00	562	343.00	709	355.10	9842
321.00	14730	332.00	10118	344.10	194	356.00	1059
322.00	6633	333.00	13546	345.10	275	357.10	559
323.10	155200	334.10	94632	346.00	36384	358.00	1167
324.10	30440	335.10	26248	347.00	6600	359.00	4007
325.10	2768	336.10	3662	348.00	968	360.00	872
326.00	3322	337.10	357	350.00	1134	361.10	877
327.00	27848	338.90	2300	351.00	2721	362.40	152
328.10	14191	340.10	2342	352.00	49672	363.10	465
329.00	2792	341.00	19096	353.10	33536	364.00	1713

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
365.00	200064	377.00	2907	390.00	14038	403.10	56624
366.00	30624	378.00	476	391.00	9254	404.10	21000
367.00	2358	379.10	223	392.10	7346	405.00	3137
369.00	169	380.80	209	393.10	895	406.00	249
370.00	5178	382.00	422	395.00	927	408.00	544
371.00	13788	383.00	26472	395.90	504	409.00	407
372.10	94496	384.00	7987	396.90	1324	410.00	2120
373.10	24680	385.00	2088	397.90	177	411.00	422
374.10	2996	385.90	367	398.30	208	415.00	2812
375.00	290	387.80	285	401.00	5642	416.10	464
375.90	212	389.00	862	402.00	39496	419.00	373

511011
CH 05-10-11

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
420.00	596	441.10	1123328				
421.00	52856	442.10	7877632				
422.00	44800	443.10	1586688				
423.00	397248	444.10	152320				
424.10	79880	445.10	9102				
425.10	7945	445.90	497				
426.00	625	460.90	163				
427.00	384	475.10	206				
438.10	158						
439.10	657						
439.90	755						

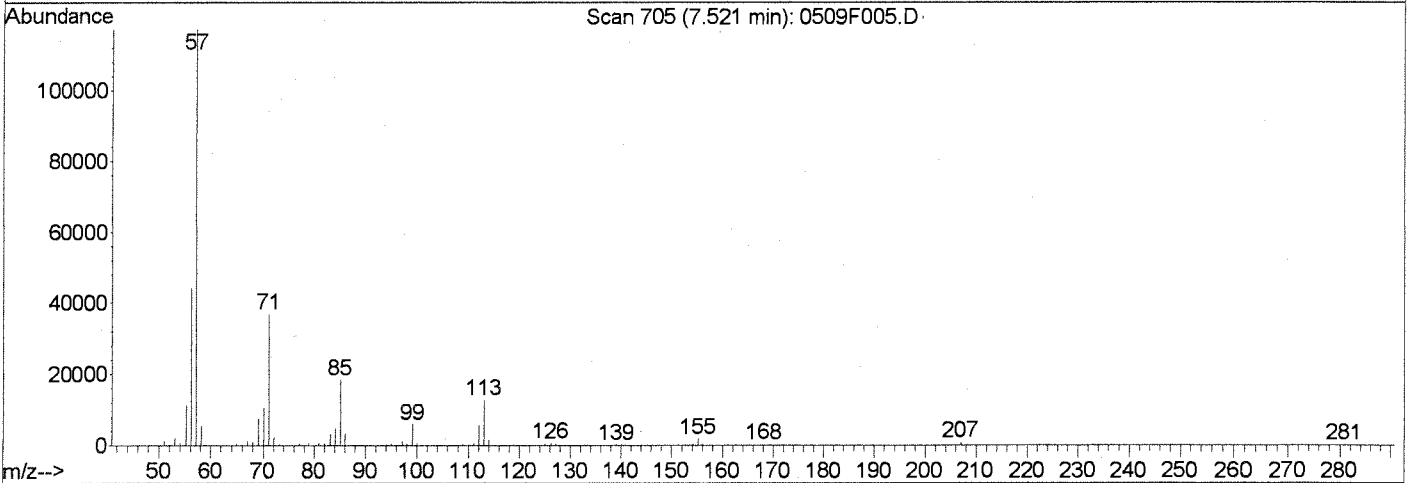
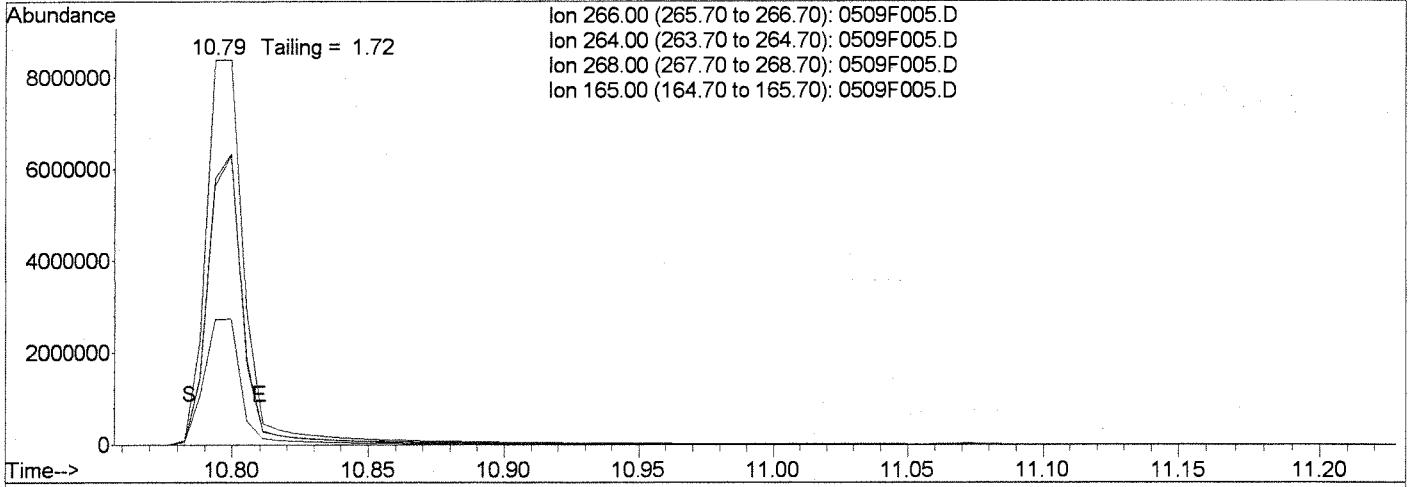
LB
511011
04 05 10 11

Quantitation Report

Data File : J:\MS26\DATA\050911\0509F005.D
Acq On : 9 May 2011 11:15 am
Sample : 10ug/mL DFTPP | SVM34-33F
Misc :
MS Integration Params: rteint.p

Vial: 1
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Method : J:\MS26\METHODS\SIM\A_DFTPP.M (RTE Integrator)
Title : dftpp tune mix
Last Update : Tue Nov 30 13:38:58 2010
Response via : Initial Calibration



TIC: 0509F005.D

(1) Pentachlorophenol

Exp R.T. 7.52min

response 0

Ion	Exp%	Act%
266.00	100	0
264.00	63.70	0.00
268.00	63.30	0.00
165.00	71.50	0.00

LB
5/10/11
CH 05:10:11

Data File : J:\MS26\DATA\050911\0509F006.D
 Acq On : 9 May 2011 11:43 am
 Sample : IB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:56:54 2011

Vial: 2
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	76813	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	0.00	96	0	0.00	ng/ml	
Spiked Amount	50.000		Recovery	=	0.00%	

Target Compounds Qvalue

KB
5/10/11

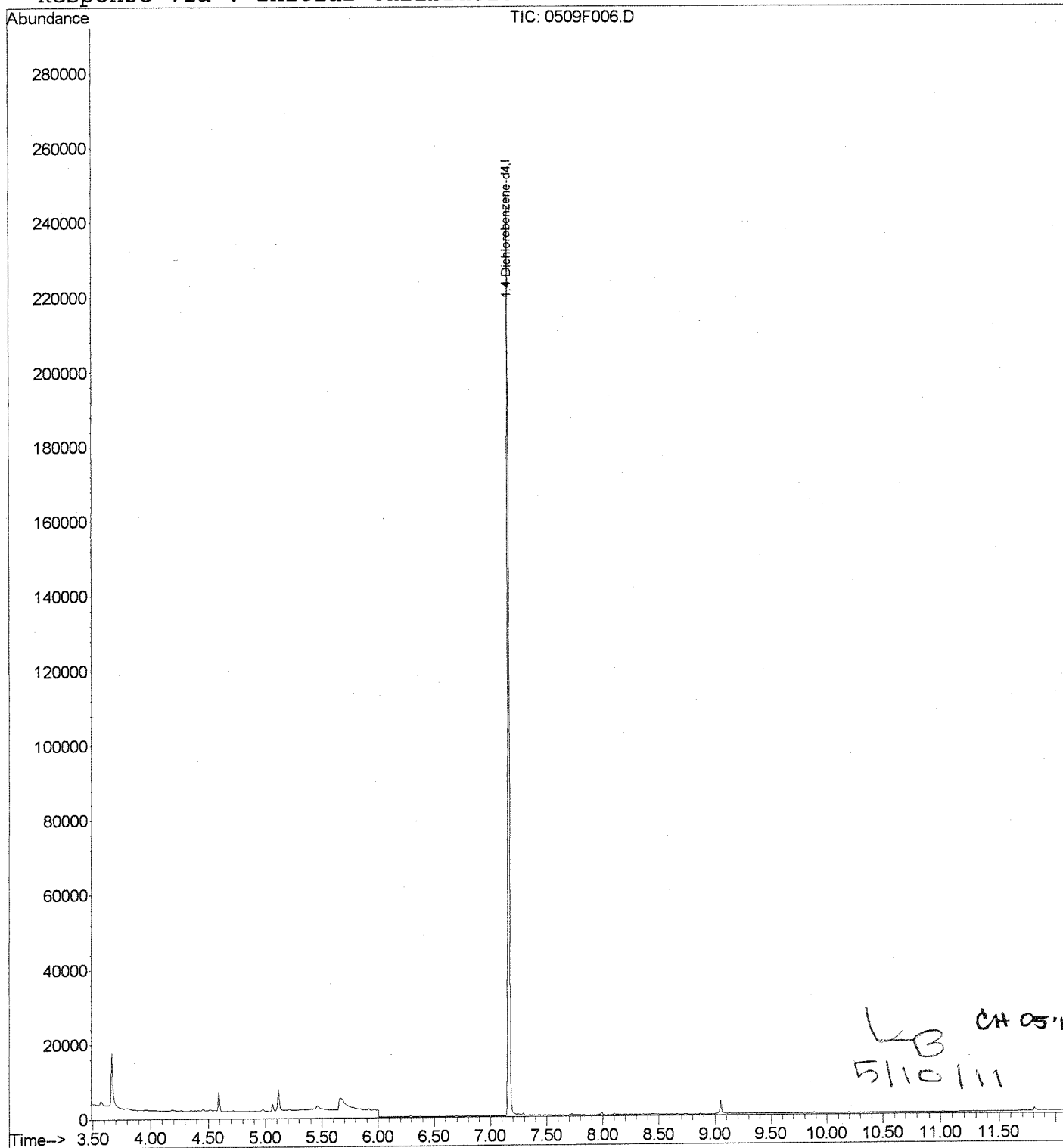
CH 05.10.11

Data File : J:\MS26\DATA\050911\0509F006.D
Acq On : 9 May 2011 11:43 am
Sample : IB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:56 2011

Vial: 2
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Data File : J:\MS26\DATA\050911\0509F007.D Vial: 3
 Acq On : 9 May 2011 12:03 pm Operator: KBailey
 Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:30 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.16	152	81459	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.98	96	1201m	1.98	ng/ml	0.04
Spiked Amount	50.000		Recovery	=	3.96%	
Target Compounds						
3) 1,4-Dioxane	3.99	88	1170m	1.88	ng/ml	Qvalue

CA 0510-11

LB
5/10/11

(#) = qualifier out of range (m) = manual integration
 0509F007.D 050911_DX.M Mon May 09 14:57:13 2011

Data File : J:\MS26\DATA\050911\0509F007.D

Vial: 3

Acq On : 9 May 2011 12:03 pm

Operator: KBailey

Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:22 2011

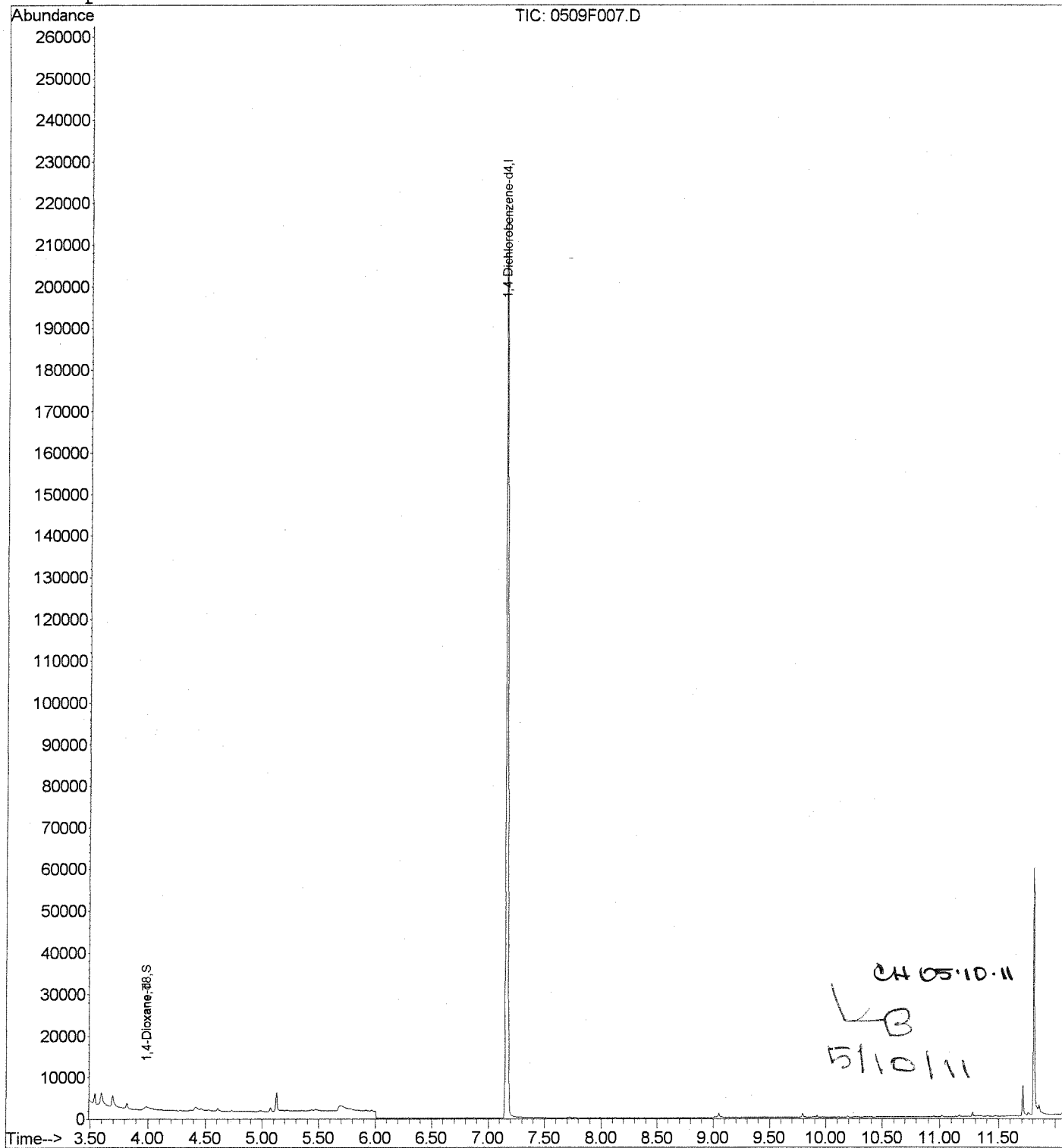
Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:26:14 2011

Response via : Initial Calibration



Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F007.D

Vial: 3

Acq On : 9 May 2011 12:03 pm

Operator: KBailey

Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:21 2011

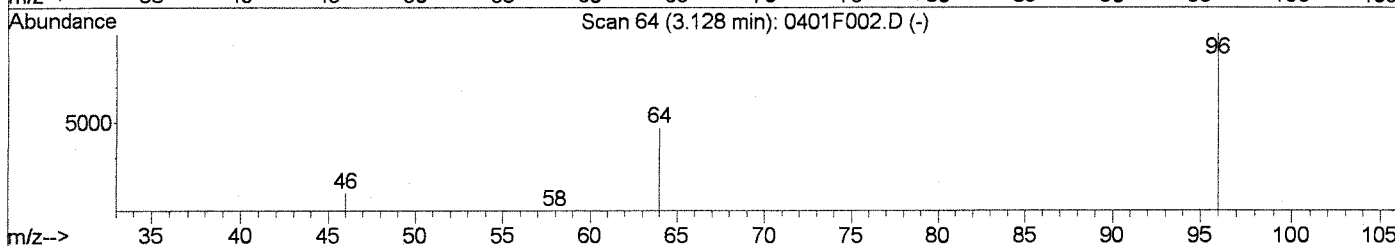
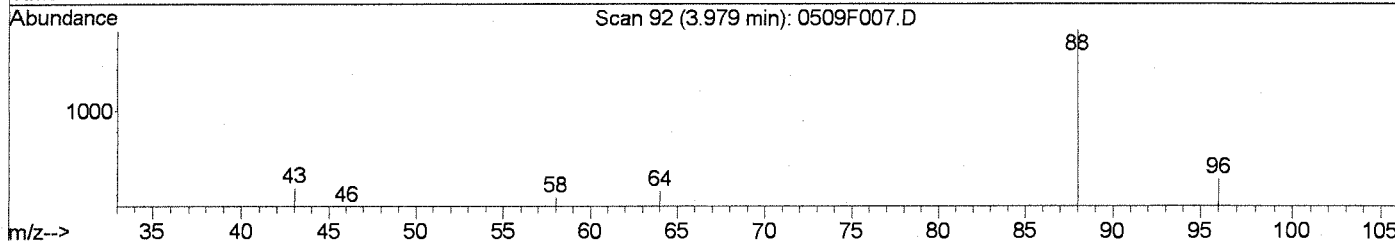
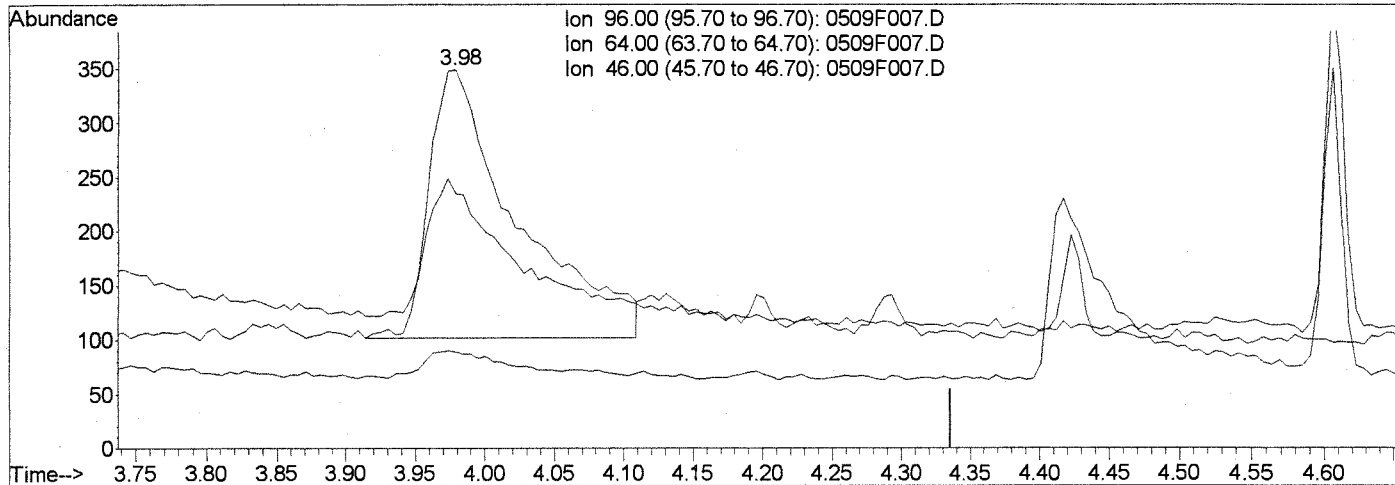
Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:21:18 2011

Response via : Multiple Level Calibration



TIC: 0509F007.D

(2) 1,4-Dioxane-d8 (S)

3.98min 1.80ng/ml

response 1087

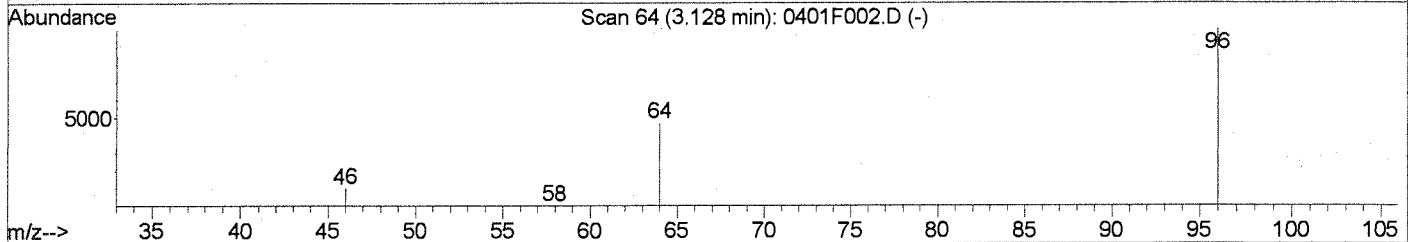
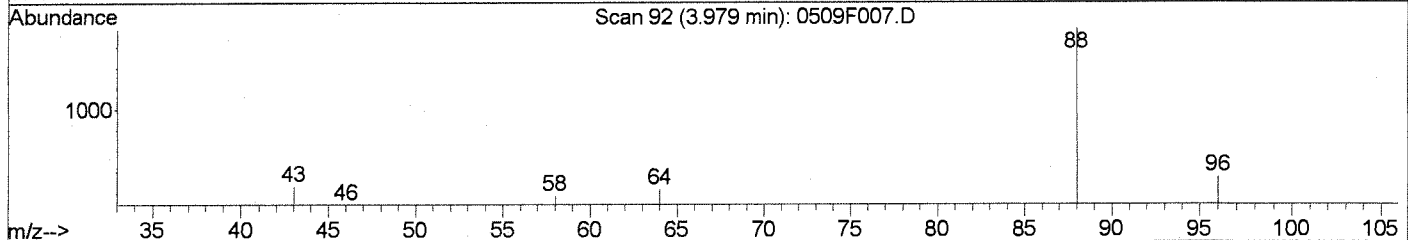
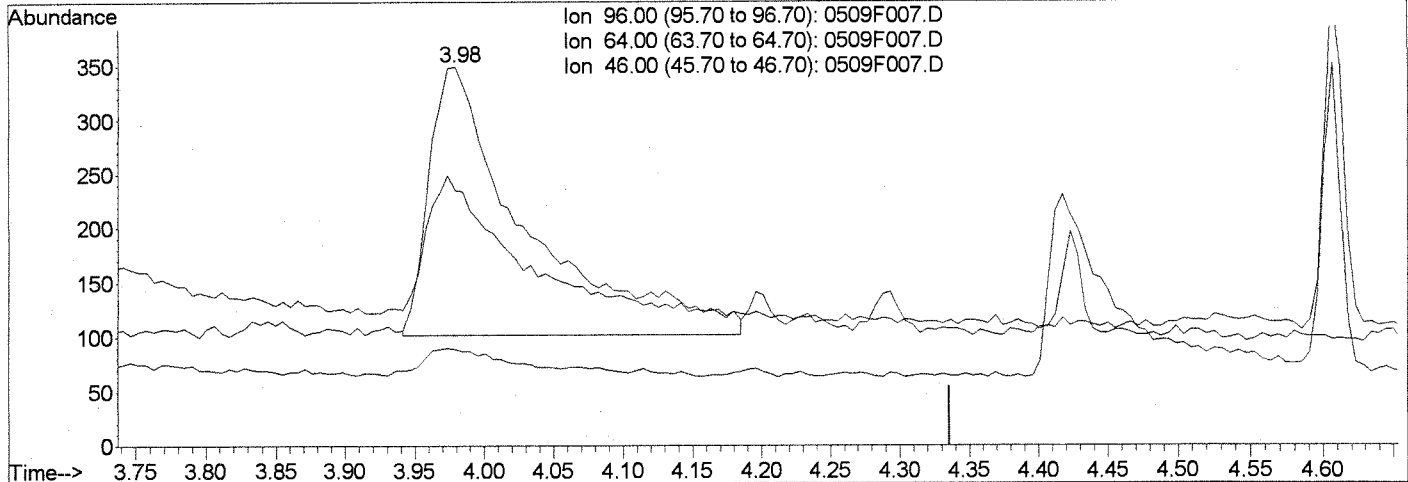
Ion	Exp%	Act%
96.00	100	100
64.00	55.60	45.75
46.00	11.70	8.91
0.00	0.00	0.00

Data File : J:\MS26\DATA\050911\0509F007.D
Acq On : 9 May 2011 12:03 pm
Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:21 2011

Vial: 3
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:21:18 2011
Response via : Multiple Level Calibration



TIC: 0509F007.D

(2) 1,4-Dioxane-d8 (S)

3.98min 1.98ng/ml m

response 1201

Ion	Exp%	Act%
96.00	100	100
64.00	55.60	67.34
46.00	11.70	25.50
0.00	0.00	0.00

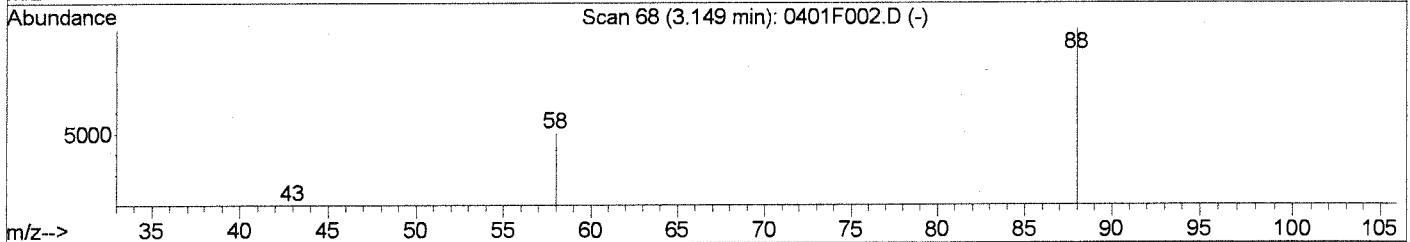
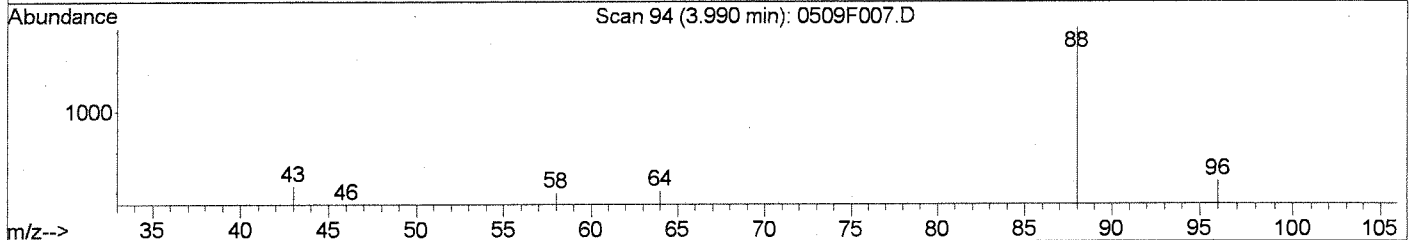
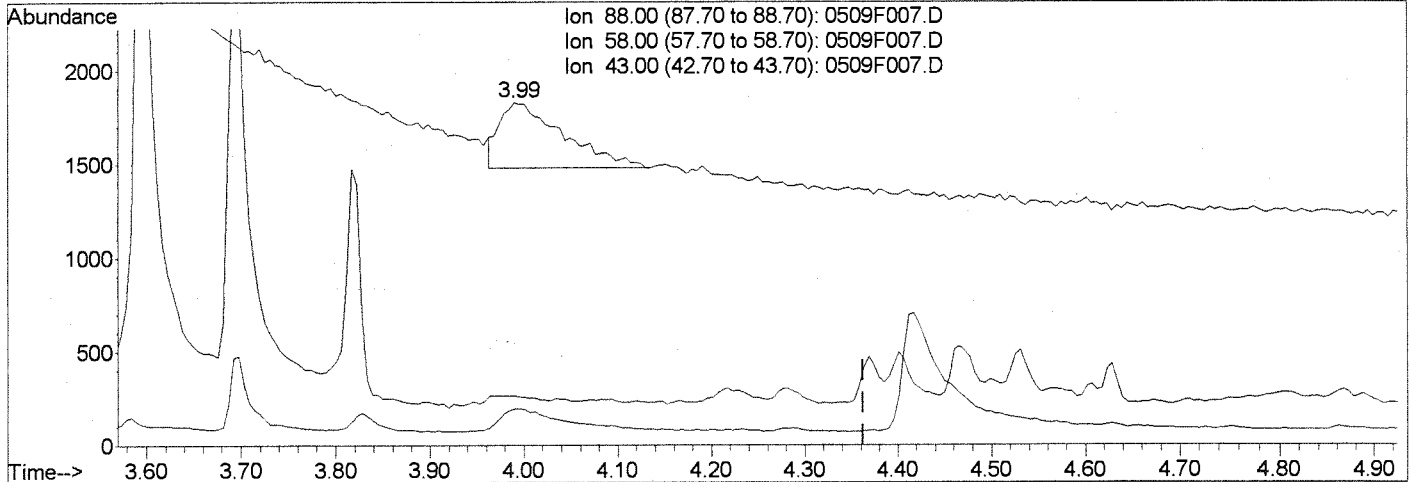
LC
LB 5/10/11
0405-10-11

Data File : J:\MS26\DATA\050911\0509F007.D
 Acq On : 9 May 2011 12:03 pm
 Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:21 2011

Vial: 3
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F007.D

(3) 1,4-Dioxane (T)

3.99min 2.67ng/ml

response 1657

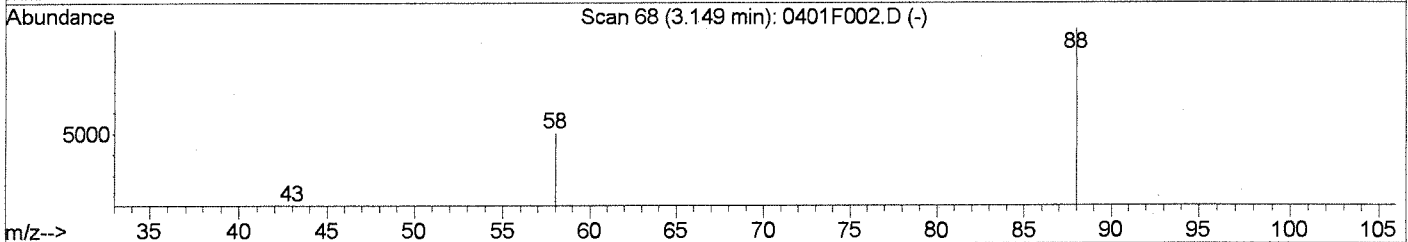
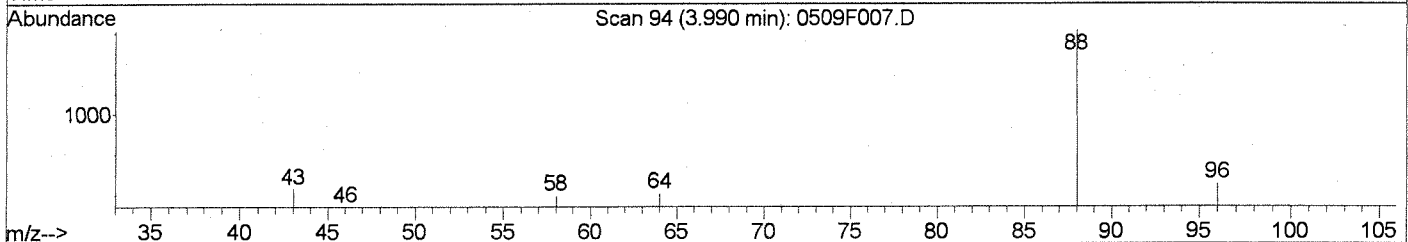
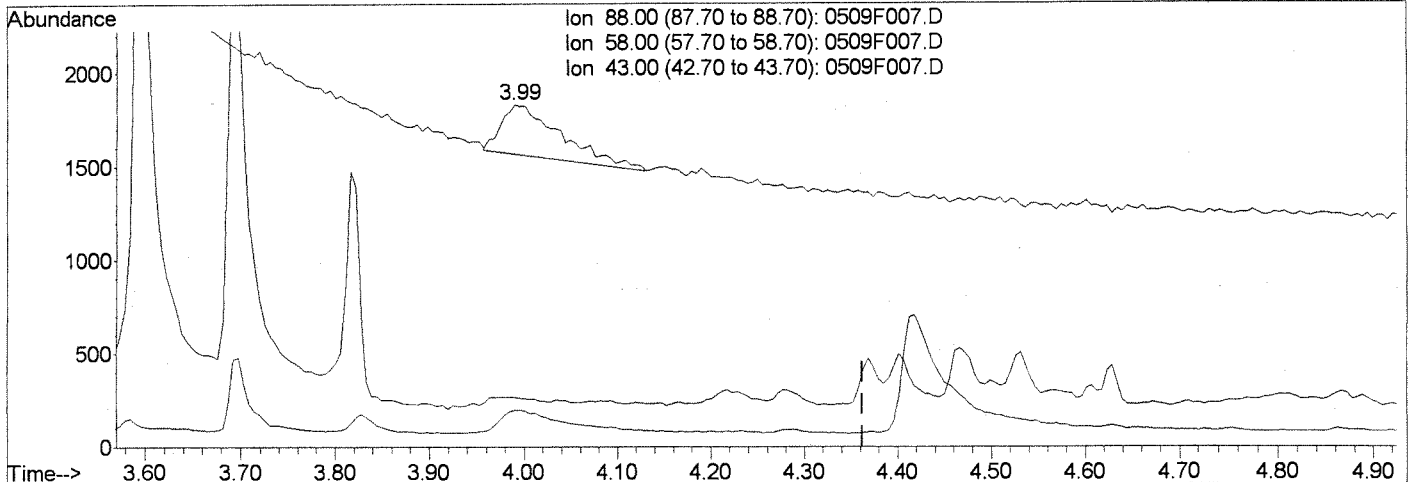
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	31.43
43.00	15.30	9.43
0.00	0.00	0.00

Data File : J:\MS26\DATA\050911\0509F007.D
Acq On : 9 May 2011 12:03 pm
Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:22 2011

Vial: 3
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:21:18 2011
Response via : Multiple Level Calibration



TIC: 0509F007.D

(3) 1,4-Dioxane (T)
3.99min 1.88ng/ml m
response 1170

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	10.71#
43.00	15.30	14.43
0.00	0.00	0.00

01
LB 5/10/11
CH 05.10.11

Data File : J:\MS26\DATA\050911\0509F008.D Vial: 4
 Acq On : 9 May 2011 12:23 pm Operator: KBailey
 Sample : 4.0ng/mL ICAL 1,4-Dioxane | SVM34-56C Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:30 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	80983	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.96	96	2312	3.84	ng/ml	0.02
Spiked Amount	50.000		Recovery	=	7.68%	
Target Compounds						
3) 1,4-Dioxane	3.97	88	2314m	3.75	ng/ml	Qvalue

LB
5/10/11

CA 05-10-11

Data File : J:\MS26\DATA\050911\0509F008.D

Vial: 4

Acq On : 9 May 2011 12:23 pm

Operator: KBailey

Sample : 4.0ng/mL ICAL 1,4-Dioxane | SVM34-56C

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:22 2011

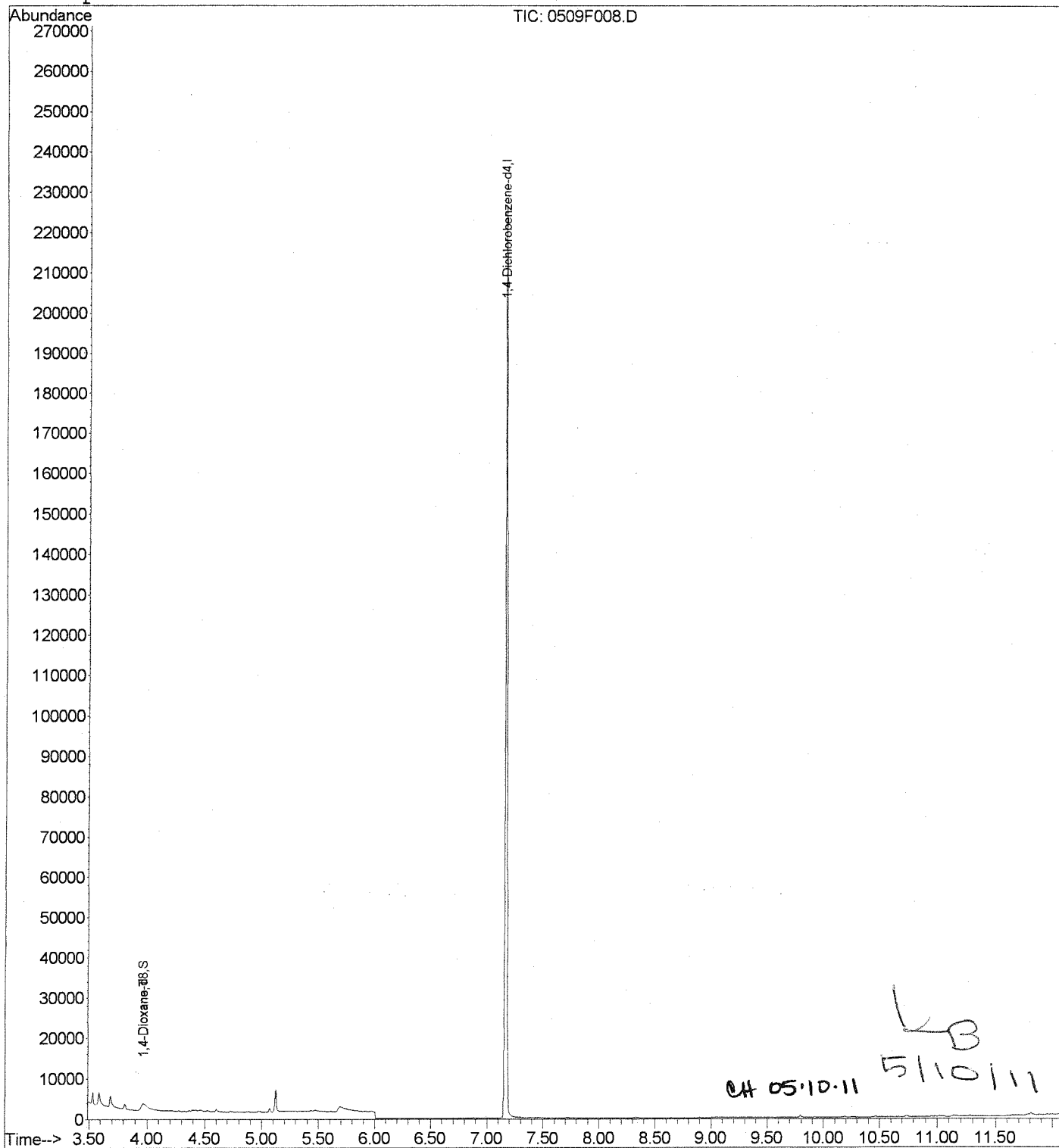
Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:26:14 2011

Response via : Initial Calibration



Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F008.D

Vial: 4

Acq On : 9 May 2011 12:23 pm

Operator: KBailey

Sample : 4.0ng/mL ICAL 1,4-Dioxane | SVM34-56C

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:21 2011

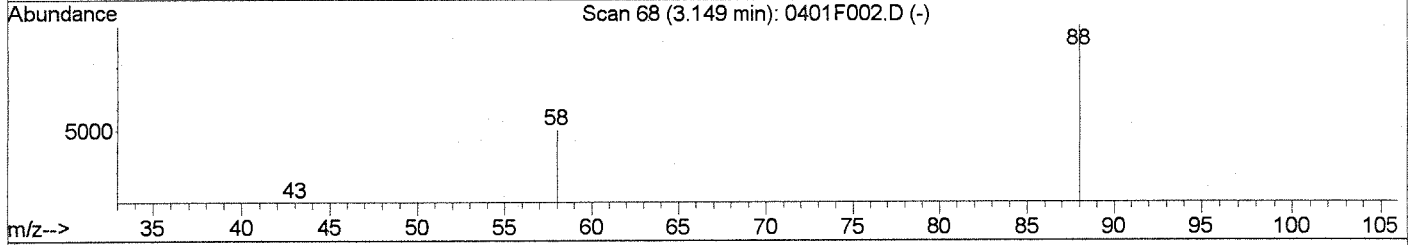
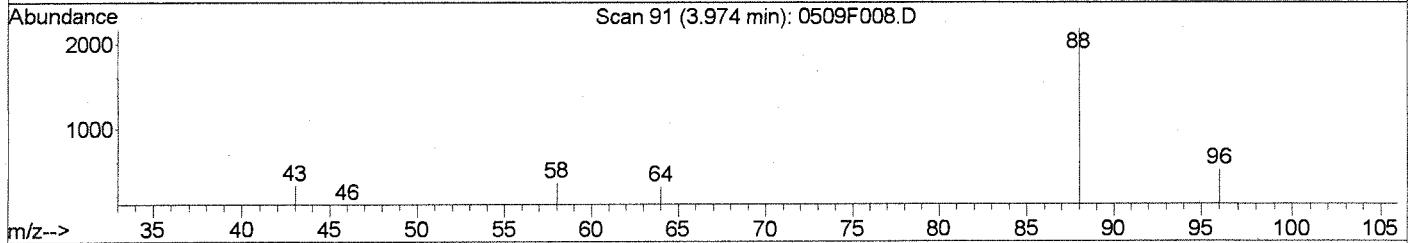
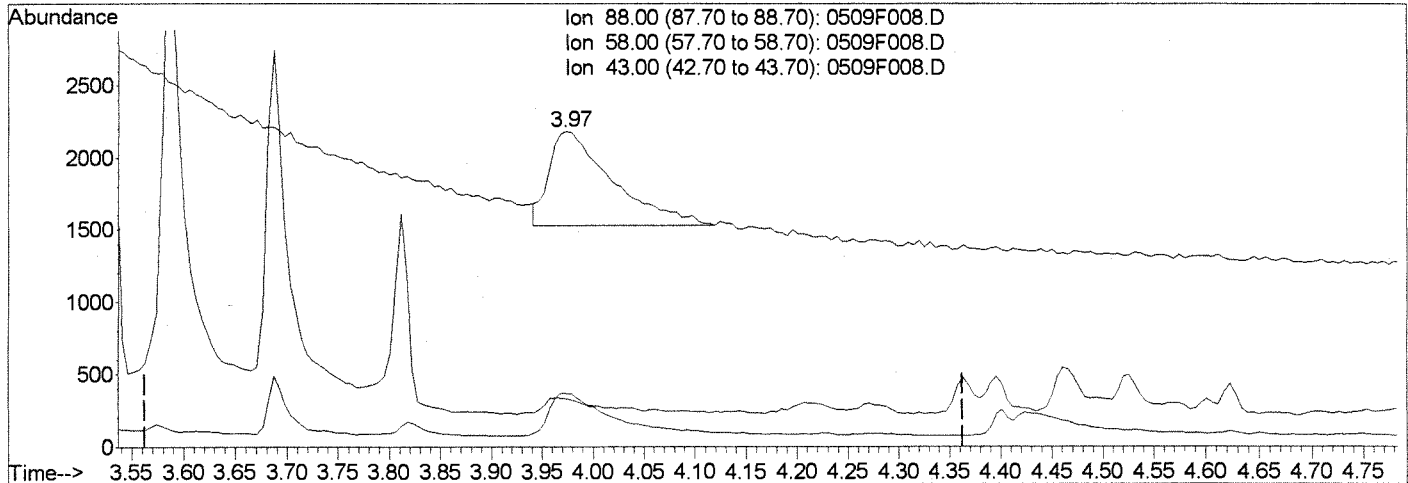
Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:21:18 2011

Response via : Multiple Level Calibration



TIC: 0509F008.D

(3) 1,4-Dioxane (T)		
3.97min	4.55ng/ml	
response	2811	
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	42.09
43.00	15.30	14.90
0.00	0.00	0.00

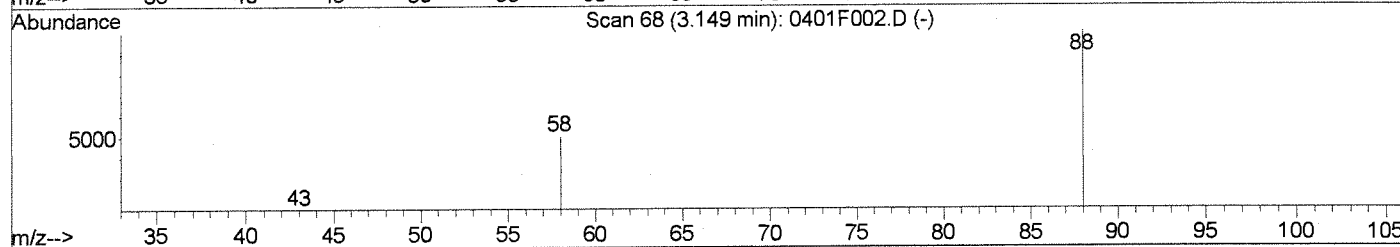
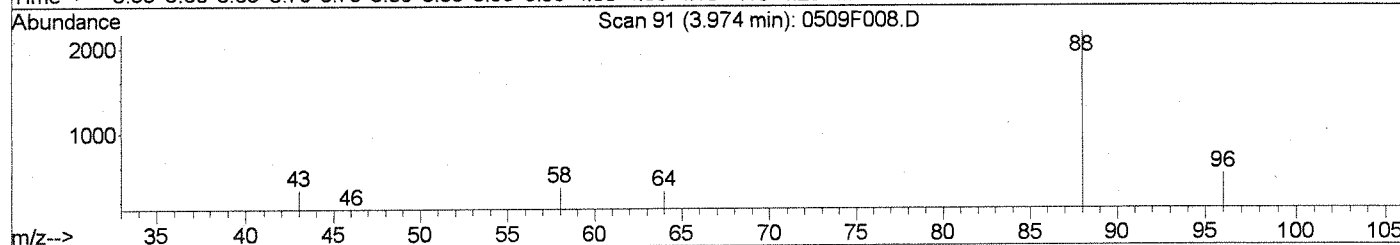
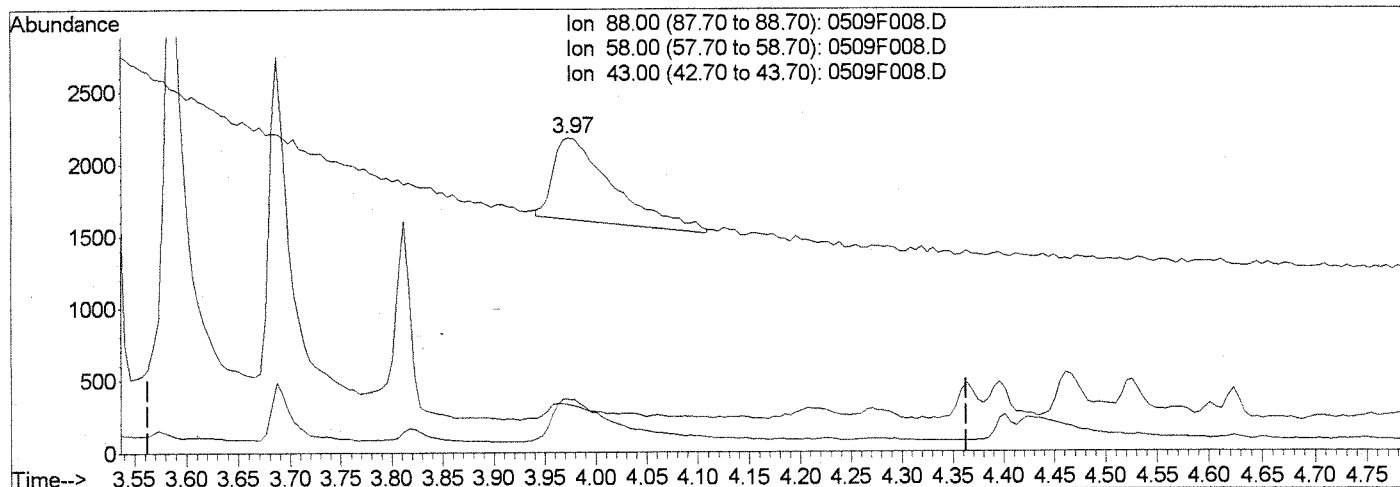
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F008.D
 Acq On : 9 May 2011 12:23 pm
 Sample : 4.0ng/mL ICAL 1,4-Dioxane | SVM34-56C
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:22 2011

Vial: 4
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F008.D

(3) 1,4-Dioxane (T)		
3.97min	3.75ng/ml m	
response	2314	
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	16.78#
43.00	15.30	15.13
0.00	0.00	0.00

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 LB 5/10/11
 CH 05-10-11

Data File : J:\MS26\DATA\050911\0509F009.D Vial: 5
 Acq On : 9 May 2011 12:43 pm Operator: KBailey
 Sample : 10ng/mL ICAL 1,4-Dioxane | SVM34-56D Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:30 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	82998	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.95	96	6105	9.90	ng/ml	0.01
Spiked Amount	50.000		Recovery	=	19.80%	
Target Compounds						
3) 1,4-Dioxane	3.97	88	6107m	9.64	ng/ml	Qvalue

KB
5/10/11

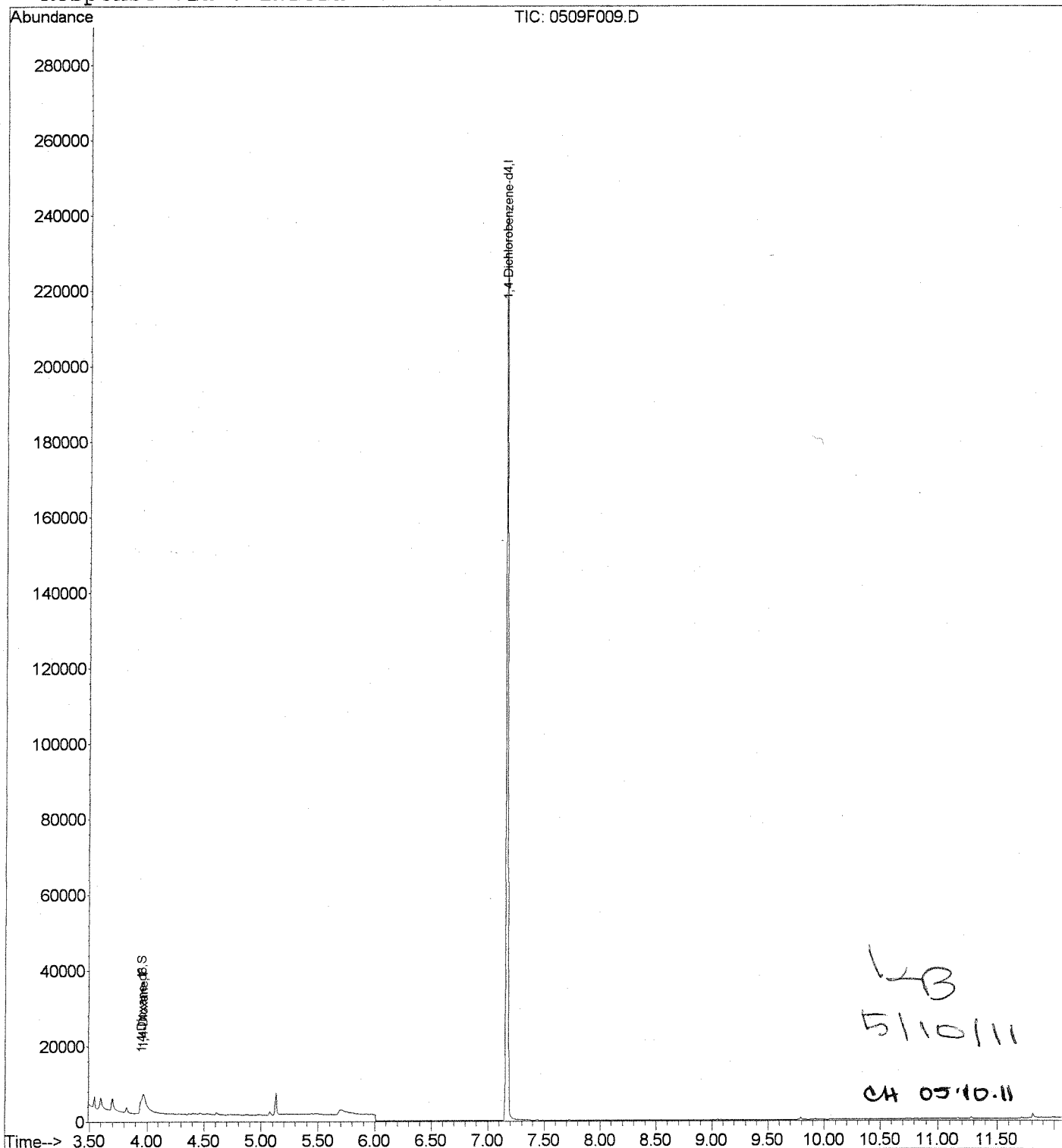
CH 05.10.11

Data File : J:\MS26\DATA\050911\0509F009.D
Acq On : 9 May 2011 12:43 pm
Sample : 10ng/mL ICAL 1,4-Dioxane | SVM34-56D
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:22 2011

Vial: 5
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F009.D

Vial: 5

Acq On : 9 May 2011 12:43 pm

Operator: K Bailey

Sample : 10ng/mL ICAL 1,4-Dioxane | SVM34-56D

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:21 2011

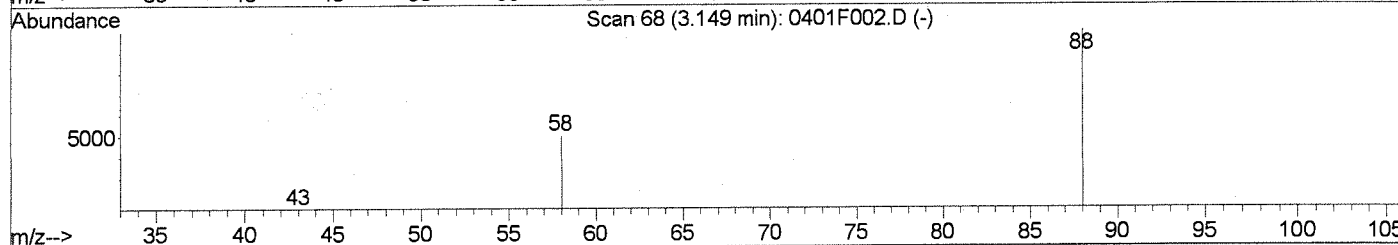
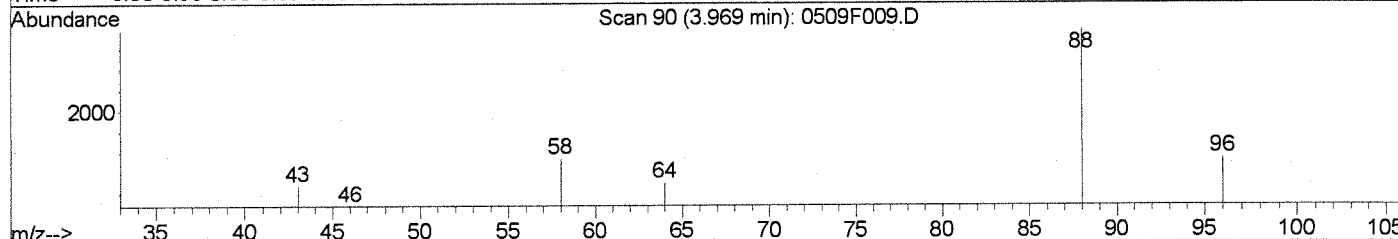
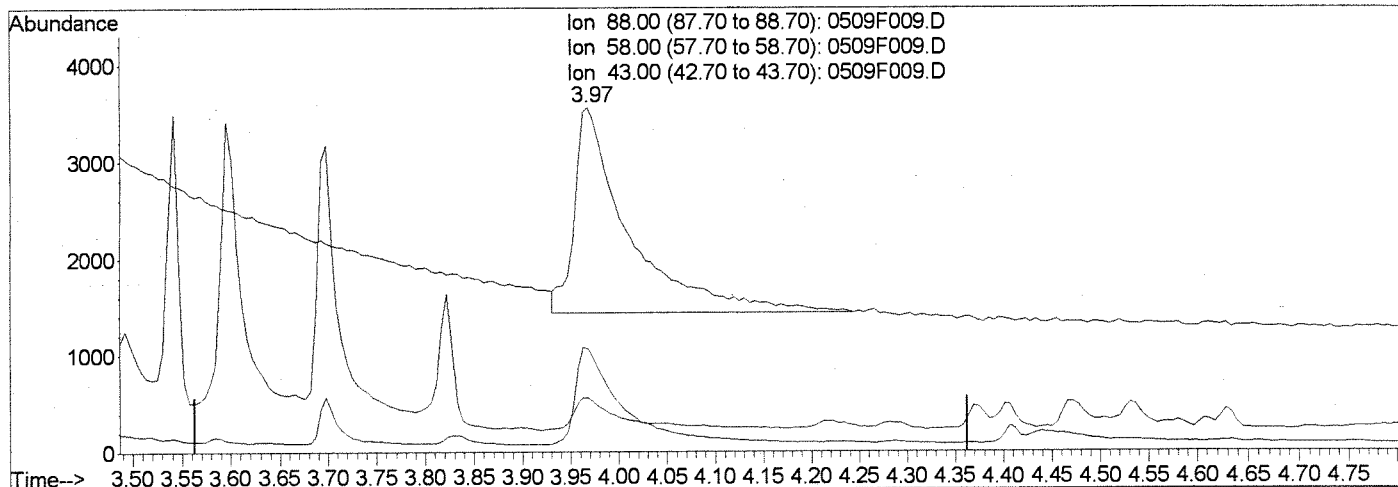
Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:21:18 2011

Response via : Multiple Level Calibration



TIC: 0509F009.D

(3) 1,4-Dioxane (T)		
3.97min	13.34ng/ml	
response	8447	
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	46.26
43.00	15.30	14.95
0.00	0.00	0.00

Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F009.D

Vial: 5

Acq On : 9 May 2011 12:43 pm

Operator: KBailey

Sample : 10ng/mL ICAL 1,4-Dioxane | SVM34-56D

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:22 2011

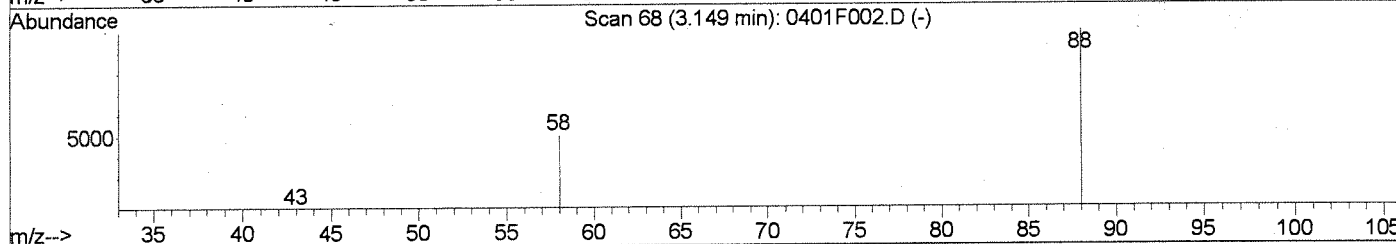
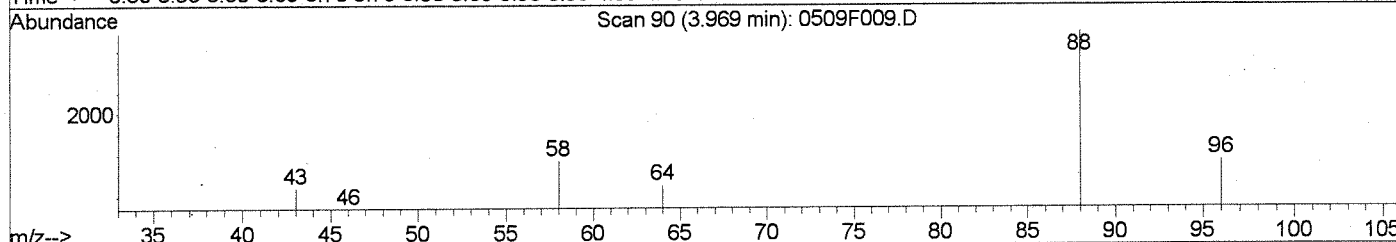
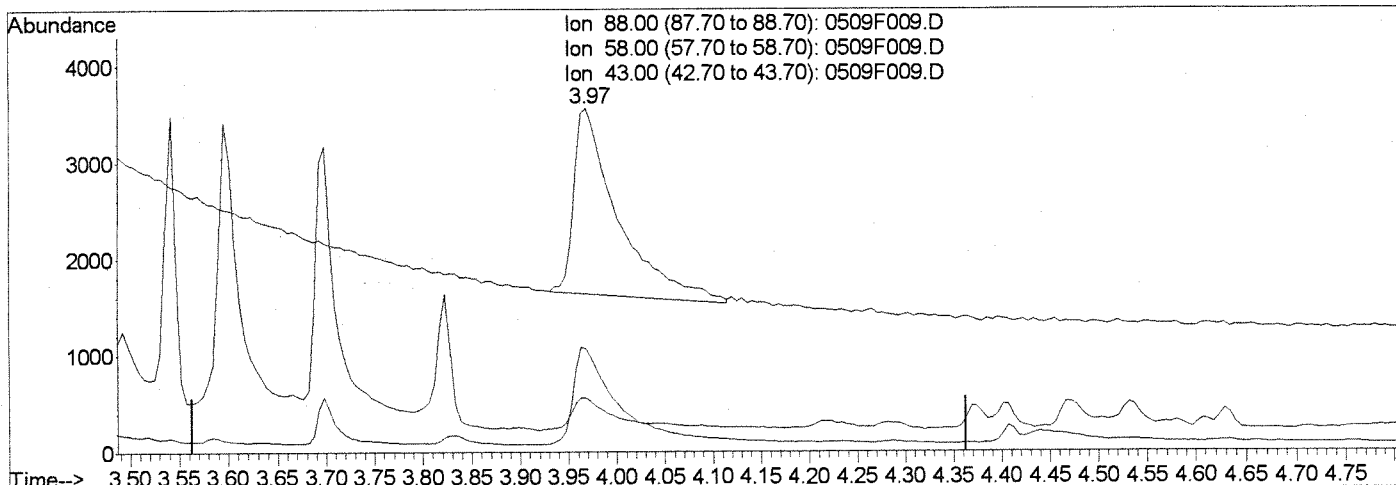
Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:21:18 2011

Response via : Multiple Level Calibration



TIC: 0509F009.D

(3) 1,4-Dioxane (T)

3.97min 9.64ng/ml m

response 6107

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	29.95
43.00	15.30	15.62
0.00	0.00	0.00

01
KB 5/10/11

04 05'10'11

Data File : J:\MS26\DATA\050911\0509F010.D
 Acq On : 9 May 2011 1:02 pm
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:30 2011

Vial: 6
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	84266	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.94	96	13588	21.69	ng/ml	0.00
Spiked Amount	50.000		Recovery	=	43.38%	
Target Compounds						
3) 1,4-Dioxane	3.96	88	13117m	20.40	ng/ml	Qvalue

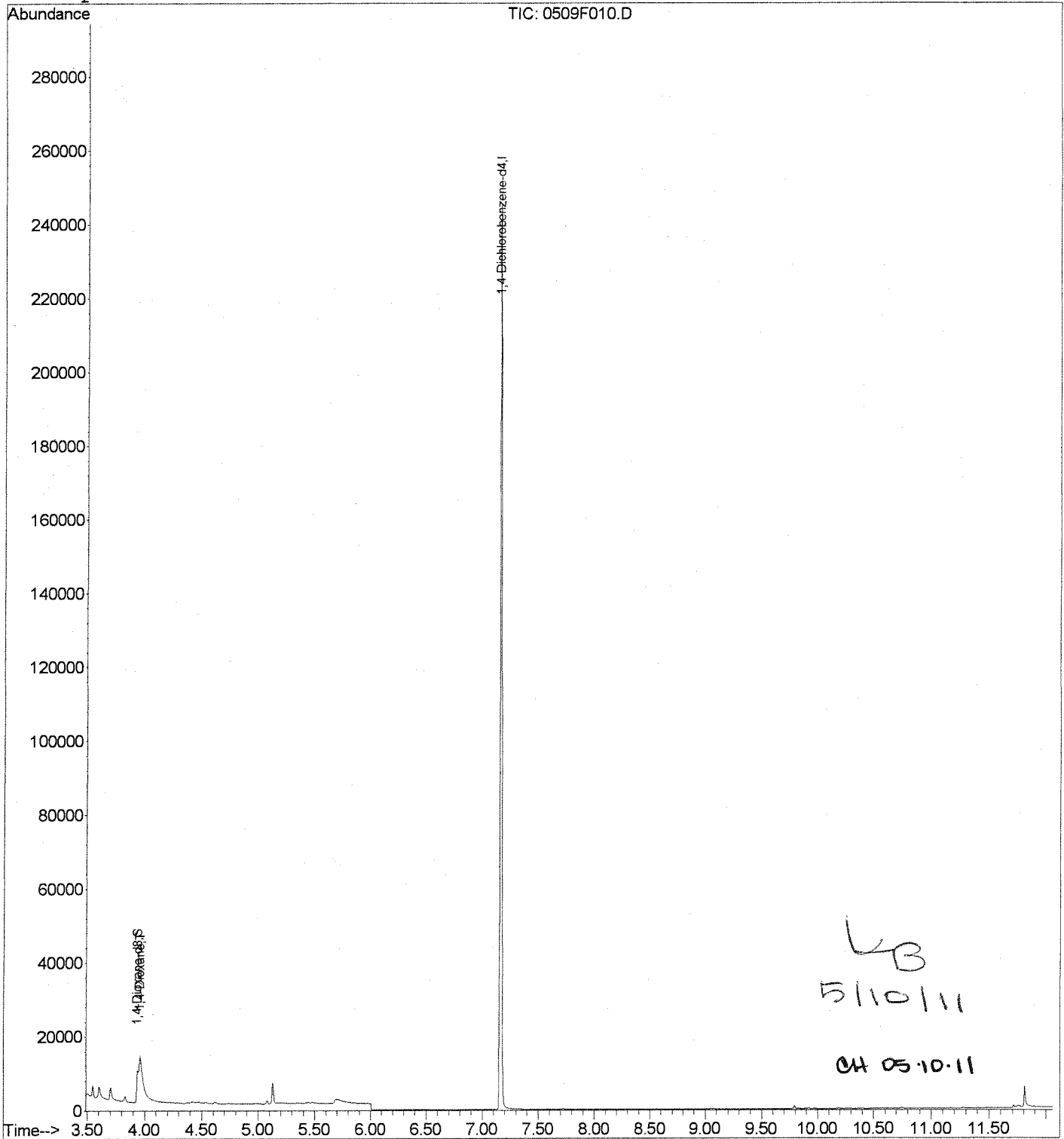
LB
 5/10/11
 04 05-10-11

Data File : J:\MS26\DATA\050911\0509F010.D
Acq On : 9 May 2011 1:02 pm
Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:23 2011

Vial: 6
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



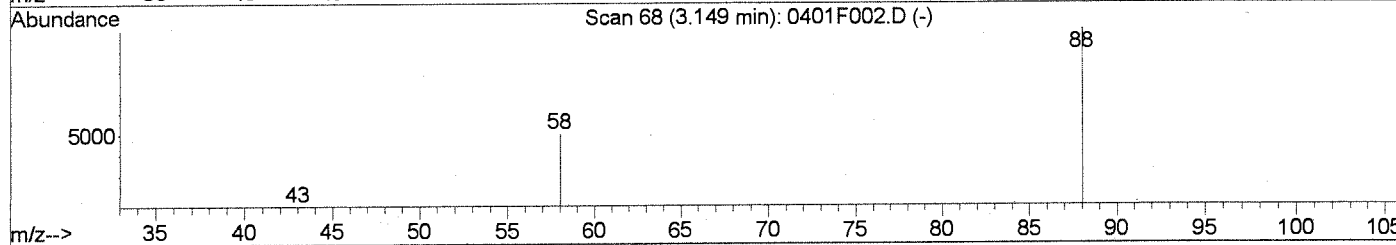
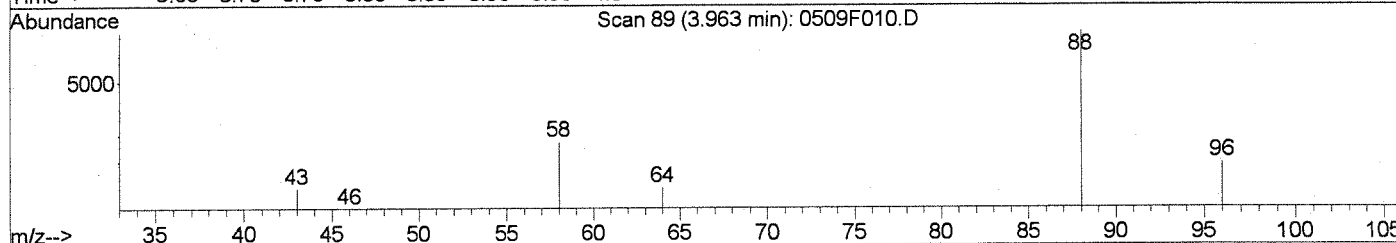
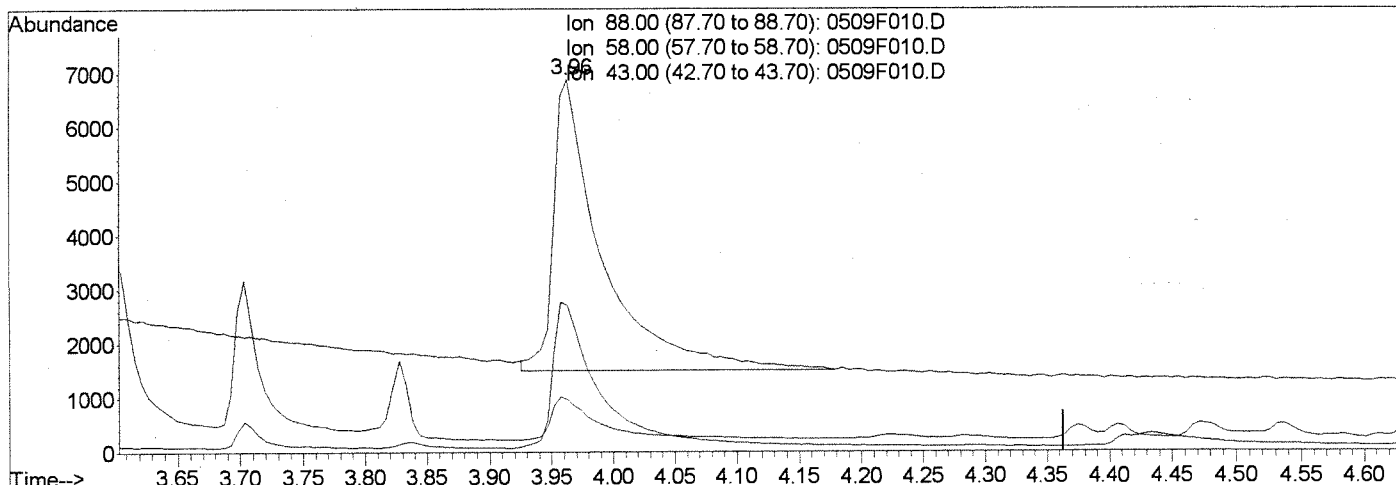
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F010.D
 Acq On : 9 May 2011 1:02 pm
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:21 2011

Vial: 6
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F010.D

(3) 1,4-Dioxane (T)		
3.96min	22.91ng/ml	
response	14729	
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	48.60
43.00	15.30	13.88
0.00	0.00	0.00

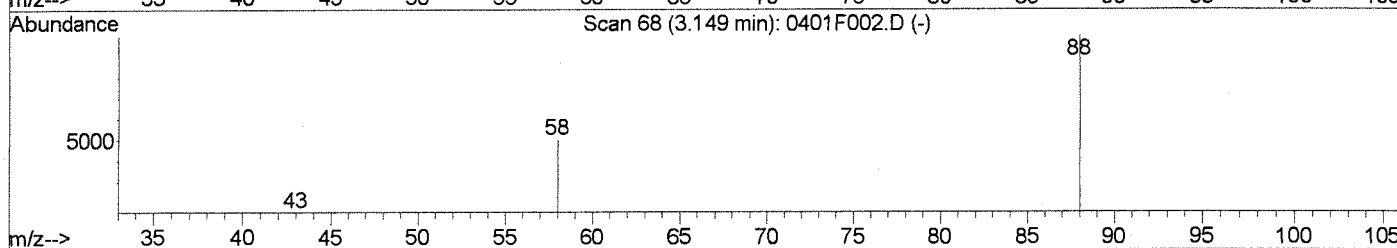
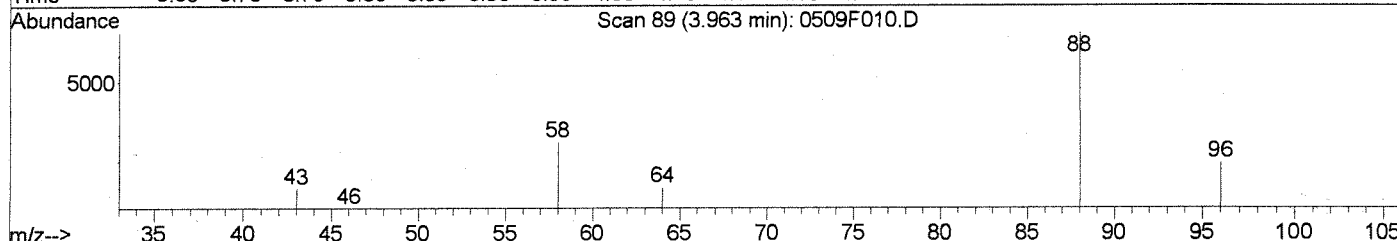
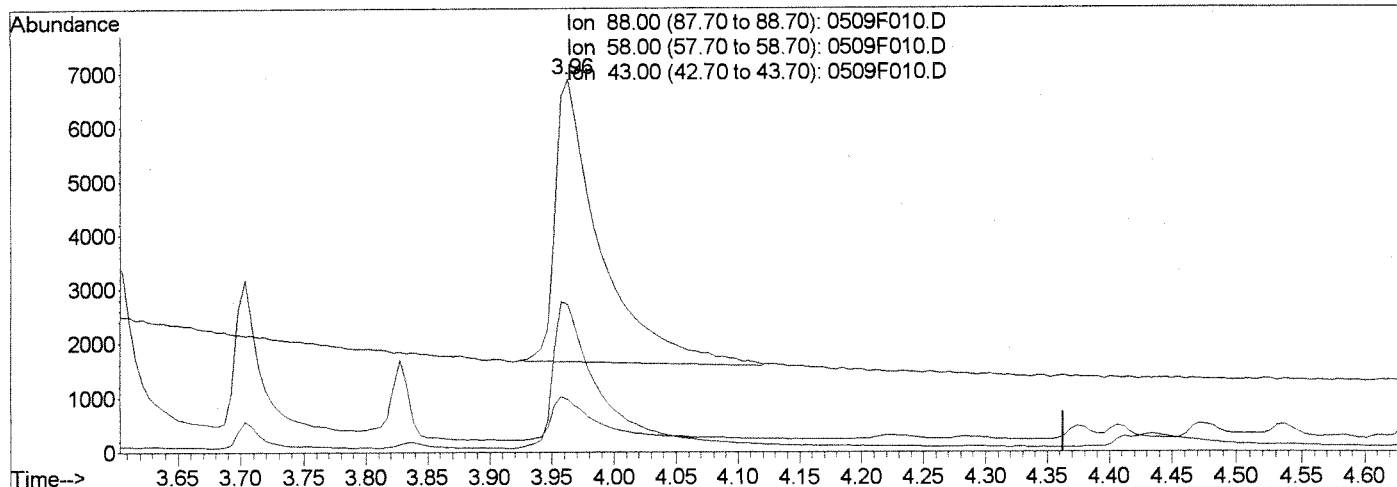
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F010.D
 Acq On : 9 May 2011 1:02 pm
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:23 2011

Vial: 6
 Operator: K Bailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F010.D

(3) 1,4-Dioxane (T)

3.96min 20.40ng/ml m

response 13117

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	39.32
43.00	15.30	14.10
0.00	0.00	0.00

01
 LB 5/10/11
 @ 05-10-11

Data File : J:\MS26\DATA\050911\0509F011.D Vial: 7
 Acq On : 9 May 2011 1:22 pm Operator: KBailey
 Sample : 50ng/mL ICAL 1,4-Dioxane | SVM34-56F Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:30 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	82310	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.90	96	33167	54.21	ng/ml	-0.04
Spiked Amount	50.000		Recovery	=	108.42%	
Target Compounds						
3) 1,4-Dioxane	3.93	88	35042	55.80	ng/ml	Qvalue 93

LB
5/10/11

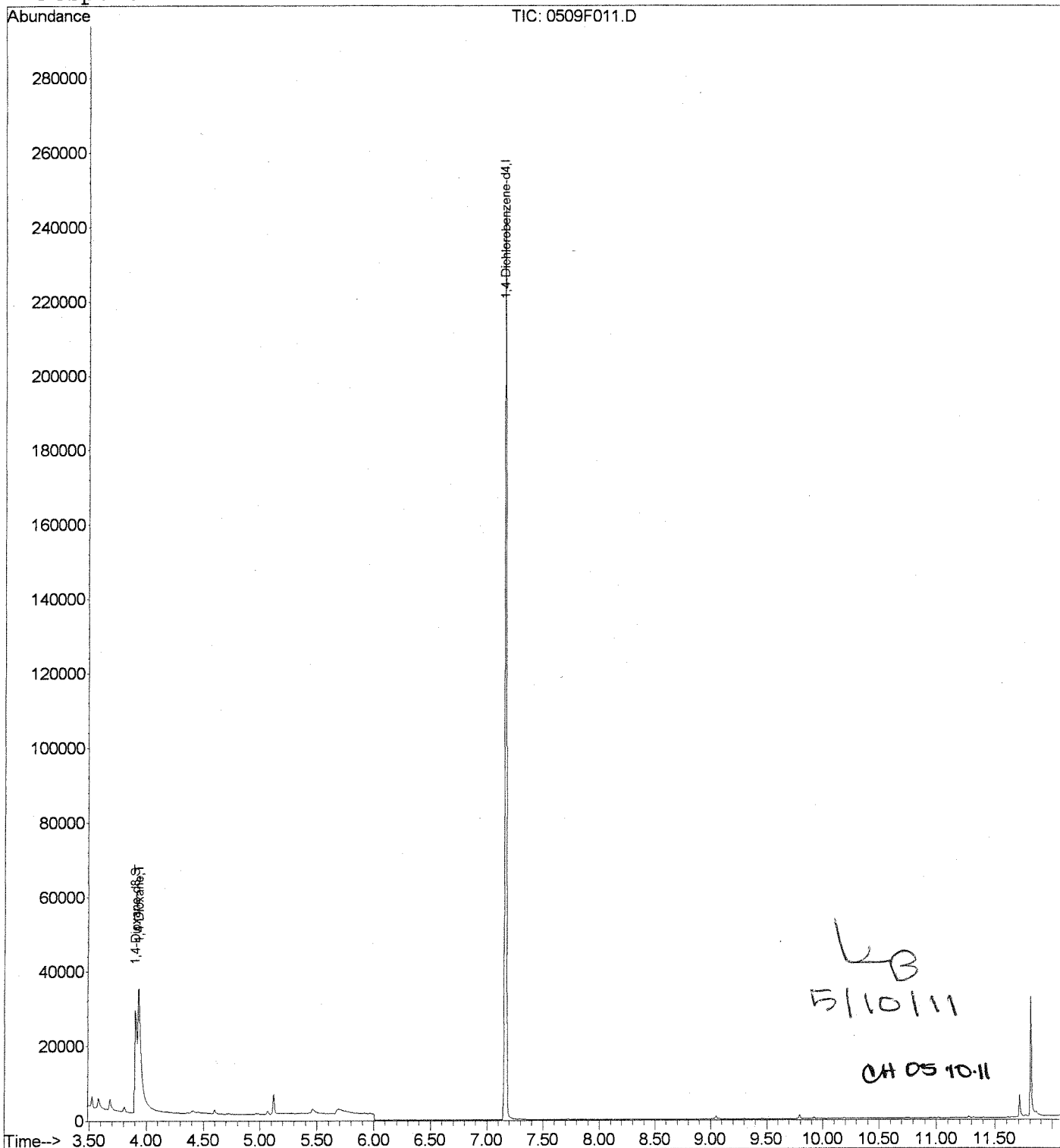
CH 05'10-11

Data File : J:\MS26\DATA\050911\0509F011.D
Acq On : 9 May 2011 1:22 pm
Sample : 50ng/mL ICAL 1,4-Dioxane | SVM34-56F
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:21 2011

Vial: 7
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Data File : J:\MS26\DATA\050911\0509F012.D Vial: 8
 Acq On : 9 May 2011 1:42 pm Operator: KBailey
 Sample : 100ng/mL ICAL 1,4-Dioxane | SVM34-56G Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:31 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	83941	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.90	96	70005	112.19	ng/ml	-0.03
Spiked Amount	50.000		Recovery	=	224.38%	
Target Compounds						
3) 1,4-Dioxane	3.94	88	72508m	113.21	ng/ml	Qvalue

LB
5/10/11

CH 05/10/11

Data File : J:\MS26\DATA\050911\0509F012.D

Vial: 8

Acq On : 9 May 2011 1:42 pm

Operator: KBailey

Sample : 100ng/mL ICAL 1,4-Dioxane | SVM34-56G

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:23 2011

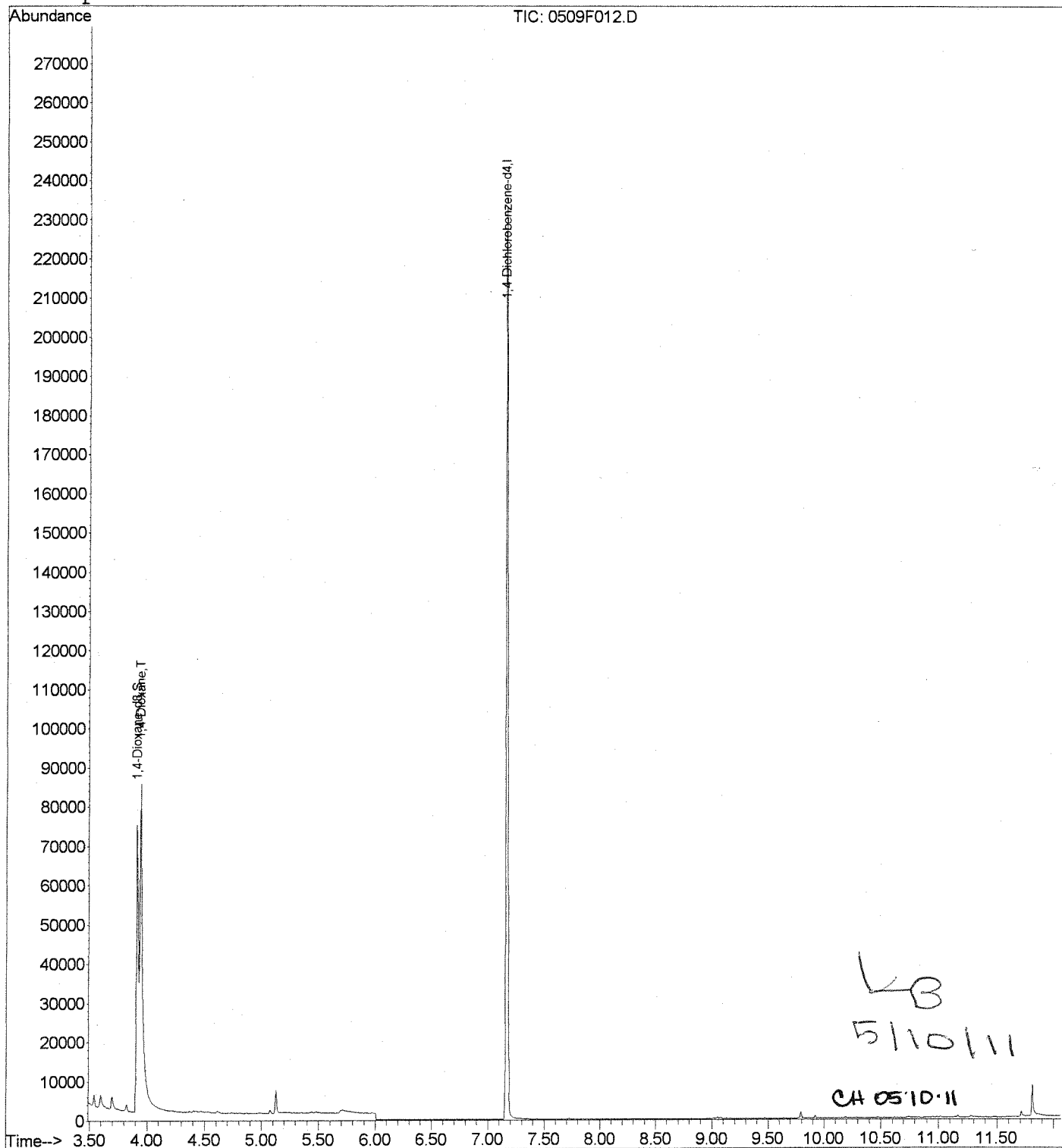
Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:26:14 2011

Response via : Initial Calibration



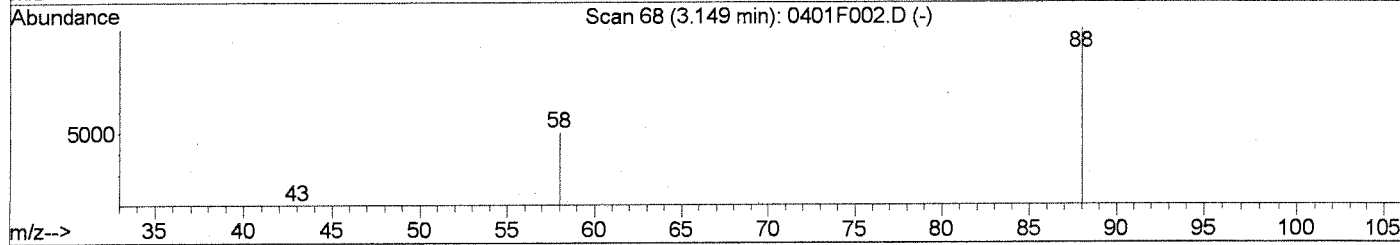
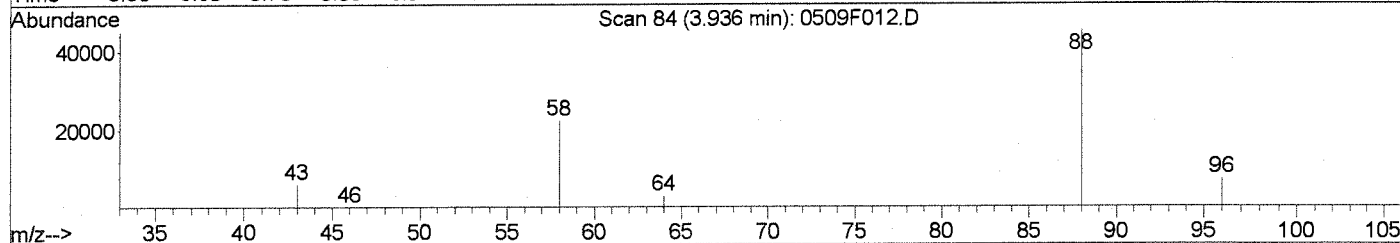
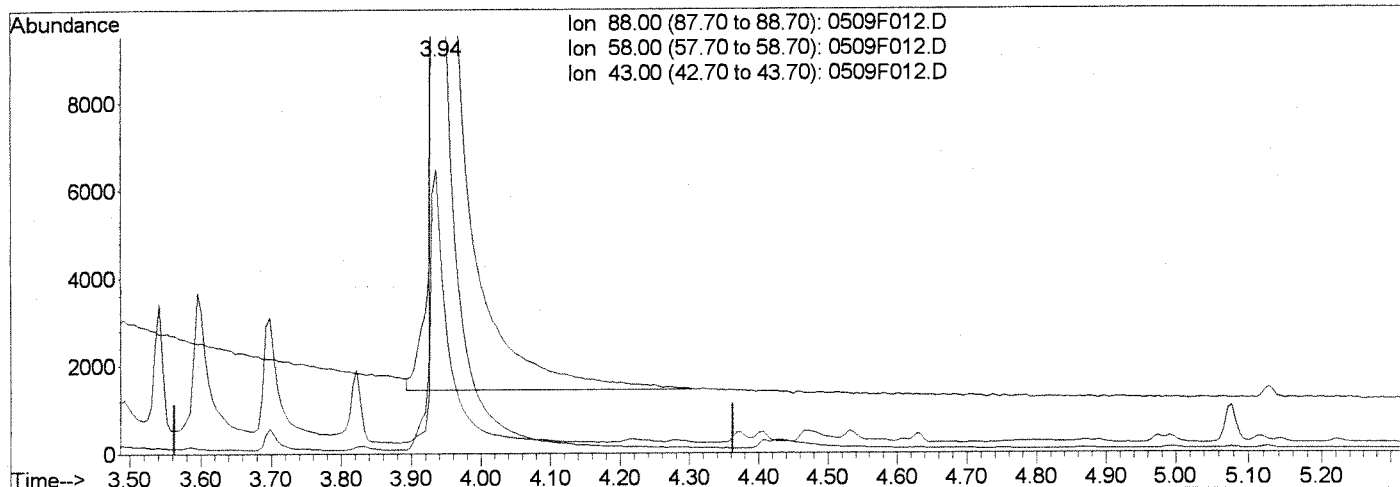
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F012.D
 Acq On : 9 May 2011 1:42 pm
 Sample : 100ng/mL ICAL 1,4-Dioxane | SVM34-56G
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:21 2011

Vial: 8
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F012.D

(3) 1,4-Dioxane (T)		
3.94min	118.97ng/ml	
response	76193	
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	51.28
43.00	15.30	14.29
0.00	0.00	0.00

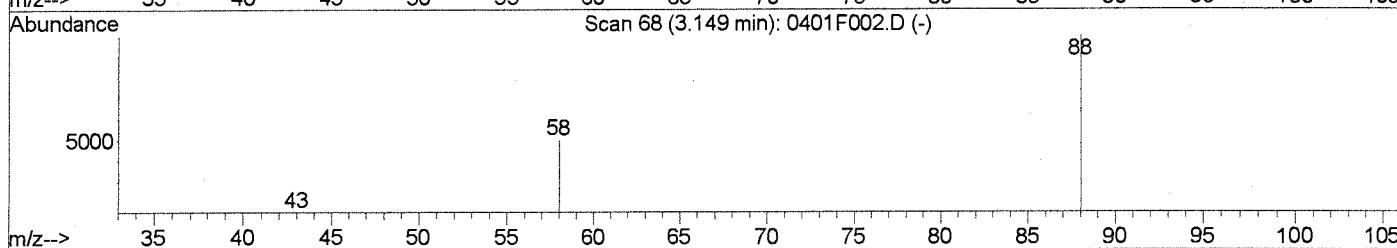
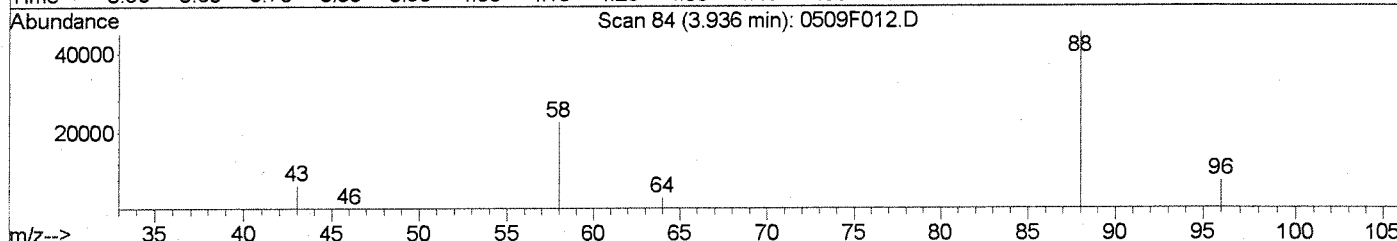
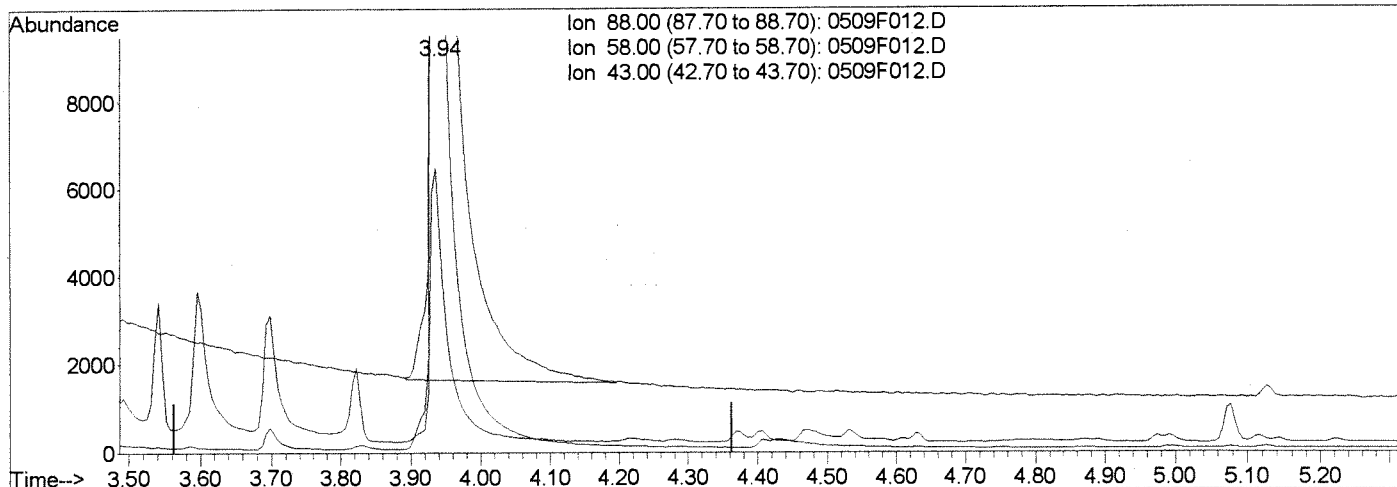
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F012.D
 Acq On : 9 May 2011 1:42 pm
 Sample : 100ng/mL ICAL 1,4-Dioxane | SVM34-56G
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:23 2011

Vial: 8
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F012.D

(3) 1,4-Dioxane (T)

3.94min 113.21ng/ml m

response 72508

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	49.81
43.00	15.30	14.36
0.00	0.00	0.00

01
 KB 5/10/11
 CA 05-10-11

Data File : J:\MS26\DATA\050911\0509F013.D Vial: 9
 Acq On : 9 May 2011 2:02 pm Operator: K Bailey
 Sample : 200ng/mL ICAL 1,4-Dioxane | SVM34-56H Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:31 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	84919	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.90	96	142313	225.45	ng/ml	-0.04
Spiked Amount	50.000		Recovery	=	450.90%	
Target Compounds						
3) 1,4-Dioxane	3.93	88	152893	235.98	ng/ml	Qvalue 89

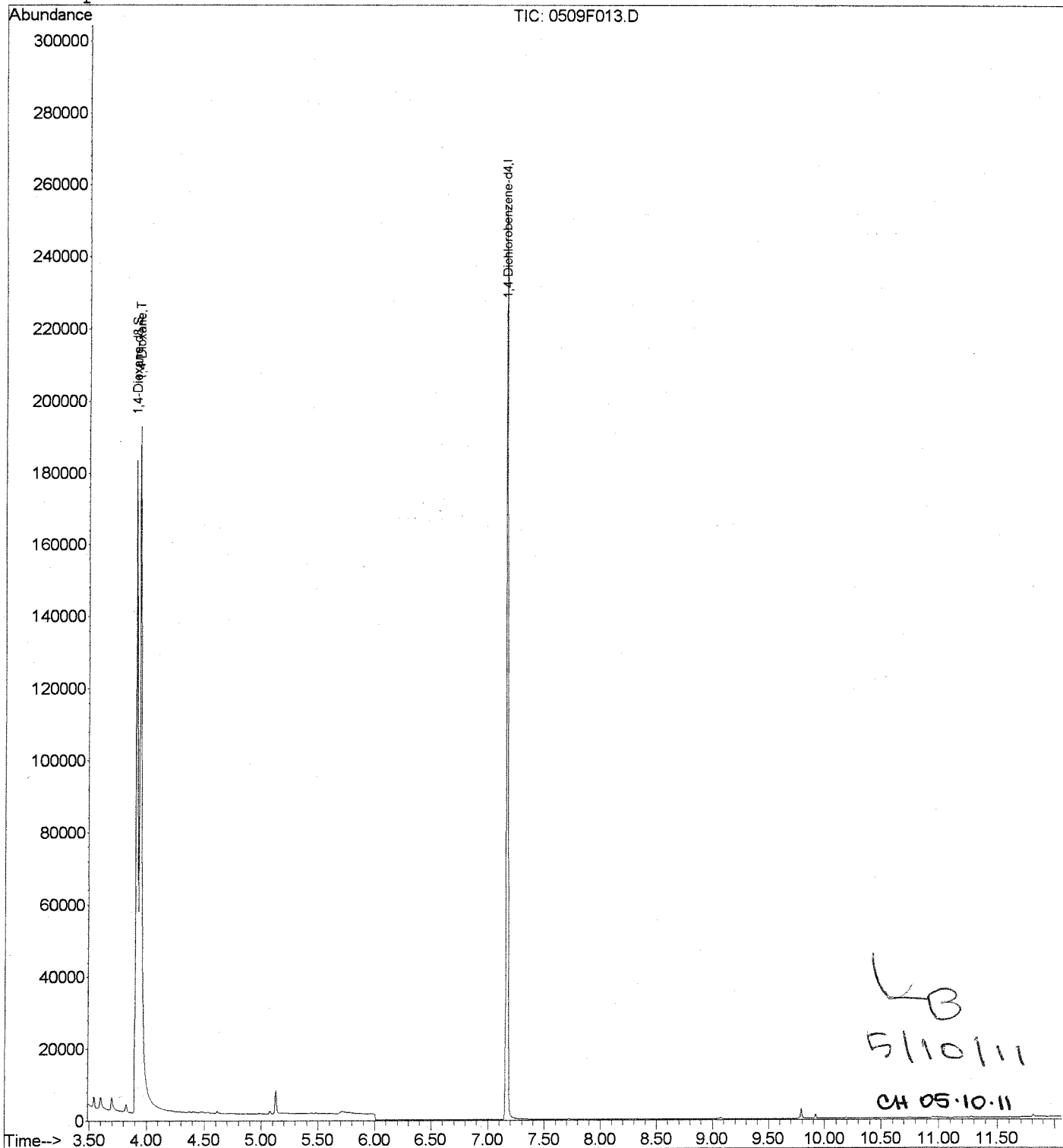
LB
 5/10/11
 CH 05.10.11

Data File : J:\MS26\DATA\050911\0509F013.D
Acq On : 9 May 2011 2:02 pm
Sample : 200ng/mL ICAL 1,4-Dioxane | SVM34-56H
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:21 2011

Vial: 9
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Data File : J:\MS26\DATA\050911\0509F014.D
 Acq On : 9 May 2011 2:21 pm
 Sample : 20ng/mL ICV 1,4-Dioxane | SVM34-57L
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:38:54 2011

Vial: 10
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	79096	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.92	96	14586	23.60	ng/ml	-0.02
Spiked Amount	50.000		Recovery	=	47.20%	
Target Compounds						
3) 1,4-Dioxane	3.94	88	14084	22.41	ng/ml	Qvalue 86

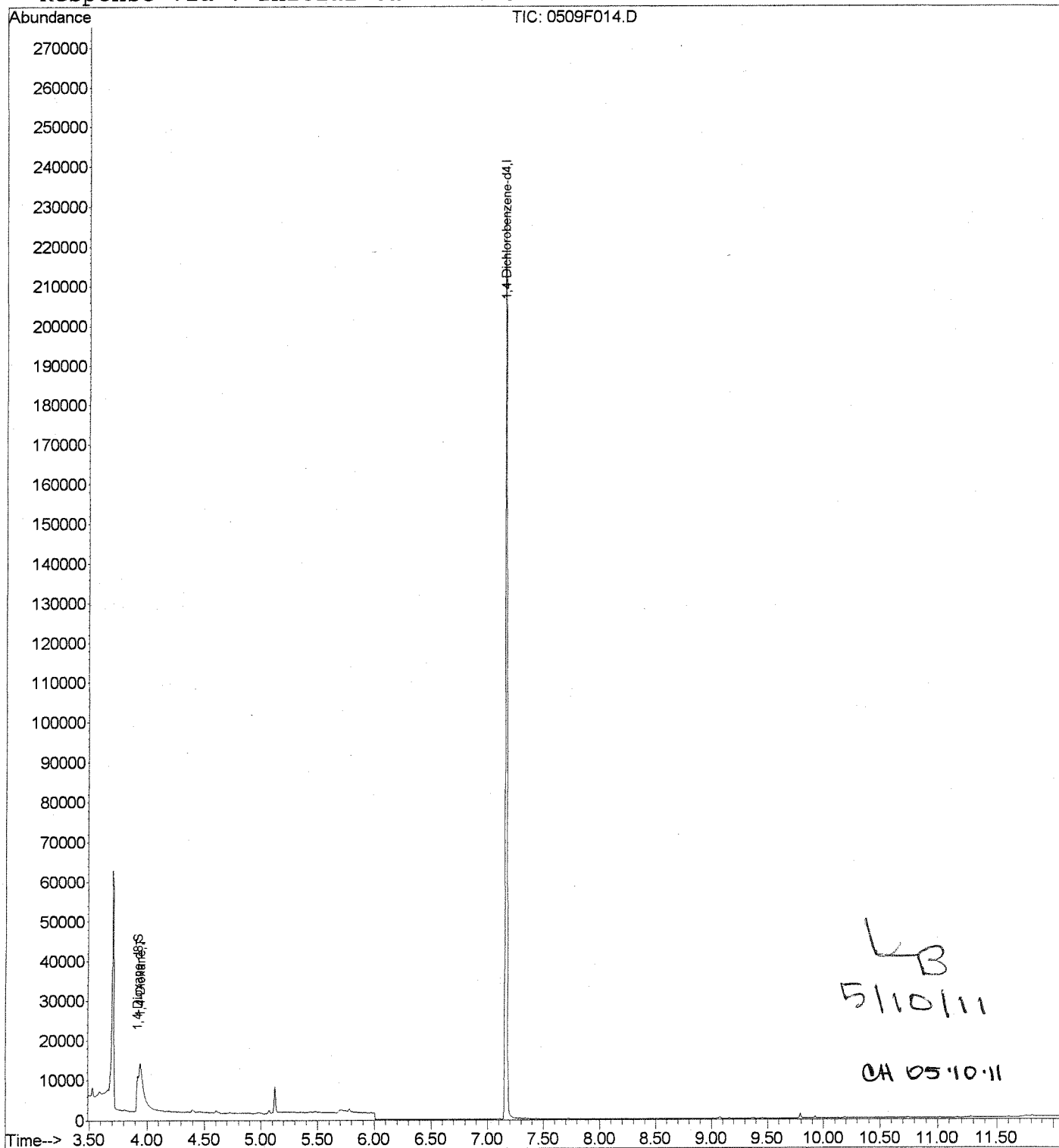
LB
 5/10/11
 CH 05:10:11

Data File : J:\MS26\DATA\050911\0509F014.D
Acq On : 9 May 2011 2:21 pm
Sample : 20ng/mL ICV 1,4-Dioxane | SVM34-57L
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:38 2011

Vial: 10
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Exception Report

Data File: J:\MS26\DATA\050911A\0509F010.D
Lab ID: KWG1104145-2
Run Type: CCV
Matrix: WATER

Date Acquired: 05/09/2011 13:02
Date Quantitated: 05/09/2011 17:06
Batch ID: KWG1104145
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	

Primary Review: KG 5/10/11

Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID:	Tier:	Matrix:	WATER
Prod Code: 8270C SIM 14_DI	Collect Date:	Receive Date:	05/10/2011
Analysis Lot: KWG1104145	Prep Lot:	Report Group:	
Analysis Method: 8270C SIM	Prep Method:		
Prep Ref:	Prep Date:		
Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487		
Title:			
Tune Ref: J:\MS26\DATA\050911\0509F005.D	Method ID: MJ402		
MB Ref:	Quant based on Method		
Data File: J:\MS26\DATA\050911A\0509F010.D	Instrument: MS26		
Acqu Date: 05/09/2011 13:02	Quant Date: 05/09/2011 17:06	Vial:	6
Run Type: CCV		Dilution:	1.0
Lab ID: KWG1104145-2		Soln Conc. Units:	ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	84266	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.94			96	13588	20.63		42-112	NA

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane	3.96			88	13696m	20.46			

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Calibration Verification Report

Calibration ID: CAL10487

Method ID: MJ402

DataFile: J:\MS26\DATA\050911A\0509F010.D

<u>Parameter Name</u>	<u>Type</u>	<u>PARM</u> <u>Type</u>	<u>Curve Fit</u>	<u>Method</u> <u>Criteria</u>	<u>Min</u> <u>RF</u>	<u>ICAL</u> <u>RF</u>	<u>CCV</u> <u>RF</u>	<u>%Diff</u>	<u>Sol'n</u> <u>Conc.</u>	<u>True</u> <u>Value</u>	<u>% Drift</u>
1,4-Dioxane-d8		SURR	AverageRF	20	0.01	0.391	0.403	3.2			
1,4-Dioxane		MS	AverageRF	20	0.01	0.397	0.406	2.3			

Evaluate Continuing Calibration Report

Data File : J:\MS26\DATA\050911A\0509F010.D Vial: 6
 Acq On : 9 May 2011 1:02 pm Operator: KBailey
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration

Min. RRF : 0.010 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	1,4-Dichlorobenzene-d4	50.000	50.000	0.0	100	0.00
2 S	1,4-Dioxane-d8	20.000	20.633	-3.2	100	0.00
3 T	1,4-Dioxane	20.000	20.455	-2.3	104	0.00

Data File : J:\MS26\DATA\050911A\0509F010.D
 Acq On : 9 May 2011 1:02 pm
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 17:05:24 2011

Vial: 6
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	84266	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.94	96	13588	20.63	ng/ml	0.00
Spiked Amount	50.000		Recovery	=	41.26%	
Target Compounds						
3) 1,4-Dioxane	3.96	88	13696m	20.46	ng/ml	Qvalue

Data File : J:\MS26\DATA\050911A\0509F010.D

Vial: 6

Acq On : 9 May 2011 1:02 pm

Operator: KBailey

Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 17:06 2011

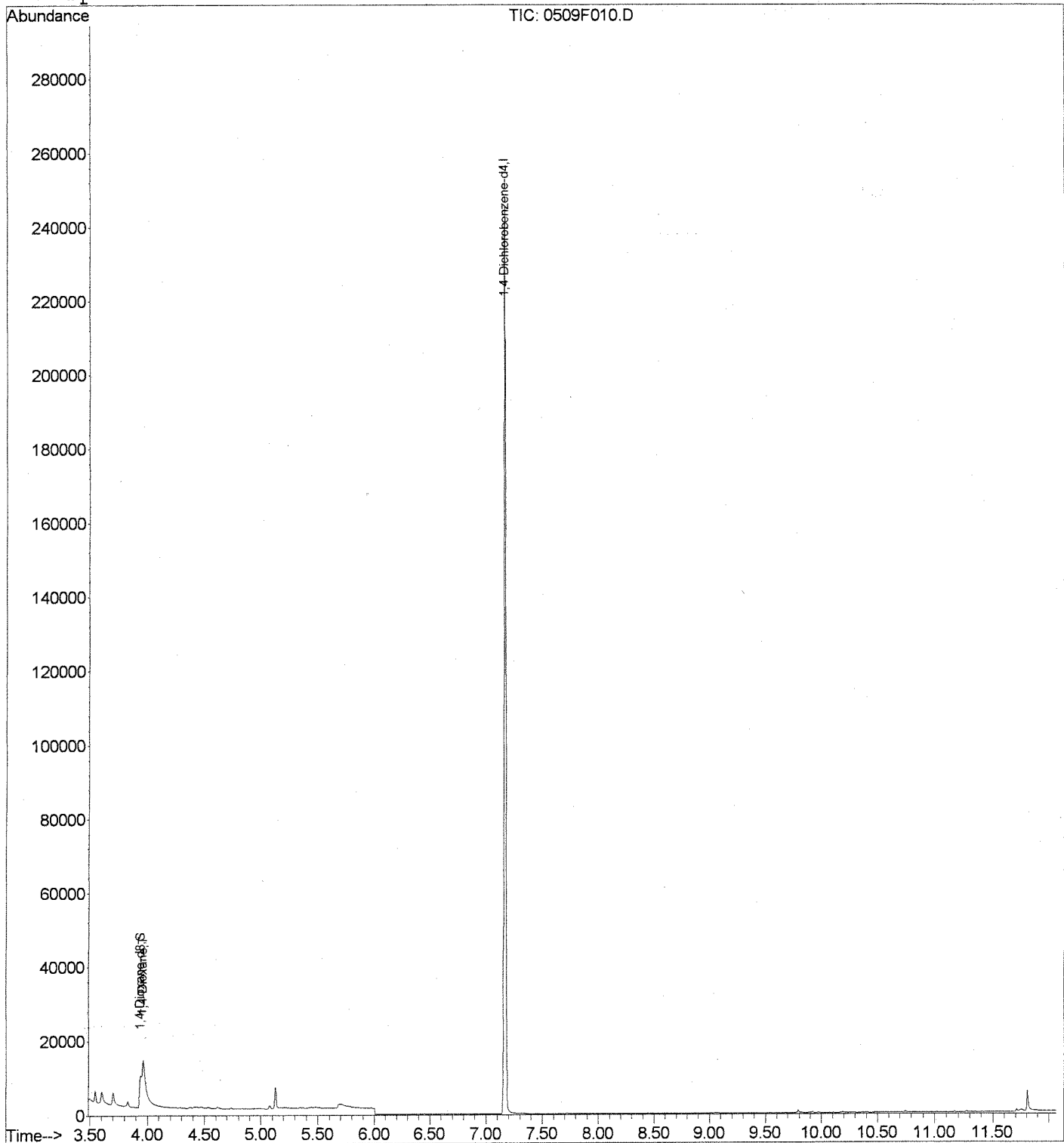
Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:26:14 2011

Response via : Initial Calibration



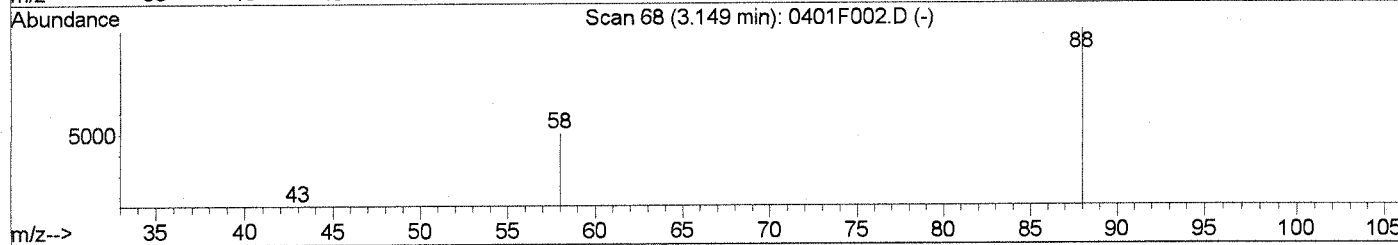
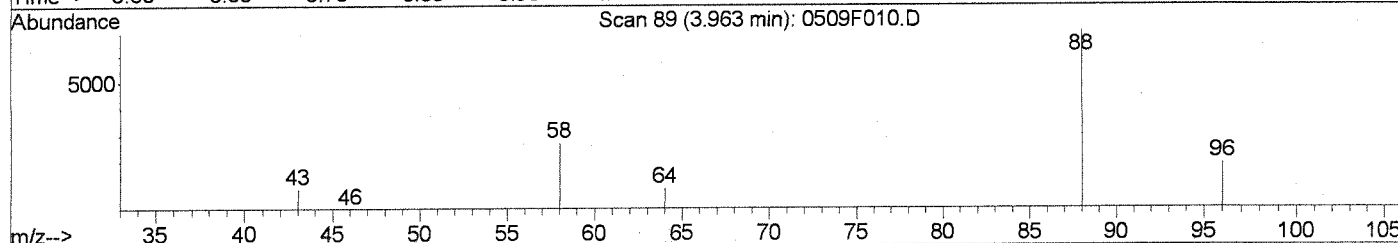
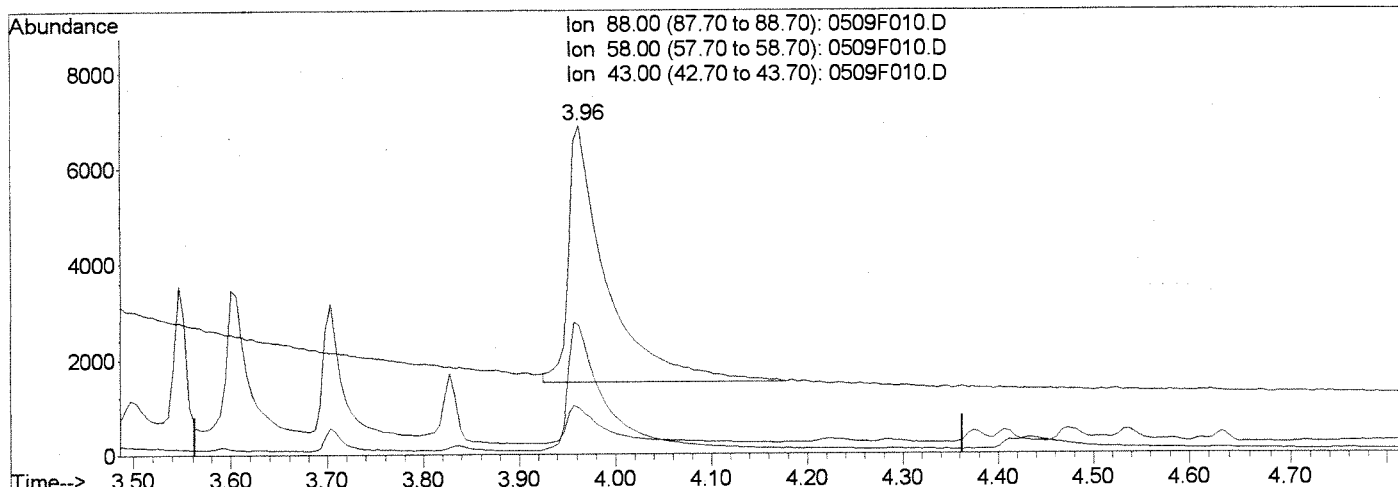
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911A\0509F010.D
 Acq On : 9 May 2011 1:02 pm
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 17:05 2011

Vial: 6
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F010.D

(3) 1,4-Dioxane (T)

3.96min 22.00ng/ml
 response 14729

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	48.60
43.00	14.10	13.88
0.00	0.00	0.00

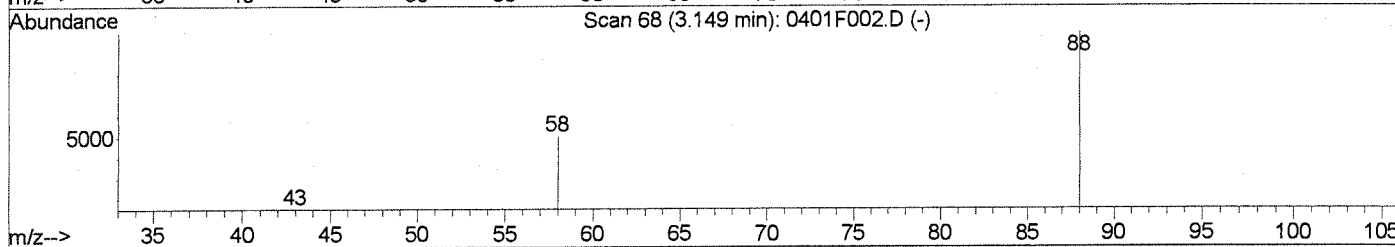
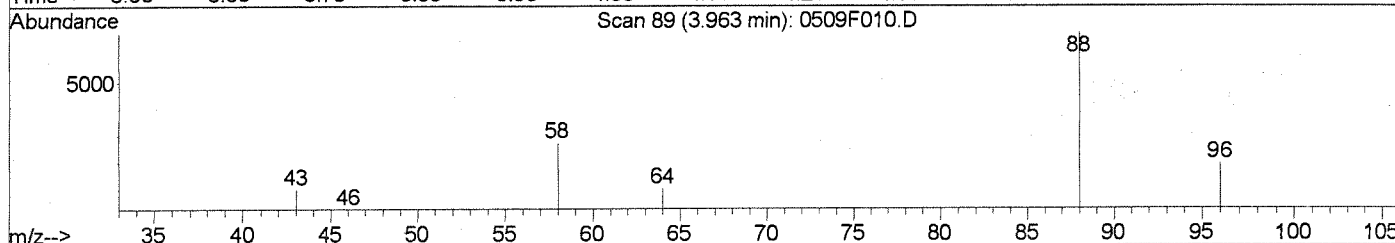
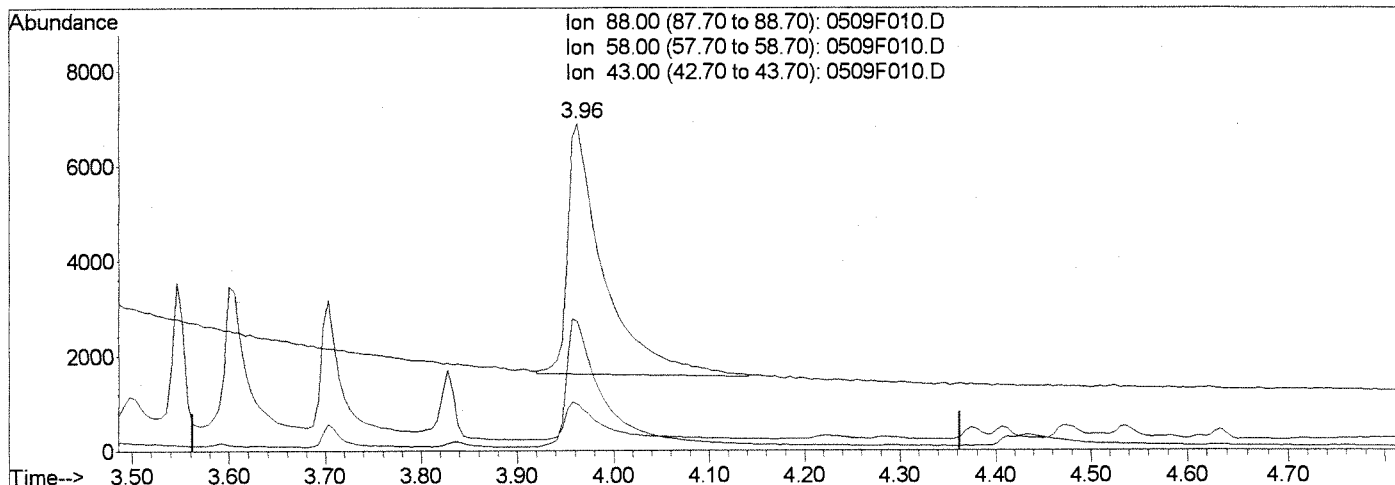
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911A\0509F010.D
 Acq On : 9 May 2011 1:02 pm
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 17:06 2011

Vial: 6
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F010.D

(3) 1,4-Dioxane (T)

3.96min 20.46ng/ml m

response 13696

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	39.32
43.00	14.10	14.10
0.00	0.00	0.00

01
 LB 5/10/11
 CH 05.10.11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101605
Date Analyzed: 05/09/2011

**Continuing Calibration Verification Summary
 1,4-Dioxane by GC/MS**

Calibration Type: Internal Standard
Analysis Method: 8270C SIM

Calibration Date: 05/09/2011
Calibration ID: CAL10487
Analysis Lot: KWG1104145
Units: ng/ml

File ID: J:\MS26\DATA\050911A\0509F010.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
1,4-Dioxane	20	20	0.01	0.397	0.406	2	NA	± 20 %	AverageRF
1,4-Dioxane-d8	20	21	0.01	0.391	0.403	3	NA	± 20 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Exception Report

Data File: J:\MS26\DATA\050911A\0509F010.D
Lab ID: KWG1104145-2
Run Type: CCV
Matrix: WATER

Date Acquired: 05/09/2011 13:02
Date Quantitated: 05/09/2011 17:06
Batch ID: KWG1104145
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	

Primary Review: KG 5/10/11

Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID:	Tier:	Matrix:	WATER
Prod Code: 8270C SIM 14_DI	Collect Date:	Receive Date:	05/10/2011

Analysis Lot: KWG1104145	Prep Lot:	Report Group:
Analysis Method: 8270C SIM	Prep Method:	
Prep Ref:	Prep Date:	

Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487
Title:	
Tune Ref: J:\MS26\DATA\050911\0509F005.D	Method ID: MJ402
MB Ref:	Quant based on Method

Data File: J:\MS26\DATA\050911A\0509F010.D	Instrument: MS26
Acqu Date: 05/09/2011 13:02	Quant Date: 05/09/2011 17:06
Run Type: CCV	Vial: 6
Lab ID: KWG1104145-2	Dilution: 1.0
	Soln Conc. Units: ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	84266	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.94			96	13588	20.63		42-112	NA

Target Compounds

							Final Conc. Units:				
							ug/L				
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?	
1	1,4-Dioxane	3.96			88	13696m	20.46				

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

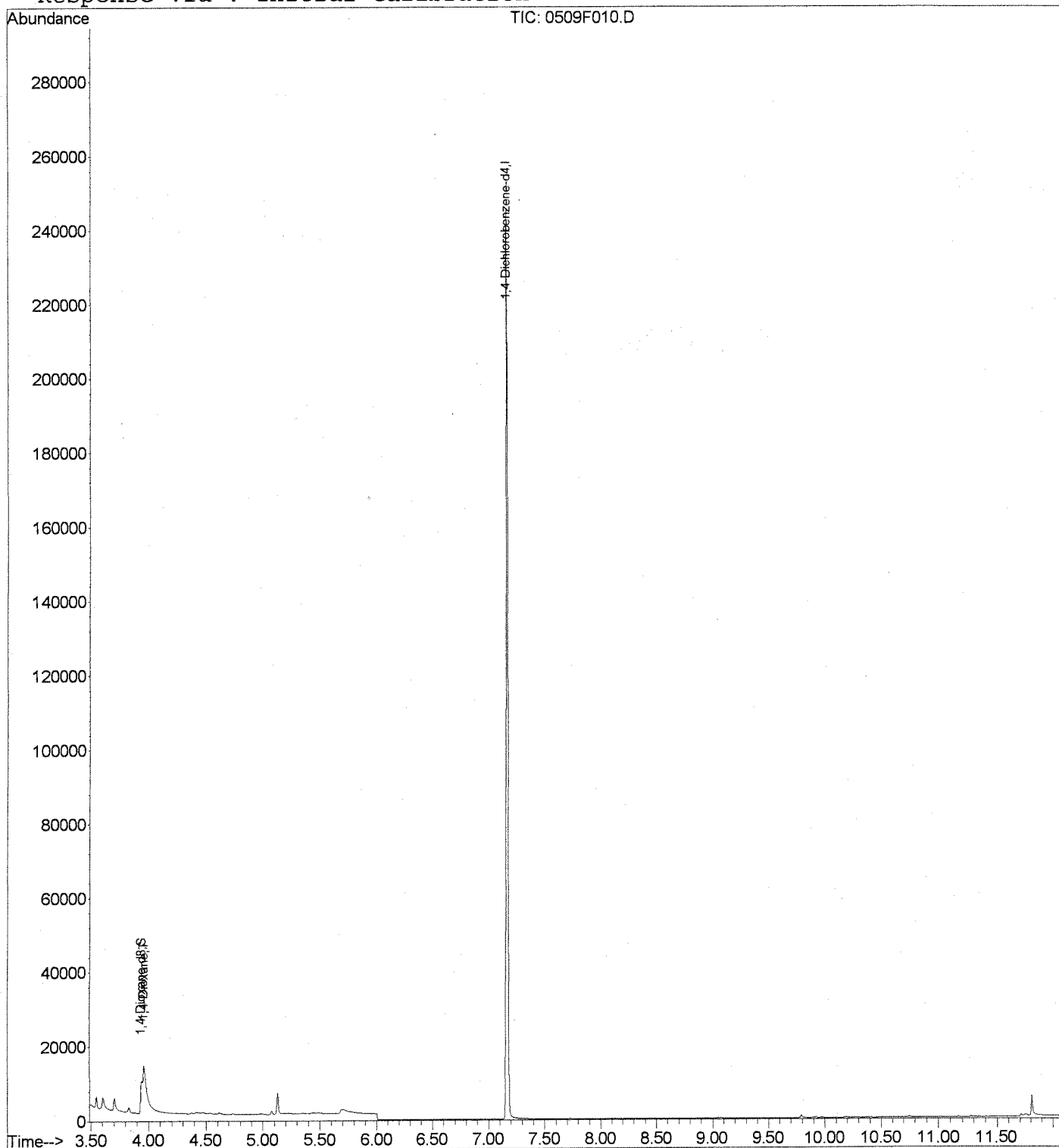
Data File : J:\MS26\DATA\050911A\0509F010.D Vial: 6
 Acq On : 9 May 2011 1:02 pm Operator: KBailey
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 17:05:24 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	84266	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.94	96	13588	20.63	ng/ml	0.00
Spiked Amount	50.000		Recovery	=	41.26%	
Target Compounds						
3) 1,4-Dioxane	3.96	88	13696m	20.46	ng/ml	Qvalue

Data File : J:\MS26\DATA\050911A\0509F010.D Vial: 6
Acq On : 9 May 2011 1:02 pm Operator: KBailey
Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 9 17:06 2011 Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



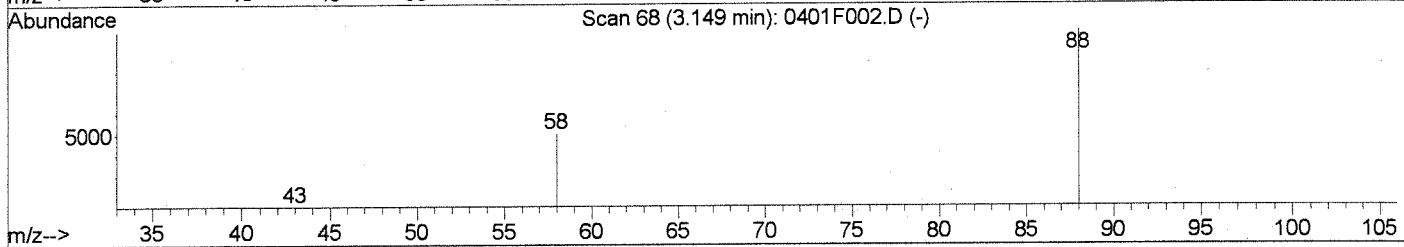
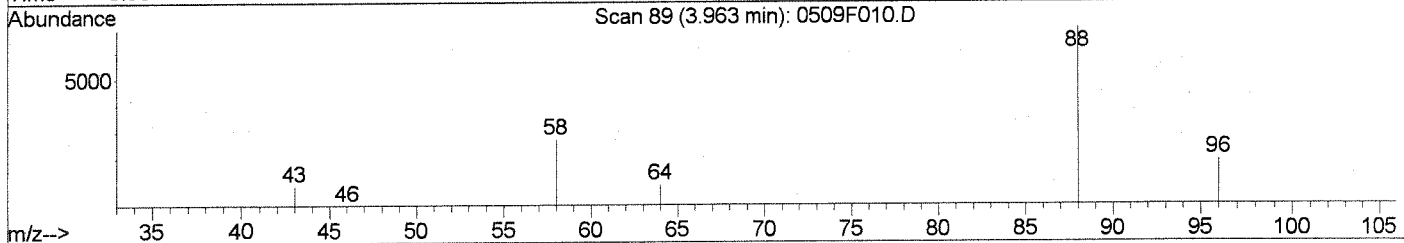
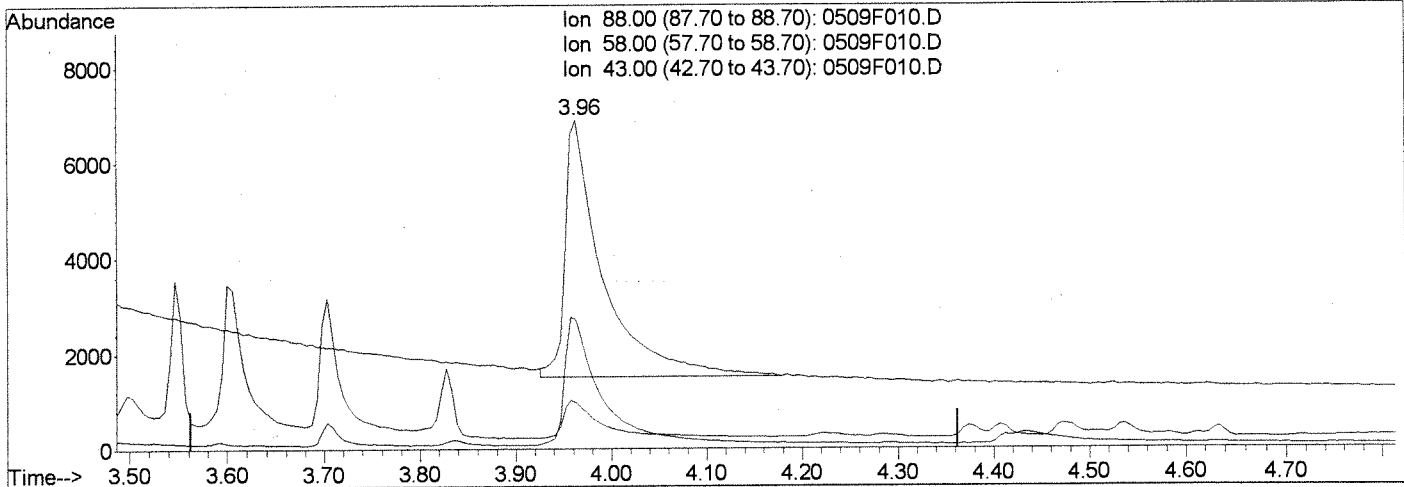
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911A\0509F010.D
 Acq On : 9 May 2011 1:02 pm
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 17:05 2011

Vial: 6
 Operator: K Bailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F010.D

(3) 1,4-Dioxane (T)

3.96min 22.00ng/ml
 response 14729

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	48.60
43.00	14.10	13.88
0.00	0.00	0.00

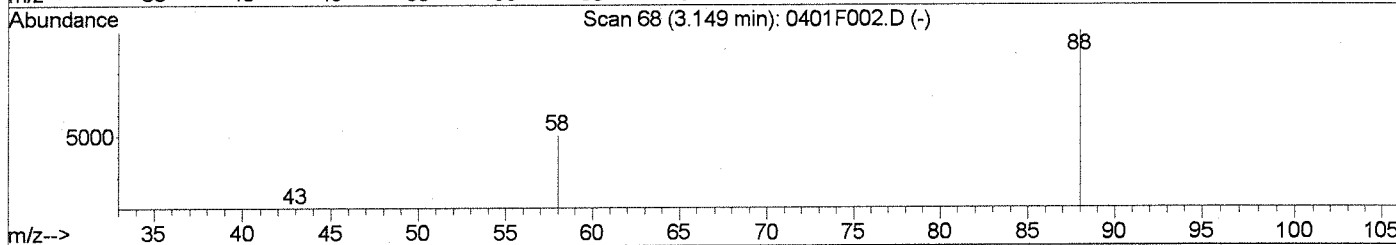
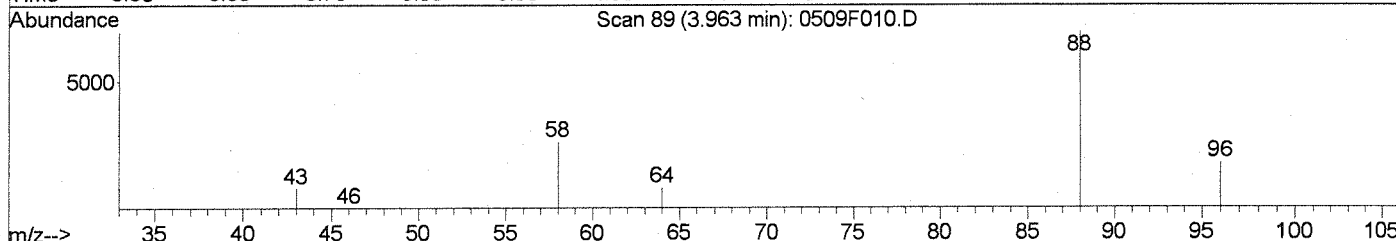
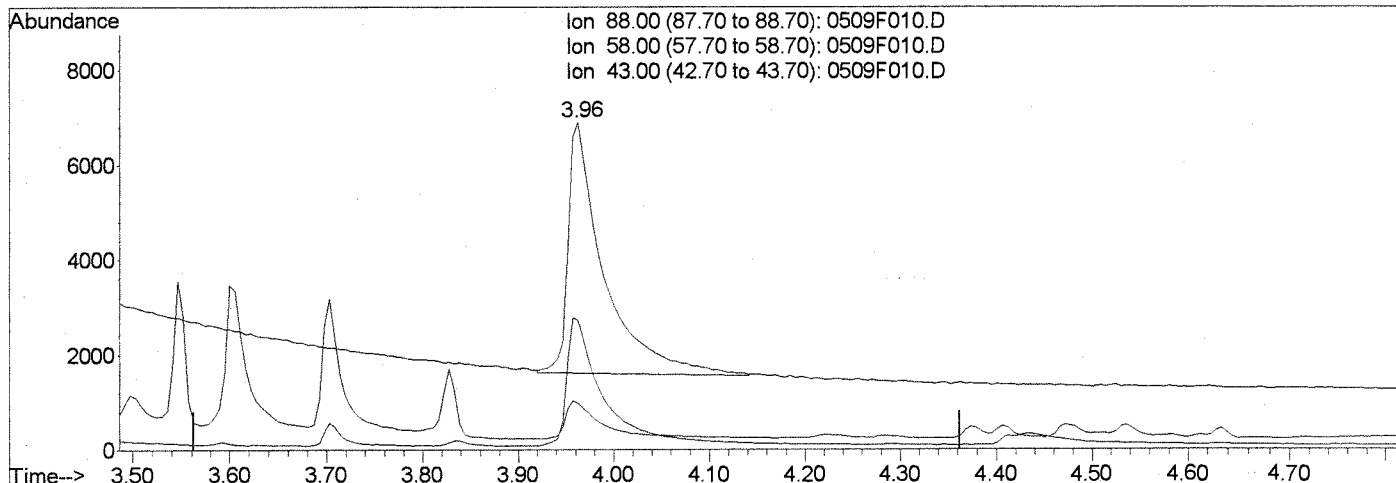
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911A\0509F010.D
 Acq On : 9 May 2011 1:02 pm
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 17:06 2011

Vial: 6
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F010.D

(3) 1,4-Dioxane (T)
 3.96min 20.46ng/ml m
 response 13696

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	39.32
43.00	14.10	14.10
0.00	0.00	0.00

01
 KB 5/10/11
 CH 05.10.11

Organic Analysis:
1,4-Dioxane by GC/MS

Validation Package

Sample Prep and Screen Data

Preparation Information

Group ID: KWG1103961	Prep Method: EPA 3510C	Prep Date: 05/04/11 15:45
Department: Semivoa GCMS		

Lab Code	Client ID	Product	Matrix	Amt. Ext.	Final Vol.
KWG1103961-1	Matrix Spike	8270C SIM 14_DIOXANE	WATER	100ml	50ml
KWG1103961-2	Duplicate Matrix Spike	8270C SIM 14_DIOXANE	WATER	100ml	50ml
KWG1103961-3	Lab Control Sample	8270C SIM 14_DIOXANE	WATER	100ml	50ml
KWG1103961-4	Method Blank	8270C SIM 14_DIOXANE	WATER	100ml	50ml
P1101579-005	MW-24-1	8270C SIM 14_DIOXANE	WATER	100ml	50ml
P1101605-005	MW-4-1	8270C SIM 14_DIOXANE	WATER	100ml	50ml
P1101607-001	MW-13	8270C SIM 14_DIOXANE	WATER	100ml	50ml

Lab Code	Parent Lab Code	Comments
KWG1103961-1	P1101579-005	
KWG1103961-2	P1101579-005	

Lab Code	Prep Event ID	Surrogate Solution ID	Amount Added	Spike Solution ID	Amount Added	Witness
KWG1103961-1	1015803	SVM34-59G	50uL	SVM33-87C	50uL	LBerg
KWG1103961-2	1015804	SVM34-59G	50uL	SVM33-87C	50uL	LBerg
KWG1103961-3	1015805	SVM34-59G	50uL	SVM33-87C	50uL	LBerg
KWG1103961-4	1015806	SVM34-59G	50uL			LBerg
P1101579-005	1015802	SVM34-59G	50uL			LBerg
P1101605-005	1015913	SVM34-59G	50uL			LBerg
P1101607-001	1015912	SVM34-59G	50uL			LBerg

Comments _____

IS: SVM34-59G

Started By: SJones Assisted By: _____ Training Yes No

Completed By: KKerriga Assisted By: _____ Yes No

Reviewed By: [Signature] Date: 5/9/11 Storage: SVM LAB / MS2L

Chain of Custody

Relinquished By: <u>[Signature]</u>	Date: <u>5/6/11</u>	Extracts Examined
Received By: <u>[Signature]</u>	Date: <u>5/9/11</u>	Yes <input checked="" type="radio"/> No <input type="radio"/>

Preparation Information

Group ID: KWG1103961	Prep Method: EPA 3510C	Prep Date: 05/04/11 15:45
Department: Semivoa GCMS		

#	Lab Code	Client ID	B#	√	Product	Matrix	Amt. Ext.	pH	Int. Vol.	Final Vol.	Surr. Added	Spike Added
1	KWG1103961-1	Matrix Spike P1579-5	04		8270C SIM 14_DIOXANE	WATER	100ml	N/A	N/A	50ml	50ul	50ul
2	KWG1103961-2	Duplicate Matrix Spike P1579-5	04		8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	↓
3	KWG1103961-3	Lab Control Sample			8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	↓
4	KWG1103961-4	Method Blank			8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	N/A
5	P1101579-005	MW-24-1	04	/	8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	↓
6	P1101605-005	MW-4-1	04	/	8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	↓
7	P1101607-001	MW-13	04	/	8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	↓

Comments: _____

#132095

Surrogate ID: SVM34-59G @ 50ug/ml, exp. 10-1-11, 50ul (\$20) #54-11EE

Spike ID: SVM33-87C @ 50ug/ml, exp. 6-21-11, 50ul (20)

Witness: *Jessica Lee* 8-4-11

Started By: SJones Assisted By: _____

Completed By: *[Signature]* Assisted By: _____

Additional Prep Information For 1,4 Dioxane by EPA 3510

Service Request P1101579, P1101605 Workgroup KWG1103961
+ P1101607

Pre-Prep Information:

DCM Lot DD020

Batch Start (Time/Date/Initial): 15:45/5-4-11/SJ

Batch Stop (Time/Date/Initial): 16:30/5-4-11/SJ

Sulfate Lot # BF1002 Salt Lot # G38343

Extract Storage: Puckleberry

Date Completed: 9:26AM 5/6/11 KR

Comments/Observations:

Bench Sheet Review Check List

- Hold Times Met (if no, Reason: _____)
- Prep date, dept, method, product code correct in stealth
- Spike Information correct
- Weights/Volumes and units correct on raw and final bench sheets
- Sample IDs have been checked—Bottle numbers appended if required
- Names present for: Started by, Completed by, relinquished by, and witnessed by.
- Training has been circled
- Extract Storage recorded
- Additional Prep Sheet completely filled out (NA or line out Blanks)
- All clean-ups have been noted on additional prep sheet
- Signed service request with Form V, if applicable, has been attached

Injection Log

Directory: J:\MS26\DATA\050911

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	0509F001.d	1.	PR		9 May 2011 09:4
2	1	0509F002.d	1.	PR		9 May 2011 10:0
3	1	0509F003.d	1.	10ug/mL DFTPP SVM34-33F	NR	9 May 2011 10:2
4	1	0509F004.d	1.	10ug/mL DFTPP SVM34-33F		9 May 2011 10:4
5	1	0509F005.d	1.	10ug/mL DFTPP SVM34-33F	OK - New Tune	9 May 2011 11:1
6	2	0509F006.d	1.	IB		9 May 2011 11:4
7	3	0509F007.d	1.	2.0ng/mL ICAL 1,4-Dioxane SVM34-56B		9 May 2011 12:0
8	4	0509F008.d	1.	4.0ng/mL ICAL 1,4-Dioxane SVM34-56C		9 May 2011 12:2
9	5	0509F009.d	1.	10ng/mL ICAL 1,4-Dioxane SVM34-56D		9 May 2011 12:4
10	6	0509F010.d	1.	20ng/mL ICAL 1,4-Dioxane SVM34-56E		9 May 2011 13:0
11	7	0509F011.d	1.	50ng/mL ICAL 1,4-Dioxane SVM34-56F		9 May 2011 13:2
12	8	0509F012.d	1.	100ng/mL ICAL 1,4-Dioxane SVM34-56G		9 May 2011 13:4
13	9	0509F013.d	1.	200ng/mL ICAL 1,4-Dioxane SVM34-56H		9 May 2011 14:0
14	10	0509F014.d	1.	20ng/mL ICV 1,4-Dioxane SVM34-57L		9 May 2011 14:2
15	11	0509F015.d	1.	KWG1103961-4 MB		9 May 2011 14:4
16	12	0509F016.d	1.	KWG1103961-3 LCS		9 May 2011 15:0
17	13	0509F017.d	1.	KWG1103961-1 MS P1101579-005MS		9 May 2011 15:2
18	14	0509F018.d	1.	KWG1103961-2 DMS P1101579-005DMS		9 May 2011 15:4
19	15	0509F019.d	1.	P1101579-005		9 May 2011 16:0
20	16	0509F020.d	1.	P1101605-005		9 May 2011 16:2
21	17	0509F021.d	1.	P1101607-001		9 May 2011 16:4

Run # 245353

CAL10487

LB 5110111

04 05.10.11

LABORATORY REPORT

May 1 , 2011

David Conner
Battelle
4800 Oak Grove Dr. M/S 180-801
Pasadena, CA 91109

RE: JPL-GW-2Q11 / G005862 / JPL GWM

Dear David:

Enclosed are the results of the samples submitted to our laboratory on April 28, 2011. One of the samples was sent out for partial analysis to our Kelso facility. Please find their report attached. For your reference, these analyses have been assigned our service request number P1101607.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-10-1; Minnesota Department of Health, NELAP Certificate No. 219474; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.



Digitally Signed By Sue Anderson at 2:05 pm, May 19, 2011

Sue Anderson
Project Manager

Client: Battelle
Project: JPL-GW-2Q11 / G005862 / JPL GWM

CAS Project No: P1101607

CASE NARRATIVE

The samples were received intact under chain of custody on April 28, 2011 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

DETAIL SUMMARY REPORT

 Client: Battelle
 Project ID: JPL-GW-2Q11 / G005862 / JPL GWM

Service Request: P1101607

 Date Received: 4/28/2011
 Time Received: 15:45

Client Sample ID	Lab Code	Matrix	Date				
			Collected	Time Collected	7196A - Cr6	8270C SIM - 14_DIOXANE	521 - Nitrosamines
MW-13	P1101607-001	Water	4/28/2011	08:43	X	X	X
MW-5	P1101607-002	Water	4/28/2011	12:33	X		
DUPE-6-2Q11	P1101607-003	Water	4/28/2011	13:00	X		

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl <i>tert</i> -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLIC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Client: Battelle

Service Request: P1101607

Project: JPL-GW-2Q11/G005862 / JPL GWM

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101607-001.01		4/28/11	1611	SMO / MZAMORA	
		4/28/11	1611	SUBBED / MZAMORA	
		4/30/11	1158	K-Delilah-36 / FADAIR	
		5/2/11	1025	In Lab / RHAYES	
		5/2/11	1542	K-Delilah-36 / SDAVIS	
P1101607-001.02	521	4/28/11	1611	SMO / MZAMORA	
		4/28/11	1611	SUBBED / MZAMORA	
		4/30/11	1158	K-Delilah-36 / FADAIR	
		5/2/11	0845	Custodian / DMOORE	
		5/2/11	0845	In Lab / RHAYES	
	5/2/11	1542	K-Delilah-36 / SDAVIS		
P1101607-001.03	7196A	4/28/11	1611	SMO / MZAMORA	
		4/28/11	1611	P-37 / MZAMORA	
		4/28/11	1620	In Lab / SANDERSON	
		4/28/11	1718	P-37 / SANDERSON	
P1101607-001.04	8270C SIM	4/28/11	1611	SMO / MZAMORA	
		4/28/11	1611	SUBBED / MZAMORA	
		4/30/11	1158	K-Delilah-36 / FADAIR	
		5/4/11	1535	Custodian / DMOORE	
		5/4/11	1535	In Lab / SJONES	
		5/4/11	1609	K-Delilah-36 / DMOORE	
P1101607-002.01	7196A	4/28/11	1611	SMO / MZAMORA	
		4/28/11	1611	P-37 / MZAMORA	
		4/28/11	1620	In Lab / SANDERSON	
		4/28/11	1718	P-37 / SANDERSON	
P1101607-003.01	7196A	4/28/11	1611	SMO / MZAMORA	
		4/28/11	1611	P-37 / MZAMORA	
		4/28/11	1620	In Lab / SANDERSON	
		4/28/11	1718	P-37 / SANDERSON	

Sample Acceptance Check Form

Client: Battelle Work order: P1101607

Project: JPL-GW-2Q11 / G005862/JPL GWM

Sample(s) received on: 4/28/11 Date opened: 4/28/11 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- | | Yes | No | N/A |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were sample containers properly marked with client sample ID? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 Container(s) supplied by CAS ? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 Did sample containers arrive in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 Were chain-of-custody papers used and filled out? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 Did sample container labels and/or tags agree with custody papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 Was sample volume received adequate for analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 Are samples within specified holding times? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 Was proper temperature (thermal preservation) of cooler at receipt adhered to? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cooler Temperature _____ °C Blank Temperature <u>2</u> °C | | | |
| 9 Was a trip blank received? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10 Were custody seals on outside of cooler/Box? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate preservation , according to method/SOP or Client specified information? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are pH preserved? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were VOA vials checked for presence/absence of air bubbles? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12 Tubes: Are the tubes capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Do they contain moisture? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13 Badges: Are the badges properly capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101607-001.01	1000ml AG NP					
P1101607-001.02	1000ml AG NP					
P1101607-001.03	125mL Plastic NP					
P1101607-001.04	500mL AG NP					
P1101607-002.01	125mL Plastic NP					
P1101607-003.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

Analytical Report

Client : Battelle
 Project Name : JPL-GW-2Q11
 Project Number : G005862 / JPL GWM
 Sample Matrix : WATER

Service Request : P1101607
 Date Collected : 04/28/11
 Date Received : 04/28/11

Chromium, Hexavalent

Prep Method : None
 Analysis Method : 7196A
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date/Time Analyzed	Result	Result Notes
MW-13	P1101607-001	0.010	0.003	1	04/28/11 16:45	0.009	J
MW-5	P1101607-002	0.010	0.003	1	04/28/11 16:45	ND	
DUPE-6-2Q11	P1101607-003	0.010	0.003	1	04/28/11 16:45	ND	
Method Blank	P1101607-MB	0.010	0.003	1	04/28/11 16:45	ND	

J Estimated concentration. The result is less than the PQL but greater than the MDL.

Approved By Kane Rya Date : 4/29/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11 / G005862 / JPL GWM

Service Request: P1101607
Date Analyzed: 04/28/11

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: _____
ICCBMDL/120594

Karen Rya

Date: _____

4/29/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11 / G005862 / JPL GWM

Service Request: P1101607
Date Analyzed: 04/28/11

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0500	0.0509	102	90-110
CCV1	0.0500	0.0509	102	90-110
CCV2	0.0500	0.0501	100	90-110

Approved By: Karen Rya Date: 4/29/11
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL-GW-2Q11
Project Number : G005862 / JPL GWM
Sample Matrix : WATER

Service Request : P1101607
Date Collected : NA
Date Received : NA
Date Extracted : NA
Date Analyzed : 04/28/11

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name : Laboratory Control Sample
Lab Code : P1101607-LCS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0413	103	90-110	

Approved By

Kam Rya

Date :

4/29/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
 Project Name : JPL-GW-2Q11
 Project Number : G005862 / JPL GWM
 Sample Matrix : WATER

Service Request : P1101607
 Date Collected : 04/28/11
 Date Received : 04/28/11
 Date Extracted : NA
 Date Analyzed : 04/28/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-13 Units : mg/L (ppm)
 Lab Code : P1101607-001MS P1101607-001DMS Basis : NA
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	0.0089	0.0518	0.0527	86	88	73-119	2	J

J Estimated concentration. The result is less than the PQL but greater than the MDL.

Approved By Kam Ryan Date : 4/29/11

pH Run Log

Service Request #(s): 11101605, 1607

Time: 0910

Sample	VWR lot #	Exp.
pH 2 Buffer	524-11041002	1/30/12
pH 4 Buffer	524-11041003	8/31/11
pH 7 Buffer	524-11041004	9/30/12
pH 10 Buffer	524-03021001	9/30/11

Slope	Prep.Run #
} 0.83%	—
	Run#
	—

pH in liquid: (1) 9040B, (2) 9040C pH in solid: (3) 9045C, (4) 9045D (Note method number in column labeled # below)

pH adjustment:(5) 7196A,(6) 7199 (Note method # in column labeled #)

Sample	#	pH	Temp. °C
pH 2.000	5	2.014	22.3°
pH 4.000	T	3.989	22.5°
pH 7.000	T	6.991	22.5°
pH 10.000	T	9.990	22.5°
Ref#: <u>11101605</u> Exp: <u>1/30/12</u> <u>919-112-364031</u>		6.357	22.7°
DI		2.063	21.2°
pH 2.000	5	2.014	22.6°
TIME: <u>10:15</u>			
pH 2.000	5	2.003	22.3°
<u>1605-1.01</u>	T	2.099	6.8°
-2.01	T	2.010	6.8°
-3.01	T	2.085	7.8°
-4.01	T	1.994	7.5°
-5.01	T	1.937	8.0°
-6.01	T	2.098	8.1°
<u>1607-1.01</u>	T	2.082	9.3°
-2.01	T	1.948	10.1°

Sample	#	pH	Temp. °C
<u>1607-3.01</u>	5	2.031	9.4°
<u>pH 2.000</u>	5	2.014	21.3°
<p><i>Handwritten notes:</i> <u>space not used</u></p>			

pH Adjustments: **7196A:** Diluted/Conc H₂SO₄ EXP: 11/20/14

7199A: Diluted NaOH _____ EXP: _____

Comments: _____

* Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 4/25/11

Note: ATC probe used; therefore, temperature correction calculation is not necessary.

Analyst: SR

Date: 4/25/11

Reviewer: KR

Date: 4/29/11

Hexavalent Chromium (Liquids)



Method EPA 7196A

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Service Request#(s): P1101605 1607
 Stock#: 524-02281103 T.V.=100PPM EX: 2/28/12
 CVICCV#: 524-10151001 T.V.=100PPM EX: 3/20/12

Run#: 244177 page 1 of 2
 Prep Run#: _____
 Conc. H₂SO₄ Lot#: EMD 49284 EXP: 11/20/14
 Coloring Reagent Ref#: 524-04151102 EX: 5/15/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.06	0.01	0.05	0.1	0.99994015
Absorbance @ 540 nm	0.000	0.011	0.057	0.114	

Sample #	Sample Vol.(mL)	Dilution	pH ✓	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1 JCB	10ml	—	✓	0.000	0.000	0.000	0.000155	10.00%
2 JCV 0.05PPM	—	—	✓	0.000	0.058	0.058	0.0509	102%
3 MB	—	—	✓	0.000	0.000	0.000	0.000155	10.00%
4 LCS 0.04PPM	—	—	✓	0.000	0.047	0.047	0.0413	103%
5 1605-2.01	—	—	✓	0.001	0.047	0.001	0.00103	10.00%
6 -2.01 MS 0.05PPM	—	—	✓	0.001	0.049	0.048	0.0422	84%
7 -2.01 MSD J	—	—	✓	0.001	0.049	0.048	0.0422	84%
8 -2.01	—	—	✓	0.000	0.001	0.001	0.00103	10.00%
9 -2.01 VS 0.03PPM	—	—	✓	0.000	0.035	0.035	0.0308	103%
10 -3.01	—	—	✓	0.000	0.000	0.000	0.000155	10.00%
11 -4.01	—	—	✓	0.000	0.003	0.003	0.00278	10.00%
12 -5.01	—	—	✓	0.000	0.000	0.000	0.000155	10.00%
13 JCV 0.05PPM	—	—	✓	0.000	0.058	0.058	0.0509	102%
14 CCB1	—	—	✓	0.000	0.000	0.000	0.000155	10.00%
15 1605-6.01	—	—	✓	0.000	0.000	0.000	0.000155	10.00%
16 1607-1.01	—	—	✓	0.000	0.010	0.010	0.00891	11%
17 J -1.01 MS 0.05PPM	—	—	✓	0.000	0.059	0.059	0.0518	86%

pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10151001 ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 ↑ 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of _____ ↑ 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.25 ml of _____ ↑ 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: _____
 Analyzed By: _____
 Reviewed By: _____

Date/Time: 4/28/14 @ 16:30
 Date/Time: 4/28/14 @ 16:45
 Date: 4/29/14

Hexavalent Chromium (Liquids)



Method EPA 7196A

74

Service Request#(s): 11101605 1607 Run#: 244177
 Stock#: 524-02281103 T.V. 100ppm EXP: 2/28/12 Prep Run#: _____
 ICV/CCV#: 524-10151001 T.V. = 100ppm EXP: 3/2012 Conc. H₂SO₄ Lot#: EMF 49284
 Coloring Reagent Ref#: 524-04151102 EXP: 5/15/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	
Absorbance @ 540 nm	0.000	0.011	0.057	0.114	0.99994015

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1607-1.01 MSD	1.01	—	✓	0.000	0.060	0.060	0.0527	88% 2%
T-2.01	2.01	—	✓	0.002	0.002	0.000	0.000/55	10.00% 3%
T-2.01 VS 0.03ppm	2.01	—	✓	0.002	0.032	0.030	0.0264	88%
✓ -3.01	3.01	—	✓	0.002	0.002	0.000	0.000/55	10.00% 3%
CV3 0.05ppm	0.05	—	✓	0.000	0.057	0.057	0.05007	100%
CVB3	0.05	—	✓	0.000	0.000	0.000	0.000/55	10.00% 3%
Space not used								

pH Requirement: Method 7196A (2 ± 0.5). * Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10151001 @ 10 ↑ 50 ml of pH adjusted DI WATER (T.V. = 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 ↑ 10 ml of pH adjusted sample (T.V. = 0.05 ppm)

LCS spiked with 0.2 ml of _____ ↑ 50 ml of pH adjusted DI Water (T.V. = 0.04 ppm)

Verification Standard Spiked 0.3 ml of _____ @ 10 ↑ 10 ml of sample (T.V. = 0.03 ppm)

Comments: _____

Prepared By: [Signature]
 Analyzed By: [Signature]
 Reviewed By: [Signature]

Date/Time: 4/28/11 @ 1630
 Date/Time: 4/28/11 @ 1645
 Date: 4/29/11

150

11/23/09 519-11230902 1000ppm SO₂ (ICV/CCV)

JW 0.1607g Na₂SO₃ (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/DI
EXP: 5/23/10

11/23/09 519-11230903 A,B,C,D PH REFERENCE

JW PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/20/12

11/24/09 519-11240901 1000ppm SO₄ Standard

JW PURCHASED CAT # ICC-006
LOT # K60794
EXP: 9/30/13

11/25/09 519-~~H/25~~^{82 11/25/09} 11250901 0.1N H₂SO₄

JW 5.6ml CONC H₂SO₄ (EMD 47050 EXP: 9/13/10)
EXP: ~~H/25~~^{82 11/25/09} 9/13/10

11/30/09 519-11300901 Cr⁶⁺ Coloring Reagent

JW 0.2500g Diphenylcarbohydrazide (EMD 47103 EXP: 9/13/10)
↑ 50ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 519-11300902 25133ppb Stock for O₃ in Air

JW 0.05ml Pyridine-4-Carboxaldehyde (Alfa Aesar Lot 10140598; EXP 8/11/12)
↑ 500ml deionized H₂O
EXP: 12/14/09

11/30/09 519-11300903 25133ppb ICV/CCV for O₃ in Air

JW 0.05ml Pyridine-4-carboxaldehyde (TCT Lot # I67INC; EXP: 8/10/12)
↑ 500ml w/DI H₂O
EXP: 12/14/09

Reviewed And Approved By:

Initial: LL Date: 12/22/09

3/1/10 524-03011001 PH 4.000 Buffer
 Purchased 500 ml CAT# 5657-01
 JT BAKER LOT # H31526
 EXP 8/31/11

3/1/10 524-03011002 PH 7.000 Buffer
 Purchased 500 ml CAT# 5656-01
 JT BAKER LOT # H47531
 EXP: 1/31/12

3/1/10 524-03011003 1000 ppm Cl (US)
 Purchased 120 ml Cat # 1955-4
 RICA CHEM CO LOT # 1001395
 EXP: 7/20/11

3/1/10 524-03011004 NH₃ Filling Sol'n
 Purchased 60 ml Oriax 951202
 Thermo Scientific LOT # MT1
 P/N. 702613-A04
 EXP: 3/1/11

3/2/10 524-03021001 PH 10.000 buffer
 Purchased 500 ml Cat # 5655-01
 JT Baker LOT # H34508
 EXP: 9/30/11

10/6/10
SV

524-10061001

25133 ppb Stock for O3

0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar
10140598 :Exp: 8/11/12 up to 500 ml w/ DI
Water.

EXP: 10/20/10

10/6/10
SV

524-10061002

25133 ppb ION/COV for O3

0.05 ml Pyridine-4-carboxaldehyde TEI
(ICINE) :Exp: 8/10/12 up to 500 ml w/ DI
Water.

EXP: 10/20/10

10/6/10
SV

524-10061003

MBTH 50/17

0.5000 g MBTH (Aldrich 54696EK :Exp: 8/7/14) up
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ EMD 44284; Exp 11/20/10

EXP: 10/7/10

10/15/10
SV

524-10151001

Cr6+ ION/COV Stock
100ppm Cr6+

Purchased
Ricca Chemical Co
500ml Plastic
LOT # 1010177
EXP: 3/20/12

Cut No 2095-16

10/15/10
SV

524-10151002

500ppm NO₂ Stock

Purchased
Ricca Chemical Co
LOT # 1010271
EXP: 4/20/11

Cut No: 5444-54
12ml amber glass

10/28/10 524-10781002 1000 PPM SO3 ION/CON
JW

0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up
to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 524-11011001 ION/CON Cr⁶⁺ T.V = 0.579 PPM
JW 0.5 ml 519-04090904 (T.V = 115.8 mg/L; EXP: 12/30/10)
↑ 100 ml w/ DI
EXP: 11/15/10

11/1/10 524-11011002 Cr⁶⁺ Coloring Reagent
JW 0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP:
11/30/13) ↑ 50 ml w/ Acetone (EMD 471542; EXP:
9/24/12)
EXP: 11/15/10

11/4/10 524-11041001 A-SE PH Filling Soln
JW PURCHASED (3M KCl)
Thermo Scientific P/N 702613-AD2
LOT Code: OR1
EXP: 11/4/11

11/4/10 524-11041002 PH 2.000 Buffer
JW purchased
BDH CAT NO: 5010-500 ml
LOT # 1002199
EXP: 1/2012

11/4/10 524-11041003 pH 4.000 Buffer
 purchased
 JT Baker Cat No: 5657-01 500 ml
 Lot # J30507
 Exp: 8/31/12

11/4/10 524-11041004 pH 7.000 Buffer
 purchased
 J.T. Baker Cat No: 5656-01 500 ml
 Lot # J35515
 Exp: 9/30/12

11/5/10 524-11051001 MBTH Soln
 0.5000 g MBTH (Aldrich 501616EX :Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ (EMD 49884
 Exp: 11/22/14)
 Exp: 11/6/10

11/8/10 524-11081001 1000 PPM NH₃
 0.3141g NH₄Cl (EMD 49198931; Exp: 10/19/14) 100 ml
 w/ 524-10231006 Exp: 10/22/11
 Exp: 10/22/11

11/12/10 524-11121001 1000 PPM SO₃ STOCK
 0.1591 Na₂SO₃ (JT Baker Lot #H110627; Exp: 8/31/14) up to
 100 ml w/ DI Water.
 Exp: 11/26/10

54

2/21/11
JW
524-0221101 1:1 H₂SO₄
250ml H₂SO₄ (EMD 49284; EXP: 11/20/14)
ADDED SLOWLY TO 250ml DI. COOL
COMPLETELY
EXP. 2/21/12

2/21/11
JW
524-0221102 Cr6+ Coloring Reagent
0.2500g 1,5-naphthylcarbohydrazide (EMD LOT 4710372,
EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD
LOT # 471540; EXP: 9/24/12).
EXP: 3/21/11

2/28/11
JW
524-0228101 0.1 H₂SO₄
5.6 ml conc H₂SO₄ (EMD 49284 EXP: 11/20/14) ↑ 2L
w/ DI H₂O
EXP: 2/28/12

2/28/11
JW
524-0228102 1001^{mg/L} Cr6+
Purchased
Inorganic Ventures CGCR(6)1-1
125ml Clear Glass
LOT# D2-CR03040
EXP: 3/1/2012

2/28/11
JL

524-02281103 10ppm Cr6+ Sol'n
1.0ml 524-02281102 (100ppm Cr6+; EXP: 3/1/12) ↑
100ml w/ DI H2O
EXP: 2/28/12

3/7/11
JL

524-03071101 Cr6+ (6/01/11) Reagent
0.2500g 1,5-Diphenylcarbazide
(EMD Lot 47103721, EXP: 1/30/12) ↑ 50ml w/
Acetone (EMD 47154, EXP: 9/24/12).
EXP: 4/7/11

3/7/11
JL

524-03071102 500ppm NO2
Purchased
Ricca Chem Co Cat No 5444:5-4
Lot # 1102544
EXP: 8/20/11

3/17/11
JL

524-03271101 Alkaline Digestion Sol'n
20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g
Na2CO3 (EMD 44321715B; EXP: 10/11/12) ↑ 1L
w/ DI H2O.
EXP: 4/17/11

Reviewed And Approved By:
Initial: KL Date: 3/18/11

4/14/11
JL

524-04141101 ICG2 Eluent
75ml 524-04291002 (100 Conc Eluent, EXP 4/29/11)
↑ 750ml w/ DI H2O. DEGAS
EXP: 4/28/11

4/15/11
SA

524-04151101 ICO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EMD 4710372 exp: 1/30/12) in 100 mL Methanol (B&J 2-931K exp: 10/1/12). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 4710372 exp: 1/30/12). Bring up to volume w/ DI H2O; mix and degas.

EXP: 4/30/11

4/15/11
SA

524-04151102 Cycle Cleaning Reagent

0.250g 1,5-Diphenylcarbohydrazide (EMD 4710372 exp: 1/30/12) + 50 mL w/ Acetone (EMD 471540; exp: 9/24/12)

EXP: 5/15/11

4/15/11
SA

524-04151102 13.5 N NaOH

100g NaOH (EMD 47022713 exp: 10/1/12) + 100 mL DI H2O

EXP: 4/15/12

4/18/11
SA

524-04181101 1000 ppm Cr6+

0.1 mL - 524-02281102 (1000 ppm Cr6+; exp: 3/1/12) + 100 mL w/ pH ADJUSTED DI (9.391)

EXP: 3/1/12

4/18/11
SA

524-04181102 ICN ICO2 25ppb

0.25 mL Ref 524-10151001 @ 0.1% exp: 3/20/12 up to 100 mL with pH adjusted (pH = 9.241), degassed DI Water.

EXP: 5/2/11

May 16, 2011

Analytical Report for Service Request No: P1101607

Sue Anderson
Columbia Analytical Services
2655 Park Center Drive
Suite A
Simi Valley, CA 93065-6209

RE: JPL-GW-2Q11/G005862 / JPL GWM

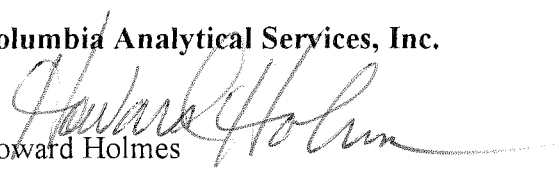
Dear Sue:

Enclosed are the results of the samples submitted to our laboratory on April 28, 2011. For your reference, these analyses have been assigned our service request number P1101607.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3364. You may also contact me via Email at HHolmes@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.
Howard Holmes
Project Chemist

HH/ln

Page 1 of 233

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H In accordance with the 2007 EPA Methods Update Rule published in the Federal Register, the holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value that was detected outside the quantitation range.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Agency	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DEQ	WA100010
South Carolina DHEC	61002
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-



Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Battelle
Project: JPL-GW-2Q11/G005862 JPL GWM
Sample Matrix: Water

Service Request No.: P1101607
Date Received: 4/28/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

One water sample was received for analysis at Columbia Analytical Services on 4/28/11. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

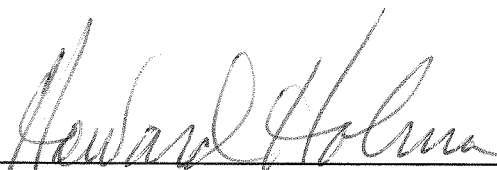
Nitrosamines by EPA 521

No anomalies associated with the analysis of these samples were observed.

1,4-Dioxane by EPA Method 8270C SIM

No anomalies associated with the analysis of these samples were observed.

Approved by



Date

5-17-11

Chain of Custody

CAS Contact: Sue Anderson

Project Name: JPL-GW-2Q11
 Project Number: G005862 / JPL GWM
 Project Manager: David Conner
 Company: Battelle

Lab Code	Client Sample ID	# of Cont.	Matrix	Date	Sample		Send To				
					Time	Date Received					
P1101607-001	MW-13	3	Water	4/28/11	0843	4/28/11	<table border="1"> <tr> <td>14_DIOXANE 8270C SIM</td> <td>IV</td> </tr> <tr> <td>Nitrosamines 521</td> <td>IV</td> </tr> </table>	14_DIOXANE 8270C SIM	IV	Nitrosamines 521	IV
14_DIOXANE 8270C SIM	IV										
Nitrosamines 521	IV										

Test Comments
 Nitrosamines - 521 P1101607-001 NDMMA

Special Instructions/Comments		Turnaround Requirements <input type="checkbox"/> RUSH (Surcharges Apply) PLEASE CIRCLE WORK DAYS 1 2 3 4 5 <input checked="" type="checkbox"/> STANDARD Requested FAX Date: _____ Requested Report Date: 05/15/11		Report Requirements <input type="checkbox"/> I. Results Only <input type="checkbox"/> II. Results + QC Summaries <input type="checkbox"/> III. Results + QC and Calibration Summaries <input checked="" type="checkbox"/> IV. Data Validation Report with Raw Data POL/MDL/J <u>Y</u> EDD <u>Y</u>		Invoice Information PO# P1101607 Bill to	
-------------------------------	--	---	--	---	--	---	--

Relinquished By: W Steiner Wanda 15/10 Received By: John Allen CAS 3/11 0982
 Airbill Number: _____

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC HH

Client / Project: CAS Sim Service Request: HH P1101607
 Received: 4/30/11 Opened: 4/30/11 By: JA Unloaded: 4/30/11 By: JA

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered
2. Samples were received in: (circle) Cooler Box Envelope Other _____ NA
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	NA	Tracking Number	NA	Filed
4.1		291			17 789 05X 4442 714715		

7. Packing material used. Inserts Baggies Bubble Wrap Gel Packs Wet Ice Sleeves Other _____
8. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
9. Did all bottles arrive in good condition (unbroken)? Indicate in the table below. NA Y N
10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
11. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA Y N
12. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
13. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below. NA Y N
14. Were VOA vials received without headspace? Indicate in the table below. NA Y N
15. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Nitrosamines

Organic Analysis:
Nitrosamines by EPA 521

Summary Package

Sample and QC Results

Client: Battelle
 Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607

Cover Page - Organic Analysis Data Package
 Nitrosamines by EPA 521

Sample Name	Lab Code	Date Collected	Date Received
MW-13MS	KWG1103886-1	04/28/2011	04/28/2011
MW-13DMS	KWG1103886-2	04/28/2011	04/28/2011
MW-13	P1101607-001	04/28/2011	04/28/2011

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Lara E. Portwood

Name: Lara Portwood

Date: 5/15/11

Title: Scientist

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Collected: 04/28/2011
Date Received: 04/28/2011

Nitrosamines by EPA 521

Sample Name: MW-13
Lab Code: P1101607-001
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND	U	2.0	0.32	1	05/02/11	05/13/11	KWG1103886	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	98	70-130	05/13/11	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101607
Date Collected: NA
Date Received: NA

Nitrosamines by EPA 521

Sample Name: Method Blank
Lab Code: KWG1103886-4
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND	U	2.0	0.32	1	05/02/11	05/13/11	KWG1103886	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	92	70-130	05/13/11	Acceptable

Comments: _____

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607

Surrogate Recovery Summary
Nitrosamines by EPA 521

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
MW-13	P1101607-001	98
Method Blank	KWG1103886-4	92
MW-13MS	KWG1103886-1	99
MW-13DMS	KWG1103886-2	96
Lab Control Sample	KWG1103886-3	102

Surrogate Recovery Control Limits (%)

Sur1 = N-Nitrosodimethylamine-d6 70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Extracted: 05/02/2011
Date Analyzed: 05/13/2011

Matrix Spike/Duplicate Matrix Spike Summary
Nitrosamines by EPA 521

Sample Name: MW-13
Lab Code: P1101607-001
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low
Extraction Lot: KWG1103886

Analyte Name	Sample Result	MW-13MS KWG1103886-1 Matrix Spike			MW-13DMS KWG1103886-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
N-Nitrosodimethylamine	ND	17.4	20.0	87	17.7	20.0	88	70-130	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101607
Date Extracted: 05/02/2011
Date Analyzed: 05/13/2011

Lab Control Spike Summary
Nitrosamines by EPA 521

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low
Extraction Lot: KWG1103886

Analyte Name	Lab Control Sample KWG1103886-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
N-Nitrosodimethylamine	17.6	20.0	88	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101607
Date Extracted: 05/02/2011
Date Analyzed: 05/13/2011
Time Analyzed: 01:28

Method Blank Summary
Nitrosamines by EPA 521

Sample Name: Method Blank
Lab Code: KWG1103886-4
Extraction Method: METHOD
Analysis Method: 521

File ID: J:\MS16\DATA\051211-521\0512025.D
Instrument ID: MS16
Level: Low
Extraction Lot: KWG1103886

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1103886-3	J:\MS16\DATA\051211-521\0512028.D	05/13/11	03:25
MW-13	P1101607-001	J:\MS16\DATA\051211-521\0512031.D	05/13/11	05:22
MW-13MS	KWG1103886-1	J:\MS16\DATA\051211-521\0512032.D	05/13/11	06:01
MW-13DMS	KWG1103886-2	J:\MS16\DATA\051211-521\0512033.D	05/13/11	06:40

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101607
Date Extracted: 05/02/2011
Date Analyzed: 05/13/2011
Time Analyzed: 03:25

Lab Control Sample Summary
Nitrosamines by EPA 521

Sample Name: Lab Control Sample
Lab Code: KWG1103886-3
Extraction Method: METHOD
Analysis Method: 521

File ID: J:\MS16\DATA\051211-521\0512028.D
Instrument ID: MS16
Level: Low
Extraction Lot: KWG1103886

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1103886-4	J:\MS16\DATA\051211-521\0512025.D	05/13/11	01:28
MW-13	P1101607-001	J:\MS16\DATA\051211-521\0512031.D	05/13/11	05:22
MW-13MS	KWG1103886-1	J:\MS16\DATA\051211-521\0512032.D	05/13/11	06:01
MW-13DMS	KWG1103886-2	J:\MS16\DATA\051211-521\0512033.D	05/13/11	06:40

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Calibration Date: 05/12/2011

**Initial Calibration Summary
Nitrosamines by EPA 521**

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS16\DATA\051211-521\0512015.D	E	J:\MS16\DATA\051211-521\0512019.D
B	J:\MS16\DATA\051211-521\0512016.D	F	J:\MS16\DATA\051211-521\0512020.D
C	J:\MS16\DATA\051211-521\0512017.D		
D	J:\MS16\DATA\051211-521\0512018.D		

Analyte Name	Level			Level			Level			Level			Level		
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF
N-Nitrosodimethylamine-d6	A	1.0	3.06	B	2.0	3.45	C	5.0	4.25	D	10	4.54	E	20	5.21
	F	50	7.35												
N-Nitrosodimethylamine	A	1.0	1.11	B	2.0	1.01	C	5.0	1.35	D	10	1.24	E	20	1.38
	F	50	2.25												

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Calibration Date: 05/12/2011

**Initial Calibration Summary
 Nitrosamines by EPA 521**

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

Analyte Name	Compound Type	Calibration Evaluation					RRF Evaluation		
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
N-Nitrosodimethylamine-d6	SURR	Quadratic	COD	1.000		≥ 0.99	4.64		
N-Nitrosodimethylamine	MS	Quadratic	COD	0.999		≥ 0.99	1.39		

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Calibration Date: 05/12/2011
Date Analyzed: 05/12/2011

Second Source Calibration Verification
Nitrosamines by EPA 521

Calibration Type: Internal Standard
Analysis Method: 521

Calibration ID: CAL10502
Units: ug/L

File ID: J:\MS16\DATA\051211-521\0512021.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine	10	7.6	1.39	0.877	NA	-24	± 30 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Date Analyzed: 05/13/2011

**Continuing Calibration Verification Summary
 Nitrosamines by EPA 521**

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/12/2011
Calibration ID: CAL10502
Analysis Lot: KWG1104312
Units: ug/L

File ID: J:\MS16\DATA\051211-521\0512024.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	5.0	5.5		4.64	4.53	NA	9	± 50 %	Quadratic
N-Nitrosodimethylamine	5.0	4.6		1.39	1.00	NA	-9	± 50 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Date Analyzed: 05/13/2011

**Continuing Calibration Verification Summary
 Nitrosamines by EPA 521**

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/12/2011
Calibration ID: CAL10502
Analysis Lot: KWG1104312
Units: ug/L

File ID: J:\MS16\DATA\051211-521\0512035.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	10	11		4.64	4.96	NA	9	± 50 %	Quadratic
N-Nitrosodimethylamine	10	9.5		1.39	1.14	NA	-5	± 50 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607

**Analysis Run Log
 Nitrosamines by EPA 521**

Analysis Method: 521

Analysis Lot: KWG1104312
Instrument ID: MS16

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
\0512022.D	GC/MS Tuning - Decafluorotriphenylp	KWG1104312-1	5/12/2011	23:31		5/13/2011	00:00
\0512024.D	Continuing Calibration Verification	KWG1104312-2	5/13/2011	00:49		5/13/2011	01:18
\0512025.D	Method Blank	KWG1103886-4	5/13/2011	01:28		5/13/2011	01:57
\0512028.D	Lab Control Sample	KWG1103886-3	5/13/2011	03:25		5/13/2011	03:54
\0512029.D	ZZZZZZ	ZZZZZZ	5/13/2011	04:04		5/13/2011	04:33
\0512030.D	ZZZZZZ	ZZZZZZ	5/13/2011	04:43		5/13/2011	05:12
\0512031.D	MW-13	P1101607-001	5/13/2011	05:22		5/13/2011	05:51
\0512032.D	MW-13MS	KWG1103886-1	5/13/2011	06:01		5/13/2011	06:30
\0512033.D	MW-13DMS	KWG1103886-2	5/13/2011	06:40		5/13/2011	07:09
\0512035.D	Continuing Calibration Verification	KWG1104312-3	5/13/2011	07:58		5/13/2011	08:27
\0512042.D	ZZZZZZ	ZZZZZZ	5/13/2011	12:32		5/13/2011	13:01
\0512046.D	Continuing Calibration Verification	KWG1104312-4	5/13/2011	15:08		5/13/2011	15:37

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Extracted: 05/02/2011

**Extraction Prep Log
 Nitrosamines by EPA 521**

Extraction Method: METHOD
Analysis Method: 521

Extraction Lot: KWG1103886
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
MW-13	P1101607-001	04/28/11	04/28/11	500ml	1ml	NA	
Method Blank	KWG1103886-4	NA	NA	500ml	1ml	NA	
MW-13MS	KWG1103886-1	04/28/11	04/28/11	500ml	1ml	NA	
MW-13DMS	KWG1103886-2	04/28/11	04/28/11	500ml	1ml	NA	
Lab Control Sample	KWG1103886-3	NA	NA	500ml	1ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Organic Analysis:
Nitrosamines by EPA 521

Validation Package

Organic Analysis:
Nitrosamines by EPA 521

Validation Package

QC Reports

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607

**Surrogate Recovery Summary
 Nitrosamines by EPA 521**

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
MW-13	P1101607-001	98
Method Blank	KWG1103886-4	92
MW-13MS	KWG1103886-1	99
MW-13DMS	KWG1103886-2	96
Lab Control Sample	KWG1103886-3	102

Surrogate Recovery Control Limits (%)

Sur1 = N-Nitrosodimethylamine-d6 70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Extracted: 05/02/2011
Date Analyzed: 05/13/2011

Matrix Spike/Duplicate Matrix Spike Summary
Nitrosamines by EPA 521

Sample Name: MW-13
Lab Code: P1101607-001
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low
Extraction Lot: KWG1103886

Analyte Name	Sample Result	MW-13MS KWG1103886-1 Matrix Spike			MW-13DMS KWG1103886-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
N-Nitrosodimethylamine	ND	17.4	20.0	87	17.7	20.0	88	70-130	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101607
Date Extracted: 05/02/2011
Date Analyzed: 05/13/2011

Lab Control Spike Summary
Nitrosamines by EPA 521

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low
Extraction Lot: KWG1103886

Analyte Name	Lab Control Sample KWG1103886-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
N-Nitrosodimethylamine	17.6	20.0	88	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101607
Date Extracted: 05/02/2011
Date Analyzed: 05/13/2011
Time Analyzed: 01:28

Method Blank Summary
Nitrosamines by EPA 521

Sample Name: Method Blank
Lab Code: KWG1103886-4

File ID: J:\MS16\DATA\051211-521\0512025.D
Instrument ID: MS16

Extraction Method: METHOD
Analysis Method: 521

Level: Low
Extraction Lot: KWG1103886

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1103886-3	J:\MS16\DATA\051211-521\0512028.D	05/13/11	03:25
MW-13	P1101607-001	J:\MS16\DATA\051211-521\0512031.D	05/13/11	05:22
MW-13MS	KWG1103886-1	J:\MS16\DATA\051211-521\0512032.D	05/13/11	06:01
MW-13DMS	KWG1103886-2	J:\MS16\DATA\051211-521\0512033.D	05/13/11	06:40

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101607
Date Extracted: 05/02/2011
Date Analyzed: 05/13/2011
Time Analyzed: 03:25

Lab Control Sample Summary
Nitrosamines by EPA 521

Sample Name: Lab Control Sample
Lab Code: KWG1103886-3
Extraction Method: METHOD
Analysis Method: 521

File ID: J:\MS16\DATA\051211-521\0512028.D
Instrument ID: MS16
Level: Low
Extraction Lot: KWG1103886

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1103886-4	J:\MS16\DATA\051211-521\0512025.D	05/13/11	01:28
MW-13	P1101607-001	J:\MS16\DATA\051211-521\0512031.D	05/13/11	05:22
MW-13MS	KWG1103886-1	J:\MS16\DATA\051211-521\0512032.D	05/13/11	06:01
MW-13DMS	KWG1103886-2	J:\MS16\DATA\051211-521\0512033.D	05/13/11	06:40

Organic Analysis:
Nitrosamines by EPA 521

Validation Package

Raw Data

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Collected: 04/28/2011
Date Received: 04/28/2011

Nitrosamines by EPA 521

Sample Name: MW-13
Lab Code: P1101607-001
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND	U	2.0	0.32	1	05/02/11	05/13/11	KWG1103886	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	98	70-130	05/13/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\051211-521\0512031.D
Lab ID: P1101607-001
RunType: SMPL
Matrix: WATER

Date Acquired: 05/13/2011 05:22
Date Quantitated: 05/13/2011 12:51
Batch ID: KWG1104312
Analysis Method: 521
ListJoinID: LJ11419

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
Preparation Holding Time	NA	NA	NA	x	
Pre-Preparation Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Method Blank	NA	NA	NA	x	
MB Surrogate Recovery	NA	NA	NA	x	
Lab Control Spike	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: *W. J. [Signature]*

Secondary Review: *[Signature]*

Quantitation Report

Bottle ID:		Tier:	IV	Matrix:	WATER
Prod Code:	521 Nitrosamine	Collect Date:	04/28/2011	Receive Date:	04/28/2011

Analysis Lot:	KWG1104312	Prep Lot:	KWG1103886	Report Group:	P1101607
Analysis Method:	521	Prep Method:	METHOD		
Prep Ref:	1015265	Prep Date:	05/02/2011		

Quant Method:	J:\MS16\METHODS\051211_D14.M	Calibration ID:	CAL10502
Title:	Nitrosamines by EPA 521	Report List ID:	LJ11419
Tune Ref:	J:\MS16\DATA\051211-521\0512022.D	Method ID:	MJ808
MB Ref:	J:\MS16\DATA\051211-521\0512025.D	Quant based on Report List	

Data File:	J:\MS16\DATA\051211-521\0512031.D	Instrument:	MS16
Acqu Date:	05/13/2011 05:22	Quant Date:	05/13/2011 12:51
Run Type:	SMPL	Vial:	12
Lab ID:	P1101607-001	Dilution:	1.0
		Soln Conc. Units:	ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.10	0.00	97	25953	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.44	0.01	0.00	50	22914	9.83	98	70-130	OK *

Target Compounds

								Final Conc. Units: ng/L		
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine	10.54	0.02	0.00	47	188	0.1200	0.32	U	

Prep Amount: 500 ml **Dilution:** 1.0
Prep Final Vol: 1 ml **Unit Factor:** 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of iCAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of iCAL
 c: check for co-elution

Data File : J:\MS16\DATA\051211-521\0512031.D
 Acq On : 13 May 2011 05:22
 Sample : P1101607-001
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 11:24:27 2011

Vial: 12
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL_10502
 Last Update : Fri May 13 10:05:05 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

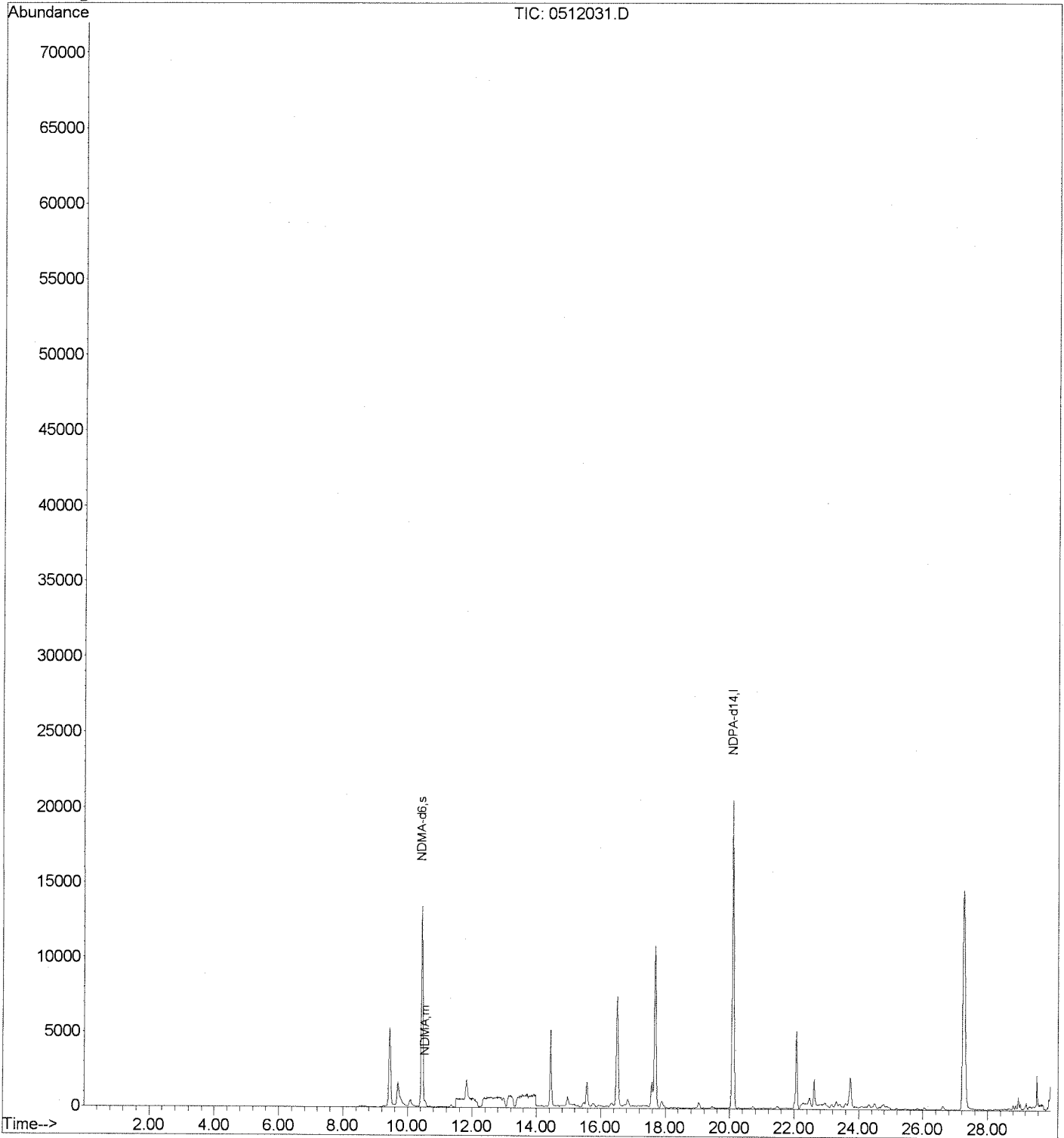
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.10	97	25953	50.00	ug/L	-0.01
System Monitoring Compounds						
3) NDMA-d6	10.44	50	22914	9.83	ug/L	0.00
Target Compounds						
4) NDMA	10.54	47	188	0.12	ug/L	Qvalue # 22

Data File : J:\MS16\DATA\051211-521\0512031.D
Acq On : 13 May 2011 05:22
Sample : P1101607-001
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 12:51 2011

Vial: 12
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101607
Date Collected: NA
Date Received: NA

Nitrosamines by EPA 521

Sample Name: Method Blank
Lab Code: KWG1103886-4
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND U	2.0	0.32	1	05/02/11	05/13/11	KWG1103886	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	92	70-130	05/13/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\051211-521\0512025.D
Lab ID: KWG1103886-4
RunType: MB
Matrix: DRINKING WATER

Date Acquired: 05/13/2011 01:28
Date Quantitated: 05/13/2011 12:49
Batch ID: KWG1104312
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: W. J. [Signature]

Secondary Review: [Signature]

Quantitation Report

Bottle ID: Prod Code: 521 Nitrosamine	Tier: Collect Date:	Matrix: DRINKING WATE Receive Date: 05/02/2011
Analysis Lot: KWG1104312 Analysis Method: 521 Prep Ref: 1015271	Prep Lot: KWG1103886 Prep Method: METHOD Prep Date: 05/02/2011	Report Group:
Quant Method: J:\MS16\METHODS\051211_D14.M Title: Tune Ref: J:\MS16\DATA\051211-521\0512022.D MB Ref:	Calibration ID: CAL10502 Method ID: MJ808 Quant based on Method	
Data File: J:\MS16\DATA\051211-521\0512025.D Acqu Date: 05/13/2011 01:28 Run Type: MB Lab ID: KWG1103886-4	Quant Date: 05/13/2011 12:49	Instrument: MS16 Vial: 8 Dilution: 1.0 Soln Conc. Units: ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.09	-0.01	97	31460	50.00	OK
1	N-Nitrosodiethylamine-d10			81	0d		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.44	0.01	0.00	50	25627	9.17	92	70-130	OK ✓

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine				47	0d		0.32	U	
1	N-Nitrosomethylethylamine				61	0		0.50	U	
1	N-Nitrosodiethylamine				75	0		0.76	U	
1	N-Nitrosodi-n-propylamine				89	0		0.76	U	
1	N-Nitrosopyrrolidine				55	0d		0.61	U	
1	N-Nitrosopiperidine				69	0d		0.55	U	
1	N-Nitrosodi-n-butylamine				57	0d		0.77	U	

Prep Amount: 500 ml **Dilution:** 1.0
Prep Final Vol: 1 ml **Unit Factor:** 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS16\DATA\051211-521\0512025.D
 Acq On : 13 May 2011 01:28
 Sample : 050211-MB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 11:24:26 2011

Vial: 8
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL 10502
 Last Update : Fri May 13 10:05:05 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

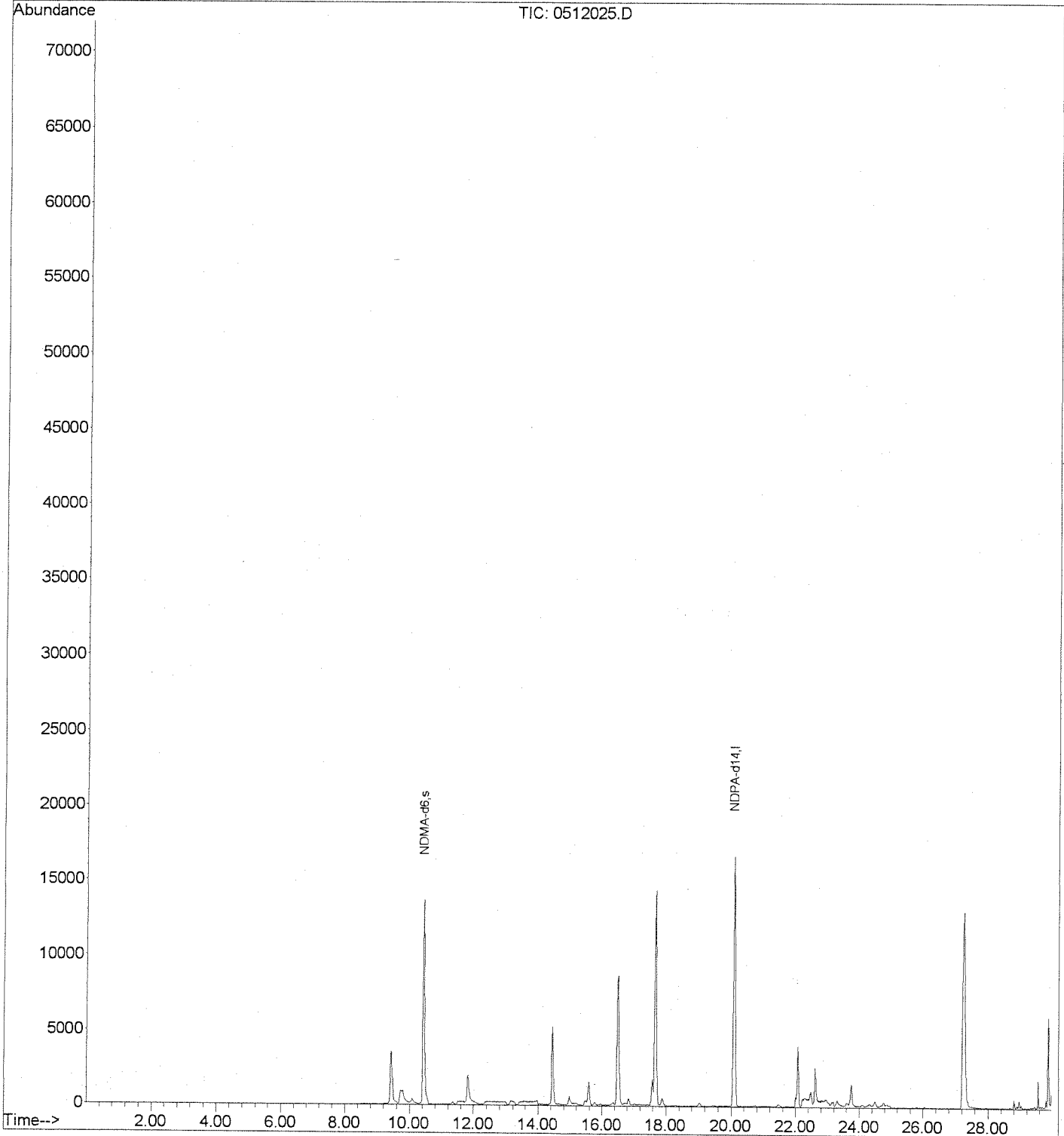
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	31460	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.44	50	25627	9.17	ug/L	0.00
Target Compounds						Qvalue

Data File : J:\MS16\DATA\051211-521\0512025.D
Acq On : 13 May 2011 01:28
Sample : 050211-MB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 12:49 2011

Vial: 8
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Collected: 04/28/2011
Date Received: 04/28/2011

Nitrosamines by EPA 521

Sample Name: MW-13MS
Lab Code: KWG1103886-1
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	17.4		2.0	0.32	1	05/02/11	05/13/11	KWG1103886	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	99	70-130	05/13/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\051211-521\0512032.D
Lab ID: KWG1103886-1 -- P1101607-001MS
RunType: MS
Matrix: WATER

Date Acquired: 05/13/2011 06:01
Date Quantitated: 05/13/2011 12:51
Batch ID: KWG1104312
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review:

Secondary Review:

Quantitation Report

Bottle ID:		Tier:		Matrix:	WATER
Prod Code:	521 Nitrosamine	Collect Date:		Receive Date:	05/02/2011

Analysis Lot:	KWG1104312	Prep Lot:	KWG1103886	Report Group:	
Analysis Method:	521	Prep Method:	METHOD		
Prep Ref:	1015268	Prep Date:	05/02/2011		

Quant Method:	J:\MS16\METHODS\051211_D14.M	Calibration ID:	CAL10502
Title:		Method ID:	MJ808
Tune Ref:	J:\MS16\DATA\051211-521\0512022.D	Quant based on Method	
MB Ref:	J:\MS16\DATA\051211-521\0512025.D		

Data File:	J:\MS16\DATA\051211-521\0512032.D	Instrument:	MS16
Acqu Date:	05/13/2011 06:01	Quant Date:	05/13/2011 12:51
Run Type:	MS	Vial:	13
Lab ID:	KWG1103886-1 -- P1101607-001MS	Dilution:	1.0
		Soln Conc. Units:	ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.11	0.01	97	28599	50.00	OK
1	N-Nitrosodiethylamine-d10			81	0d		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.45	0.02	0.00	50	25479	9.91	99	70-130	OK

Target Compounds

Final Conc. Units: ng/L

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine	10.57	0.05	0.00	47	5894	8.70	17.4		
1	N-Nitrosomethylethylamine	13.13	0.01	0.00	61	40416	7.67	15.3		
1	N-Nitrosodiethylamine	15.24	0.03	0.00	75	6355	9.19	18.4		
1	N-Nitrosodi-n-propylamine	20.40	0.01	0.00	89	6530	8.71	17.4		
1	N-Nitrosopyrrolidine	22.74	-0.01	0.00	55	42923	8.35	16.7		
1	N-Nitrosopiperidine	23.66	0.02	0.00	69	74868	8.36	16.7		
1	N-Nitrosodi-n-butylamine	25.83		0.00	57	23441	7.48	15.0		

Prep Amount: 500 ml **Dilution:** 1.0
Prep Final Vol: 1 ml **Unit Factor:** 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Data File : J:\MS16\DATA\051211-521\0512032.D
 Acq On : 13 May 2011 06:01
 Sample : P1101607-001 MS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 11:24:27 2011

Vial: 13
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL 10502
 Last Update : Fri May 13 10:05:05 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

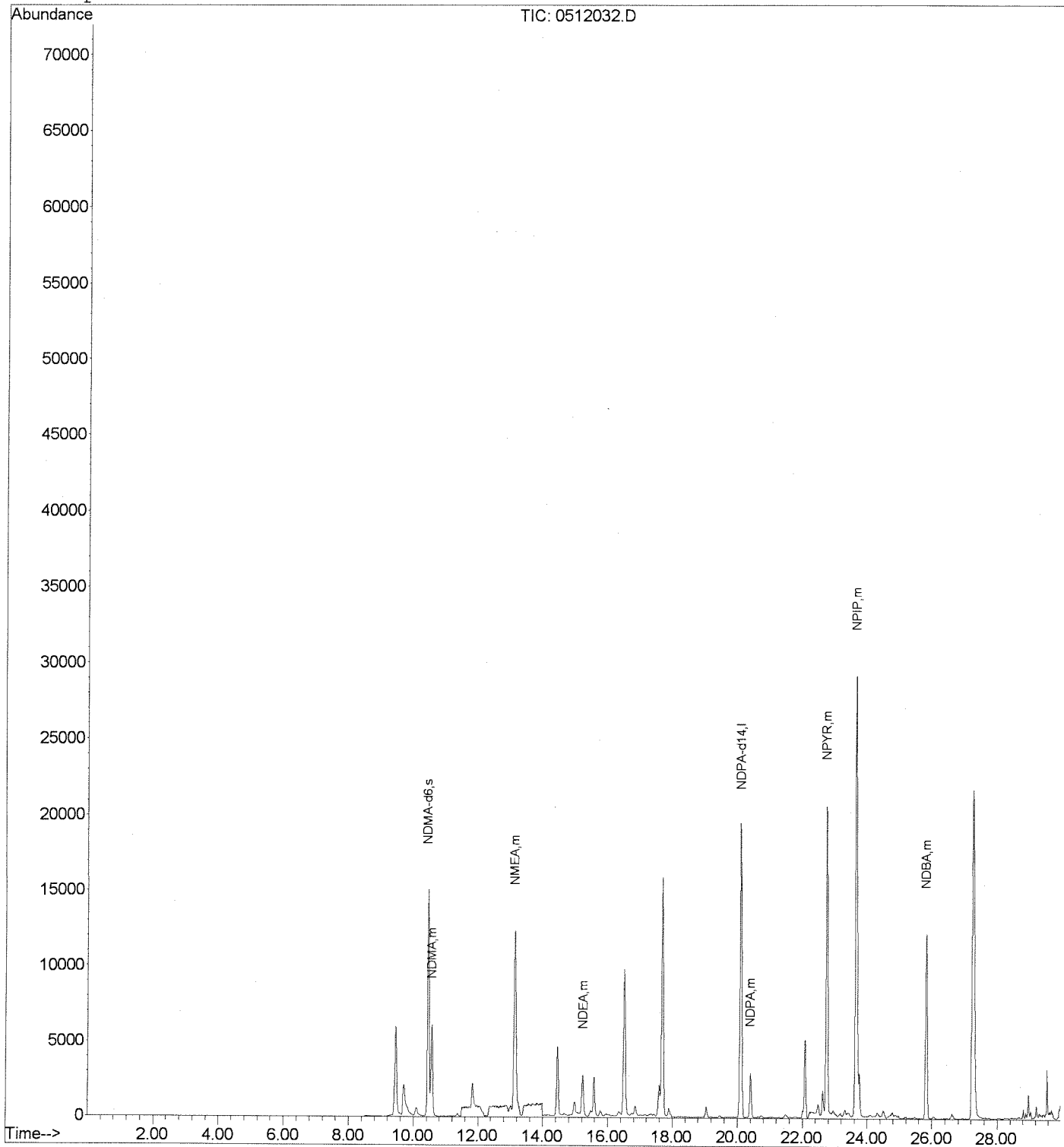
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.11	97	28599	50.00	ug/L	0.00
System Monitoring Compounds						
3) NDMA-d6	10.45	50	25479	9.91	ug/L	0.01
Target Compounds						Qvalue
4) NDMA	10.57	47	5894	8.70	ug/L #	12
5) NMEA	13.13	61	40416	7.67	ug/L	79
6) NDEA	15.24	75	6355	9.19	ug/L #	53
7) NDPA	20.40	89	6530	8.71	ug/L #	21
8) NPYR	22.74	55	42923	8.35	ug/L	87
9) NPIP	23.66	69	74868	8.36	ug/L	82
10) NDBA	25.83	57	23441	7.48	ug/L #	24

Data File : J:\MS16\DATA\051211-521\0512032.D
Acq On : 13 May 2011 06:01
Sample : P1101607-001 MS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 12:51 2011

Vial: 13
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Collected: 04/28/2011
Date Received: 04/28/2011

Nitrosamines by EPA 521

Sample Name: MW-13DMS
Lab Code: KWG1103886-2
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	17.7	2.0	0.32	1	05/02/11	05/13/11	KWG1103886	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	96	70-130	05/13/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\051211-521\0512033.D
Lab ID: KWG1103886-2 -- P1101607-001DMS
RunType: DMS
Matrix: WATER

Date Acquired: 05/13/2011 06:40
Date Quantitated: 05/13/2011 12:51
Batch ID: KWG1104312
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review:

Secondary Review:

Quantitation Report

Bottle ID:	Tier:	Matrix:
Prod Code: 521 Nitrosamine	Collect Date:	WATER
		Receive Date: 05/02/2011

Analysis Lot: KWG1104312	Prep Lot: KWG1103886	Report Group:
Analysis Method: 521	Prep Method: METHOD	
Prep Ref: 1015269	Prep Date: 05/02/2011	

Quant Method: J:\MS16\METHODS\051211_D14.M	Calibration ID: CAL10502
Title:	
Tune Ref: J:\MS16\DATA\051211-521\0512022.D	Method ID: MJ808
MB Ref: J:\MS16\DATA\051211-521\0512025.D	Quant based on Method

Data File: J:\MS16\DATA\051211-521\0512033.D	Instrument: MS16
Acqu Date: 05/13/2011 06:40	Quant Date: 05/13/2011 12:51
Run Type: DMS	Vial: 14
Lab ID: KWG1103886-2 -- P1101607-001DMS	Dilution: 1.0
	Soln Conc. Units: ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.10	0.00	97	30515	50.00	OK ↵
1	N-Nitrosodiethylamine-d10			81	0d		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.43	0.00	0.00	50	26221	9.60	96	70-130	OK ↵

Target Compounds

Final Conc. Units: ng/L										
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine	10.55	0.03	0.00	47	6395	8.83	17.7		
1	N-Nitrosomethylethylamine	13.13	0.01	0.00	61	41110	7.34	14.7		
1	N-Nitrosodiethylamine	15.23	0.02	0.00	75	6362	8.66	17.3		
1	N-Nitrosodi-n-propylamine	20.41	0.02	0.00	89	6716	8.42	16.8		
1	N-Nitrosopyrrolidine	22.75		0.00	55	48111	8.74	17.5		
1	N-Nitrosopiperidine	23.66	0.02	0.00	69	81678	8.54	17.1		
1	N-Nitrosodi-n-butylamine	25.83		0.00	57	28530	8.42	16.8		

Prep Amount: 500 ml **Dilution:** 1.0
Prep Final Vol: 1 ml **Unit Factor:** 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS16\DATA\051211-521\0512033.D
 Acq On : 13 May 2011 06:40
 Sample : P1101607-001 DMS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 11:24:28 2011

Vial: 14
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL 10502
 Last Update : Fri May 13 10:05:05 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

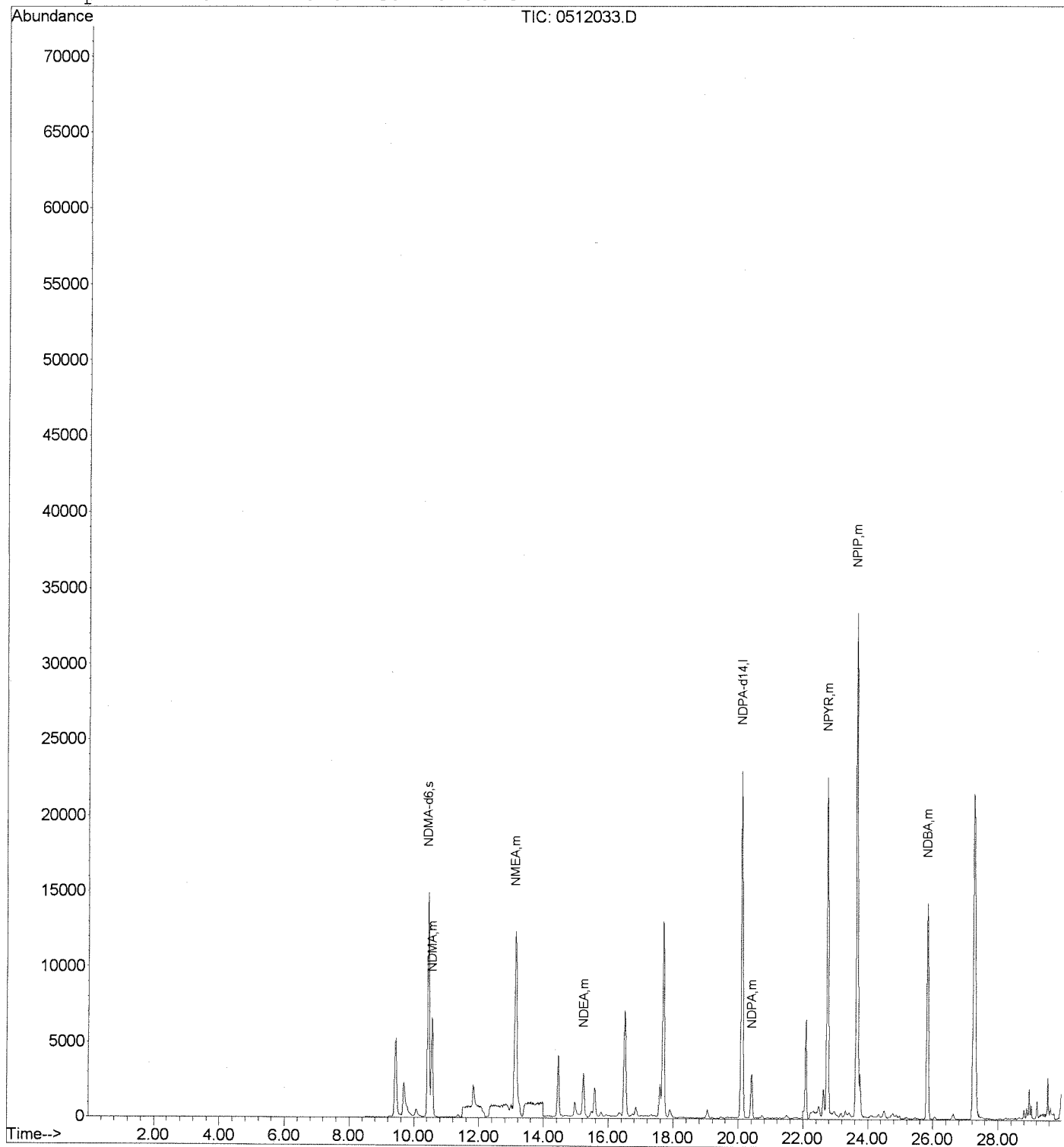
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.10	97	30515	50.00	ug/L	-0.01
System Monitoring Compounds						
3) NDMA-d6	10.43	50	26221	9.60	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.55	47	6395	8.83	ug/L	# 50
5) NMEA	13.13	61	41110	7.34	ug/L	77
6) NDEA	15.23	75	6362	8.66	ug/L	# 31
7) NDPA	20.41	89	6716	8.42	ug/L	# 27
8) NPYR	22.75	55	48111	8.74	ug/L	80
9) NPIP	23.66	69	81678	8.54	ug/L	77
10) NDBA	25.83	57	28530	8.42	ug/L	50

Data File : J:\MS16\DATA\051211-521\0512033.D
Acq On : 13 May 2011 06:40
Sample : P1101607-001 DMS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 12:51 2011

Vial: 14
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL_10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101607
Date Collected: NA
Date Received: NA

Nitrosamines by EPA 521

Sample Name: Lab Control Sample
Lab Code: KWG1103886-3
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	17.6		2.0	0.32	1	05/02/11	05/13/11	KWG1103886	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	102	70-130	05/13/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\051211-521\0512028.D
Lab ID: KWG1103886-3
RunType: LCS
Matrix: DRINKING WATER

Date Acquired: 05/13/2011 03:25
Date Quantitated: 05/13/2011 12:50
Batch ID: KWG1104312
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: *W. B. 1/11*
 Secondary Review: *[Signature]*

Quantitation Report

Bottle ID:	Tier:	Matrix:
Prod Code: 521 Nitrosamine	Collect Date:	DRINKING WATER
		Receive Date: 05/02/2011

Analysis Lot: KWG1104312	Prep Lot: KWG1103886	Report Group:
Analysis Method: 521	Prep Method: METHOD	
Prep Ref: 1015270	Prep Date: 05/02/2011	

Quant Method: J:\MS16\METHODS\051211_D14.M	Calibration ID: CAL10502
Title:	
Tune Ref: J:\MS16\DATA\051211-521\0512022.D	Method ID: MJ808
MB Ref: J:\MS16\DATA\051211-521\0512025.D	Quant based on Method

Data File: J:\MS16\DATA\051211-521\0512028.D	Instrument: MS16
Acqu Date: 05/13/2011 03:25	Quant Date: 05/13/2011 12:50
Run Type: LCS	Vial: 9
Lab ID: KWG1103886-3	Dilution: 1.0
	Soln Conc. Units: ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.10	0.00	97	25467	50.00	OK
1	N-Nitrosodiethylamine-d10			81	0d		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.43	0.00	0.00	50	23540	10.22	102	70-130	OK

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Final Conc. Units: ng/L		Q	Rpt?
							Solution Conc	Final Conc		
1	N-Nitrosodimethylamine	10.55	0.03	0.00	47	5331	8.82	17.6		
1	N-Nitrosomethylethylamine	13.12		0.00	61	36494	7.76	15.5		
1	N-Nitrosodiethylamine	15.22	0.01	0.00	75	5320	8.67	17.3		
1	N-Nitrosodi-n-propylamine	20.41	0.02	0.00	89	5487	8.26	16.5		
1	N-Nitrosopyrrolidine	22.74	-0.01	0.00	55	40023	8.71	17.4		
1	N-Nitrosopiperidine	23.64		0.00	69	67844	8.50	17.0		
1	N-Nitrosodi-n-butylamine	25.82	-0.01	0.00	57	23098	8.19	16.4		

Prep Amount: 500 ml Dilution: 1.0
 Prep Final Vol: 1 ml Unit Factor: 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 F: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS16\DATA\051211-521\0512028.D
 Acq On : 13 May 2011 03:25
 Sample : 050211-LCS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 11:24:26 2011

Vial: 9
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL_10502
 Last Update : Fri May 13 10:05:05 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) NDPA-d14	20.10	97	25467	50.00	ug/L	-0.01
System Monitoring Compounds						
3) NDMA-d6	10.43	50	23540	10.22	ug/L	0.00
Target Compounds						
4) NDMA	10.55	47	5331	8.82	ug/L #	1
5) NMEA	13.12	61	36494	7.76	ug/L	67
6) NDEA	15.22	75	5320	8.67	ug/L #	23
7) NDPA	20.41	89	5487	8.26	ug/L #	9
8) NPYR	22.74	55	40023	8.71	ug/L	83
9) NPIP	23.64	69	67844	8.50	ug/L	80
10) NDBA	25.82	57	23098	8.19	ug/L #	40

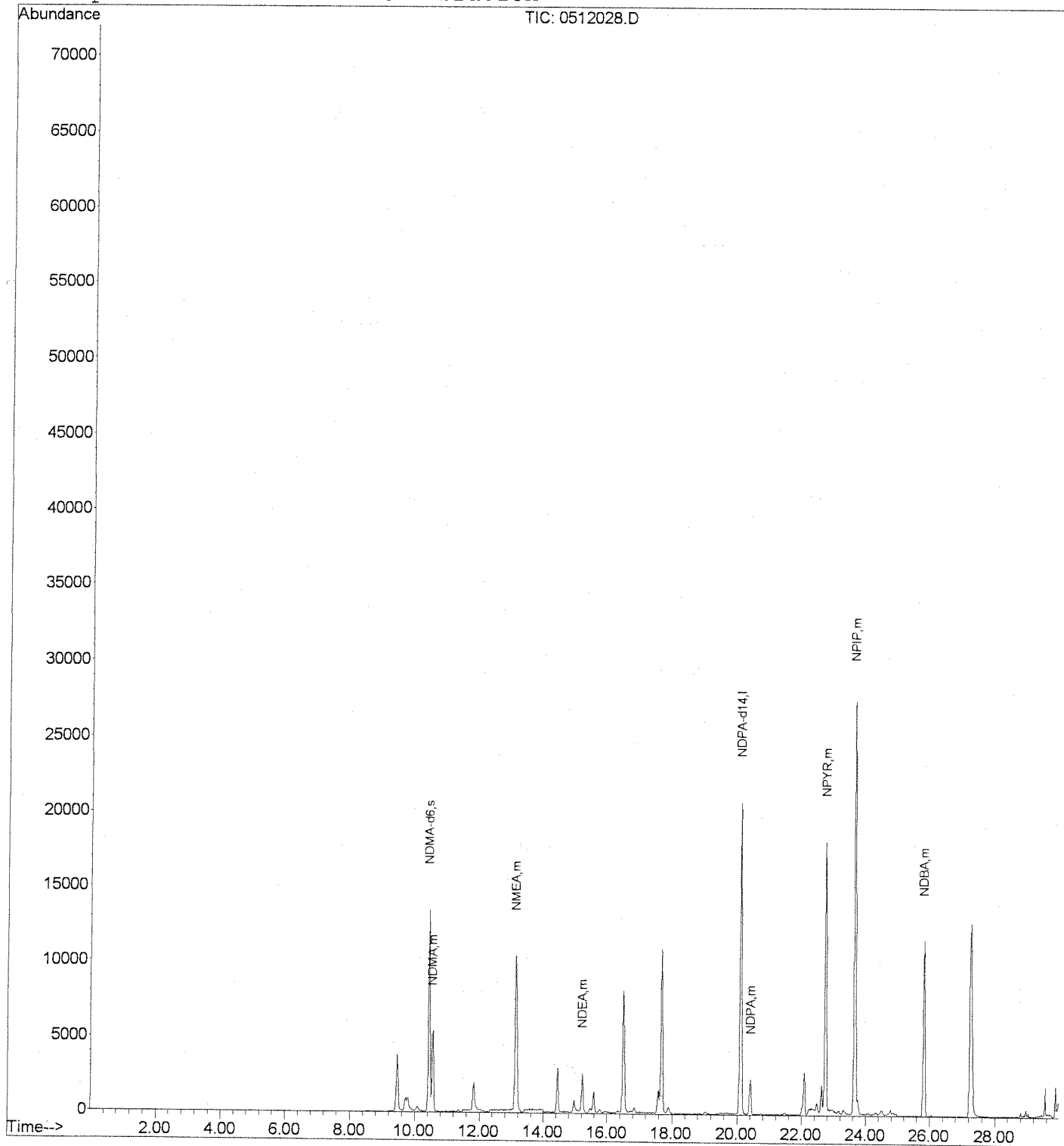
(#) = qualifier out of range (m) = manual integration
 0512028.D 051211_D14.M Fri May 13 12:55:35 2011

Data File : J:\MS16\DATA\051211-521\0512028.D
Acq On : 13 May 2011 03:25
Sample : 050211-LCS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 12:50 2011

Vial: 9
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



Organic Analysis:
Nitrosamines by EPA 521

Validation Package

Standards Data

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Calibration Date: 05/12/2011

**Initial Calibration Summary
 Nitrosamines by EPA 521**

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS16\DATA\051211-521\0512015.D	E	J:\MS16\DATA\051211-521\0512019.D
B	J:\MS16\DATA\051211-521\0512016.D	F	J:\MS16\DATA\051211-521\0512020.D
C	J:\MS16\DATA\051211-521\0512017.D		
D	J:\MS16\DATA\051211-521\0512018.D		

Analyte Name	Level			Level			Level			Level			Level		
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF
N-Nitrosodimethylamine-d6	A	1.0	3.06	B	2.0	3.45	C	5.0	4.25	D	10	4.54	E	20	5.21
	F	50	7.35												
N-Nitrosodimethylamine	A	1.0	1.11	B	2.0	1.01	C	5.0	1.35	D	10	1.24	E	20	1.38
	F	50	2.25												

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Calibration Date: 05/12/2011

**Initial Calibration Summary
 Nitrosamines by EPA 521**

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

Analyte Name	Compound Type	Calibration Evaluation					RRF Evaluation		
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
N-Nitrosodimethylamine-d6	SURR	Quadratic	COD	1.000		≥ 0.99	4.64		
N-Nitrosodimethylamine	MS	Quadratic	COD	0.999		≥ 0.99	1.39		

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Calibration Date: 05/12/2011
Date Analyzed: 05/12/2011

**Second Source Calibration Verification
 Nitrosamines by EPA 521**

Calibration Type: Internal Standard
Analysis Method: 521

Calibration ID: CAL10502
Units: ug/L

File ID: J:\MS16\DATA\051211-521\0512021.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine	10	7.6	1.39	0.877	NA	-24	± 30 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Injection Log

Directory: J:\MS16\DATA\051211-521

CAL 10502

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1		0512.D	1.	IB		
2	1	0512001.D	1.	5-11B 521 1 PPB		12 May 2011 20:1
3	2	0512002.D	1.	5-11C 521 2 PPB		12 May 2011 20:5
4	3	0512003.D	1.	5-11D 521 5 PPB		12 May 2011 21:3
5	4	0512004.D	1.	5-11E 521 10 PPB		12 May 2011 22:1
6	5	0512005.D	1.	5-11F 521 20 PPB		12 May 2011 22:4
7	6	0512006.D	1.	5-11G 521 50 PPB		12 May 2011 23:2
8	7	0512007.D	1.	5-11H 521 ICV10 PPB		12 May 2011.12:0
9	5	0512008.D	1.	5-11F 521 20 PPB		12 May 2011 12:4
10	7	0512009.D	1.	5-11H 521 ICV10 PPB		12 May 2011 25:2
11		0512010.D	1.	IB		12 May 2011 26:0
12	3	0512011.D	1.	5-11D 521 5 PPB		12 May 2011 26:4
13	8	0512012.D	1.	050211-MB		12 May 2011 27:2
14	2	0512013.D	1.	5-11C 521 2 PPB		12 May 2011 28:0
15		0512014.D	1.	IB		12 May 2011 28:4
16	1	0512015.D	1.	5-11B 521 1 PPB		12 May 2011 30:2
17	2	0512016.D	1.	5-11C 521 2 PPB		12 May 2011 30:5
18	3	0512017.D	1.	5-11D 521 5 PPB		12 May 2011 31:3
19	4	0512018.D	1.	5-11E 521 10 PPB		12 May 2011 32:1
20	5	0512019.D	1.	5-11F 521 20 PPB		12 May 2011 32:5
21	6	0512020.D	1.	5-11G 521 50 PPB		12 May 2011 33:3
22	7	0512021.D	1.	5-11H 521 ICV10 PPB		12 May 2011 34:1
23		0512022.D	1.	IB		12 May 2011 34:5
24	3	0512023.D	1.	5-11D 521 5 PPB		12 May 2011 35:3
25	3	0512024.D	1.	5-11D 521 5 PPB		13 May 2011 12:1
26	8	0512025.D	1.	050211-MB		13 May 2011 12:4
27	2	0512026.D	1.	5-11C 521 2 PPB		13 May 2011 13:2
28	8	0512027.D	1.	050211-MB		13 May 2011 14:0
29	9	0512028.D	1.	050211-LCS		13 May 2011 14:4
						13 May 2011 15:2

051211
5/17/11

DATA ANALYSIS PARAMETERS

Method Name: J:\MS16\METHODS\051211_D14.M

Percent Report Settings

Sort By: Signal

Output Destination

Screen: Yes
Printer: No
File: No

Integration Events: Meth Default

Generate Report During Run Method: No

Signal Correlation Window: 0.020

Qualitative Report Settings

Peak Location of Unknown: Apex

Library to Search Minimum Quality
L:\DATABASE\NIST98.L 0

Integration Events: Meth Default

Report Type: Summary

Output Destination

Screen: No
Printer: Yes
File: No

Generate Report During Run Method: No

Quantitative Report Settings

Report Type: Summary

Output Destination

Screen: No
Printer: Yes
File: No

Generate Report During Run Method: Yes

Reference Window: 0.60 Minutes
Non-Reference Window: 1.00 Minutes
Correlation Window: 0.05 minutes
Default Multiplier: 1.00
Default Sample Concentration: 0.00

Compound Information

1) NDPA-d14 (ISTD)

Ret. Time 20.11 min., Extract & Integrate from 19.81 to 20.41 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 97.00			*** METH DEFAULT ***
Q1 145.00	27.70	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	50.000	33124
2	50.000	32642
3	50.000	33027
4	50.000	34066
5	50.000	30941
6	50.000	30878

Qualifier Peak Analysis OFF ISTD conc: 50.000 ug/L
Curve Fit: Avg. RF

2) NDEA-d10 ()

Ret. Time 14.98 min., Extract & Integrate from 14.68 to 15.28 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 81.00			*** METH DEFAULT ***
Q1 113.00	4.70	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	50.000	-1
2	50.000	-1
3	50.000	-1
4	50.000	-1
5	50.000	-1
6	50.000	-1

Qualifier Peak Analysis OFF
Curve Fit: Avg. RF

3) NDMA-d6 ()

Ret. Time 10.43 min., Extract & Integrate from 10.13 to 10.73 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 50.00			*** METH DEFAULT ***

Q1 81.00 8.40 20.0

*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	2027
2	2.000	4501
3	5.000	14037
4	10.000	30941
5	20.000	64495
6	50.000	226827

Qualifier Peak Analysis OFF

Curve Fit: Quadratic

4) NDMA ()

Ret. Time 10.55 min., Extract & Integrate from 10.25 to 10.85 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 47.00			*** METH DEFAULT ***
Q1 75.00	12.60	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	736
2	2.000	1325
3	5.000	4463
4	10.000	8429
5	20.000	17071
6	50.000	69326

Qualifier Peak Analysis OFF

Curve Fit: Quadratic

5) NMEA ()

Ret. Time 13.13 min., Extract & Integrate from 12.82 to 13.43 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 61.00			*** METH DEFAULT ***
Q1 89.00	9.40	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	4469
2	2.000	9214
3	5.000	29471
4	10.000	60836
5	20.000	126903
6	50.000	353142

Qualifier Peak Analysis OFF

Curve Fit: Quadratic

6) NDEA ()

Ret. Time 15.24 min., Extract & Integrate from 14.94 to 15.54 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 75.00			*** METH DEFAULT ***
Q1 103.00	13.00	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
--------	-------------	----------

1	1.000	543
2	2.000	1201
3	5.000	3824
4	10.000	7990
5	20.000	15844
6	50.000	41484

Qualifier Peak Analysis OFF

Curve Fit: Quadratic

7) NDPA ()

Ret. Time 20.42 min., Extract & Integrate from 20.12 to 20.72 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 89.00			*** METH DEFAULT ***
Q1 131.00	9.80	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	565
2	2.000	1341
3	5.000	4167
4	10.000	8465
5	20.000	17439
6	50.000	45632

Qualifier Peak Analysis OFF

Curve Fit: Quadratic

8) NPYR ()

Ret. Time 22.75 min., Extract & Integrate from 22.45 to 23.05 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 55.00			*** METH DEFAULT ***
Q1 101.00	12.10	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	4102
2	2.000	9115
3	5.000	26752
4	10.000	59611
5	20.000	119028
6	50.000	303697

Qualifier Peak Analysis OFF

Curve Fit: Quadratic

9) NPIP ()

Ret. Time 23.66 min., Extract & Integrate from 23.36 to 23.96 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 69.00			*** METH DEFAULT ***
Q1 115.00	12.60	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	7526
2	2.000	15898
3	5.000	47284

4	10.000	102967
5	20.000	206391
6	50.000	519935

Qualifier Peak Analysis OFF
Curve Fit: Quadratic

10) NDBA ()

Ret. Time 25.83 min., Extract & Integrate from 25.53 to 26.13 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 57.00			*** METH DEFAULT ***
Q1 159.00	14.10	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	1432
2	2.000	4540
3	5.000	16066
4	10.000	34476
5	20.000	79619
6	50.000	192628

Qualifier Peak Analysis OFF
Curve Fit: Quadratic

END OF DATA ANALYSIS PARAMETERS

Fri May 13 10:00:11 2011

Response Factor Report MS16

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL 10502
 Last Update : Fri May 13 09:55:14 2011
 Response via : Initial Calibration

Calibration Files

1 =0512015.D 2 =0512016.D 3 =0512017.D
 4 =0512018.D 5 =0512019.D 6 =0512020.D

Compound	1	2	3	4	5	6	Avg	%RSD
-----ISTD-----								
1) I NDPA-d14								
2) NDEA-d10							0.000#	-1.00
3) s NDMA-d6	3.060	3.447	4.250	4.541	5.211	7.346	4.643	32.99
4) m NDMA	1.111	1.015	1.351	1.237	1.379	2.245	1.390	31.77
5) m NMEA	0.675	0.706	0.892	0.893	1.025	1.144	0.889	E1 20.31
6) m NDEA	0.820	0.920	1.158	1.173	1.280	1.343	1.116	18.37
7) m NDPA	0.853	1.027	1.262	1.242	1.409	1.478	1.212	19.39
8) m NPYR	6.192	6.981	8.100	8.749	9.617	9.835	8.246	17.57
9) m NPIP	1.136	1.218	1.432	1.511	1.668	1.684	1.441	E1 15.77
10) m NDBA	2.162	3.477	4.865	5.060	6.433	6.238	4.706	34.87

Data File : J:\MS16\DATA\051211-521\0512015.D
 Acq On : 12 May 11 18:58
 Sample : 5-11B 521 1 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 08:15:12 2011

Vial: 1
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL_10500
 Last Update : Thu May 12 17:17:45 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.10	97	33124	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	2027	1.14	ug/L	0.00
Target Compounds						
4) NDMA	10.54	47	736	0.71	ug/L	Qvalue 82
5) NMEA	13.13	61	4469	1.11	ug/L	95
6) NDEA	15.22	75	543	0.73	ug/L	90
7) NDPA	20.39	89	565	0.69	ug/L	89
8) NPYR	22.73	55	4102	0.79	ug/L	99
9) NPIP	23.65	69	7526	0.83	ug/L	96
10) NDBA	25.83	57	1432	2.06	ug/L	87

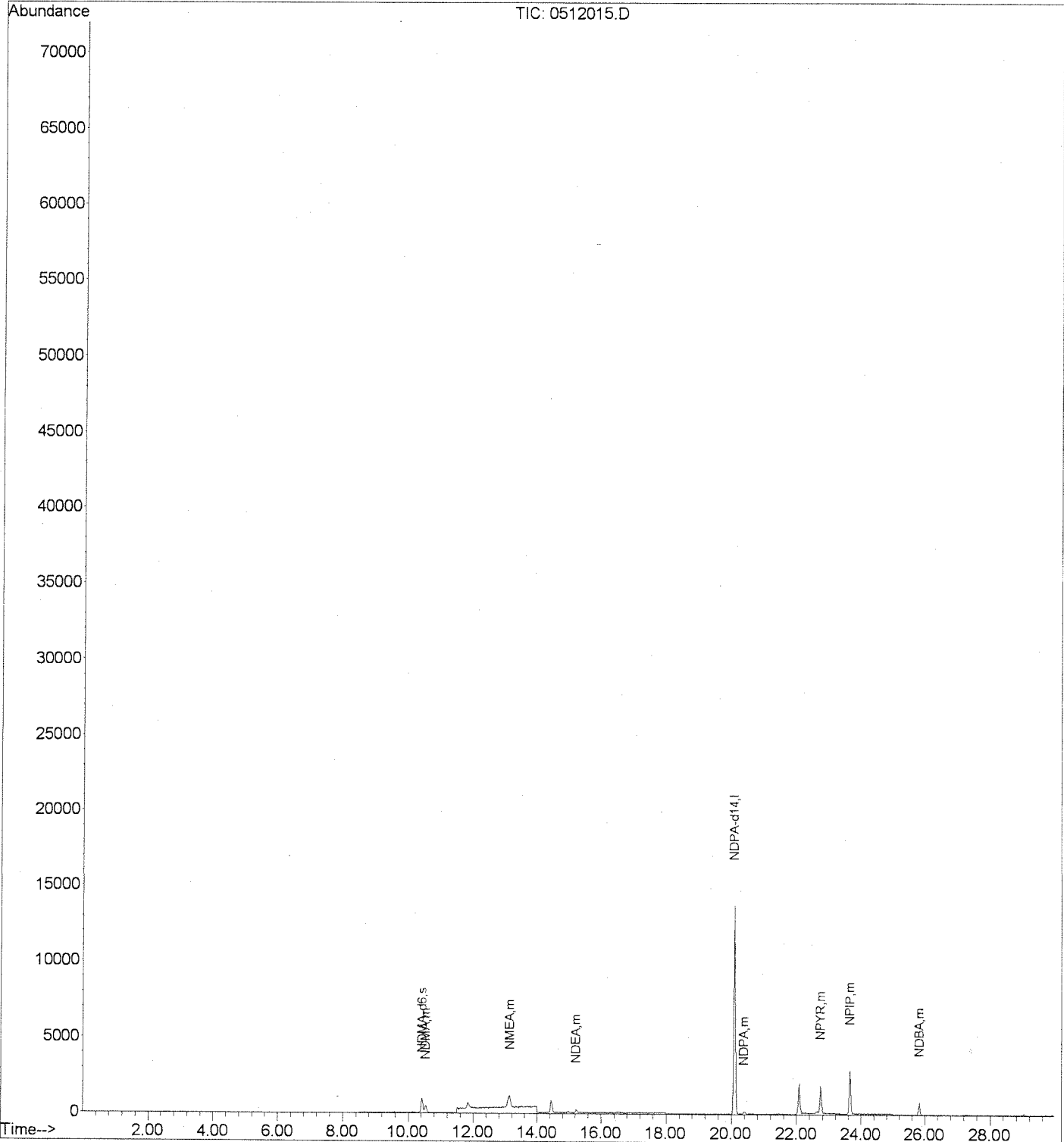
Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512015.D
Acq On : 12 May 11 18:58
Sample : 5-11B 521 1 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011

Vial: 1
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL_10500
Last Update : Fri May 13 08:21:18 2011
Response via : Initial Calibration



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Data File : J:\MS16\DATA\051211-521\0512016.D
 Acq On : 12 May 11 19:37
 Sample : 5-11C 521 2 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 08:15:12 2011

Vial: 2
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL 10500
 Last Update : Thu May 12 17:20:23 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.11	97	32642	50.00	ug/L	0.00
System Monitoring Compounds						
3) NDMA-d6	10.41	50	4501	1.93	ug/L	-0.02
Target Compounds						Qvalue
4) NDMA	10.54	47	1325	1.30	ug/L	86
5) NMEA	13.12	61	9214	1.88	ug/L	90
6) NDEA	15.22	75	1201	1.64	ug/L	86
7) NDPA	20.39	89	1341	1.66	ug/L	98
8) NPYR	22.74	55	9115	1.77	ug/L	90
9) NPIP	23.64	69	15898	1.77	ug/L	97
10) NDBA	25.81	57	4540	2.57	ug/L	97

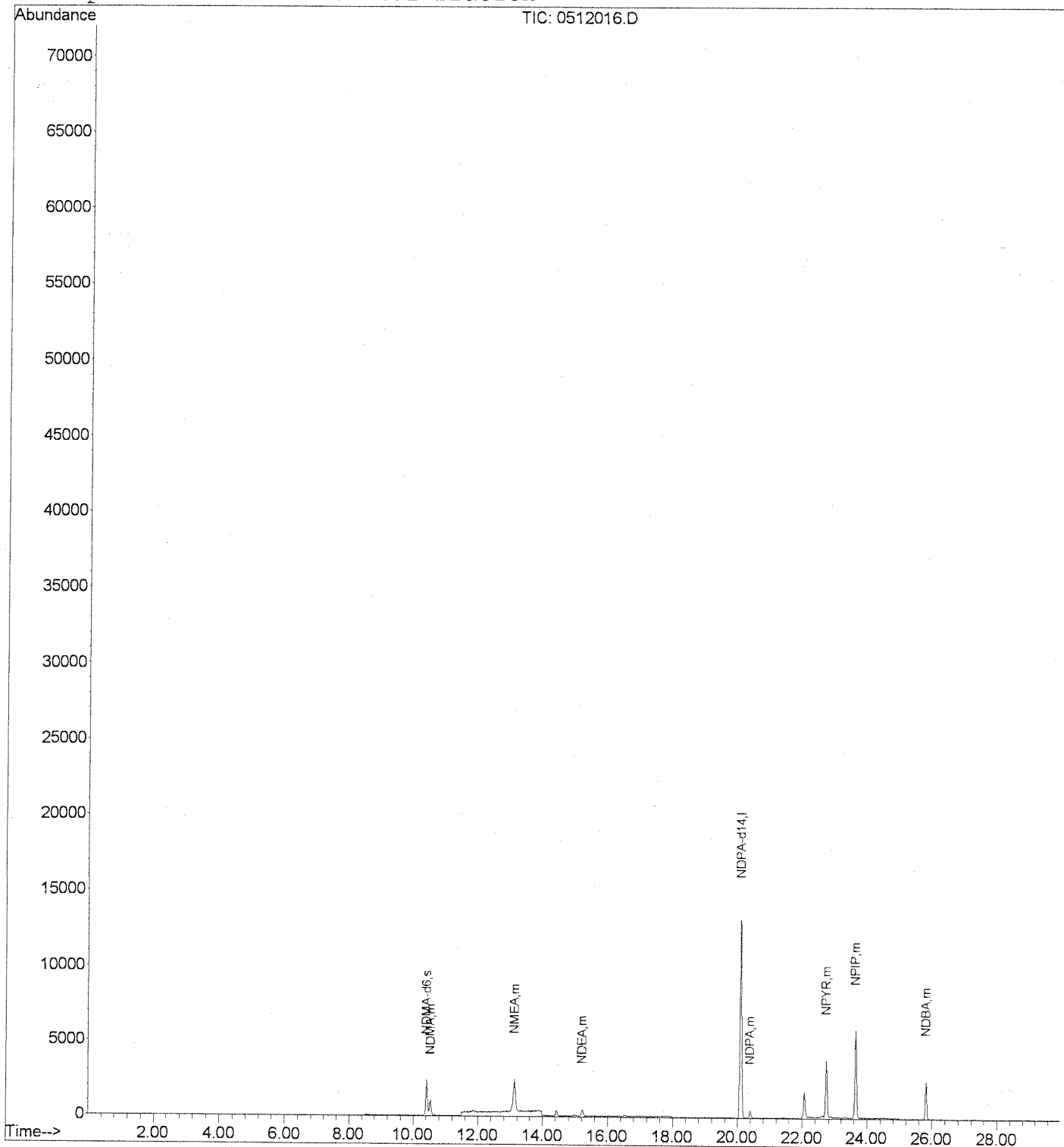
6-7-11

Data File : J:\MS16\DATA\051211-521\0512016.D
Acq On : 12 May 11 19:37
Sample : 5-11C 521 2 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011

Vial: 2
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL_10500
Last Update : Fri May 13 08:21:18 2011
Response via : Initial Calibration



Handwritten signature

Data File : J:\MS16\DATA\051211-521\0512017.D
 Acq On : 12 May 11 20:16
 Sample : 5-11D 521 5 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 08:15:13 2011

Vial: 3
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL_10500
 Last Update : Thu May 12 17:20:23 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

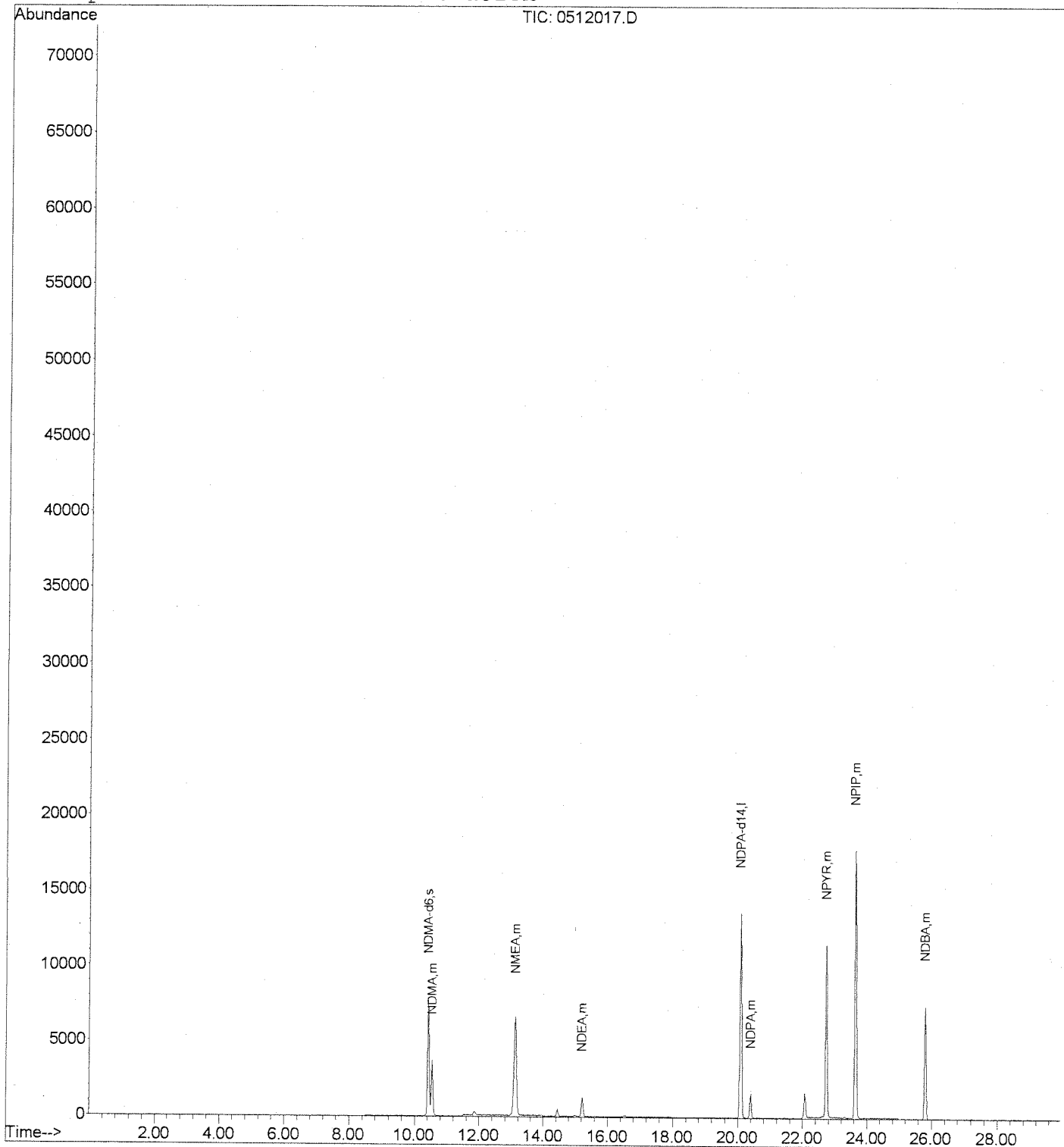
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	33027	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	14037	4.91	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.54	47	4463	4.38	ug/L	68
5) NMEA	13.12	61	29471	5.09	ug/L	93
6) NDEA	15.22	75	3824	5.15	ug/L	76
7) NDPA	20.41	89	4167	5.10	ug/L	73
8) NPYR	22.73	55	26752	5.15	ug/L	81
9) NPIP	23.64	69	47284	5.21	ug/L	94
10) NDBA	25.82	57	16066	4.47	ug/L	88

Data File : J:\MS16\DATA\051211-521\0512017.D
Acq On : 12 May 11 20:16
Sample : 5-11D 521 5 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011

Vial: 3
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL 10500
Last Update : Fri May 13 08:21:18 2011
Response via : Initial Calibration



Data File : J:\MS16\DATA\051211-521\0512018.D
 Acq On : 12 May 11 20:55
 Sample : 5-11E 521 10 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 08:15:13 2011

Vial: 4
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL 10500
 Last Update : Thu May 12 17:20:23 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	34066	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	30941	10.05	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.53	47	8429	8.17	ug/L	67
5) NMEA	13.11	61	60836	9.78	ug/L	87
6) NDEA	15.21	75	7990	10.43	ug/L	55
7) NDPA	20.39	89	8465	10.04	ug/L	87
8) NPYR	22.73	55	59611	11.12	ug/L	76
9) NPIP	23.64	69	102967	11.00	ug/L	90
10) NDBA	25.81	57	34476	7.48	ug/L	87

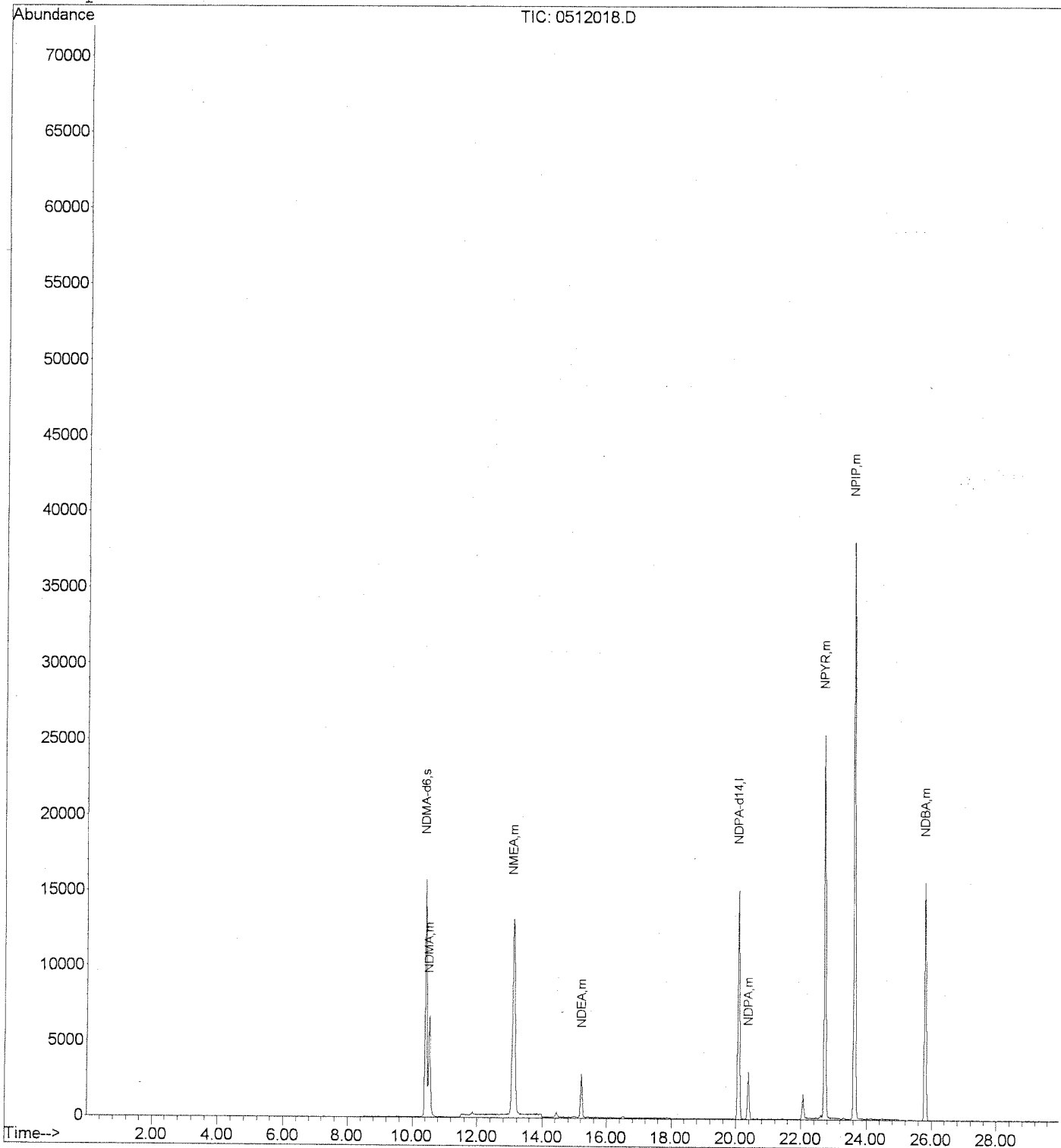
Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512018.D
Acq On : 12 May 11 20:55
Sample : 5-11E 521 10 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011

Vial: 4
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL 10500
Last Update : Fri May 13 08:21:18 2011
Response via : Initial Calibration



Data File : J:\MS16\DATA\051211-521\0512019.D
 Acq On : 12 May 11 21:34
 Sample : 5-11F 521 20 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 08:15:13 2011

Vial: 5
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL_10500
 Last Update : Thu May 12 17:20:23 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

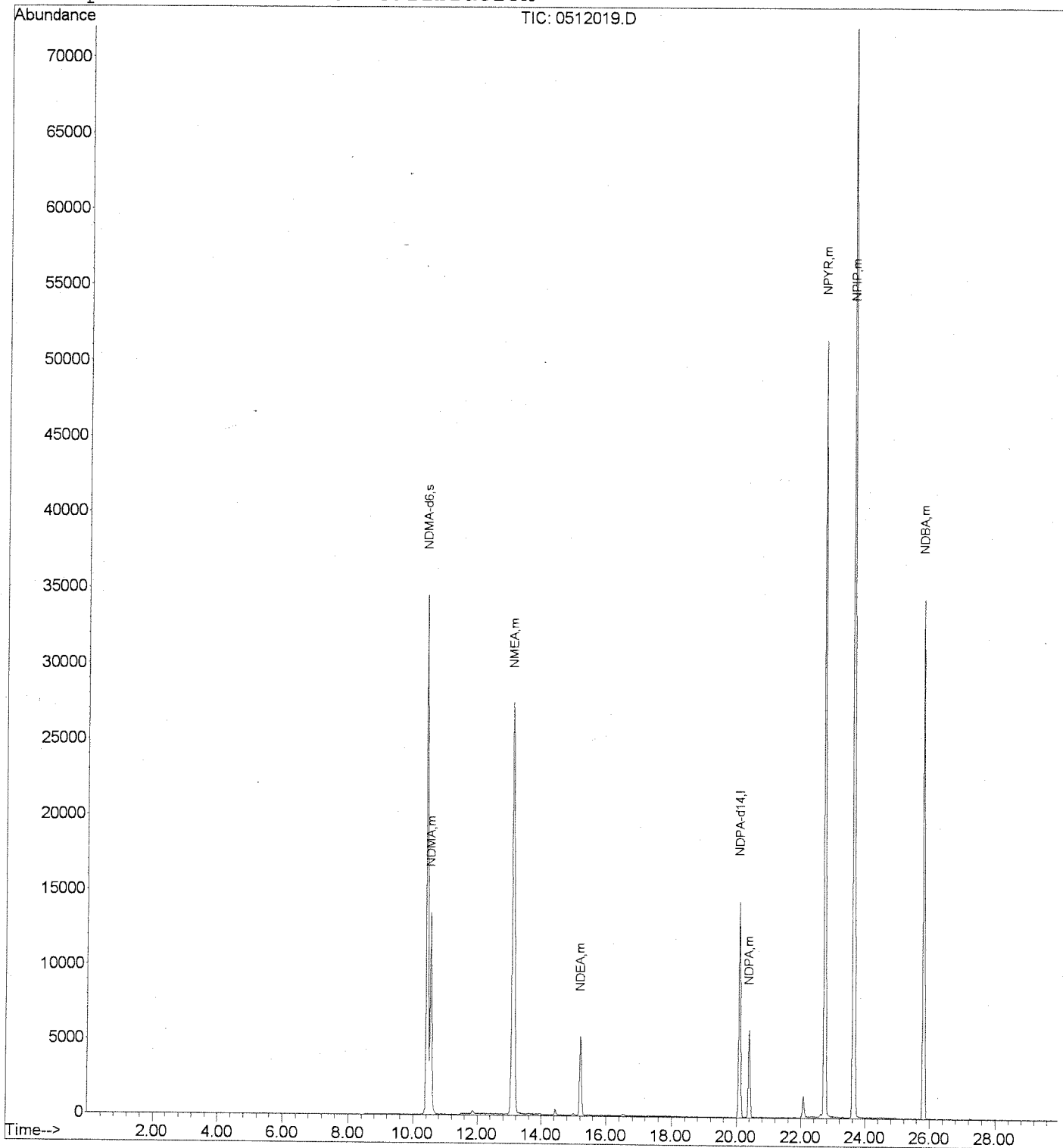
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	30941	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	64495	23.27	ug/L	0.00
Target Compounds						
4) NDMA	10.55	47	17071	19.26	ug/L	22
5) NMEA	13.13	61	126903	21.89	ug/L	88
6) NDEA	15.21	75	15844	22.76	ug/L	71
7) NDPA	20.39	89	17439	22.78	ug/L	95
8) NPYR	22.73	55	119028	24.45	ug/L	75
9) NPIP	23.64	69	206391	24.28	ug/L	90
10) NDBA	25.81	57	79619	17.80	ug/L	87

Data File : J:\MS16\DATA\051211-521\0512019.D
Acq On : 12 May 11 21:34
Sample : 5-11F 521 20 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 8:18 2011

Vial: 5
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL 10500
Last Update : Fri May 13 08:21:18 2011
Response via : Initial Calibration



Handwritten signature

Data File : J:\MS16\DATA\051211-521\0512020.D
 Acq On : 12 May 11 22:13
 Sample : 5-11G 521 50 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 08:15:13 2011

Vial: 6
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL_10500
 Last Update : Thu May 12 17:20:23 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)	
1) NDPA-d14	20.10	97	30878	50.00	ug/L	-0.02	
System Monitoring Compounds							
3) NDMA-d6	10.42	50	226827	109.62	ug/L	-0.01	
Target Compounds							
4) NDMA	10.54	47	69326	Below Cal			Qvalue 59
5) NMEA	13.11	61	353142	59.78	ug/L		80
6) NDEA	15.21	75	41484	59.72	ug/L		51
7) NDPA	20.39	89	45632	59.73	ug/L		80
8) NPYR	22.74	55	303697	62.51	ug/L		55
9) NPIP	23.64	69	519935	61.28	ug/L		76
10) NDBA	25.82	57	192628	Below Cal			96

W. S. M.

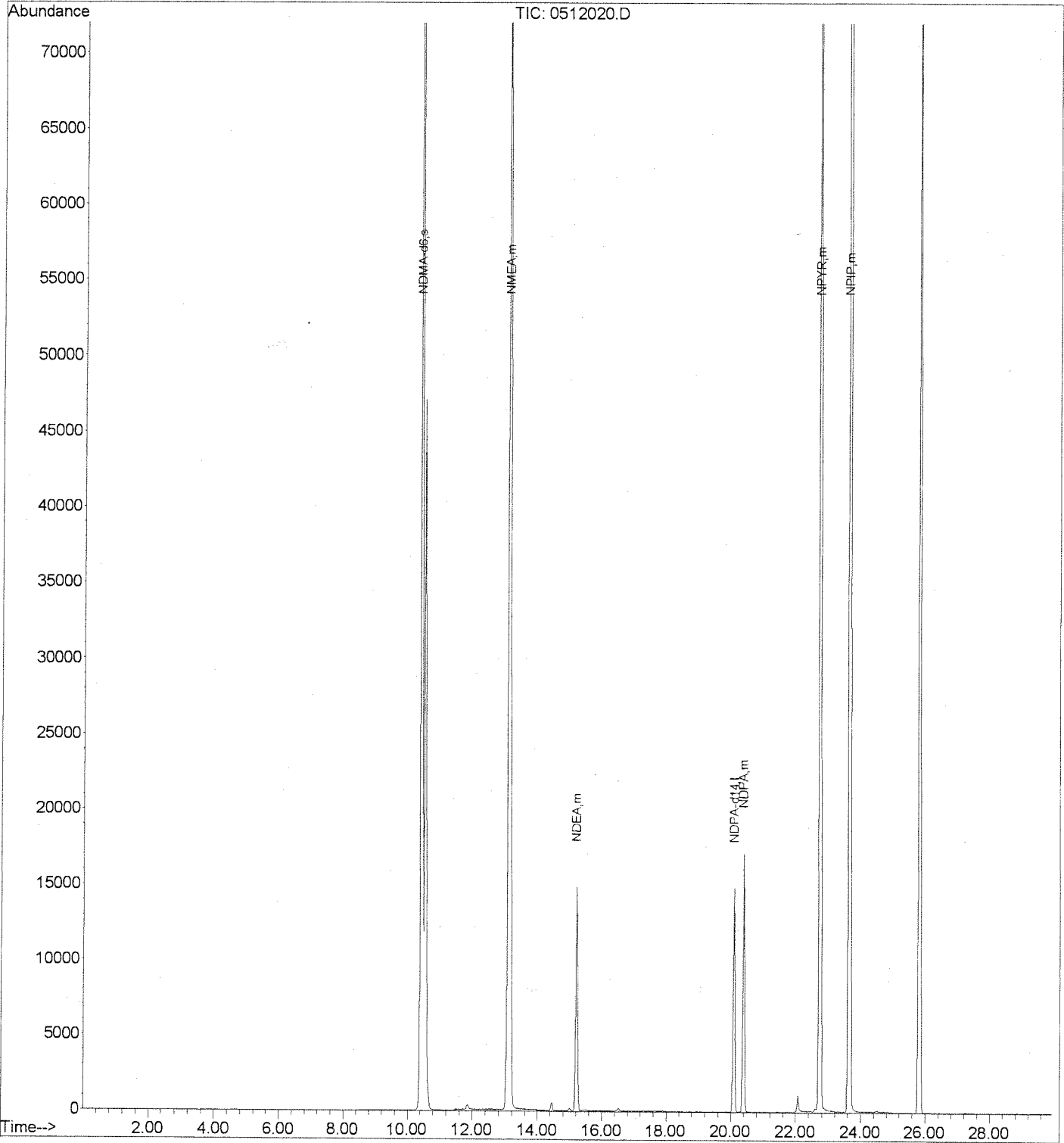
Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512020.D
Acq On : 12 May 11 22:13
Sample : 5-11G 521 50 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 8:18 2011

Vial: 6
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL 10500
Last Update : Fri May 13 08:21:18 2011
Response via : Initial Calibration



CO51211

Data File : J:\MS16\DATA\051211-521\0512021.D
 Acq On : 12 May 11 22:52
 Sample : 5-11H 521 ICV10 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 09:55:22 2011

Vial: 7
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL 10500
 Last Update : Fri May 13 09:55:14 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

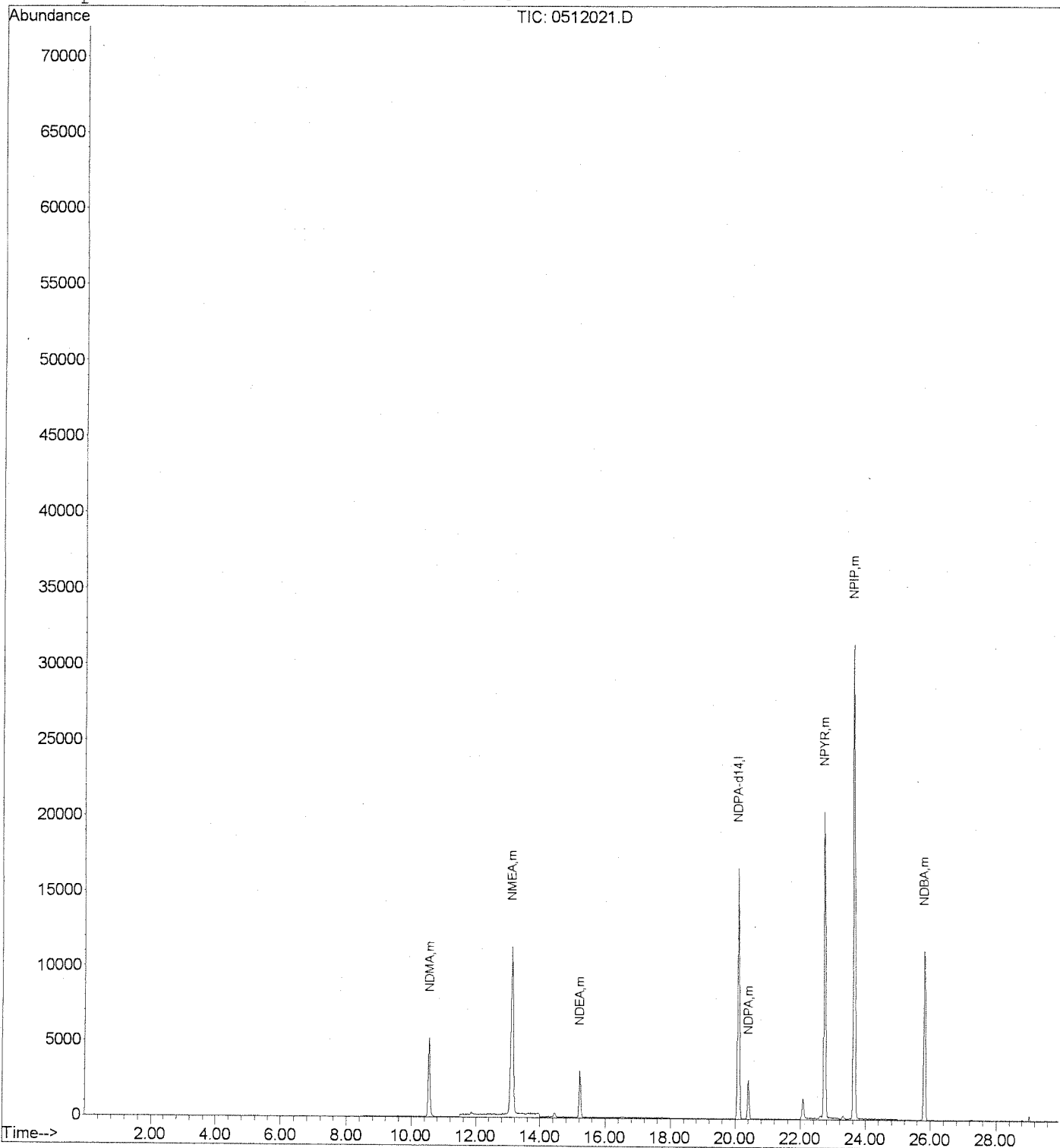
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	31927	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	0.00	50	0	0.00	ug/L	
Target Compounds						Qvalue
4) NDMA	10.56	47	5601	7.57	ug/L	# 1
5) NMEA	13.12	61	47068	7.97	ug/L	65
6) NDEA	15.21	75	6866	8.91	ug/L	# 21
7) NDPA	20.40	89	6440	7.77	ug/L	88
8) NPYR	22.74	55	48532	8.45	ug/L	85
9) NPIP	23.64	69	85018	8.49	ug/L	93
10) NDBA	25.81	57	27438	7.81	ug/L	86

Data File : J:\MS16\DATA\051211-521\0512021.D
Acq On : 12 May 11 22:52
Sample : 5-11H 521 ICV10 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 9:55 2011

Vial: 7
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL 10500
Last Update : Fri May 13 09:55:14 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Date Analyzed: 05/13/2011

**Continuing Calibration Verification Summary
 Nitrosamines by EPA 521**

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/12/2011
Calibration ID: CAL10502
Analysis Lot: KWG1104312
Units: ug/L

File ID: J:\MS16\DATA\051211-521\0512024.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	5.0	5.5		4.64	4.53	NA	9	± 50 %	Quadratic
N-Nitrosodimethylamine	5.0	4.6		1.39	1.00	NA	-9	± 50 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound


Exception Report

Data File: J:\MS16\DATA\051211-521\0512024.D
Lab ID: KWG1104312-2
RunType: CCV
Matrix: NOT APPLICABLE

Date Acquired: 05/13/2011 00:49
Date Quantitated: 05/13/2011 11:24
Batch ID: KWG1104312
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	

Primary Review: WJ1314
Secondary Review: 

Quantitation Report

Bottle ID:	Tier:	Matrix:	NOT APPLICABLE
Prod Code: 521 NITROSAMINE	Collect Date:	Receive Date:	05/13/2011

Analysis Lot: KWG1104312	Prep Lot:	Report Group:
Analysis Method: 521	Prep Method:	
Prep Ref:	Prep Date:	

Quant Method: J:\MS16\METHODS\051211_D14.M	Calibration ID: CAL10502
Title:	
Tune Ref: J:\MS16\DATA\051211-521\0512022.D	Method ID: MJ808
MB Ref:	Quant based on Method

Data File: J:\MS16\DATA\051211-521\0512024.D	Instrument: MS16
Acqu Date: 05/13/2011 00:49	Quant Date: 05/13/2011 11:24
Run Type: CCV	Vial: 3
Lab ID: KWG1104312-2	Dilution: 1.0
	Soln Conc. Units: ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.10	0.01	97	33516	50.00	OK
1	N-Nitrosodiethylamine-d10			81	0		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.43			50	15183	5.47		70-130	NA

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine	10.52			47	3365	4.55			
1	N-Nitrosomethylethylamine	13.12			61	29595	5.03			
1	N-Nitrosodiethylamine	15.21			75	3786	4.95			
1	N-Nitrosodi-n-propylamine	20.39			89	4433	5.30			
1	N-Nitrosopyrrolidine	22.75			55	27913	4.92			
1	N-Nitrosopiperidine	23.64			69	51391	5.15			
1	N-Nitrosodi-n-butylamine	25.83			57	16082	4.71			

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512024.D
 Acq On : 13 May 2011 00:49
 Sample : 5-11D 521 5 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 11:24:25 2011

Vial: 3
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL 10502
 Last Update : Fri May 13 10:05:05 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)	
1) NDPA-d14	20.10	97	33516	50.00	ug/L	-0.01	
System Monitoring Compounds							
3) NDMA-d6	10.43	50	15183	5.47	ug/L	0.00	
Target Compounds							
4) NDMA	10.52	47	3365	4.55	ug/L		Qvalue 70
5) NMEA	13.12	61	29595	5.03	ug/L		75
6) NDEA	15.21	75	3786	4.95	ug/L	#	51
7) NDPA	20.39	89	4433	5.30	ug/L		90
8) NPYR	22.75	55	27913	4.92	ug/L		98
9) NPIP	23.64	69	51391	5.15	ug/L		97
10) NDBA	25.83	57	16082	4.71	ug/L		82

(#) = qualifier out of range (m) = manual integration
 0512024.D 051211_D14.M Fri May 13 12:52:50 2011

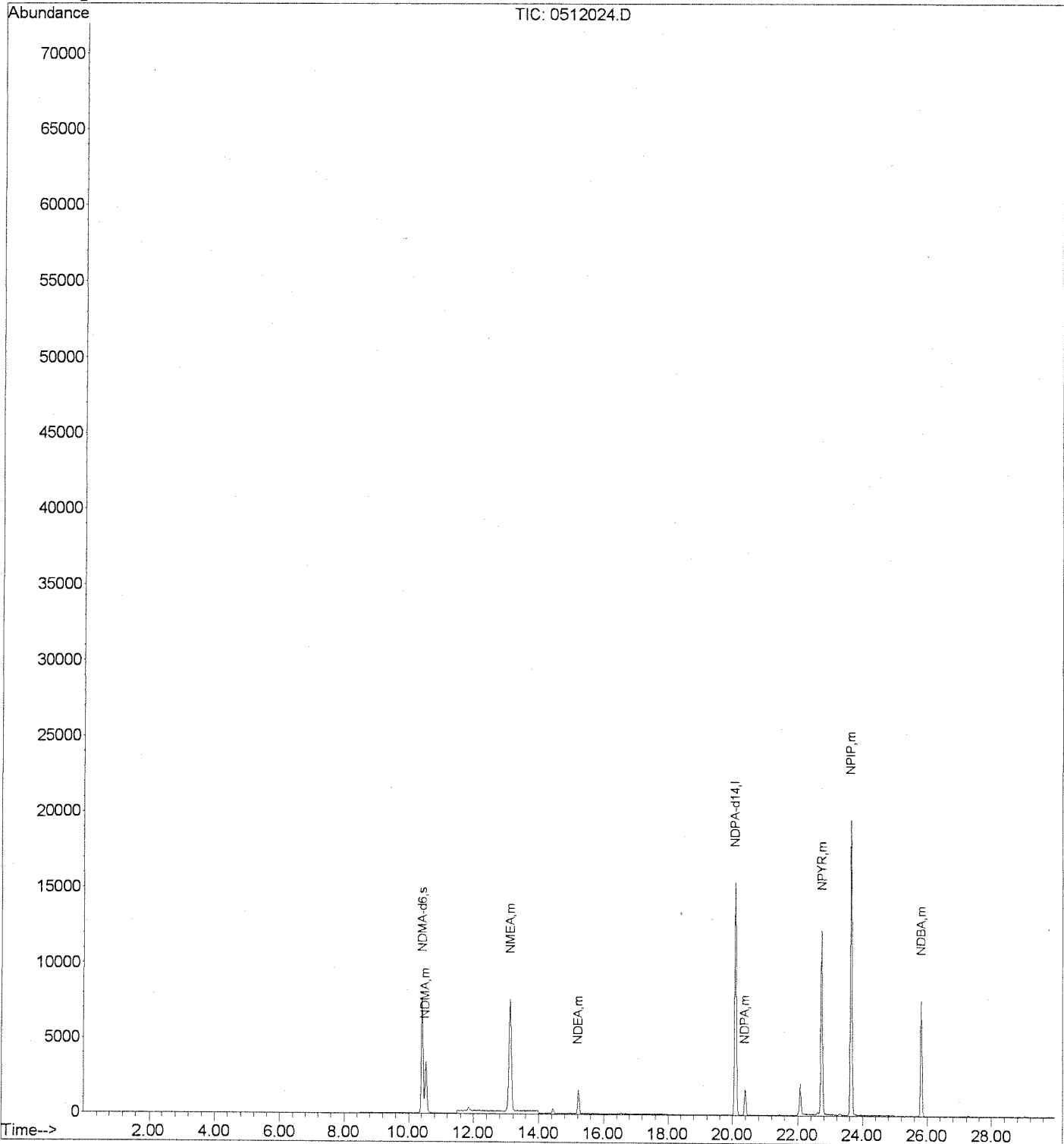
Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512024.D
Acq On : 13 May 2011 00:49
Sample : 5-11D 521 5 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24 2011

Vial: 3
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Date Analyzed: 05/13/2011

**Continuing Calibration Verification Summary
 Nitrosamines by EPA 521**

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/12/2011
Calibration ID: CAL10502
Analysis Lot: KWG1104312
Units: ug/L

File ID: J:\MS16\DATA\051211-521\0512035.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	10	11		4.64	4.96	NA	9	± 50 %	Quadratic
N-Nitrosodimethylamine	10	9.5		1.39	1.14	NA	-5	± 50 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

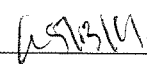
Exception Report

Data File: J:\MS16\DATA\051211-521\0512035.D
Lab ID: KWG1104312-3
RunType: CCV
Matrix: NOT APPLICABLE

Date Acquired: 05/13/2011 07:58
Date Quantitated: 05/13/2011 11:24
Batch ID: KWG1104312
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	

Primary Review: 

Secondary Review: 

Quantitation Report

Bottle ID:	Tier:	Matrix:
Prod Code: 521 NITROSAMINE	Collect Date:	NOT APPLICABLE
		Receive Date: 05/13/2011

Analysis Lot: KWG1104312	Prep Lot:	Report Group:
Analysis Method: 521	Prep Method:	
Prep Ref:	Prep Date:	

Quant Method: J:\MS16\METHODS\051211_D14.M	Calibration ID: CAL10502
Title:	
Tune Ref: J:\MS16\DATA\051211-521\0512022.D	Method ID: MJ808
MB Ref:	Quant based on Method

Data File: J:\MS16\DATA\051211-521\0512035.D	Instrument: MS16
Acqu Date: 05/13/2011 07:58	Quant Date: 05/13/2011 11:24
Run Type: CCV	Vial: 4
Lab ID: KWG1104312-3	Dilution: 1.0
	Soln Conc. Units: ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.09	0.00	97	32248	50.00	OK
1	N-Nitrosodiethylamine-d10			81	0		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.44			50	32011	10.86		70-130	NA

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Final Conc. Units: ng/L		Q	Rpt?
							Solution Conc	Final Conc		
1	N-Nitrosodimethylamine	10.56			47	7370	9.50			
1	N-Nitrosomethylethylamine	13.12			61	60530	9.93			
1	N-Nitrosodiethylamine	15.23			75	7721	9.85			
1	N-Nitrosodi-n-propylamine	20.41			89	9195	10.71			
1	N-Nitrosopyrrolidine	22.75			55	55694	9.51			
1	N-Nitrosopiperidine	23.66			69	96749	9.49			
1	N-Nitrosodi-n-butylamine	25.84			57	33749	9.33			

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 D: Compound manually deleted
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512035.D
 Acq On : 13 May 2011 07:58
 Sample : 5-11E 521 10 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 11:24:28 2011

Vial: 4
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL_10502
 Last Update : Fri May 13 10:05:05 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	32248	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.44	50	32011	10.86	ug/L	0.00
Target Compounds						
4) NDMA	10.56	47	7370	9.50	ug/L	# 42
5) NMEA	13.12	61	60530	9.93	ug/L	77
6) NDEA	15.23	75	7721	9.85	ug/L	# 41
7) NDPA	20.41	89	9195	10.71	ug/L	# 31
8) NPYR	22.75	55	55694	9.51	ug/L	83
9) NPIP	23.66	69	96749	9.49	ug/L	86
10) NDBA	25.84	57	33749	9.33	ug/L	58

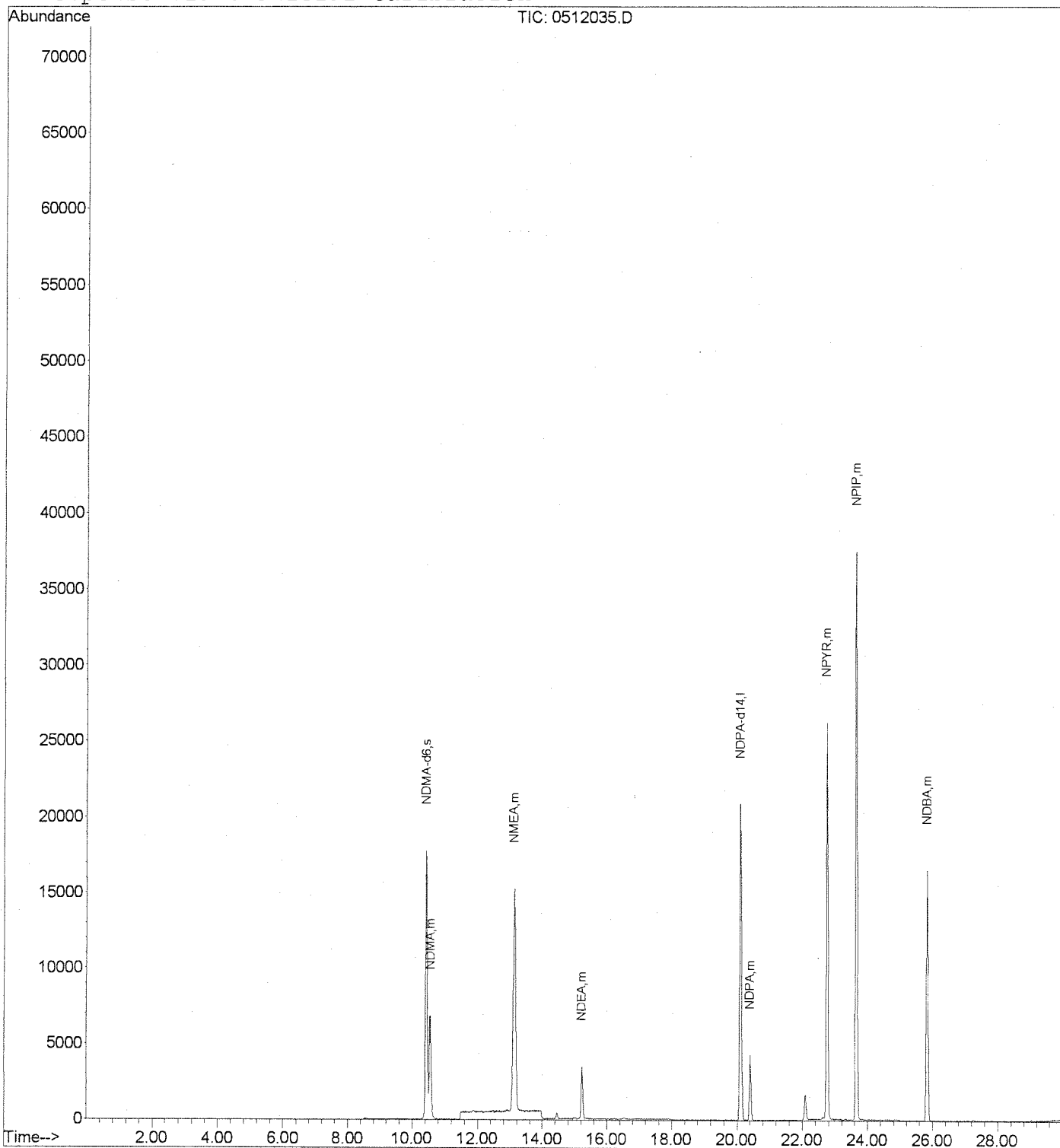
Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512035.D
Acq On : 13 May 2011 07:58
Sample : 5-11E 521 10 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24 2011

Vial: 4
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



Organic Analysis:
Nitrosamines by EPA 521

Validation Package

Sample Prep and Screen Data

Preparation Information

Group ID: KWG1103886	Prep Method: METHOD	Prep Date: 05/02/11 08:00
Department: Semivoa GC		

Lab Code	Client ID	Product	Matrix	Amt. Ext.	Final Vol.
KWG1103886-1	Matrix Spike	521 Nitrosamines	WATER	500ml	1ml
KWG1103886-2	Duplicate Matrix Spike	521 Nitrosamines	WATER	500ml	1ml
KWG1103886-3	Lab Control Sample	521 Nitrosamines	DRINKING	500ml	1ml
KWG1103886-4	Method Blank	521 Nitrosamines	DRINKING	500ml	1ml
P1101579-005	MW-24-1	521 Nitrosamines	WATER	500ml	1ml
P1101605-005	MW-4-1	521 Nitrosamines	WATER	500ml	1ml
P1101607-001	MW-13	521 Nitrosamines	WATER	500ml	1ml

Lab Code	Parent Lab Code	Comments
KWG1103886-1	P1101607-001	
KWG1103886-2	P1101607-001	

Lab Code	Prep Event ID	Surrogate Solution ID	Amount Added	Spike Solution ID	Amount Added	Witness
KWG1103886-1	1015268	DWSTD04-940	10uL	DWSTD05-81	100uL	
KWG1103886-2	1015269	DWSTD04-940	10uL	DWSTD05-81	100uL	
KWG1103886-3	1015270	DWSTD04-940	10uL	DWSTD05-81	100uL	
KWG1103886-4	1015271	DWSTD04-940	10uL			
P1101579-005	1015266	DWSTD04-940	10uL			
P1101605-005	1015267	DWSTD04-940	10uL			
P1101607-001	1015265	DWSTD04-940	10uL			

Comments: _____

Started By: RHayes Assisted By: _____ Training
Yes No

Completed By: RHayes Assisted By: _____ Yes No

Reviewed By: [Signature] Date: 5/13/11 Storage: 25A-F-06

Chain of Custody

Relinquished By: <u>[Signature]</u>	Date: <u>5/2/11</u>	Extracts Examined Yes <input checked="" type="radio"/> No <input type="radio"/>
Received By: <u>[Signature]</u>	Date: <u>5/2/11</u>	

COLUMBIA ANALYTICAL SERVICES, INC.

Service Request No.: As listed

Date Extracted: 5-2-11

Analyst: Rob Hoyle

Method: EPA 521

StarLims Run : _____

Nitrosoamines in Water

Lab ID	Client ID	Sample Volume	Surr	MS	Residual Chlorine	Final Volume
P1101579-005	ASTD 10 mL	500 mL	10 mL		<0.1	1 mL
P1101605-005	↓	↓	↓	↓	↓	↓
P1101607-001						
MB						
LCS						
P1101607-001 MS	↓	↓	↓	↓	↓	↓
P1101607-001 DMS						

Comments: _____

DCM Lot # DD020 MeOH Lot # DD471 Sulfate Lot # 3-15-11-BF-1002
 SPE Cartridge Lot # 903180-EL

Surrogate ID: DWSTD04-940 1ppm xP 5/5/11 ISTD: DWSTD04-990 5ppm xP: 8/7/11

Spike ID: DWSTD05-8 I 100ppb xP 10/18/11

Vial: Amber Extract Storage: ZISA-F-06 Extracts Received: u 5/2/11

Reviewed By:	Date:
--------------	-------

Preparation Information Benchsheet

Prep Run#: 133014

Prep WorkFlow: OrgExtDW(14/28)

Status: Draft

Team: Semivoa GC

Prep Method: Method

Prep Date/Time: 5/2/11 10:08 AM

Number of Copies to make: 3

#	Lab Code	Client ID	B#	✓	Test	Matrix	Amt Ext.	pH	Int Vol	Final Vol	Surr Added	Spike Added
1	P1101605-005	MW-4-1	.02	✓	521/Nitrosamines	Water						
2	P1101607-001	MW-13	.02	✓	521/Nitrosamines	Water						
3	P1101579-005	MW-24-1	.02	✓	521/Nitrosamines	Water						

Comments: used for ID only

Surrogate ID: _____ Spike ID: _____

Witnessed By: _____

Analyst: _____ Assisted By: _____

1,4-Dioxane

Organic Analysis:
1,4-Dioxane by GC/MS

Summary Package

Sample and QC Results

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607

Cover Page - Organic Analysis Data Package
1,4-Dioxane by GC/MS

Sample Name	Lab Code	Date Collected	Date Received
MW-13	P1101607-001	04/28/2011	04/28/2011

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: 

Name: Carl Degen

Date: 5/12/11

Title: SWR Supervisor

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Collected: 04/28/2011
Date Received: 04/28/2011

1,4-Dioxane by GC/MS

Sample Name: MW-13
Lab Code: P1101607-001
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	0.90 J	1.0	0.16	1	05/04/11	05/09/11	KWG1103961	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	94	42-112	05/09/11	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Collected: NA
Date Received: NA

1,4-Dioxane by GC/MS

Sample Name: Method Blank
Lab Code: KWG1103961-4
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	ND	U	1.0	0.16	1	05/04/11	05/09/11	KWG1103961	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	99	42-112	05/09/11	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607

Surrogate Recovery Summary
1,4-Dioxane by GC/MS

Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
Batch QC	P1101579-005	87
MW-13	P1101607-001	94
Method Blank	KWG1103961-4	99
Batch QCMS	KWG1103961-1	94
Batch QCDMS	KWG1103961-2	93
Lab Control Sample	KWG1103961-3	92

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Dioxane-d8 42-112

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
 Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
 Date Analyzed: 05/09/2011
 Time Analyzed: 13:02

Internal Standard Area and RT Summary
 1,4-Dioxane by GC/MS

File ID: J:\MS26\DATA\050911A\0509F010.D
 Instrument ID: MS26
 Analysis Method: 8270C SIM

Lab Code: KWG1104145-2
 Analysis Lot: KWG1104145

1,4-Dichlorobenzene-d4		
	Area	RT
Results ==>	84,266	7.17
Upper Limit ==>	168,532	7.67
Lower Limit ==>	42,133	6.67
ICAL Result ==>	84,266	7.17

Associated Analyses

Method Blank	KWG1103961-4	74,665	7.17
Lab Control Sample	KWG1103961-3	77,544	7.17
Batch QCMS	KWG1103961-1	79,462	7.17
Batch QCDMS	KWG1103961-2	83,825	7.17
Batch QC	P1101579-005	76,259	7.17
MW-13	P1101607-001	83,066	7.17

Results flagged with an asterisk (*) indicate values outside control criteria.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Extracted: 05/04/2011
Date Analyzed: 05/09/2011

**Matrix Spike/Duplicate Matrix Spike Summary
 1,4-Dioxane by GC/MS**

Sample Name: Batch QC
Lab Code: P1101579-005
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1103961

Analyte Name	Sample Result	Batch QCMS KWG1103961-1 Matrix Spike			Batch QCDMS KWG1103961-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
1,4-Dioxane	1.1	26.3	25.0	101	25.6	25.0	98	40-114	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Extracted: 05/04/2011
Date Analyzed: 05/09/2011

Lab Control Spike Summary
1,4-Dioxane by GC/MS

Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1103961

Analyte Name	Lab Control Sample KWG1103961-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
1,4-Dioxane	25.1	25.0	100	52-105

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Extracted: 05/04/2011
Date Analyzed: 05/09/2011
Time Analyzed: 14:42

Method Blank Summary
1,4-Dioxane by GC/MS

Sample Name: Method Blank
Lab Code: KWG1103961-4
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

File ID: J:\MS26\DATA\050911\0509F015.D
Instrument ID: MS26
Level: Low
Extraction Lot: KWG1103961

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1103961-3	J:\MS26\DATA\050911\0509F016.D	05/09/11	15:02
Batch QCMS	KWG1103961-1	J:\MS26\DATA\050911\0509F017.D	05/09/11	15:21
Batch QCDMS	KWG1103961-2	J:\MS26\DATA\050911\0509F018.D	05/09/11	15:41
Batch QC	P1101579-005	J:\MS26\DATA\050911\0509F019.D	05/09/11	16:01
MW-13	P1101607-001	J:\MS26\DATA\050911\0509F021.D	05/09/11	16:40

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Extracted: 05/04/2011
Date Analyzed: 05/09/2011
Time Analyzed: 15:02

Lab Control Sample Summary
1,4-Dioxane by GC/MS

Sample Name: Lab Control Sample
Lab Code: KWG1103961-3
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

File ID: J:\MS26\DATA\050911\0509F016.D
Instrument ID: MS26
Level: Low
Extraction Lot: KWG1103961

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1103961-4	J:\MS26\DATA\050911\0509F015.D	05/09/11	14:42
Batch QCMS	KWG1103961-1	J:\MS26\DATA\050911\0509F017.D	05/09/11	15:21
Batch QCDMS	KWG1103961-2	J:\MS26\DATA\050911\0509F018.D	05/09/11	15:41
Batch QC	P1101579-005	J:\MS26\DATA\050911\0509F019.D	05/09/11	16:01
MW-13	P1101607-001	J:\MS26\DATA\050911\0509F021.D	05/09/11	16:40

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Date Analyzed: 05/09/2011
Time Analyzed: 11:15

Tune Summary
1,4-Dioxane by GC/MS

File ID: J:\MS26\DATA\050911\0509F005.D
Instrument ID: MS26
Column:

Analysis Method: 8270C SIM
Analysis Lot: KWG1104145

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	12.7	700992	PASS
68	69	0	2	1.4	13150	PASS
69	198	0	100	17.7	972672	PASS
70	69	0	2	0.5	5066	PASS
127	198	10	80	36.3	1997824	PASS
197	198	0	2	0.0	0	PASS
198	442	30	100	69.9	5508096	PASS
199	198	5	9	6.8	373632	PASS
275	198	10	60	28.3	1558528	PASS
365	442	1	50	2.5	200064	PASS
441	443	0	100	70.8	1123328	PASS
442	442	100	100	100.0	7877632	PASS
443	442	15	24	20.1	1586688	PASS

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
Continuing Calibration Verification	KWG1104145-2	J:\MS26\DATA\050911A\0509F010.E	05/09/2011	13:02	
Method Blank	KWG1103961-4	J:\MS26\DATA\050911\0509F015.D	05/09/2011	14:42	
Lab Control Sample	KWG1103961-3	J:\MS26\DATA\050911\0509F016.D	05/09/2011	15:02	
Batch QCMS	KWG1103961-1	J:\MS26\DATA\050911\0509F017.D	05/09/2011	15:21	
Batch QCDMS	KWG1103961-2	J:\MS26\DATA\050911\0509F018.D	05/09/2011	15:41	
Batch QC	P1101579-005	J:\MS26\DATA\050911\0509F019.D	05/09/2011	16:01	
MW-13	P1101607-001	J:\MS26\DATA\050911\0509F021.D	05/09/2011	16:40	

Results flagged with an asterisk (*) indicate the analysis performed outside specified tune window

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Calibration Date: 05/09/2011

Initial Calibration Summary
1,4-Dioxane by GC/MS

Calibration ID: CAL10487
Instrument ID: MS26

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS26\DATA\050911\0509F007.D	E	J:\MS26\DATA\050911\0509F011.D
B	J:\MS26\DATA\050911\0509F008.D	F	J:\MS26\DATA\050911\0509F012.D
C	J:\MS26\DATA\050911\0509F009.D	G	J:\MS26\DATA\050911\0509F013.D
D	J:\MS26\DATA\050911\0509F010.D		

Analyte Name	Level			Level			Level			Level					
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF			
1,4-Dioxane	A	2.0	0.359	B	4.0	0.357	C	10	0.368	D	20	0.389	E	50	0.426
	F	100	0.432	G	200	0.450									
1,4-Dioxane-d8	A	2.0	0.369	B	4.0	0.357	C	10	0.368	D	20	0.403	E	50	0.403
	F	100	0.417	G	200	0.419									

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Calibration Date: 05/09/2011

Initial Calibration Summary
1,4-Dioxane by GC/MS

Calibration ID: CAL10487
Instrument ID: MS26

Column: MS

Analyte Name	Compound Type	Calibration Evaluation				RRF Evaluation			
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
1,4-Dioxane	MS	AverageRF	% RSD	9.6		≤ 15	0.397		0.01
1,4-Dioxane-d8	SURR	AverageRF	% RSD	6.6		≤ 15	0.391		0.01

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
 Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
 Calibration Date: 05/09/2011
 Date Analyzed: 05/09/2011

Second Source Calibration Verification
 1,4-Dioxane by GC/MS

Calibration Type: Internal Standard
 Analysis Method: 8270C SIM

Calibration ID: CAL10487
 Units: ng/ml

File ID: J:\MS26\DATA\050911\0509F014.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
1,4-Dioxane	20	22	0.397	0.445	12	NA	± 20 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Date Analyzed: 05/09/2011

**Continuing Calibration Verification Summary
 1,4-Dioxane by GC/MS**

Calibration Type: Internal Standard
Analysis Method: 8270C SIM

Calibration Date: 05/09/2011
Calibration ID: CAL10487
Analysis Lot: KWG1104145
Units: ng/ml

File ID: J:\MS26\DATA\050911A\0509F010.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
1,4-Dioxane	20	20	0.01	0.397	0.406	2	NA	± 20 %	AverageRF
1,4-Dioxane-d8	20	21	0.01	0.391	0.403	3	NA	± 20 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607

**Analysis Run Log
 1,4-Dioxane by GC/MS**

Analysis Method: 8270C SIM

Analysis Lot: KWG1104145
Instrument ID: MS26

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0509F005.D	GC/MS Tuning - Generic	KWG1104145-1	5/9/2011	11:15		5/9/2011	11:30
0509F010.D	Continuing Calibration Verification	KWG1104145-2	5/9/2011	13:02		5/9/2011	13:14
0509F015.D	Method Blank	KWG1103961-4	5/9/2011	14:42		5/9/2011	14:54
0509F016.D	Lab Control Sample	KWG1103961-3	5/9/2011	15:02		5/9/2011	15:14
0509F017.D	Batch QCMS	KWG1103961-1	5/9/2011	15:21		5/9/2011	15:33
0509F018.D	Batch QCDMS	KWG1103961-2	5/9/2011	15:41		5/9/2011	15:53
0509F019.D	Batch QC	P1101579-005	5/9/2011	16:01		5/9/2011	16:13
0509F020.D	ZZZZZZ	ZZZZZZ	5/9/2011	16:21		5/9/2011	16:33
0509F021.D	MW-13	P1101607-001	5/9/2011	16:40		5/9/2011	16:52

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Extracted: 05/04/2011

**Extraction Prep Log
 1,4-Dioxane by GC/MS**

Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Extraction Lot: KWG1103961
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
MW-13	P1101607-001	04/28/11	04/28/11	100ml	50ml	NA	
Method Blank	KWG1103961-4	NA	NA	100ml	50ml	NA	
Batch QCMS	KWG1103961-1	NA	NA	100ml	50ml	NA	
Batch QCDMS	KWG1103961-2	NA	NA	100ml	50ml	NA	
Batch QC	P1101579-005	NA	NA	100ml	50ml	NA	
Lab Control Sample	KWG1103961-3	NA	NA	100ml	50ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Organic Analysis:
1,4-Dioxane by GC/MS

Validation Package

Organic Analysis:
1,4-Dioxane by GC/MS

Validation Package

QC Reports

Client: Battelle
 Project: JPL-GW-2Q11/G005862 / JPL GWM
 Sample Matrix: Water

Service Request: P1101607

Surrogate Recovery Summary
1,4-Dioxane by GC/MS

Extraction Method: EPA 3510C
 Analysis Method: 8270C SIM

Units: PERCENT
 Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
Batch QC	P1101579-005	87
MW-13	P1101607-001	94
Method Blank	KWG1103961-4	99
Batch QCMS	KWG1103961-1	94
Batch QCDMS	KWG1103961-2	93
Lab Control Sample	KWG1103961-3	92

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Dioxane-d8 42-112

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Date Analyzed: 05/09/2011
Time Analyzed: 13:02

Internal Standard Area and RT Summary
1,4-Dioxane by GC/MS

File ID: J:\MS26\DATA\050911A\0509F010.D
Instrument ID: MS26
Analysis Method: 8270C SIM

Lab Code: KWG1104145-2
Analysis Lot: KWG1104145

1,4-Dichlorobenzene-d4		
	<u>Area</u>	<u>RT</u>
Results ==>	84,266	7.17
Upper Limit ==>	168,532	7.67
Lower Limit ==>	42,133	6.67
ICAL Result ==>	84,266	7.17

Associated Analyses

Method Blank	KWG1103961-4	74,665	7.17
Lab Control Sample	KWG1103961-3	77,544	7.17
Batch QCMS	KWG1103961-1	79,462	7.17
Batch QCDMS	KWG1103961-2	83,825	7.17
Batch QC	P1101579-005	76,259	7.17
MW-13	P1101607-001	83,066	7.17

Results flagged with an asterisk (*) indicate values outside control criteria.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Extracted: 05/04/2011
Date Analyzed: 05/09/2011

**Matrix Spike/Duplicate Matrix Spike Summary
 1,4-Dioxane by GC/MS**

Sample Name: Batch QC
Lab Code: P1101579-005
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1103961

Analyte Name	Sample Result	Batch QCMS KWG1103961-1 Matrix Spike			Batch QCDMS KWG1103961-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
1,4-Dioxane	1.1	26.3	25.0	101	25.6	25.0	98	40-114	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Extracted: 05/04/2011
Date Analyzed: 05/09/2011

Lab Control Spike Summary
1,4-Dioxane by GC/MS

Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1103961

Lab Control Sample
 KWG1103961-3
 Lab Control Spike

Analyte Name	Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
1,4-Dioxane	25.1	25.0	100	52-105

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Extracted: 05/04/2011
Date Analyzed: 05/09/2011
Time Analyzed: 14:42

Method Blank Summary
1,4-Dioxane by GC/MS

Sample Name: Method Blank
Lab Code: KWG1103961-4
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

File ID: J:\MS26\DATA\050911\0509F015.D
Instrument ID: MS26
Level: Low
Extraction Lot: KWG1103961

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1103961-3	J:\MS26\DATA\050911\0509F016.D	05/09/11	15:02
Batch QCMS	KWG1103961-1	J:\MS26\DATA\050911\0509F017.D	05/09/11	15:21
Batch QCDMS	KWG1103961-2	J:\MS26\DATA\050911\0509F018.D	05/09/11	15:41
Batch QC	P1101579-005	J:\MS26\DATA\050911\0509F019.D	05/09/11	16:01
MW-13	P1101607-001	J:\MS26\DATA\050911\0509F021.D	05/09/11	16:40

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Extracted: 05/04/2011
Date Analyzed: 05/09/2011
Time Analyzed: 15:02

Lab Control Sample Summary
1,4-Dioxane by GC/MS

Sample Name: Lab Control Sample
Lab Code: KWG1103961-3
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

File ID: J:\MS26\DATA\050911\0509F016.D
Instrument ID: MS26
Level: Low
Extraction Lot: KWG1103961

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1103961-4	J:\MS26\DATA\050911\0509F015.D	05/09/11	14:42
Batch QCMS	KWG1103961-1	J:\MS26\DATA\050911\0509F017.D	05/09/11	15:21
Batch QCDMS	KWG1103961-2	J:\MS26\DATA\050911\0509F018.D	05/09/11	15:41
Batch QC	P1101579-005	J:\MS26\DATA\050911\0509F019.D	05/09/11	16:01
MW-13	P1101607-001	J:\MS26\DATA\050911\0509F021.D	05/09/11	16:40

Organic Analysis:
1,4-Dioxane by GC/MS

Validation Package

Raw Data

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Collected: 04/28/2011
Date Received: 04/28/2011

1,4-Dioxane by GC/MS

Sample Name: MW-13
Lab Code: P1101607-001
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	0.90 J	1.0	0.16	1	05/04/11	05/09/11	KWG1103961	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	94	42-112	05/09/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\050911\0509F021.D
Lab ID: P1101607-001
RunType: SMPL
Matrix: WATER

Date Acquired: 05/09/2011 16:40
Date Quantitated: 05/09/2011 17:04
Batch ID: KWG1104145
Analysis Method: 8270C SIM
ListJoinID: LJ2865

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
Preparation Holding Time	NA	NA	NA	x	
Pre-Preparation Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Method Blank	NA	NA	NA	x	
MB Surrogate Recovery	NA	NA	NA	x	
Lab Control Spike	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: LP 5/10/11

Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID:		Tier:	IV	Matrix:	WATER
Prod Code:	8270C SIM 14_DI	Collect Date:	04/28/2011	Receive Date:	04/28/2011

Analysis Lot:	KWG1104145	Prep Lot:	KWG1103961	Report Group:	P1101607
Analysis Method:	8270C SIM	Prep Method:	EPA 3510C		
Prep Ref:	1015912	Prep Date:	05/04/2011		

Quant Method:	J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID:	CAL10487
Title:	1,4-Dioxane by GC/MS	Report List ID:	LJ2865
Tune Ref:	J:\MS26\DATA\050911\0509F005.D	Method ID:	MJ402
MB Ref:	J:\MS26\DATA\050911\0509F015.D	Quant based on Report List	

Data File:	J:\MS26\DATA\050911\0509F021.D	Instrument:	MS26
Acqu Date:	05/09/2011 16:40	Quant Date:	05/09/2011 17:04
Run Type:	SMPL	Vial:	17
Lab ID:	P1101607-001	Dilution:	1.0
		Soln Conc. Units:	ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	83066	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.91	-0.03	0.00	96	30356	46.76	94	42-112	OK

Target Compounds

								Final Conc. Units: ug/L		
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane	3.97	0.01	0.00	88	1182m	1.79	0.90	J	

Prep Amount: 100 ml **Dilution:** 1.0
Prep Final Vol: 50 ml **Unit Factor:** 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 F: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\050911\0509F021.D
 Acq On : 9 May 2011 4:40 pm
 Sample : P1101607-001
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 16:56:39 2011

Vial: 17
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

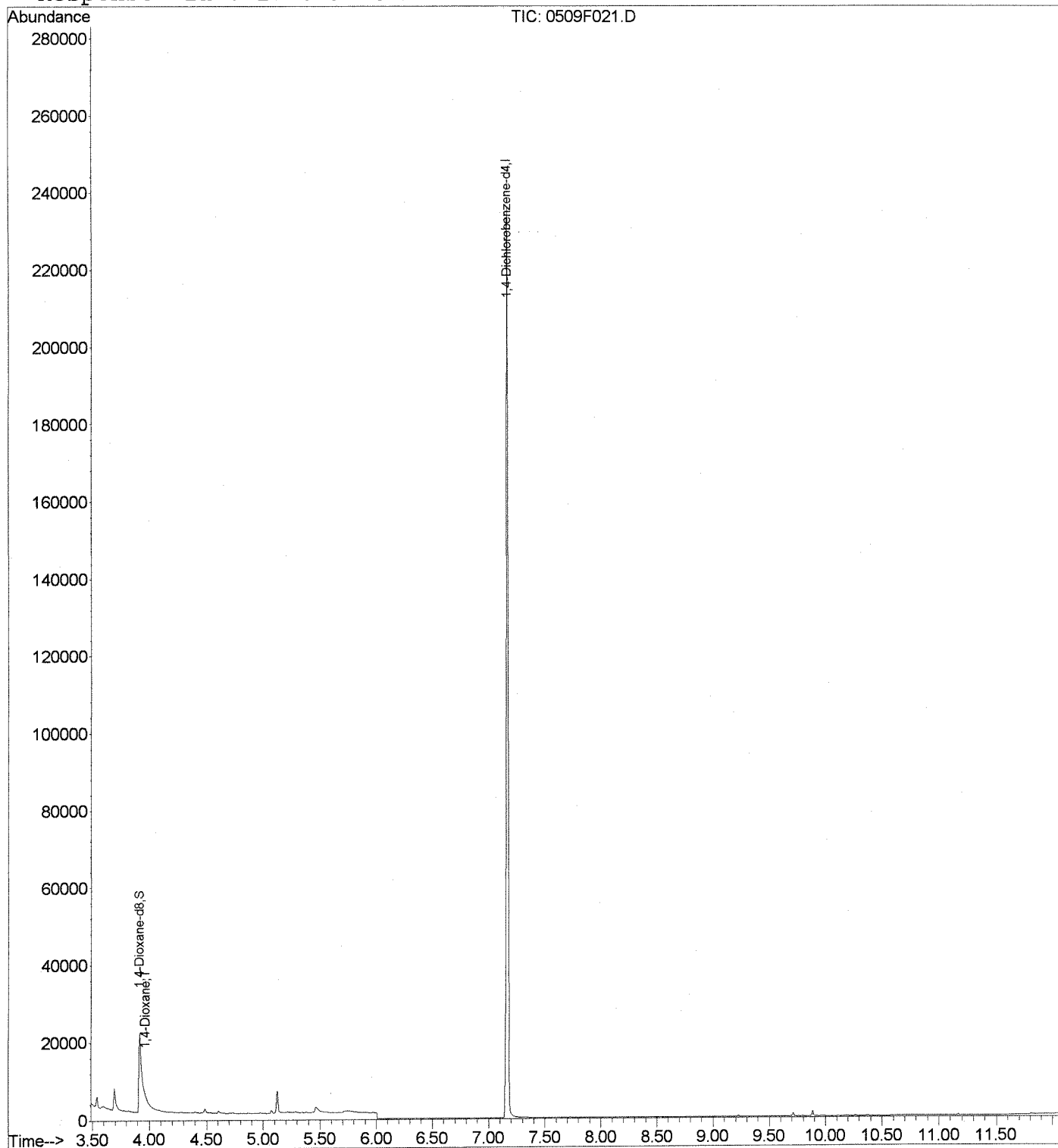
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	83066	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.91	96	30356	46.76	ng/ml	-0.02
Spiked Amount	50.000		Recovery	=	93.52%	
Target Compounds						
3) 1,4-Dioxane	3.97	88	1182m	1.79	ng/ml	Qvalue

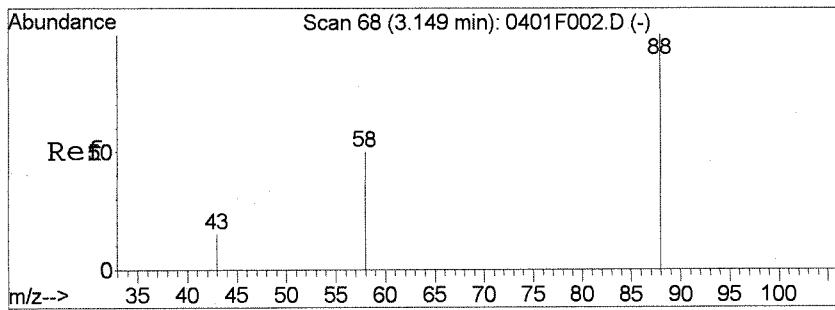
Data File : J:\MS26\DATA\050911\0509F021.D
Acq On : 9 May 2011 4:40 pm
Sample : P1101607-001
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 17:04 2011

Vial: 17
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

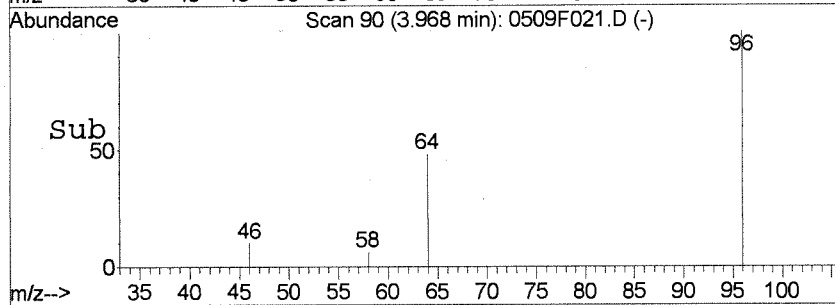
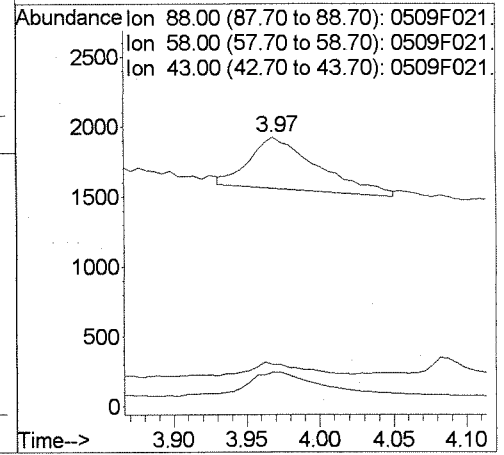
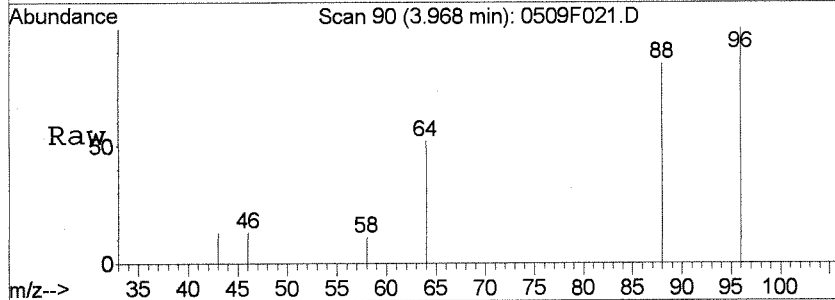
Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration





#3
 1,4-Dioxane
 Concen: 1.79 ng/ml m
 RT: 3.97 min Scan# 90
 Delta R.T. 0.01 min
 Lab File: 0509F021.D
 Acq: 9 May 2011 4:40 pm

Tgt Ion	Resp	Lower	Upper
88	100		
58	12.8	19.3	59.3#
43	15.5	0.0	34.1



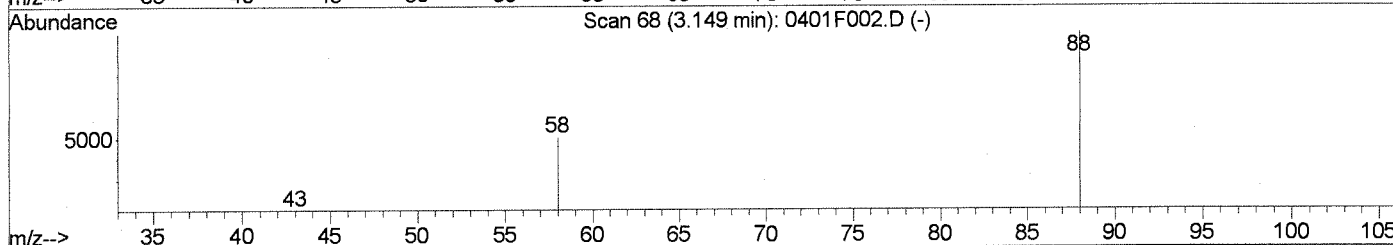
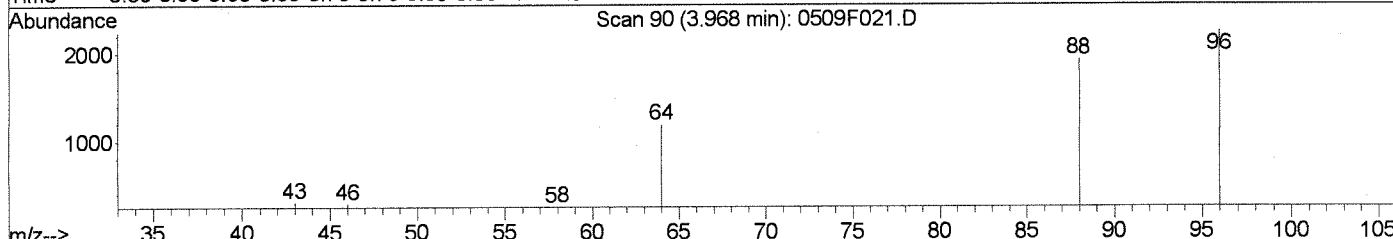
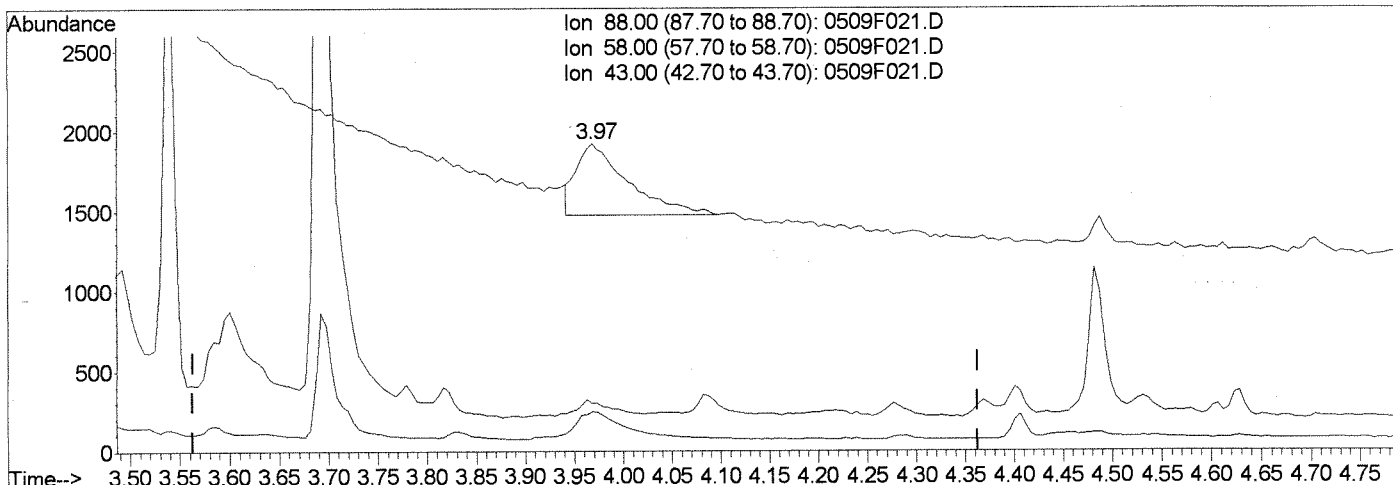
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F021.D
 Acq On : 9 May 2011 4:40 pm
 Sample : P1101607-001
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 16:56 2011

Vial: 17
 Operator: K Bailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F021.D

(3) 1,4-Dioxane (T)

3.97min 2.48ng/ml

response 1634

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	37.44
43.00	14.10	14.13
0.00	0.00	0.00

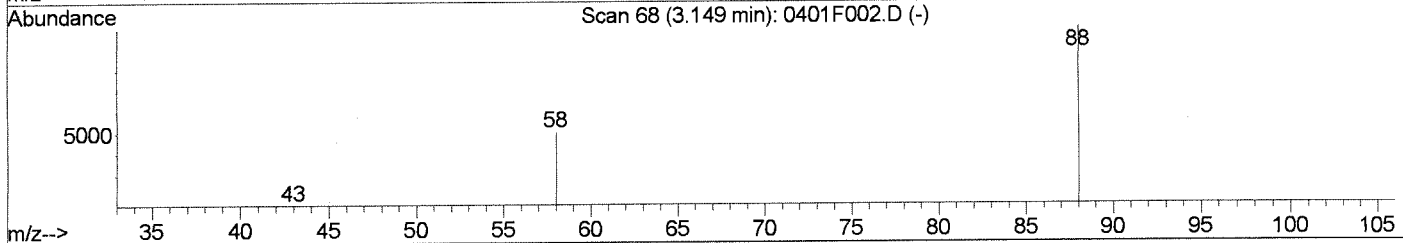
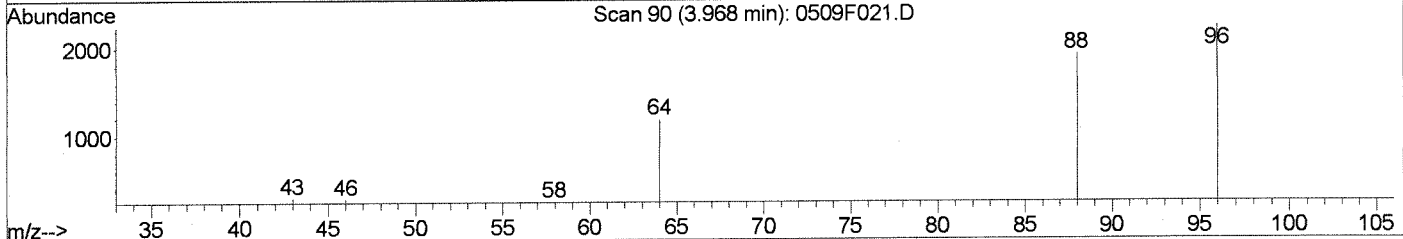
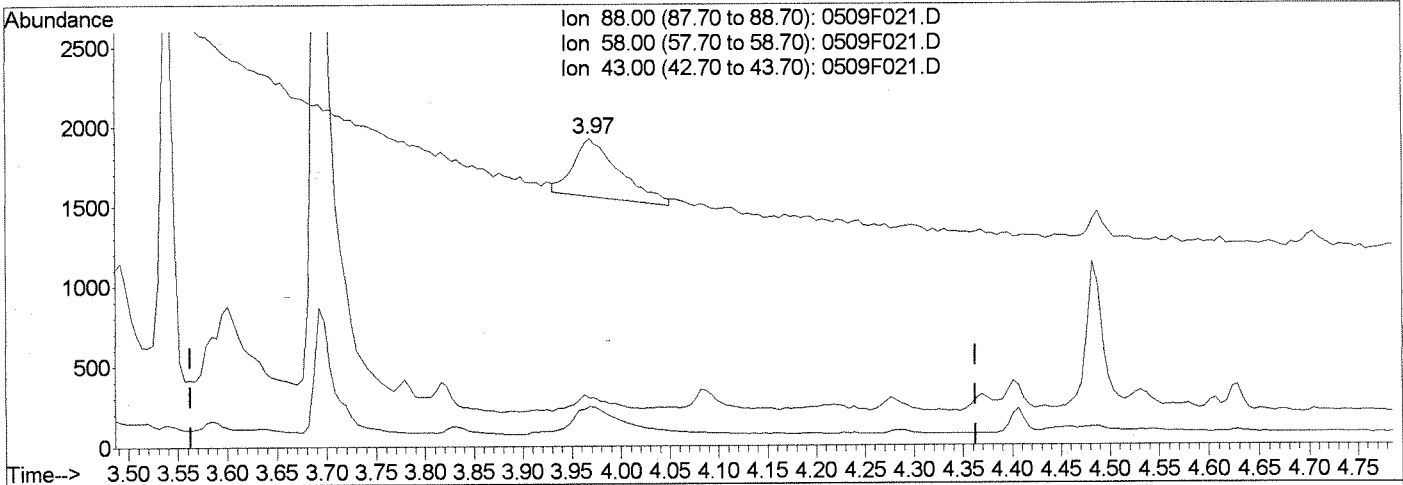
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F021.D
 Acq On : 9 May 2011 4:40 pm
 Sample : P1101607-001
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 17:04 2011

Vial: 17
 Operator: K Bailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



(3) 1,4-Dioxane (T)

3.97min 1.79ng/ml m

response 1182

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	12.84#
43.00	14.10	15.50
0.00	0.00	0.00

01
 KB 5/10/11
 CH 05.10.11

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Collected: NA
Date Received: NA

1,4-Dioxane by GC/MS

Sample Name: Method Blank
Lab Code: KWG1103961-4
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	ND U	1.0	0.16	1	05/04/11	05/09/11	KWG1103961	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	99	42-112	05/09/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\050911\0509F015.D
Lab ID: KWG1103961-4
RunType: MB
Matrix: WATER

Date Acquired: 05/09/2011 14:42
Date Quantitated: 05/09/2011 15:09
Batch ID: KWG1104145
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

P157A
P1405
P1407

Primary Review: KG 5/10/11

Secondary Review: CH 05/10/11

Quantitation Report

Bottle ID:	Tier:	Matrix:	WATER
Prod Code: 8270C SIM 14_DI	Collect Date:	Receive Date:	05/06/2011

Analysis Lot: KWG1104145	Prep Lot: KWG1103961	Report Group:
Analysis Method: 8270C SIM	Prep Method: EPA 3510C	
Prep Ref: 1015806	Prep Date: 05/04/2011	

Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487
Title:	
Tune Ref: J:\MS26\DATA\050911\0509F005.D	Method ID: MJ402
MB Ref:	Quant based on Method

Data File: J:\MS26\DATA\050911\0509F015.D	Instrument: MS26
Acqu Date: 05/09/2011 14:42	Quant Date: 05/09/2011 15:09
Run Type: MB	Vial: 11
Lab ID: KWG1103961-4	Dilution: 1.0
	Soln Conc. Units: ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	74665	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.90	-0.04	-0.01	96	28937	49.59	99	42-112	OK

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane				88	0		0.16	U	

Prep Amount: 100 ml Dilution: 1.0
 Prep Final Vol: 50 ml Unit Factor: 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\050911\0509F015.D
 Acq On : 9 May 2011 2:42 pm
 Sample : KWG1103961-4 | MB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 15:09:31 2011

Vial: 11
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	74665	50.00	ng/ml	0.00

System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.90	96	28937	49.59	ng/ml	-0.04
Spiked Amount	50.000		Recovery	= 99.18%		

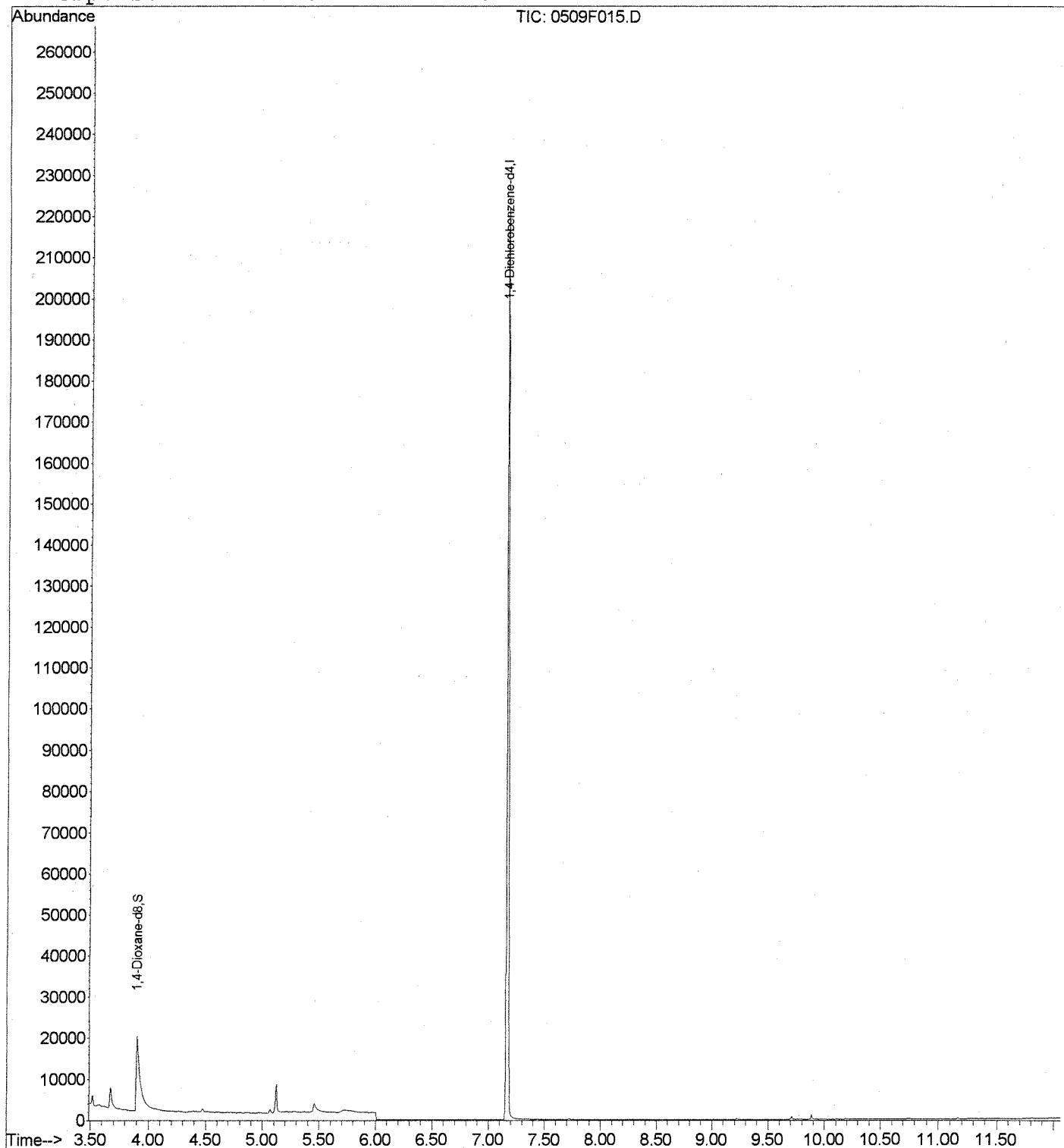
Target Compounds Qvalue

Data File : J:\MS26\DATA\050911\0509F015.D
Acq On : 9 May 2011 2:42 pm
Sample : KWG1103961-4 | MB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 15:09 2011

Vial: 11
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Collected: NA
Date Received: NA

1,4-Dioxane by GC/MS

Sample Name: Batch QC
Lab Code: P1101579-005
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	1.1		1.0	0.16	1	05/04/11	05/09/11	KWG1103961	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	87	42-112	05/09/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\050911\0509F019.D
Lab ID: P1101579-005
Run Type: SMPL
Matrix: WATER

Date Acquired: 05/09/2011 16:01
Date Quantitated: 05/09/2011 17:03
Batch ID: KWG1104145
Analysis Method: 8270C SIM
ListJoinID: LJ2865

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
Preparation Holding Time	NA	NA	NA	x	
Pre-Preparation Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Method Blank	NA	NA	NA	x	
MB Surrogate Recovery	NA	NA	NA	x	
Lab Control Spike	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Batch QC:
 P1105
 P1107

Primary Review: KG 5/10/11
 Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID:	Tier: IV	Matrix: WATER
Prod Code: 8270C SIM 14_DI	Collect Date: 04/27/2011	Receive Date: 04/27/2011

Analysis Lot: KWG1104145	Prep Lot: KWG1103961	Report Group: P1101579
Analysis Method: 8270C SIM	Prep Method: EPA 3510C	
Prep Ref: 1015802	Prep Date: 05/04/2011	

Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487
Title: 1,4-Dioxane by GC/MS	Report List ID: LJ2865
Tune Ref: J:\MS26\DATA\050911\0509F005.D	Method ID: MJ402
MB Ref: J:\MS26\DATA\050911\0509F015.D	Quant based on Report List

Data File: J:\MS26\DATA\050911\0509F019.D	Instrument: MS26
Acqu Date: 05/09/2011 16:01	Quant Date: 05/09/2011 17:03
Run Type: SMPL	Vial: 15
Lab ID: P1101579-005	Dilution: 1.0
	Soln Conc. Units: ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	76259	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.90	-0.04	-0.01	96	25837	43.35	87	42-112	OK

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Final Conc. Units: ug/L		Q	Rpt?
							Solution Conc	Final Conc		
1	1,4-Dioxane	3.95	-0.01	0.00	88	1352m	2.23	1.1		

Prep Amount: 100 ml Dilution: 1.0
 Prep Final Vol: 50 ml Unit Factor: 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\050911\0509F019.D
 Acq On : 9 May 2011 4:01 pm
 Sample : P1101579-005
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 16:18:15 2011

Vial: 15
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

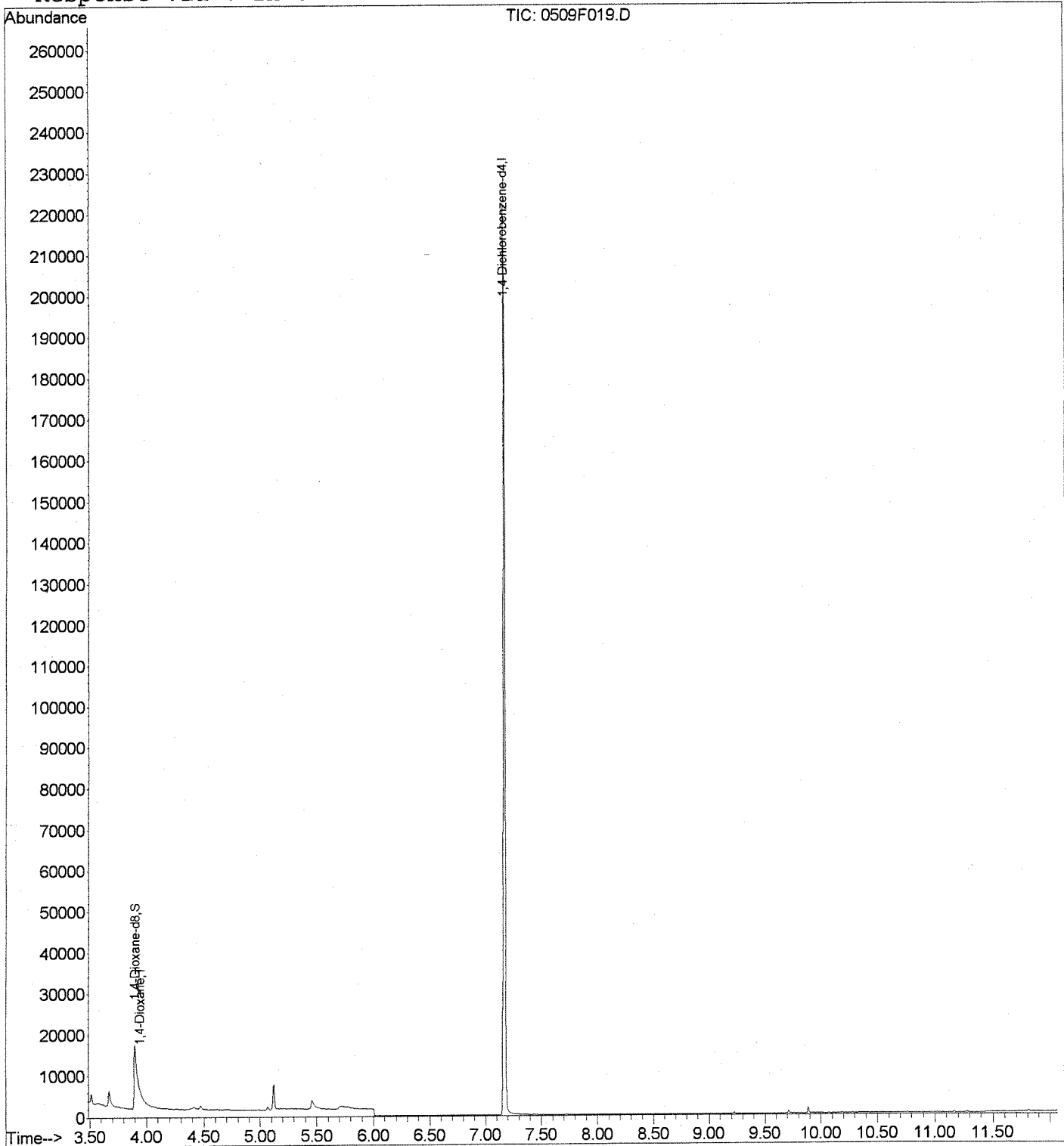
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	76259	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.90	96	25837	43.35	ng/ml	-0.04
Spiked Amount	50.000		Recovery	=	86.70%	
Target Compounds						
3) 1,4-Dioxane	3.95	88	1352m	2.23	ng/ml	Qvalue

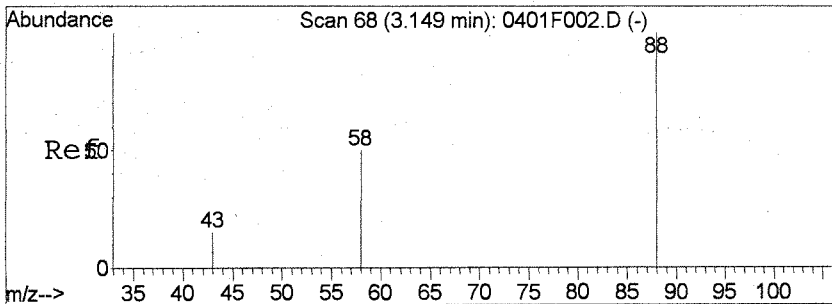
Data File : J:\MS26\DATA\050911\0509F019.D
Acq On : 9 May 2011 4:01 pm
Sample : P1101579-005
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 17:03 2011

Vial: 15
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

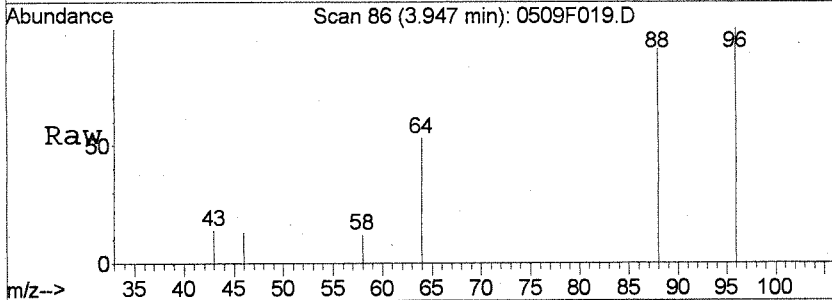
Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration

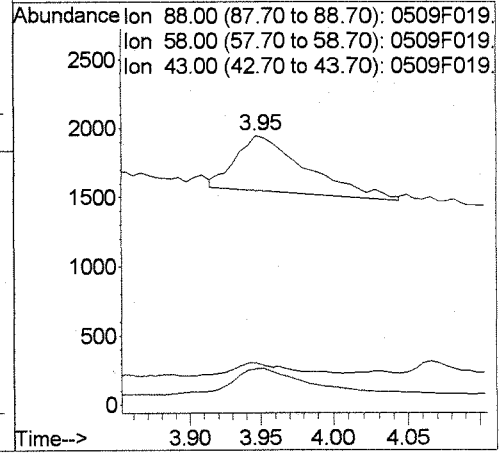
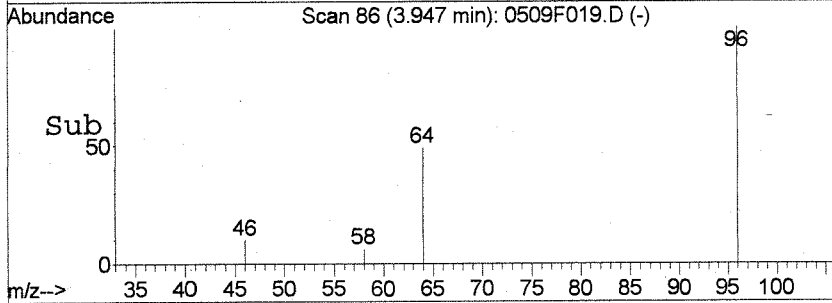




#3
 1,4-Dioxane
 Concen: 2.23 ng/ml m
 RT: 3.95 min Scan# 86
 Delta R.T. -0.02 min
 Lab File: 0509F019.D
 Acq: 9 May 2011 4:01 pm



Tgt Ion:	88	Resp:	1352
Ion Ratio	Lower	Upper	
88	100		
58	13.5	19.3	59.3#
43	15.7	0.0	34.1



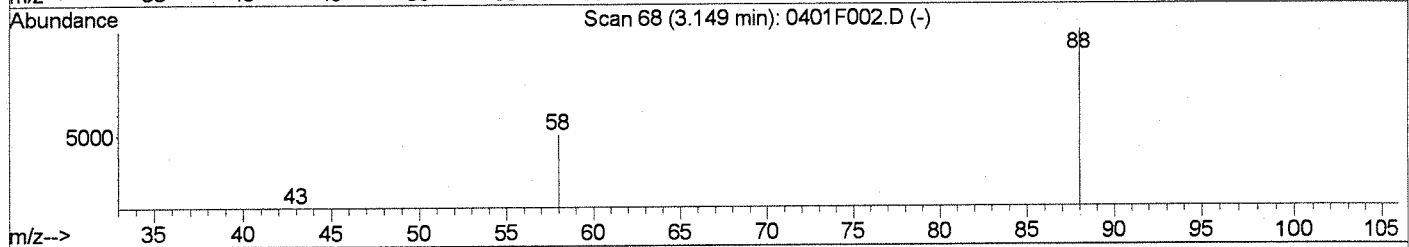
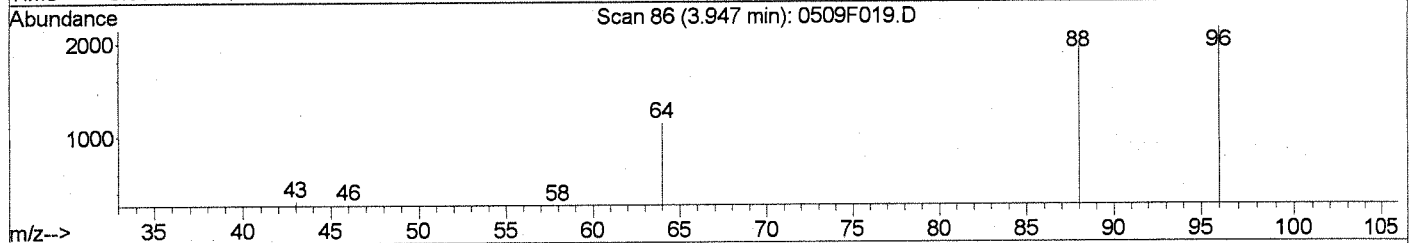
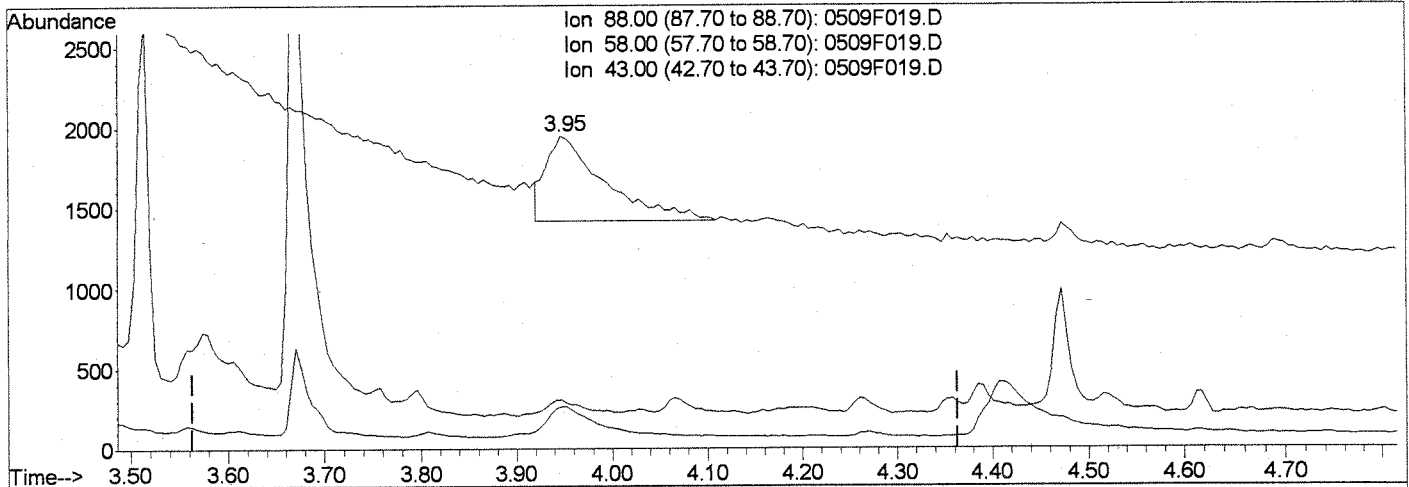
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F019.D
 Acq On : 9 May 2011 4:01 pm
 Sample : P1101579-005
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 16:18 2011

Vial: 15
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F019.D

(3) 1,4-Dioxane (T)		
3.95min	3.69ng/ml	
response	2235	
Ion	Exp%	Act%
88.00	100	100
58.00	39.30	35.31
43.00	14.10	15.08
0.00	0.00	0.00

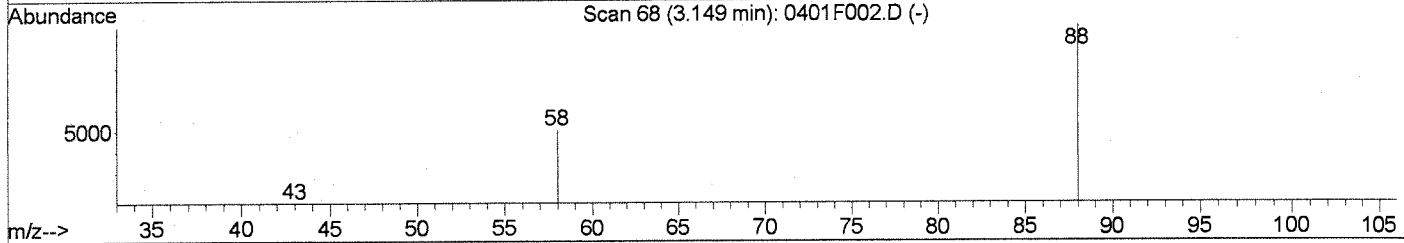
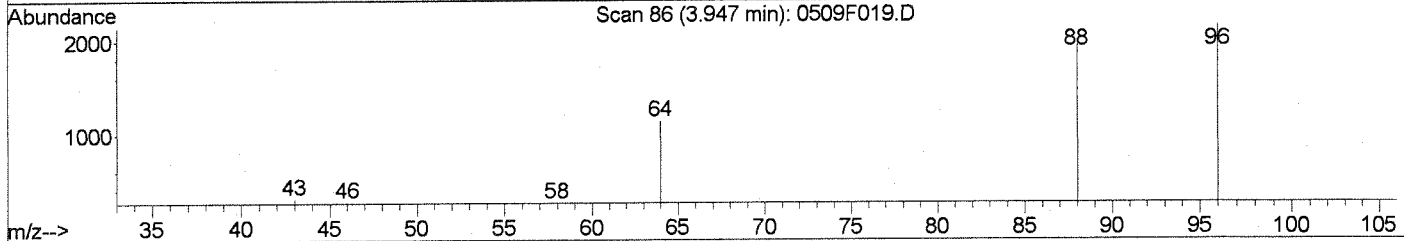
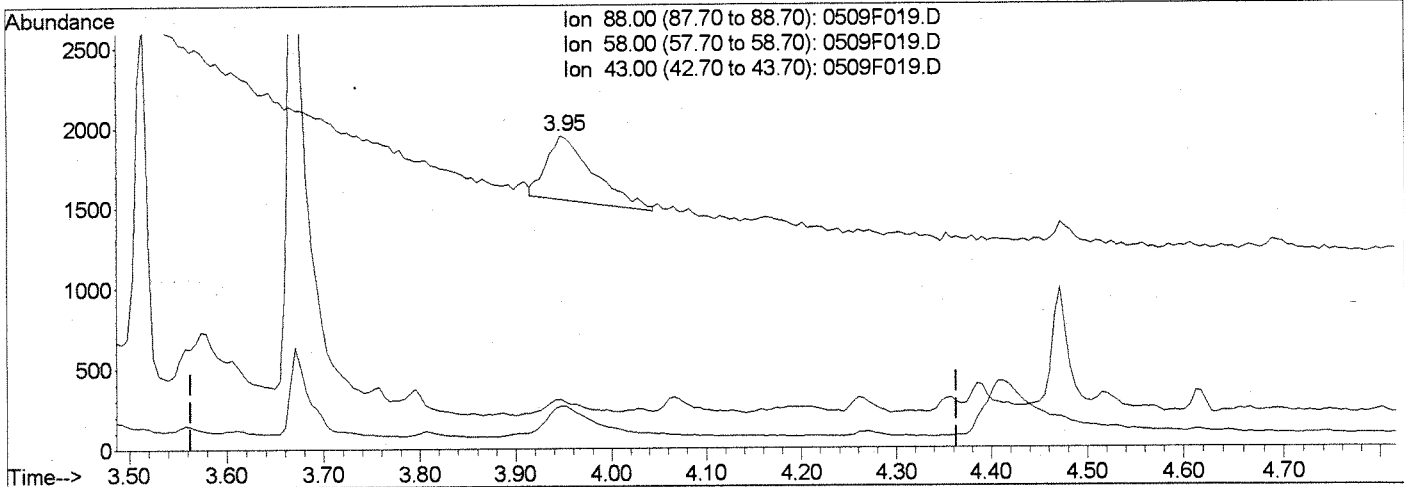
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F019.D
 Acq On : 9 May 2011 4:01 pm
 Sample : P1101579-005
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 17:03 2011

Vial: 15
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F019.D

(3) 1,4-Dioxane (T)			
3.95min	2.23ng/ml	m	
response	1352		
Ion	Exp%	Act%	
88.00	100	100	
58.00	39.30	13.46#	
43.00	14.10	15.72	
0.00	0.00	0.00	

01
 KB 5/10/11
 CH 05.10.11

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Collected: NA
Date Received: NA

1,4-Dioxane by GC/MS

Sample Name: Batch QCMS
Lab Code: KWG1103961-1
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	26.3		1.0	0.16	1	05/04/11	05/09/11	KWG1103961	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	94	42-112	05/09/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\050911\0509F017.D
Lab ID: KWG1103961-1 -- P1101579-005MS
Run Type: MS
Matrix: WATER

Date Acquired: 05/09/2011 15:21
Date Quantitated: 05/09/2011 15:45
Batch ID: KWG1104145
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Batch QC:
 P1005
 P1007

Primary Review: LB 5/10/11
 Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID:	Tier:	Matrix:
Prod Code: 8270C SIM 14_DI	Collect Date:	WATER
		Receive Date: 05/06/2011

Analysis Lot: KWG1104145	Prep Lot: KWG1103961	Report Group:
Analysis Method: 8270C SIM	Prep Method: EPA 3510C	
Prep Ref: 1015803	Prep Date: 05/04/2011	

Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487
Title:	
Tune Ref: J:\MS26\DATA\050911\0509F005.D	Method ID: MJ402
MB Ref: J:\MS26\DATA\050911\0509F015.D	Quant based on Method

Data File: J:\MS26\DATA\050911\0509F017.D	Instrument: MS26
Acqu Date: 05/09/2011 15:21	Quant Date: 05/09/2011 15:45
Run Type: MS	Vial: 13
Lab ID: KWG1103961-1 -- P1101579-005MS	Dilution: 1.0
	Soln Conc. Units: ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	79462	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.89	-0.05	-0.01	96	29261	47.12	94	42-112	OK

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane	3.92	-0.04	-0.01	88	33163	52.52	26.3		

Prep Amount: 100 ml Dilution: 1.0
 Prep Final Vol: 50 ml Unit Factor: 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\050911\0509F017.D
 Acq On : 9 May 2011 3:21 pm
 Sample : KWG1103961-1 | MS P1101579-005MS
 Misc :

Vial: 13
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

MS Integration Params: RTEINT.P
 Quant Time: May 09 15:45:09 2011

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

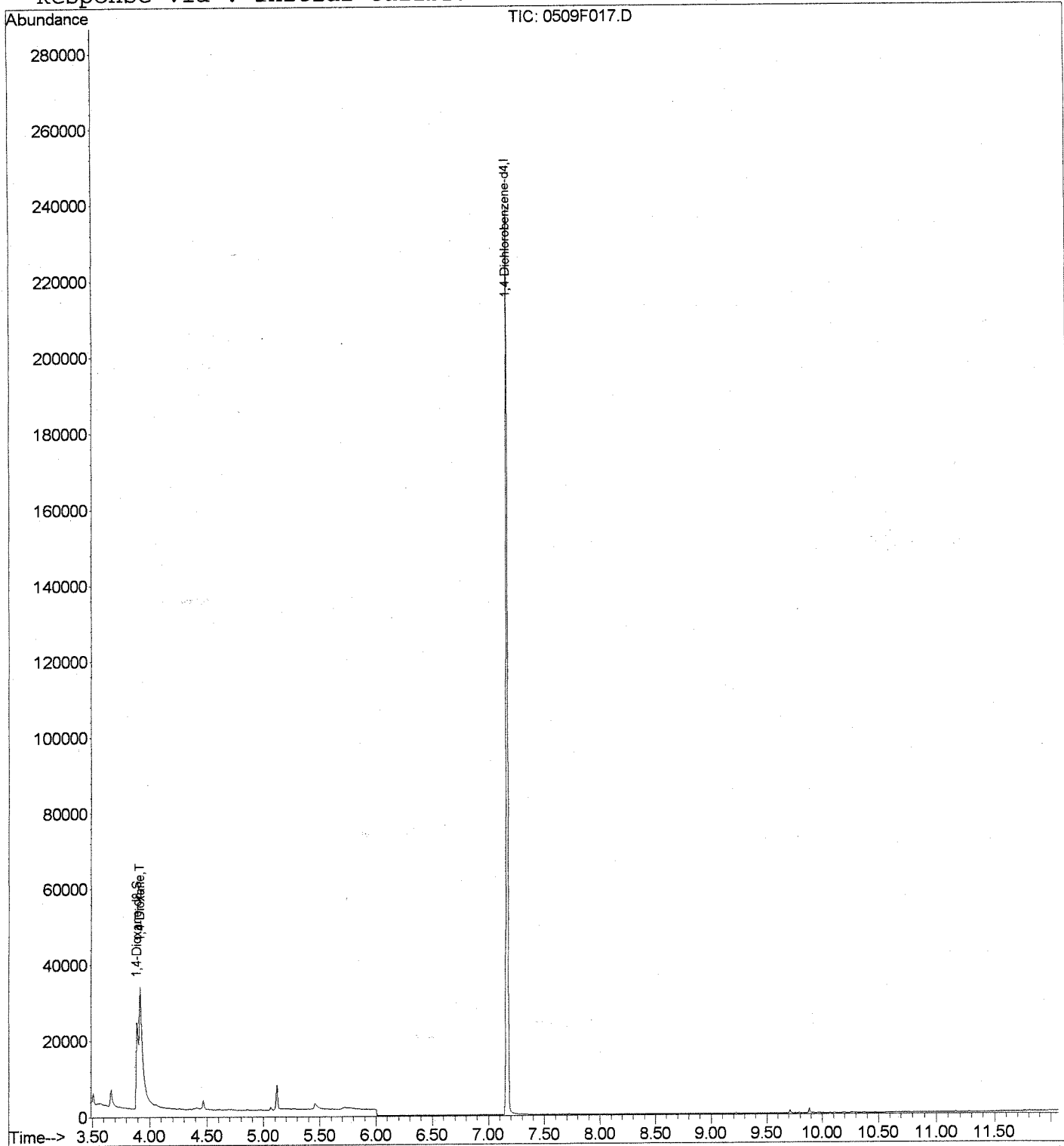
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	79462	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.89	96	29261	47.12	ng/ml	-0.05
Spiked Amount	50.000		Recovery	=	94.24%	
Target Compounds						
3) 1,4-Dioxane	3.92	88	33163	52.52	ng/ml	Qvalue 89

Data File : J:\MS26\DATA\050911\0509F017.D
Acq On : 9 May 2011 3:21 pm
Sample : KWG1103961-1 | MS P1101579-005MS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 15:45 2011

Vial: 13
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Collected: NA
Date Received: NA

1,4-Dioxane by GC/MS

Sample Name: Batch QCDMS
Lab Code: KWG1103961-2
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	25.6		1.0	0.16	1	05/04/11	05/09/11	KWG1103961	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	93	42-112	05/09/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\050911\0509F018.D
Lab ID: KWG1103961-2 -- P1101579-005DMS
Run Type: DMS
Matrix: WATER

Date Acquired: 05/09/2011 15:41
Date Quantitated: 05/09/2011 17:03
Batch ID: KWG1104145
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Batch QC:
 P1605
 P1607

Primary Review: LB 5/10/11
 Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID:	Tier:	Matrix:	WATER
Prod Code: 8270C SIM 14_DI	Collect Date:	Receive Date:	05/06/2011

Analysis Lot: KWG1104145	Prep Lot: KWG1103961	Report Group:
Analysis Method: 8270C SIM	Prep Method: EPA 3510C	
Prep Ref: 1015804	Prep Date: 05/04/2011	

Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487
Title:	
Tune Ref: J:\MS26\DATA\050911\0509F005.D	Method ID: MJ402
MB Ref: J:\MS26\DATA\050911\0509F015.D	Quant based on Method

Data File: J:\MS26\DATA\050911\0509F018.D	Instrument: MS26
Acqu Date: 05/09/2011 15:41	Quant Date: 05/09/2011 17:03
Run Type: DMS	Vial: 14
Lab ID: KWG1103961-2 -- P1101579-005DMS	Dilution: 1.0
	Soln Conc. Units: ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	83825	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.91	-0.03	0.00	96	30548	46.63	93	42-112	OK

Target Compounds

							Final Conc. Units:	ug/L		
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane	3.94	-0.02	0.00	88	34045m	51.11	25.6		

Prep Amount: 100 ml Dilution: 1.0
 Prep Final Vol: 50 ml Unit Factor: 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\050911\0509F018.D
 Acq On : 9 May 2011 3:41 pm
 Sample : KWG1103961-2 | DMS P1101579-005DMS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 16:09:47 2011

Vial: 14
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	83825	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.91	96	30548	46.63	ng/ml	-0.02
Spiked Amount	50.000		Recovery	=	93.26%	
Target Compounds						
3) 1,4-Dioxane	3.94	88	34045m	51.11	ng/ml	Qvalue

Data File : J:\MS26\DATA\050911\0509F018.D

Vial: 14

Acq On : 9 May 2011 3:41 pm

Operator: K Bailey

Sample : KWG1103961-2 | DMS P1101579-005DMS

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 17:03 2011

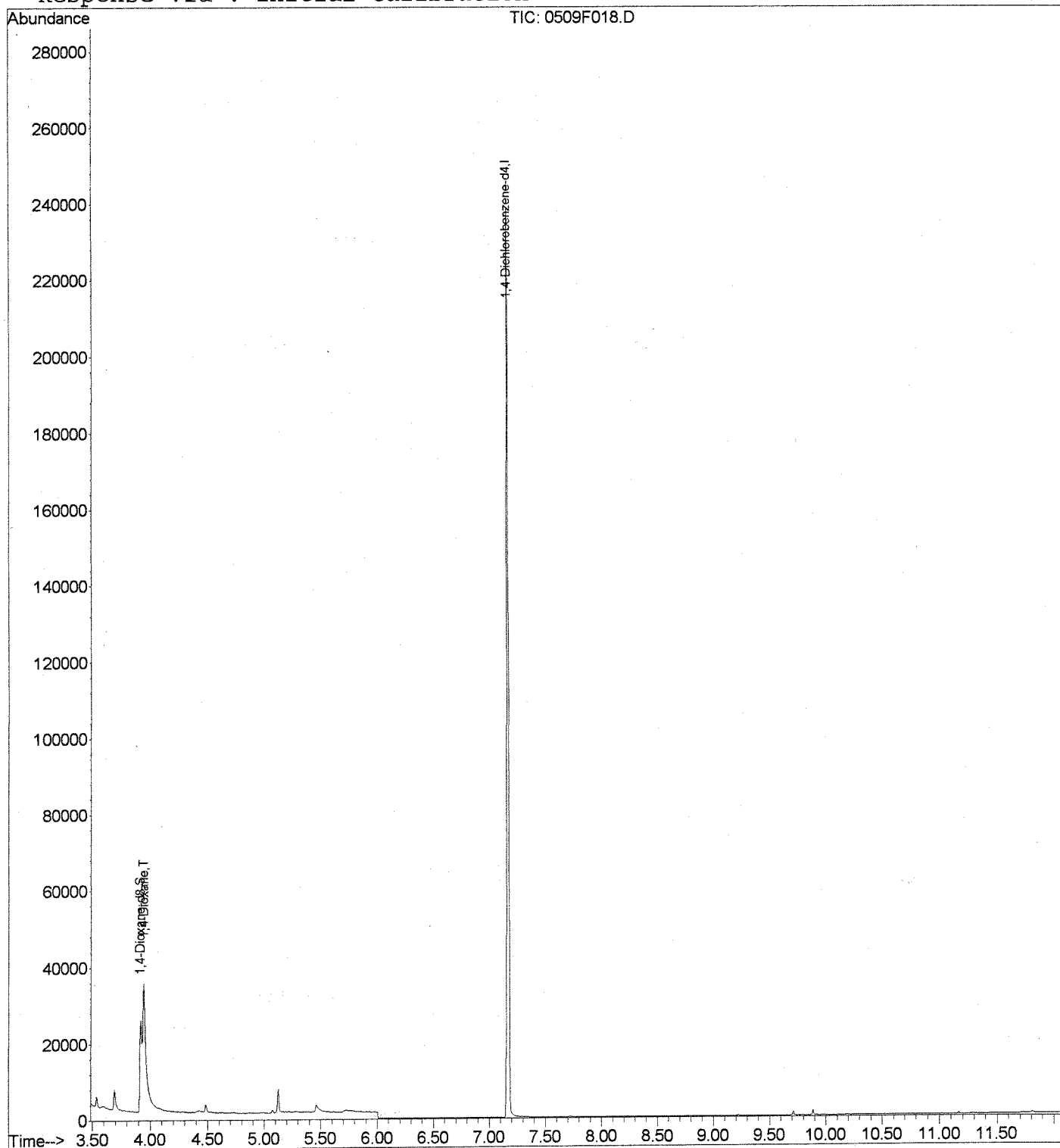
Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:26:14 2011

Response via : Initial Calibration



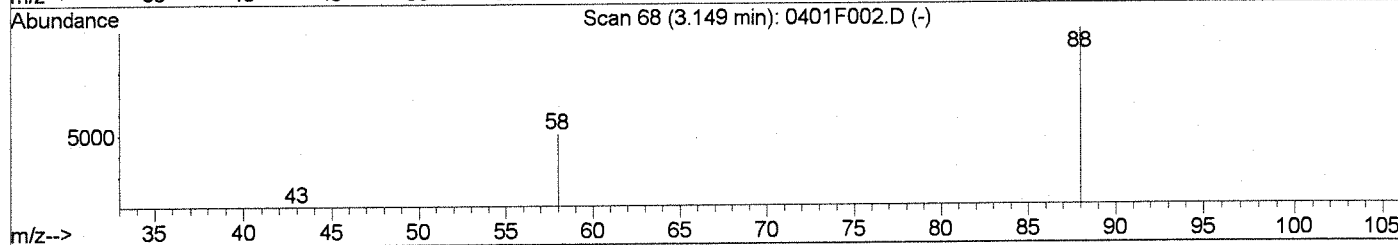
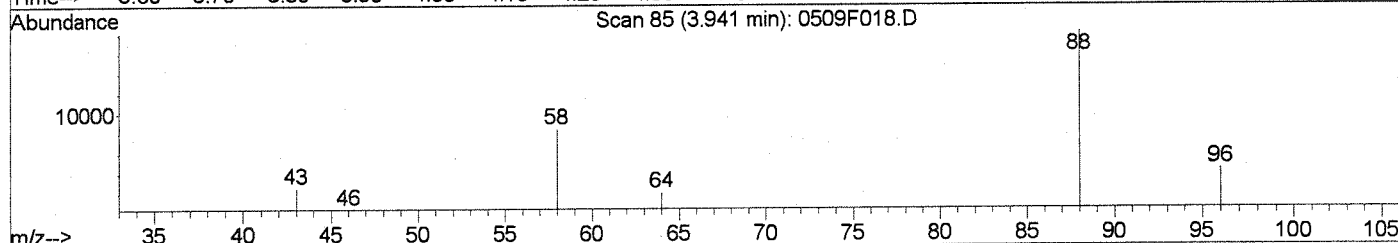
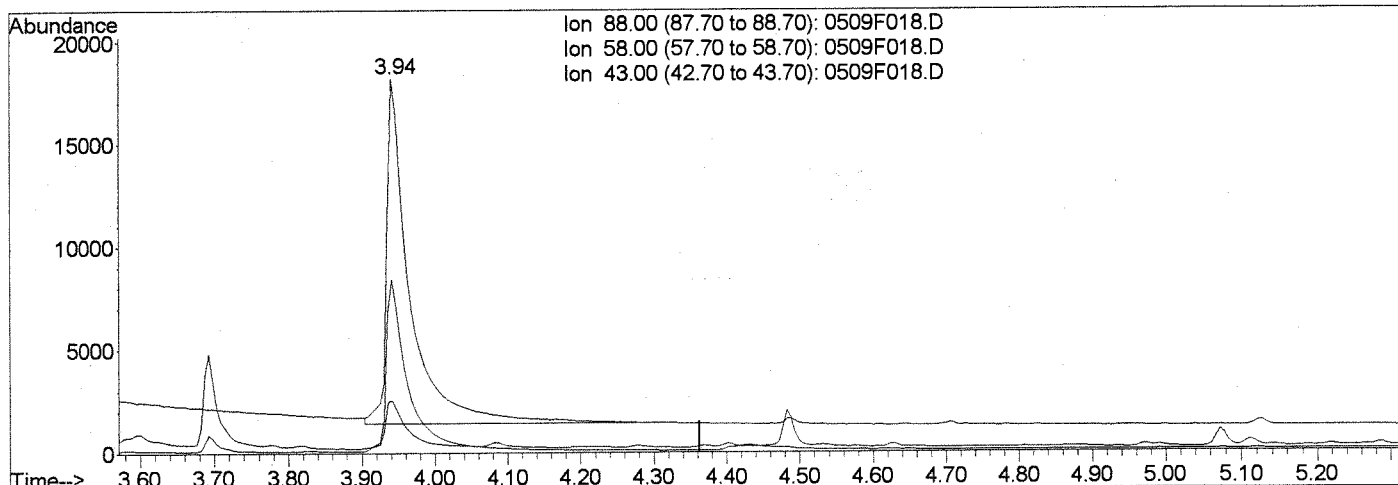
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F018.D
 Acq On : 9 May 2011 3:41 pm
 Sample : KWG1103961-2 | DMS P1101579-005DMS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 16:09 2011

Vial: 14
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F018.D

(3) 1,4-Dioxane (T)

3.94min 56.32ng/ml

response 37510

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	49.65
43.00	14.10	13.77
0.00	0.00	0.00

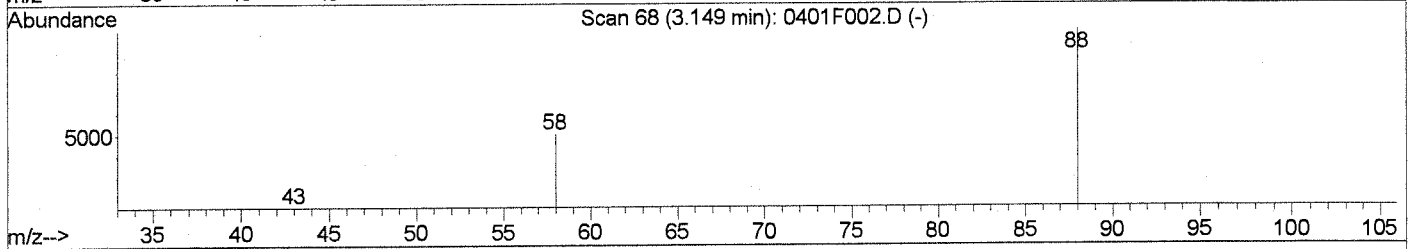
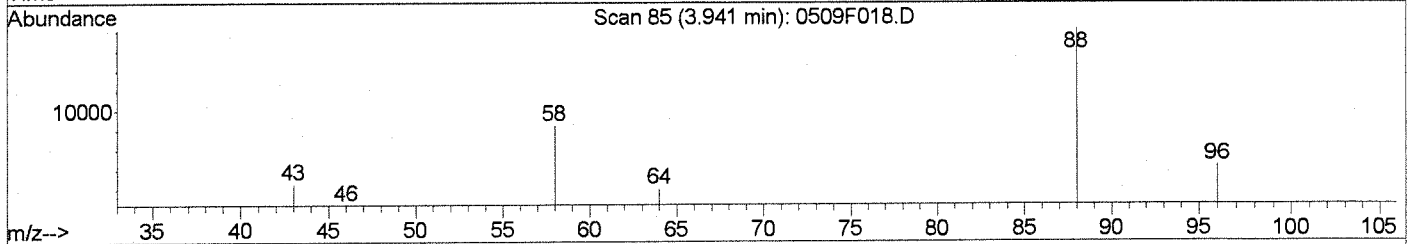
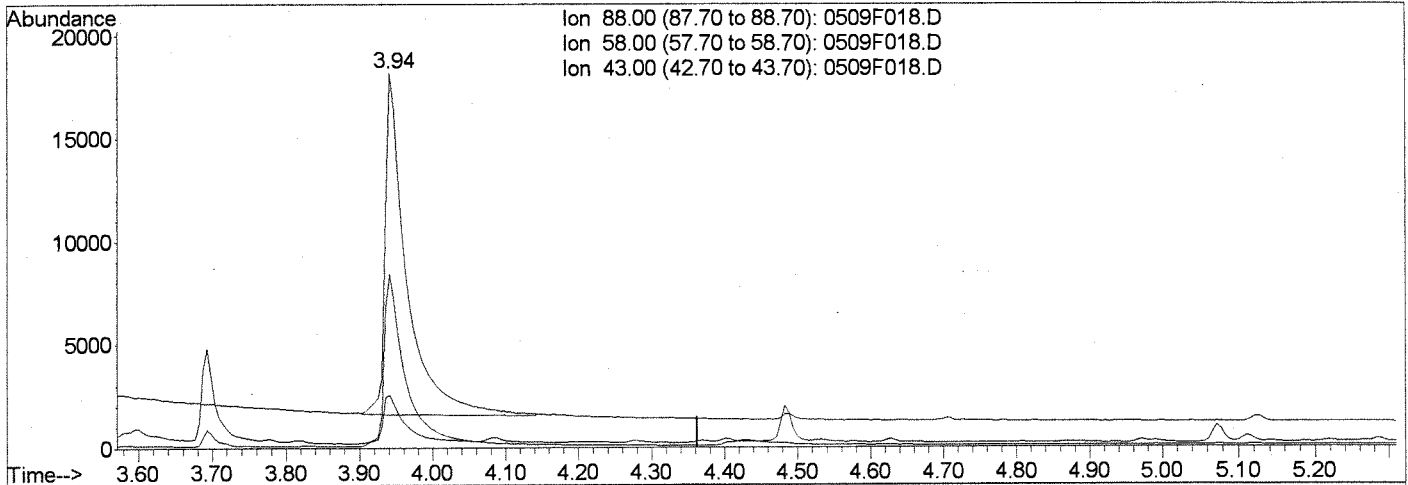
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F018.D
 Acq On : 9 May 2011 3:41 pm
 Sample : KWG1103961-2 | DMS P1101579-005DMS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 17:03 2011

Vial: 14
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F018.D

(3) 1,4-Dioxane (T)		
3.94min	51.11ng/ml m	
response	34045	
Ion	Exp%	Act%
88.00	100	100
58.00	39.30	46.26
43.00	14.10	14.00
0.00	0.00	0.00

01
 LB 5/10/11
 CH 05.10.11

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101607
Date Collected: NA
Date Received: NA

1,4-Dioxane by GC/MS

Sample Name: Lab Control Sample
Lab Code: KWG1103961-3
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	25.1		1.0	0.16	1	05/04/11	05/09/11	KWG1103961	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	92	42-112	05/09/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\050911\0509F016.D
Lab ID: KWG1103961-3
RunType: LCS
Matrix: WATER

Date Acquired: 05/09/2011 15:02
Date Quantitated: 05/09/2011 15:45
Batch ID: KWG1104145
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

P 1579
 P 1405
 P 1407

Primary Review: LB 5/10/11
 Secondary Review: CA 05.10.11

Quantitation Report

Bottle ID:	Tier:	Matrix:	WATER
Prod Code: 8270C SIM 14_DI	Collect Date:	Receive Date:	05/06/2011

Analysis Lot: KWG1104145	Prep Lot: KWG1103961	Report Group:
Analysis Method: 8270C SIM	Prep Method: EPA 3510C	
Prep Ref: 1015805	Prep Date: 05/04/2011	

Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487
Title:	
Tune Ref: J:\MS26\DATA\050911\0509F005.D	Method ID: MJ402
MB Ref: J:\MS26\DATA\050911\0509F015.D	Quant based on Method

Data File: J:\MS26\DATA\050911\0509F016.D	Instrument: MS26	Vial: 12
Acqu Date: 05/09/2011 15:02	Quant Date: 05/09/2011 15:45	Dilution: 1.0
Run Type: LCS	Soln Conc. Units: ng/ml	
Lab ID: KWG1103961-3		

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	77544	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.89	-0.05	-0.01	96	28015	46.23	92	42-112	OK

Target Compounds

							Final Conc. Units: ug/L			
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane	3.93	-0.03	0.00	88	30891	50.14	25.1		

Prep Amount: 100 ml Dilution: 1.0
 Prep Final Vol: 50 ml Unit Factor: 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 F: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\050911\0509F016.D
 Acq On : 9 May 2011 3:02 pm
 Sample : KWG1103961-3 | LCS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 15:45:02 2011

Vial: 12
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

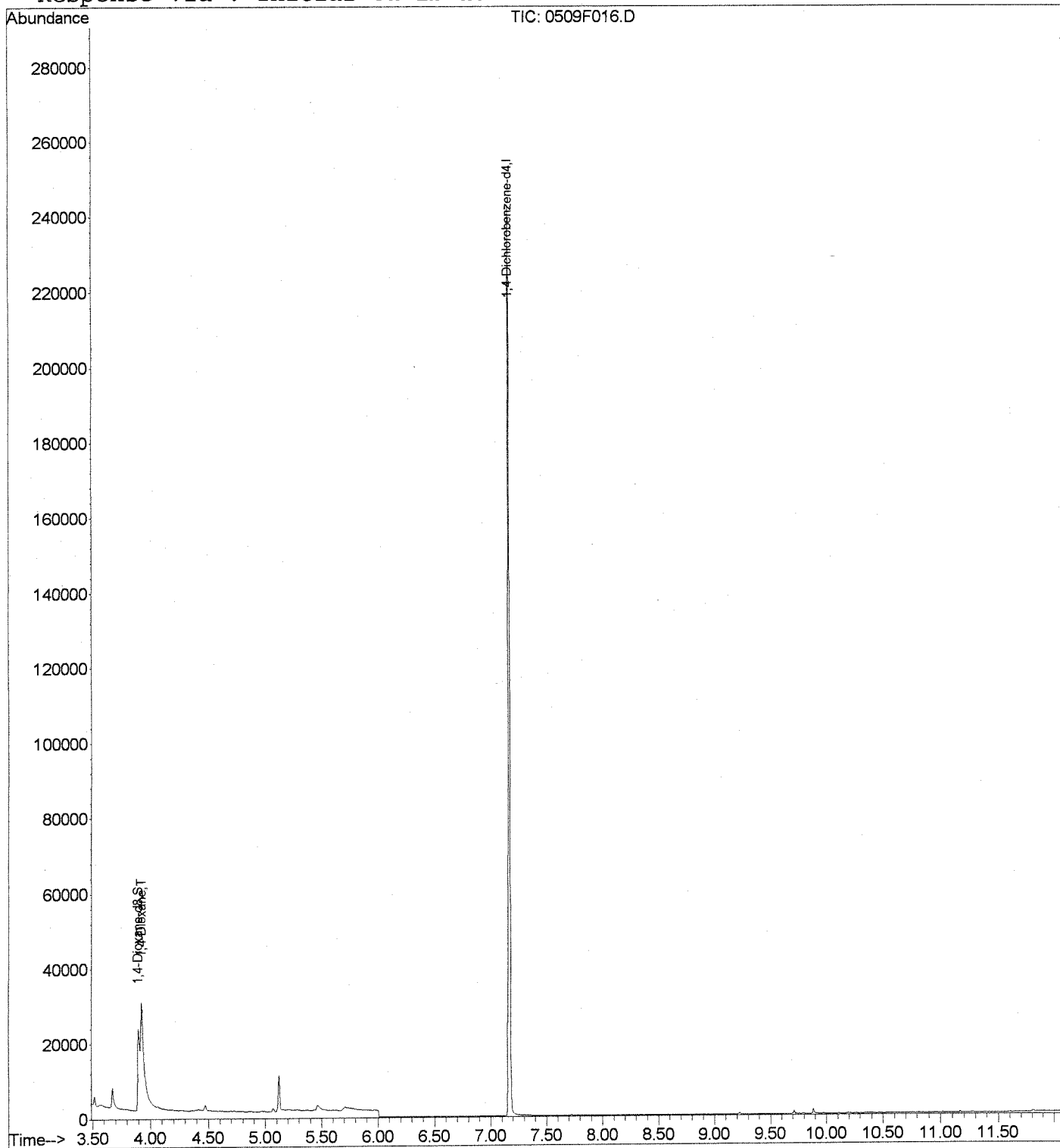
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	77544	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.89	96	28015	46.23	ng/ml	-0.04
Spiked Amount	50.000		Recovery	=	92.46%	
Target Compounds						
3) 1,4-Dioxane	3.93	88	30891	50.14	ng/ml	Qvalue 88

Data File : J:\MS26\DATA\050911\0509F016.D
Acq On : 9 May 2011 3:02 pm
Sample : KWG1103961-3 | LCS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 15:45 2011

Vial: 12
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Organic Analysis:
1,4-Dioxane by GC/MS

Validation Package

Standards Data

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Date Analyzed: 05/09/2011
Time Analyzed: 11:15

Tune Summary
1,4-Dioxane by GC/MS

File ID: J:\MS26\DATA\050911\0509F005.D
Instrument ID: MS26
Column:

Analysis Method: 8270C SIM
Analysis Lot: KWG1104145

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	12.7	700992	PASS
68	69	0	2	1.4	13150	PASS
69	198	0	100	17.7	972672	PASS
70	69	0	2	0.5	5066	PASS
127	198	10	80	36.3	1997824	PASS
197	198	0	2	0.0	0	PASS
198	442	30	100	69.9	5508096	PASS
199	198	5	9	6.8	373632	PASS
275	198	10	60	28.3	1558528	PASS
365	442	1	50	2.5	200064	PASS
441	443	0	100	70.8	1123328	PASS
442	442	100	100	100.0	7877632	PASS
443	442	15	24	20.1	1586688	PASS

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
Continuing Calibration Verification	KWG1104145-2	J:\MS26\DATA\050911A\0509F010.D	05/09/2011	13:02	
Method Blank	KWG1103961-4	J:\MS26\DATA\050911\0509F015.D	05/09/2011	14:42	
Lab Control Sample	KWG1103961-3	J:\MS26\DATA\050911\0509F016.D	05/09/2011	15:02	
Batch QCMS	KWG1103961-1	J:\MS26\DATA\050911\0509F017.D	05/09/2011	15:21	
Batch QCDMS	KWG1103961-2	J:\MS26\DATA\050911\0509F018.D	05/09/2011	15:41	
Batch QC	P1101579-005	J:\MS26\DATA\050911\0509F019.D	05/09/2011	16:01	
MW-13	P1101607-001	J:\MS26\DATA\050911\0509F021.D	05/09/2011	16:40	

Results flagged with an asterisk (*) indicate the analysis performed outside specified tune window

Exception Report

Data File: J:\MS26\DATA\050911\0509F005.D
Lab ID: KWG1104145-1
Run Type: TUNE
Matrix: WATER

Date Acquired: 05/09/2011 11:15
Date Quantitated:
Batch ID: KWG1104145
Analysis Method: DFTPP
ListJoinID: LJ1965

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Ion Ratio	NA	NA	NA	x	

Primary Review: LG 5/10/11
Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID: Prod Code: 8270C SIM 14_DI	Tier: Collect Date:	Matrix: WATER Receive Date: 05/10/2011
Analysis Lot: KWG1104145 Analysis Method: DFTPP Prep Ref:	Prep Lot: Prep Method: Prep Date:	Report Group:
Quant Method: J:\MS26\METHODS\SIMA_DFTPP.M Title: Tune Ref: MB Ref:	Calibration ID: CAL10487 Report List ID: LJ1965 Method ID: MJ190 Quant based on Report List	
Data File: J:\MS26\DATA\050911\0509F005.D Acqu Date: 05/09/2011 11:15 Run Type: TUNE Lab ID: KWG1104145-1	Quant Date:	Instrument: MS26 Vial: 1 Dilution: 1.0 Soln Conc. Units:

Tune Results

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	12.7	700992	Pass
68	69	0	2	1.4	13150	Pass
69	198	0	100	17.7	972672	Pass
70	69	0	2	0.5	5066	Pass
127	198	10	80	36.3	1997824	Pass
197	198	0	2	0.0	0	Pass
198	442	30	100	69.9	5508096	Pass
199	198	5	9	6.8	373632	Pass
275	198	10	60	28.3	1558528	Pass
365	442	1	50	2.5	200064	Pass
441	443	0.01	100	70.8	1123328	Pass
442	442	100	100	100.0	7877632	Pass
443	442	15	24	20.1	1586688	Pass

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

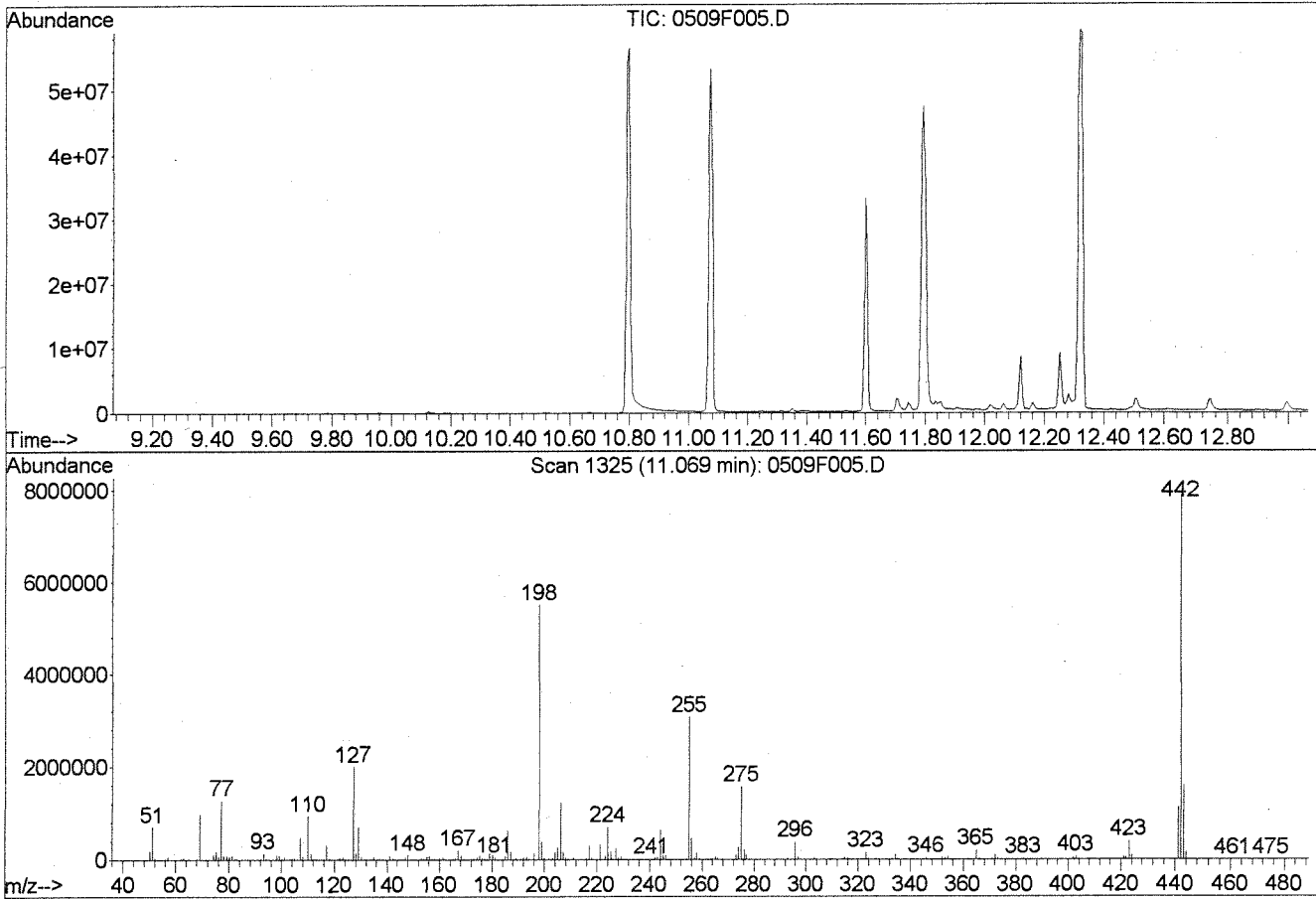
D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

DFTPP

Data File : J:\MS26\DATA\050911\0509F005.D
 Acq On : 9 May 2011 11:15 am
 Sample : 10ug/mL DFTPP | SVM34-33F
 Misc :
 MS Integration Params: rteint.p
 Method : J:\MS26\METHODS\SIM\A_DFTPP.M (RTE Integrator)
 Title : dftpp tune mix

Vial: 1
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00



Spectrum Information: Scan 1325

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	12.7	700992	PASS
68	69	0.00	2	1.4	13150	PASS
69	198	0.00	100	17.7	972672	PASS
70	69	0.00	2	0.5	5066	PASS
127	198	10	80	36.3	1997824	PASS
197	198	0.00	2	0.0	0	PASS
198	442	30	100	69.9	5508096	PASS
199	198	5	9	6.8	373632	PASS
275	198	10	60	28.3	1558528	PASS
365	442	1	50	2.5	200064	PASS
441	443	0.01	100	70.8	1123328	PASS
442	442	30	100	100.0	7877632	PASS
443	442	15	24	20.1	1586688	PASS

LB
 511011
 CH 05.10.11

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
50.10	175744	61.10	9076	72.10	684	83.10	22992
51.10	700992	62.10	11282	73.00	6516	84.00	2283
52.10	35816	63.10	33064	74.10	92872	85.10	16584
53.20	1660	64.10	4802	75.10	158656	86.10	23512
54.00	206	65.10	19008	76.10	57568	87.10	11469
55.10	4620	66.00	1436	77.10	1275392	88.10	5655
56.10	20432	67.10	1532	78.10	85416	89.10	2049
57.10	52136	68.10	13150	79.10	69640	90.10	748
58.00	2316	69.00	972672	80.10	55336	91.10	20104
59.10	671	70.10	5066	81.10	82528	92.10	21040
60.00	1086	71.10	3191	82.10	21000	93.10	133760

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
94.10	9002	105.00	33480	116.10	23712	127.10	1997824
95.10	5186	106.10	10305	117.00	311872	128.10	145920
96.10	8648	107.10	464576	118.10	24432	129.10	695488
97.20	4742	108.10	73896	119.10	4496	130.10	60976
98.10	104632	109.10	12483	120.10	6355	131.10	12409
99.10	85880	110.00	935744	121.00	2248	132.10	8242
100.10	8736	111.10	135424	122.00	28304	132.90	3695
101.00	57824	112.10	17488	123.10	47232	134.10	19000
102.00	3428	113.10	5707	124.00	21672	135.10	58984
103.10	16928	114.10	1498	125.10	22248	136.10	21792
104.00	33208	115.00	2220	126.10	5253	137.10	28872

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
138.10	6356	149.10	21408	160.00	27552	171.00	8490
139.00	3889	150.10	6395	161.10	47376	172.00	17232
140.00	7545	151.10	11578	162.00	13040	173.10	22032
141.00	85744	151.90	8398	163.10	4006	174.10	42288
142.10	29288	153.00	28504	164.00	4599	175.10	81264
143.00	21792	154.10	22976	165.00	34784	176.10	25232
144.00	5918	155.10	54680	166.10	28944	177.00	34312
145.00	6165	156.10	83888	167.10	196224	178.00	10661
146.10	14761	157.10	18992	168.10	86648	179.00	143296
147.10	45120	158.00	16257	169.10	18456	180.10	105424
148.00	94488	159.00	13164	170.00	6344	181.10	51984

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
182.10	7779	193.10	54272	206.10	1212416	219.10	3402
183.10	5240	194.10	11832	207.10	163136	221.10	312576
184.10	11434	195.10	7602	208.10	36088	223.00	70152
185.10	71120	196.10	139840	209.00	11104	224.10	696768
186.10	621952	198.00	5508096	211.00	45936	225.10	175744
187.10	175616	199.00	373632	213.00	3013	226.00	17760
188.10	17128	200.00	29040	214.00	1209	227.00	241088
189.00	31152	201.60	24672	215.00	10591	228.00	37952
190.10	5072	203.00	28320	216.00	24008	229.00	58712
191.10	16100	204.10	156416	217.00	303872	230.00	10364
192.10	48024	205.10	274688	218.00	40896	231.10	25608

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Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
232.10	5831	243.10	41064	254.00	14230	265.00	59384
233.00	4850	244.10	636288	255.00	3073536	265.90	30712
234.00	15479	245.10	88480	256.00	457216	267.00	2334
235.00	20808	246.00	98752	257.10	34264	267.90	14490
236.00	13169	247.00	20184	258.00	150784	268.90	1366
237.00	21880	248.00	5311	259.00	24240	269.90	7072
238.00	3265	249.00	21888	260.00	4355	271.00	5192
239.00	10927	250.00	3815	261.10	5748	272.00	8114
240.00	7773	251.00	4575	262.00	1214	273.00	98288
241.00	15098	252.10	4798	263.10	1351	274.00	263936
242.00	38320	253.00	10498	263.90	16329	275.00	1558528

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
276.10	212416	287.10	382	298.10	4030	308.00	6187
277.00	107512	288.10	1444	299.00	1199	309.10	3898
278.00	18200	289.00	4600	299.90	452	310.10	6102
279.00	3914	290.00	4222	301.00	5986	311.00	1534
280.10	906	291.00	2804	302.10	6855	312.00	1665
281.00	948	292.10	5797	303.10	46608	313.10	4237
282.00	2769	293.00	29104	304.10	14524	314.10	20048
283.00	13477	294.00	7352	305.00	1752	315.00	42928
284.00	9076	295.00	6824	305.90	420	316.10	28368
285.10	21248	296.00	385152	306.90	697	317.10	5455
286.10	4317	297.10	53152	307.10	695	318.00	453

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
319.00	892	330.10	823	342.10	4747	354.10	51624
319.90	1534	331.00	562	343.00	709	355.10	9842
321.00	14730	332.00	10118	344.10	194	356.00	1059
322.00	6633	333.00	13546	345.10	275	357.10	559
323.10	155200	334.10	94632	346.00	36384	358.00	1167
324.10	30440	335.10	26248	347.00	6600	359.00	4007
325.10	2768	336.10	3662	348.00	968	360.00	872
326.00	3322	337.10	357	350.00	1134	361.10	877
327.00	27848	338.90	2300	351.00	2721	362.40	152
328.10	14191	340.10	2342	352.00	49672	363.10	465
329.00	2792	341.00	19096	353.10	33536	364.00	1713

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
365.00	200064	377.00	2907	390.00	14038	403.10	56624
366.00	30624	378.00	476	391.00	9254	404.10	21000
367.00	2358	379.10	223	392.10	7346	405.00	3137
369.00	169	380.80	209	393.10	895	406.00	249
370.00	5178	382.00	422	395.00	927	408.00	544
371.00	13788	383.00	26472	395.90	504	409.00	407
372.10	94496	384.00	7987	396.90	1324	410.00	2120
373.10	24680	385.00	2088	397.90	177	411.00	422
374.10	2996	385.90	367	398.30	208	415.00	2812
375.00	290	387.80	285	401.00	5642	416.10	464
375.90	212	389.00	862	402.00	39496	419.00	373

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CH 05-10-11

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
420.00	596	441.10	1123328				
421.00	52856	442.10	7877632				
422.00	44800	443.10	1586688				
423.00	397248	444.10	152320				
424.10	79880	445.10	9102				
425.10	7945	445.90	497				
426.00	625	460.90	163				
427.00	384	475.10	206				
438.10	158						
439.10	657						
439.90	755						

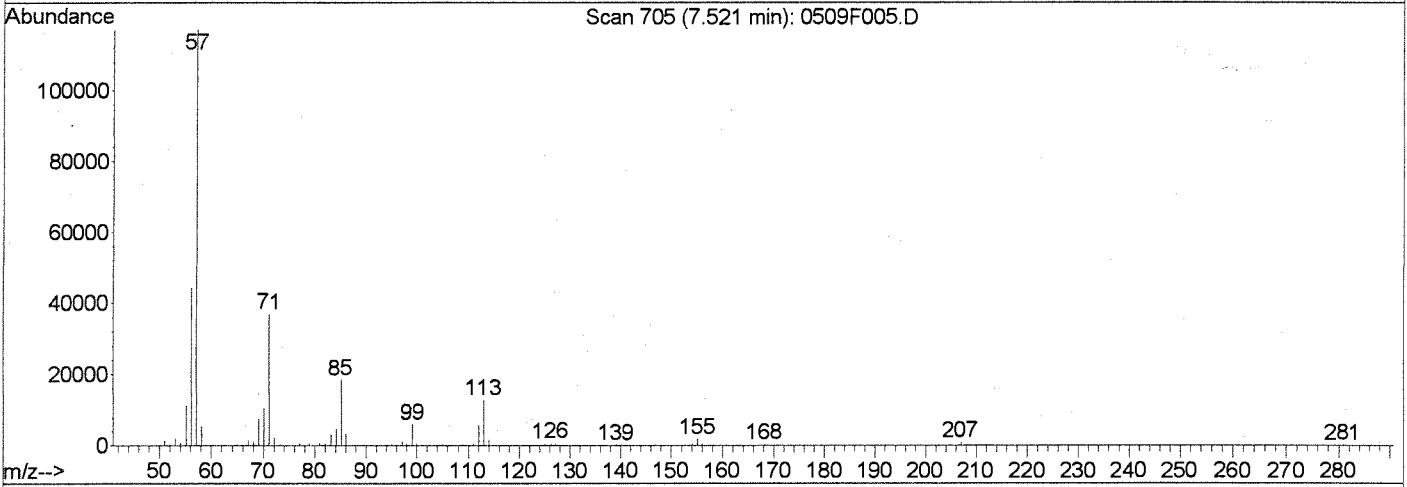
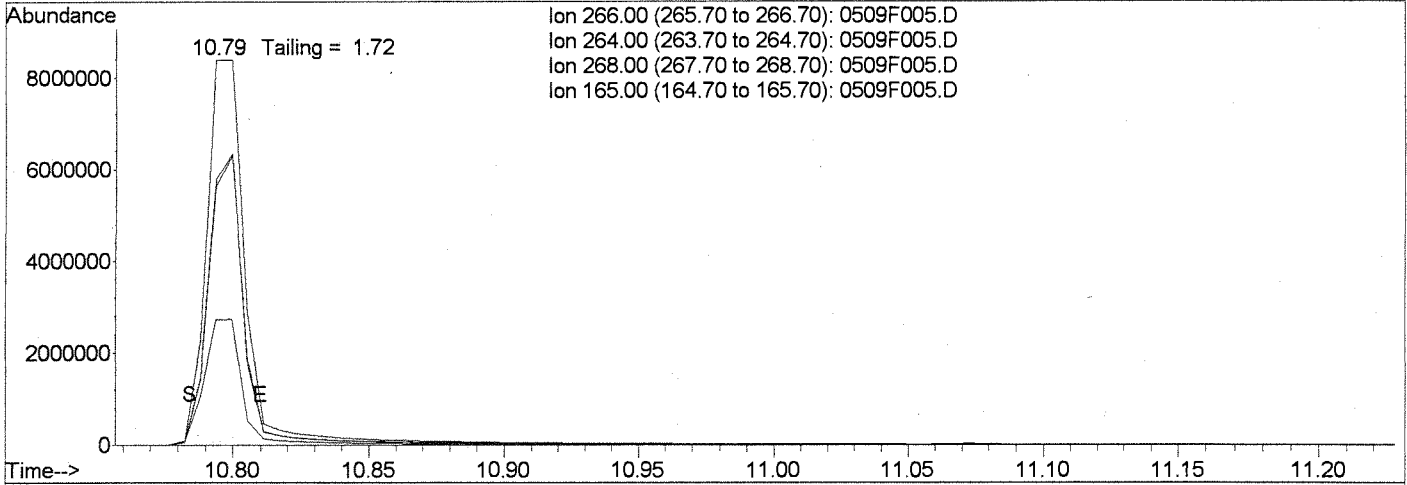
LB
511011
04 05 10 11

Quantitation Report

Data File : J:\MS26\DATA\050911\0509F005.D
Acq On : 9 May 2011 11:15 am
Sample : 10ug/mL DFTPP | SVM34-33F
Misc :
MS Integration Params: rteint.p

Vial: 1
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Method : J:\MS26\METHODS\SIM\A_DFTPP.M (RTE Integrator)
Title : dftpp tune mix
Last Update : Tue Nov 30 13:38:58 2010
Response via : Initial Calibration



TIC: 0509F005.D

(1) Pentachlorophenol

Exp R.T. 7.52min

response 0

Ion	Exp%	Act%
266.00	100	0
264.00	63.70	0.00
268.00	63.30	0.00
165.00	71.50	0.00

LB
5/10/11
04 05 10 11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
 Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
 Calibration Date: 05/09/2011

Initial Calibration Summary
 1,4-Dioxane by GC/MS

Calibration ID: CAL10487
 Instrument ID: MS26

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS26\DATA\050911\0509F007.D	E	J:\MS26\DATA\050911\0509F011.D
B	J:\MS26\DATA\050911\0509F008.D	F	J:\MS26\DATA\050911\0509F012.D
C	J:\MS26\DATA\050911\0509F009.D	G	J:\MS26\DATA\050911\0509F013.D
D	J:\MS26\DATA\050911\0509F010.D		

Analyte Name	Level			Level			Level			Level			Level		
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF
1,4-Dioxane	A	2.0	0.359	B	4.0	0.357	C	10	0.368	D	20	0.389	E	50	0.426
	F	100	0.432	G	200	0.450									
1,4-Dioxane-d8	A	2.0	0.369	B	4.0	0.357	C	10	0.368	D	20	0.403	E	50	0.403
	F	100	0.417	G	200	0.419									

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Calibration Date: 05/09/2011

**Initial Calibration Summary
 1,4-Dioxane by GC/MS**

Calibration ID: CAL10487
Instrument ID: MS26

Column: MS

Analyte Name	Compound Type	Calibration Evaluation				RRF Evaluation			
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
1,4-Dioxane	MS	AverageRF	% RSD	9.6		≤ 15	0.397		0.01
1,4-Dioxane-d8	SURR	AverageRF	% RSD	6.6		≤ 15	0.391		0.01

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Calibration Date: 05/09/2011
Date Analyzed: 05/09/2011

Second Source Calibration Verification
1,4-Dioxane by GC/MS

Calibration Type: Internal Standard
Analysis Method: 8270C SIM

Calibration ID: CAL10487
Units: ng/ml

File ID: J:\MS26\DATA\050911\0509F014.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
1,4-Dioxane	20	22	0.397	0.445	12	NA	± 20 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Injection Log

Directory: J:\MS26\DATA\050911

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	0509F001.d	1.	PR		9 May 2011 09:4
2	1	0509F002.d	1.	PR		9 May 2011 10:0
3	1	0509F003.d	1.	10ug/mL DFTPP SVM34-33F	NR	9 May 2011 10:2
4	1	0509F004.d	1.	10ug/mL DFTPP SVM34-33F		9 May 2011 10:4
5	1	0509F005.d	1.	10ug/mL DFTPP SVM34-33F	OK - New Tune	9 May 2011 11:1
6	2	0509F006.d	1.	IB		9 May 2011 11:4
7	3	0509F007.d	1.	2.0ng/mL ICAL 1,4-Dioxane SVM34-56B		9 May 2011 12:0
8	4	0509F008.d	1.	4.0ng/mL ICAL 1,4-Dioxane SVM34-56C		9 May 2011 12:2
9	5	0509F009.d	1.	10ng/mL ICAL 1,4-Dioxane SVM34-56D		9 May 2011 12:4
10	6	0509F010.d	1.	20ng/mL ICAL 1,4-Dioxane SVM34-56E		9 May 2011 13:0
11	7	0509F011.d	1.	50ng/mL ICAL 1,4-Dioxane SVM34-56F		9 May 2011 13:2
12	8	0509F012.d	1.	100ng/mL ICAL 1,4-Dioxane SVM34-56G		9 May 2011 13:4
13	9	0509F013.d	1.	200ng/mL ICAL 1,4-Dioxane SVM34-56H		9 May 2011 14:0
14	10	0509F014.d	1.	20ng/mL ICV 1,4-Dioxane SVM34-57L		9 May 2011 14:2
15	11	0509F015.d	1.	KWG1103961-4 MB		9 May 2011 14:4
16	12	0509F016.d	1.	KWG1103961-3 LCS		9 May 2011 15:0
17	13	0509F017.d	1.	KWG1103961-1 MS P1101579-005MS		9 May 2011 15:2
18	14	0509F018.d	1.	KWG1103961-2 DMS P1101579-005DMS		9 May 2011 15:4
19	15	0509F019.d	1.	P1101579-005		9 May 2011 16:0
20	16	0509F020.d	1.	P1101605-005		9 May 2011 16:2
21	17	0509F021.d	1.	P1101607-001		9 May 2011 16:4

Run # 245353

CAL10487

LB 5110111

04 05'10'11

Exception Report

Data File: J:\MS26\DATA\050911\0509F005.D
Lab ID: KWG1104145-1
RunType: TUNE
Matrix: WATER

Date Acquired: 05/09/2011 11:15
Date Quantitated:
Batch ID: KWG1104145
Analysis Method: DFTPP
ListJoinID: LJ1965

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Ion Ratio	NA	NA	NA	x	

Primary Review: LG 5/10/11

Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID: Prod Code: 8270C SIM 14_DI	Tier: Collect Date:	Matrix: WATER Receive Date: 05/10/2011
Analysis Lot: KWG1104145 Analysis Method: DFTPP Prep Ref:	Prep Lot: Prep Method: Prep Date:	Report Group:
Quant Method: J:\MS26\METHODS\SIM1A_DFTPP.M Title: Tune Ref: MB Ref:	Calibration ID: CAL10487 Report List ID: LJ1965 Method ID: MJ190 Quant based on Report List	
Data File: J:\MS26\DATA\050911\0509F005.D Acqu Date: 05/09/2011 11:15 Run Type: TUNE Lab ID: KWG1104145-1	Quant Date:	Instrument: MS26 Vial: 1 Dilution: 1.0 Soln Conc. Units:

Tune Results

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	12.7	700992	Pass
68	69	0	2	1.4	13150	Pass
69	198	0	100	17.7	972672	Pass
70	69	0	2	0.5	5066	Pass
127	198	10	80	36.3	1997824	Pass
197	198	0	2	0.0	0	Pass
198	442	30	100	69.9	5508096	Pass
199	198	5	9	6.8	373632	Pass
275	198	10	60	28.3	1558528	Pass
365	442	1	50	2.5	200064	Pass
441	443	0.01	100	70.8	1123328	Pass
442	442	100	100	100.0	7877632	Pass
443	442	15	24	20.1	1586688	Pass

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

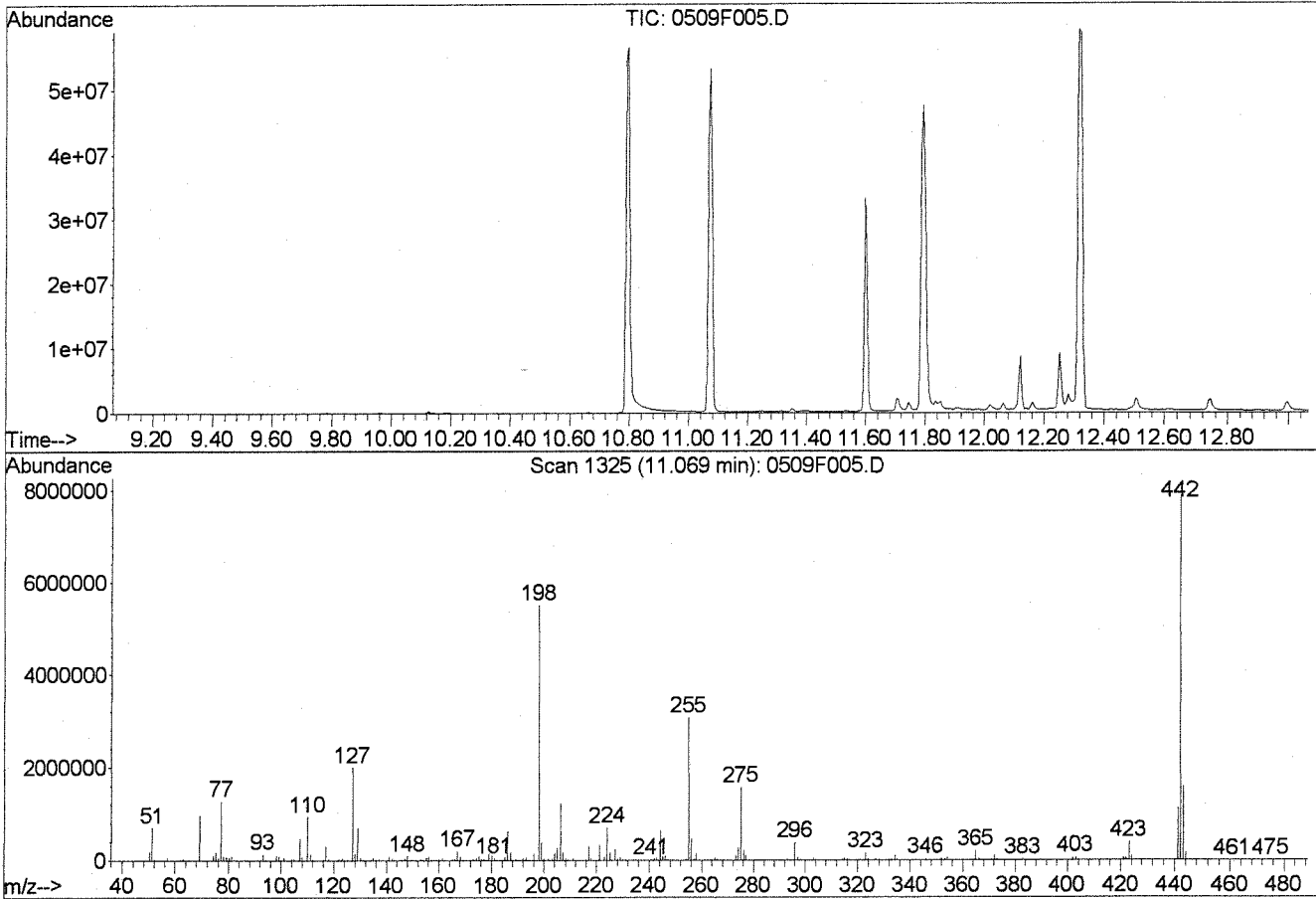
D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

DFTPP

Data File : J:\MS26\DATA\050911\0509F005.D
 Acq On : 9 May 2011 11:15 am
 Sample : 10ug/mL DFTPP | SVM34-33F
 Misc :
 MS Integration Params: rteint.p
 Method : J:\MS26\METHODS\SIM\A_DFTPP.M (RTE Integrator)
 Title : dftpp tune mix

Vial: 1
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00



Spectrum Information: Scan 1325

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	12.7	700992	PASS
68	69	0.00	2	1.4	13150	PASS
69	198	0.00	100	17.7	972672	PASS
70	69	0.00	2	0.5	5066	PASS
127	198	10	80	36.3	1997824	PASS
197	198	0.00	2	0.0	0	PASS
198	442	30	100	69.9	5508096	PASS
199	198	5	9	6.8	373632	PASS
275	198	10	60	28.3	1558528	PASS
365	442	1	50	2.5	200064	PASS
441	443	0.01	100	70.8	1123328	PASS
442	442	30	100	100.0	7877632	PASS
443	442	15	24	20.1	1586688	PASS

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 CA 05-10-11

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
50.10	175744	61.10	9076	72.10	684	83.10	22992
51.10	700992	62.10	11282	73.00	6516	84.00	2283
52.10	35816	63.10	33064	74.10	92872	85.10	16584
53.20	1660	64.10	4802	75.10	158656	86.10	23512
54.00	206	65.10	19008	76.10	57568	87.10	11469
55.10	4620	66.00	1436	77.10	1275392	88.10	5655
56.10	20432	67.10	1532	78.10	85416	89.10	2049
57.10	52136	68.10	13150	79.10	69640	90.10	748
58.00	2316	69.00	972672	80.10	55336	91.10	20104
59.10	671	70.10	5066	81.10	82528	92.10	21040
60.00	1086	71.10	3191	82.10	21000	93.10	133760

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
94.10	9002	105.00	33480	116.10	23712	127.10	1997824
95.10	5186	106.10	10305	117.00	311872	128.10	145920
96.10	8648	107.10	464576	118.10	24432	129.10	695488
97.20	4742	108.10	73896	119.10	4496	130.10	60976
98.10	104632	109.10	12483	120.10	6355	131.10	12409
99.10	85880	110.00	935744	121.00	2248	132.10	8242
100.10	8736	111.10	135424	122.00	28304	132.90	3695
101.00	57824	112.10	17488	123.10	47232	134.10	19000
102.00	3428	113.10	5707	124.00	21672	135.10	58984
103.10	16928	114.10	1498	125.10	22248	136.10	21792
104.00	33208	115.00	2220	126.10	5253	137.10	28872

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
138.10	6356	149.10	21408	160.00	27552	171.00	8490
139.00	3889	150.10	6395	161.10	47376	172.00	17232
140.00	7545	151.10	11578	162.00	13040	173.10	22032
141.00	85744	151.90	8398	163.10	4006	174.10	42288
142.10	29288	153.00	28504	164.00	4599	175.10	81264
143.00	21792	154.10	22976	165.00	34784	176.10	25232
144.00	5918	155.10	54680	166.10	28944	177.00	34312
145.00	6165	156.10	83888	167.10	196224	178.00	10661
146.10	14761	157.10	18992	168.10	86648	179.00	143296
147.10	45120	158.00	16257	169.10	18456	180.10	105424
148.00	94488	159.00	13164	170.00	6344	181.10	51984

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
182.10	7779	193.10	54272	206.10	1212416	219.10	3402
183.10	5240	194.10	11832	207.10	163136	221.10	312576
184.10	11434	195.10	7602	208.10	36088	223.00	70152
185.10	71120	196.10	139840	209.00	11104	224.10	696768
186.10	621952	198.00	5508096	211.00	45936	225.10	175744
187.10	175616	199.00	373632	213.00	3013	226.00	17760
188.10	17128	200.00	29040	214.00	1209	227.00	241088
189.00	31152	201.60	24672	215.00	10591	228.00	37952
190.10	5072	203.00	28320	216.00	24008	229.00	58712
191.10	16100	204.10	156416	217.00	303872	230.00	10364
192.10	48024	205.10	274688	218.00	40896	231.10	25608

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Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
232.10	5831	243.10	41064	254.00	14230	265.00	59384
233.00	4850	244.10	636288	255.00	3073536	265.90	30712
234.00	15479	245.10	88480	256.00	457216	267.00	2334
235.00	20808	246.00	98752	257.10	34264	267.90	14490
236.00	13169	247.00	20184	258.00	150784	268.90	1366
237.00	21880	248.00	5311	259.00	24240	269.90	7072
238.00	3265	249.00	21888	260.00	4355	271.00	5192
239.00	10927	250.00	3815	261.10	5748	272.00	8114
240.00	7773	251.00	4575	262.00	1214	273.00	98288
241.00	15098	252.10	4798	263.10	1351	274.00	263936
242.00	38320	253.00	10498	263.90	16329	275.00	1558528

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
276.10	212416	287.10	382	298.10	4030	308.00	6187
277.00	107512	288.10	1444	299.00	1199	309.10	3898
278.00	18200	289.00	4600	299.90	452	310.10	6102
279.00	3914	290.00	4222	301.00	5986	311.00	1534
280.10	906	291.00	2804	302.10	6855	312.00	1665
281.00	948	292.10	5797	303.10	46608	313.10	4237
282.00	2769	293.00	29104	304.10	14524	314.10	20048
283.00	13477	294.00	7352	305.00	1752	315.00	42928
284.00	9076	295.00	6824	305.90	420	316.10	28368
285.10	21248	296.00	385152	306.90	697	317.10	5455
286.10	4317	297.10	53152	307.10	695	318.00	453

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
319.00	892	330.10	823	342.10	4747	354.10	51624
319.90	1534	331.00	562	343.00	709	355.10	9842
321.00	14730	332.00	10118	344.10	194	356.00	1059
322.00	6633	333.00	13546	345.10	275	357.10	559
323.10	155200	334.10	94632	346.00	36384	358.00	1167
324.10	30440	335.10	26248	347.00	6600	359.00	4007
325.10	2768	336.10	3662	348.00	968	360.00	872
326.00	3322	337.10	357	350.00	1134	361.10	877
327.00	27848	338.90	2300	351.00	2721	362.40	152
328.10	14191	340.10	2342	352.00	49672	363.10	465
329.00	2792	341.00	19096	353.10	33536	364.00	1713

Scan 1325 (11.069 min): 0509F005.D
10ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
365.00	200064	377.00	2907	390.00	14038	403.10	56624
366.00	30624	378.00	476	391.00	9254	404.10	21000
367.00	2358	379.10	223	392.10	7346	405.00	3137
369.00	169	380.80	209	393.10	895	406.00	249
370.00	5178	382.00	422	395.00	927	408.00	544
371.00	13788	383.00	26472	395.90	504	409.00	407
372.10	94496	384.00	7987	396.90	1324	410.00	2120
373.10	24680	385.00	2088	397.90	177	411.00	422
374.10	2996	385.90	367	398.30	208	415.00	2812
375.00	290	387.80	285	401.00	5642	416.10	464
375.90	212	389.00	862	402.00	39496	419.00	373

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m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
420.00	596	441.10	1123328				
421.00	52856	442.10	7877632				
422.00	44800	443.10	1586688				
423.00	397248	444.10	152320				
424.10	79880	445.10	9102				
425.10	7945	445.90	497				
426.00	625	460.90	163				
427.00	384	475.10	206				
438.10	158						
439.10	657						
439.90	755						

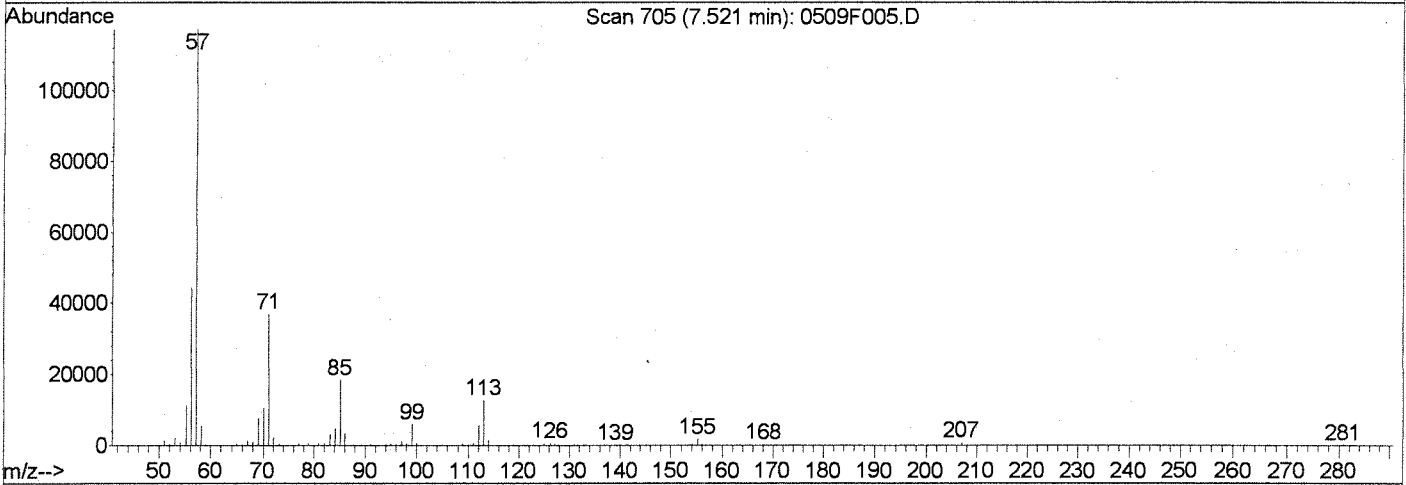
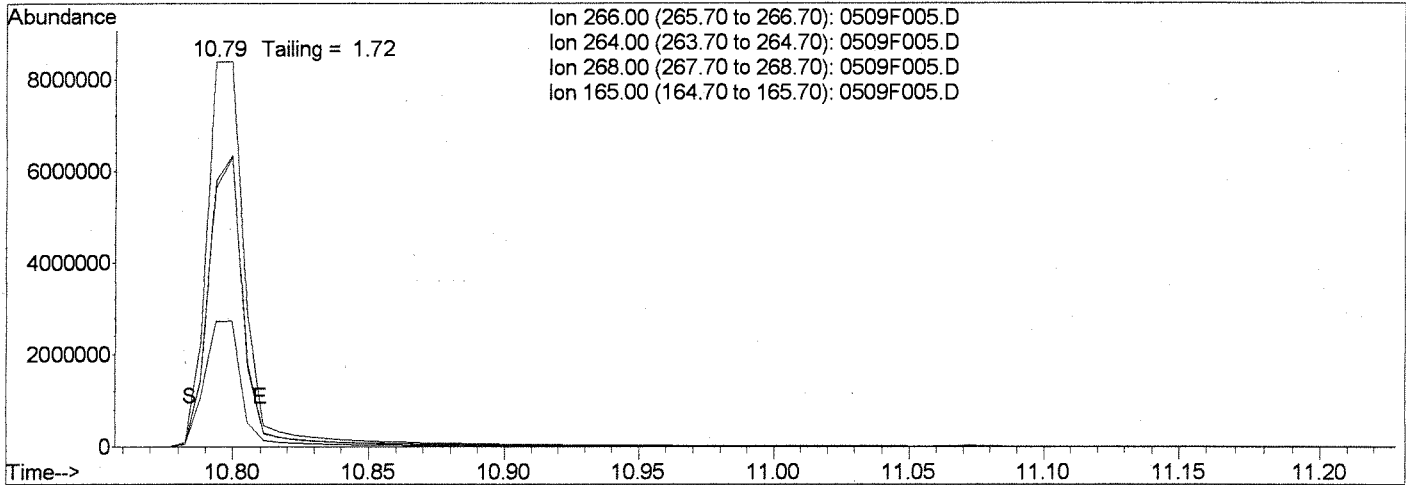
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Quantitation Report

Data File : J:\MS26\DATA\050911\0509F005.D
 Acq On : 9 May 2011 11:15 am
 Sample : 10ug/mL DFTPP | SVM34-33F
 Misc :
 MS Integration Params: rteint.p

Vial: 1
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Method : J:\MS26\METHODS\SIM\A_DFTPP.M (RTE Integrator)
 Title : dftpp tune mix
 Last Update : Tue Nov 30 13:38:58 2010
 Response via : Initial Calibration



TIC: 0509F005.D

(1) Pentachlorophenol

Exp R.T. 7.52min

response 0

Ion	Exp%	Act%
266.00	100	0
264.00	63.70	0.00
268.00	63.30	0.00
165.00	71.50	0.00

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CH 05:10:11

Data File : J:\MS26\DATA\050911\0509F006.D
Acq On : 9 May 2011 11:43 am
Sample : IB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 09 14:56:54 2011

Vial: 2
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration
DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	76813	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	0.00	96	0	0.00	ng/ml	
Spiked Amount	50.000		Recovery	=	0.00%	

Target Compounds Qvalue

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5/10/11

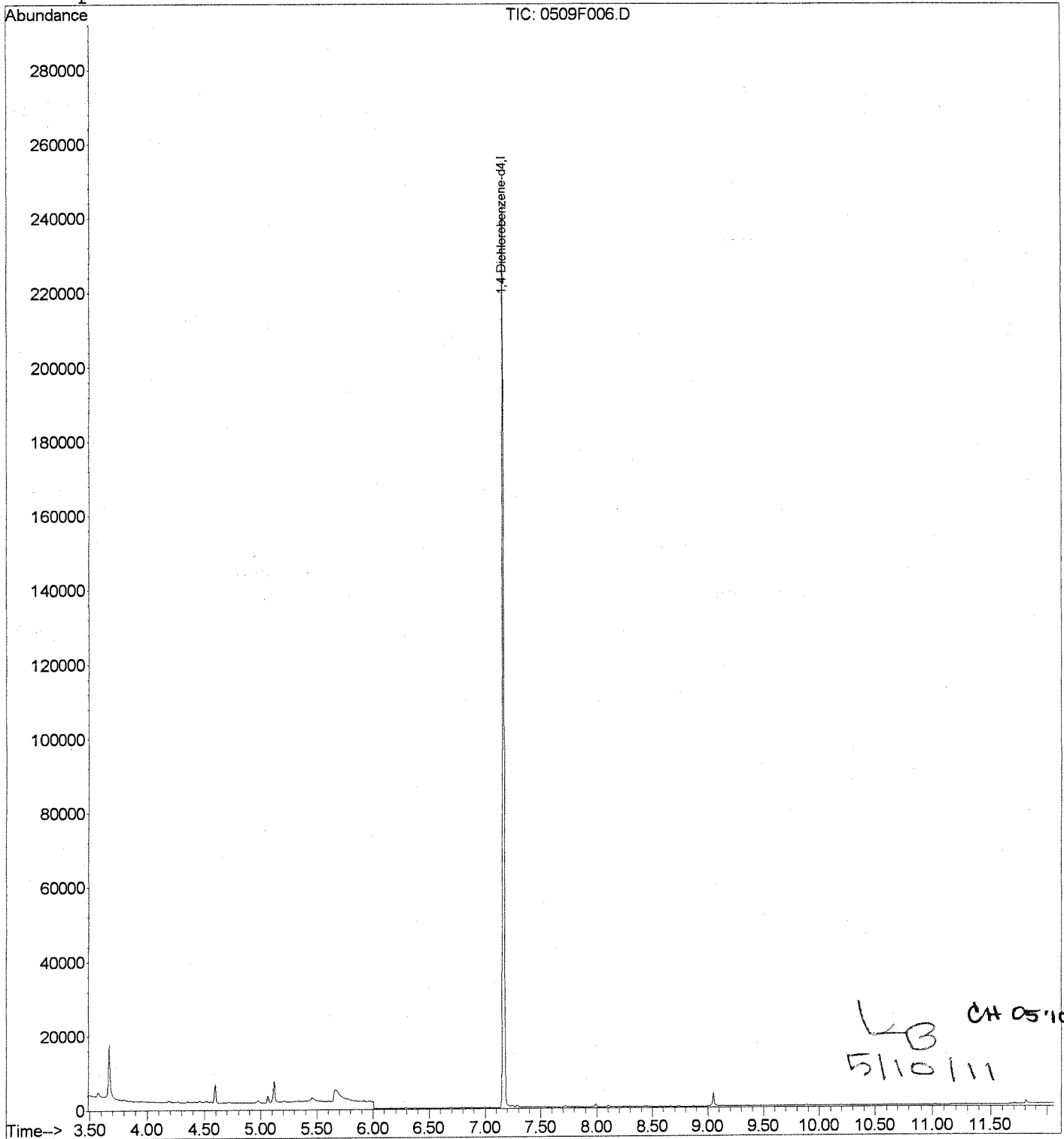
CH 05/10/11

Data File : J:\MS26\DATA\050911\0509F006.D
Acq On : 9 May 2011 11:43 am
Sample : IB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:56 2011

Vial: 2
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Data File : J:\MS26\DATA\050911\0509F007.D Vial: 3
 Acq On : 9 May 2011 12:03 pm Operator: KBailey
 Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:30 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.16	152	81459	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.98	96	1201m	1.98	ng/ml	0.04
Spiked Amount	50.000		Recovery	=	3.96%	
Target Compounds						
3) 1,4-Dioxane	3.99	88	1170m	1.88	ng/ml	Qvalue

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Data File : J:\MS26\DATA\050911\0509F007.D

Vial: 3

Acq On : 9 May 2011 12:03 pm

Operator: K Bailey

Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:22 2011

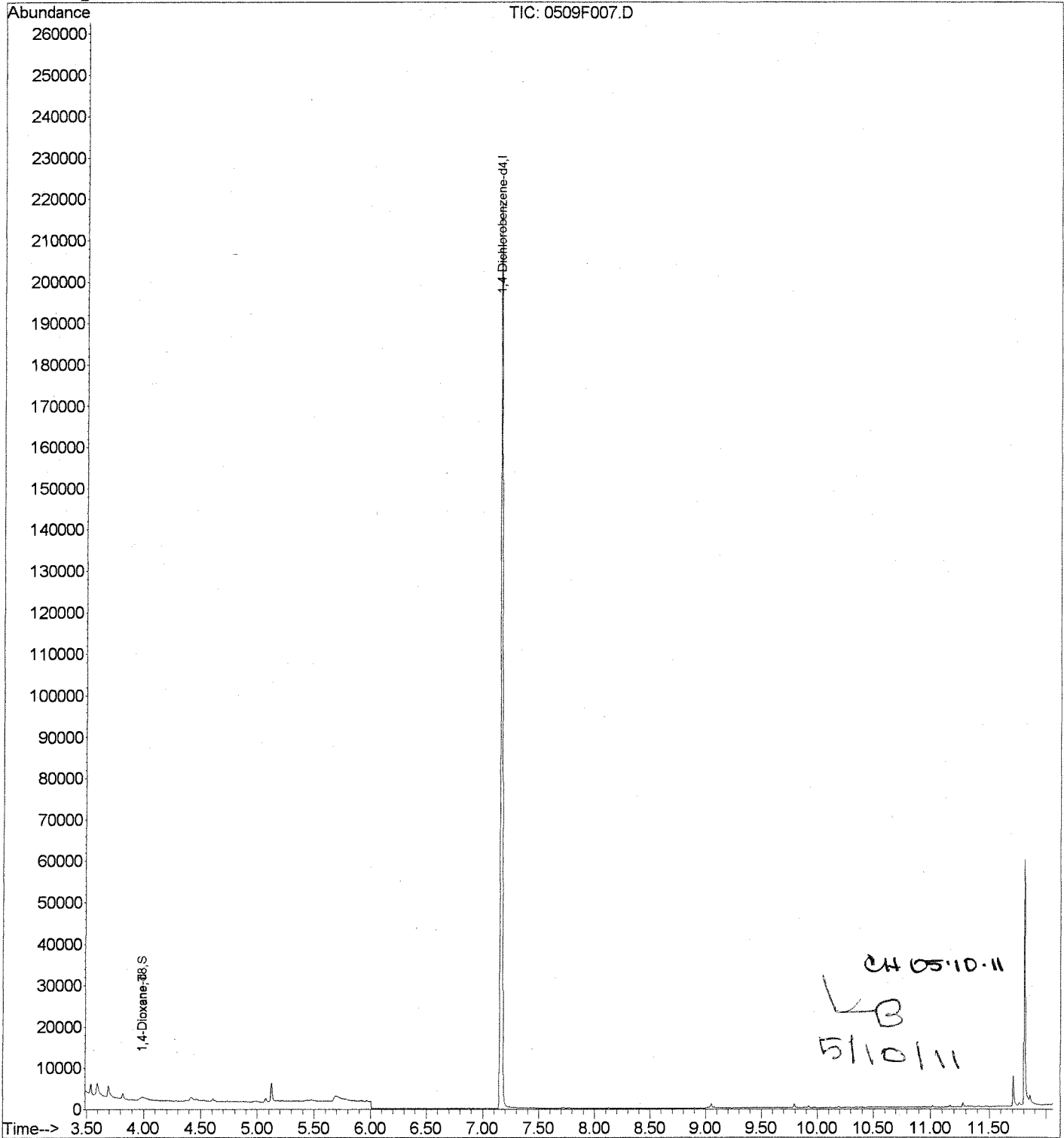
Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:26:14 2011

Response via : Initial Calibration



Quantitation Report (Qeait)

Data File : J:\MS26\DATA\050911\0509F007.D

Vial: 3

Acq On : 9 May 2011 12:03 pm

Operator: KBailey

Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:21 2011

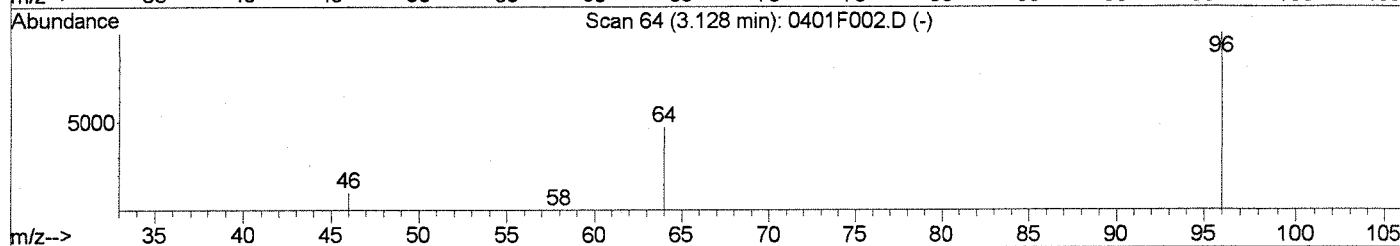
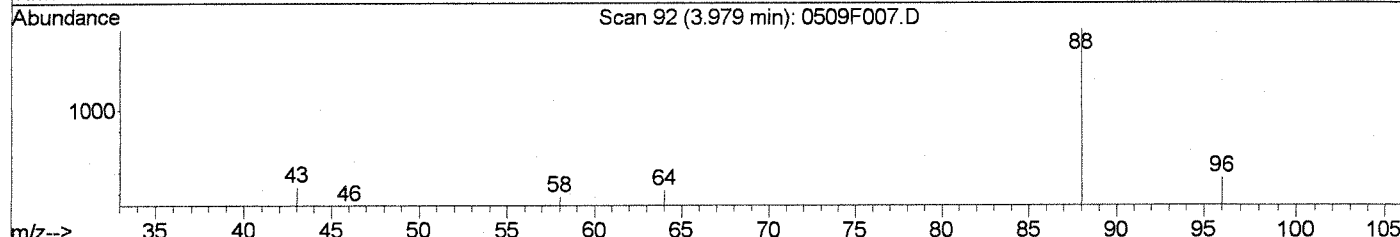
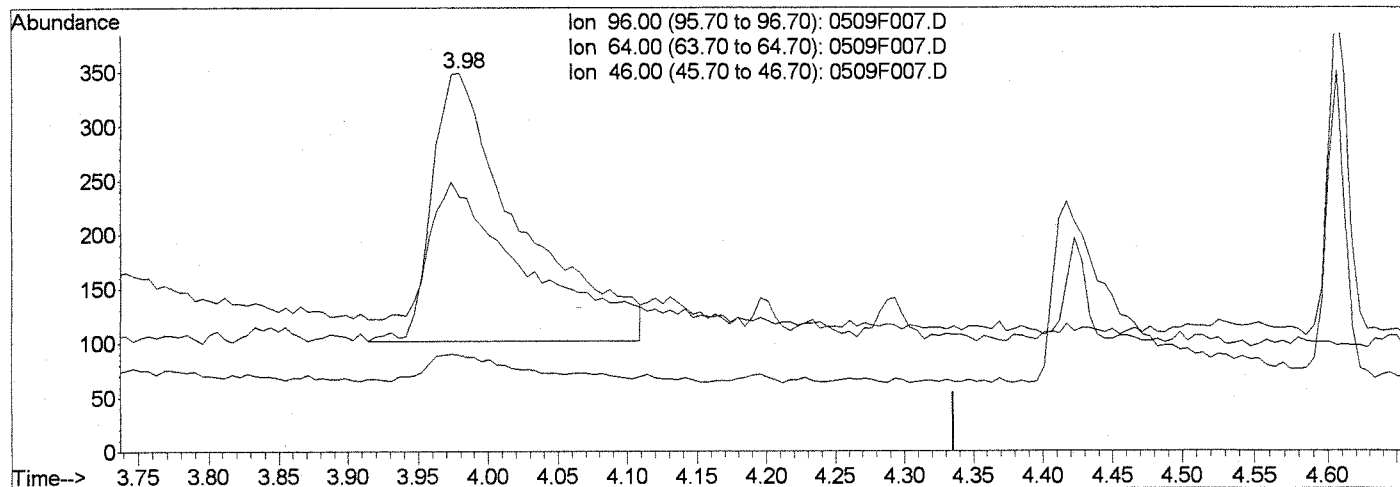
Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:21:18 2011

Response via : Multiple Level Calibration



TIC: 0509F007.D

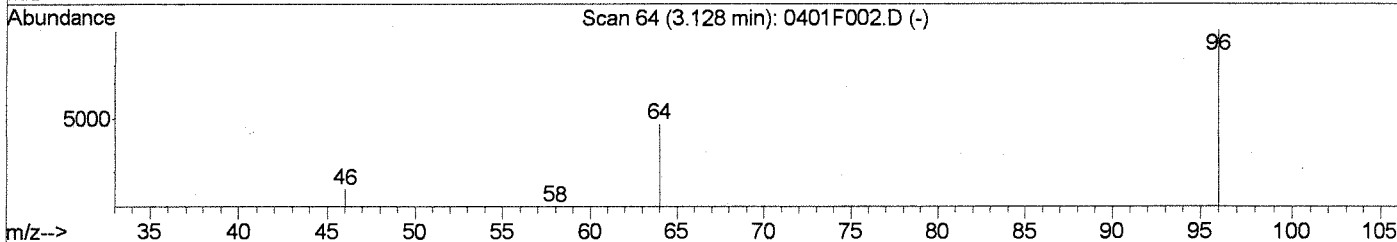
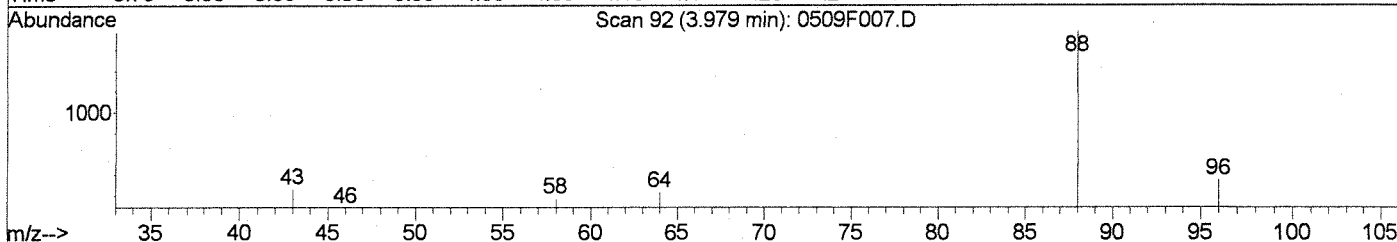
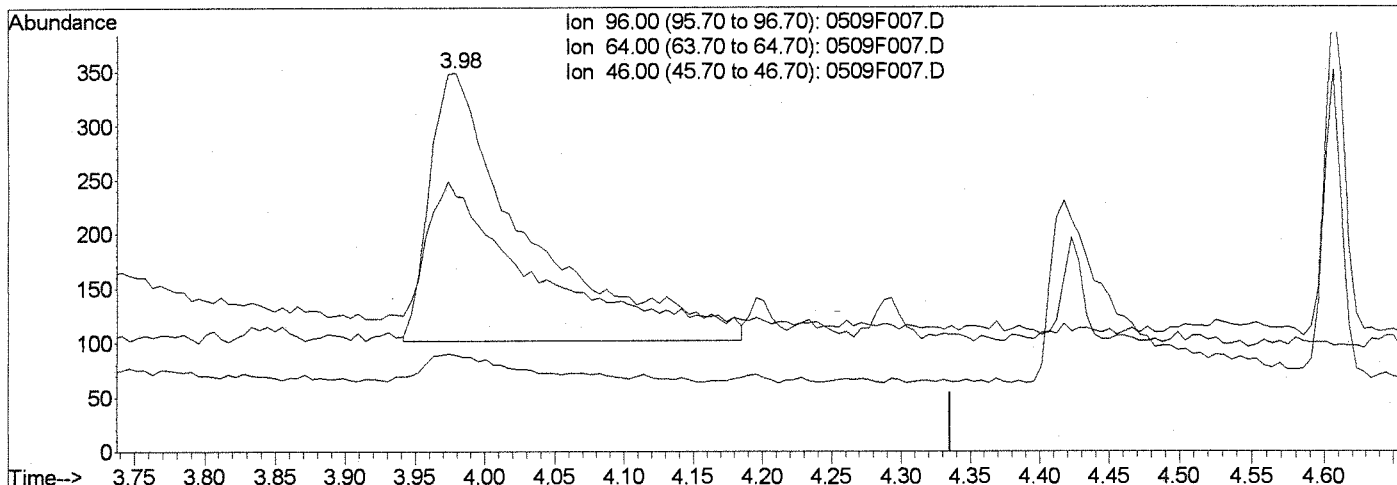
(2) 1,4-Dioxane-d8 (S)		
3.98min 1.80ng/ml		
response 1087		
Ion	Exp%	Act%
96.00	100	100
64.00	55.60	45.75
46.00	11.70	8.91
0.00	0.00	0.00

Data File : J:\MS26\DATA\050911\0509F007.D
Acq On : 9 May 2011 12:03 pm
Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:21 2011

Vial: 3
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:21:18 2011
Response via : Multiple Level Calibration



TIC: 0509F007.D

(2) 1,4-Dioxane-d8 (S)

3.98min 1.98ng/ml m

response 1201

Ion	Exp%	Act%
96.00	100	100
64.00	55.60	67.34
46.00	11.70	25.50
0.00	0.00	0.00

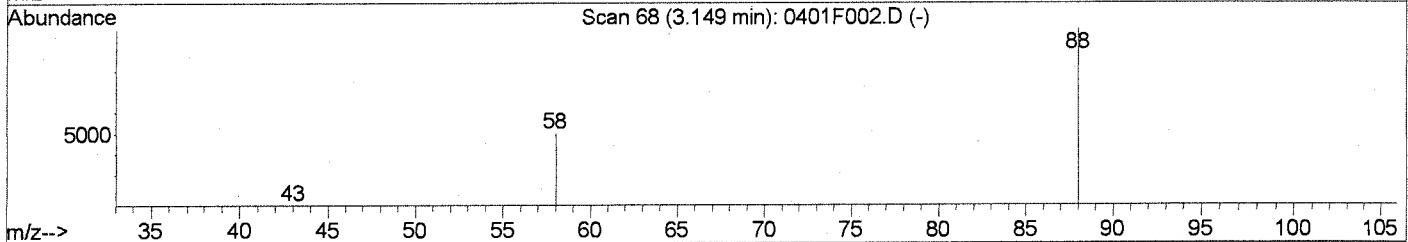
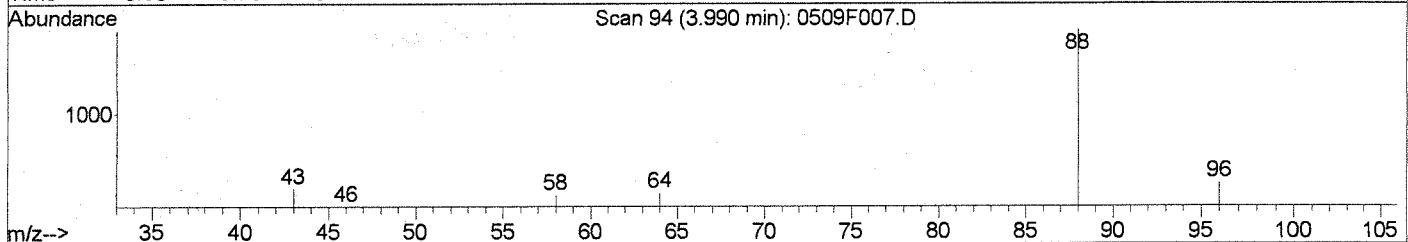
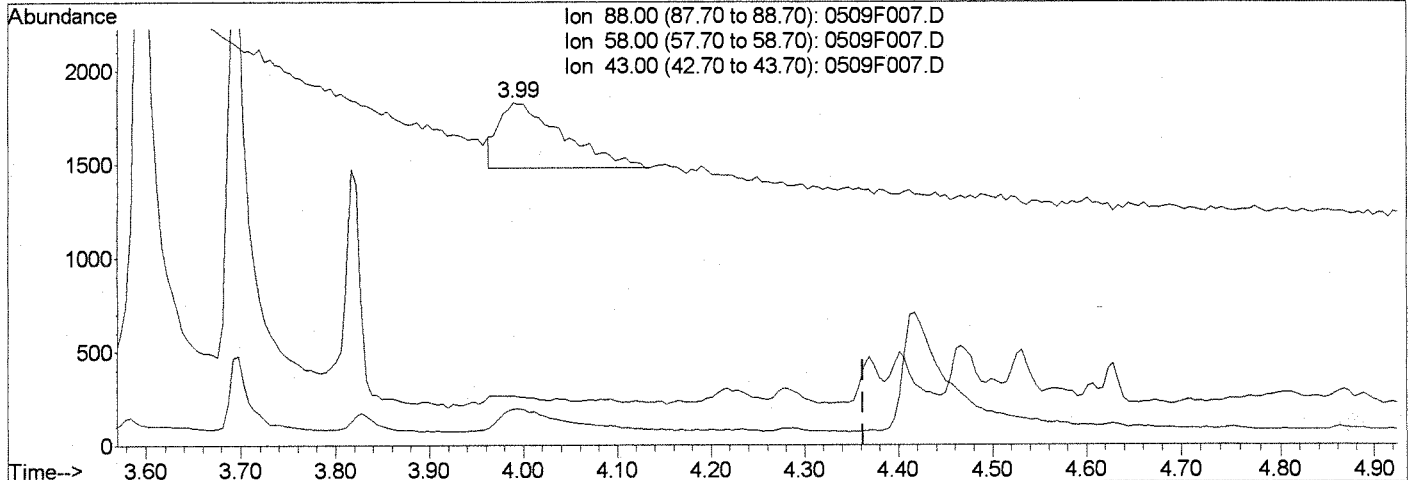
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0405-10-11

Data File : J:\MS26\DATA\050911\0509F007.D
 Acq On : 9 May 2011 12:03 pm
 Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:21 2011

Vial: 3
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F007.D

(3) 1,4-Dioxane (T)		
3.99min	2.67ng/ml	
response	1657	
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	31.43
43.00	15.30	9.43
0.00	0.00	0.00

Data File : J:\MS26\DATA\050911\0509F007.D

Vial: 3

Acq On : 9 May 2011 12:03 pm

Operator: KBailey

Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:22 2011

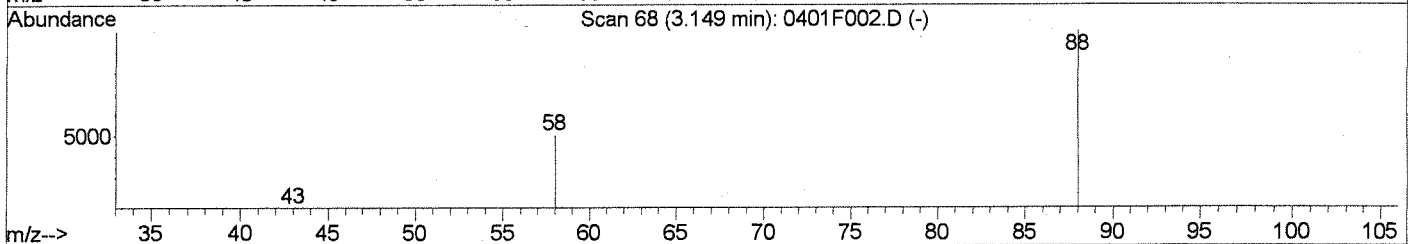
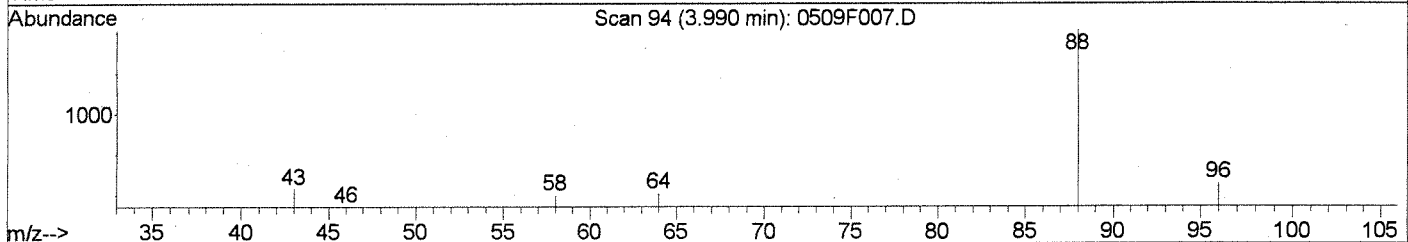
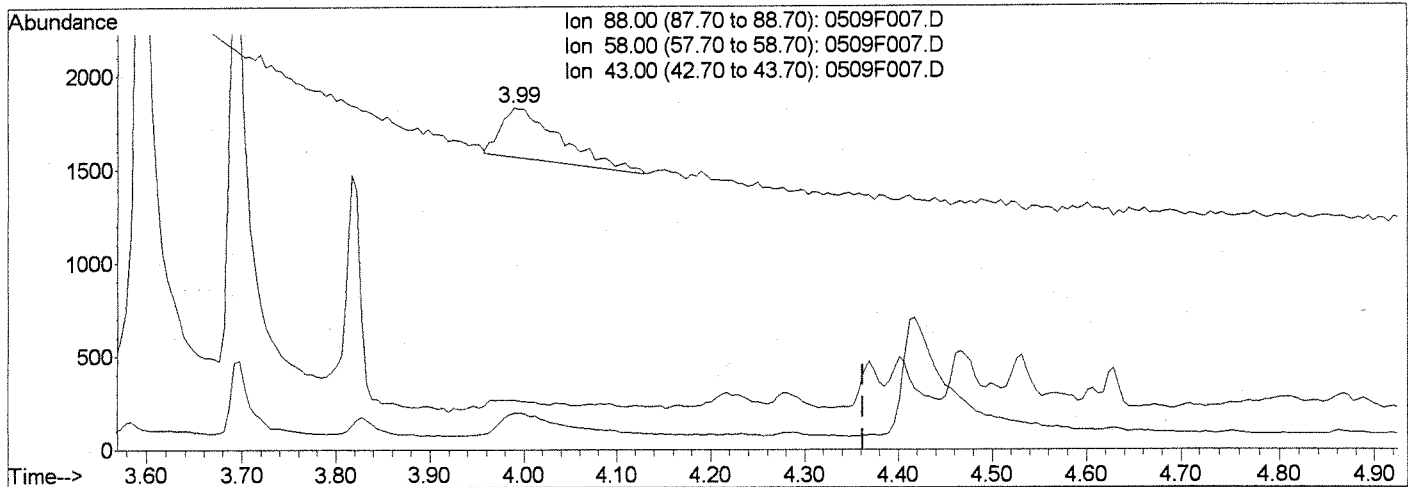
Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:21:18 2011

Response via : Multiple Level Calibration



TIC: 0509F007.D

(3) 1,4-Dioxane (T)

3.99min 1.88ng/ml m

response 1170

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	10.71#
43.00	15.30	14.43
0.00	0.00	0.00

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 LB 5/10/11
 CH 05.10.11

Data File : J:\MS26\DATA\050911\0509F008.D Vial: 4
 Acq On : 9 May 2011 12:23 pm Operator: KBailey
 Sample : 4.0ng/mL ICAL 1,4-Dioxane | SVM34-56C Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:30 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

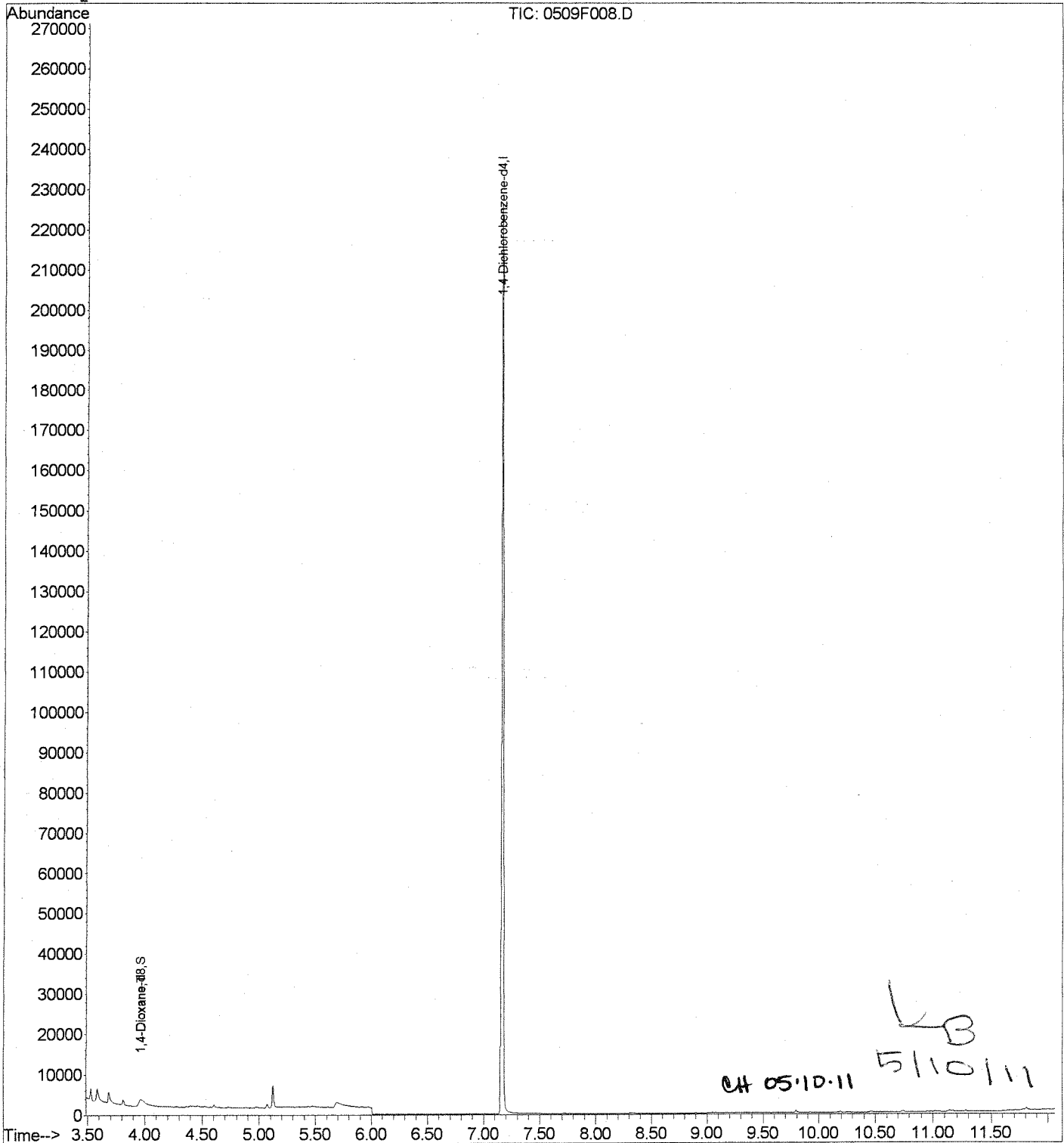
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	80983	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.96	96	2312	3.84	ng/ml	0.02
Spiked Amount	50.000		Recovery	=	7.68%	
Target Compounds						
3) 1,4-Dioxane	3.97	88	2314m	3.75	ng/ml	Qvalue

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Data File : J:\MS26\DATA\050911\0509F008.D Vial: 4
Acq On : 9 May 2011 12:23 pm Operator: KBailey
Sample : 4.0ng/mL ICAL 1,4-Dioxane | SVM34-56C Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 9 14:22 2011 Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F008.D

Vial: 4

Acq On : 9 May 2011 12:23 pm

Operator: KBailey

Sample : 4.0ng/mL ICAL 1,4-Dioxane | SVM34-56C

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:21 2011

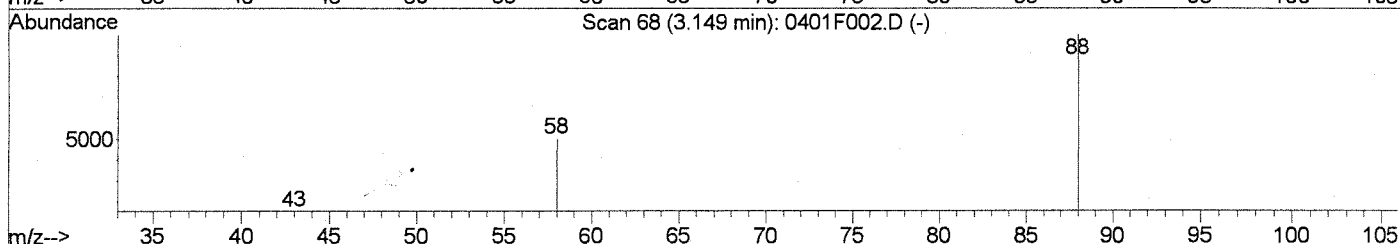
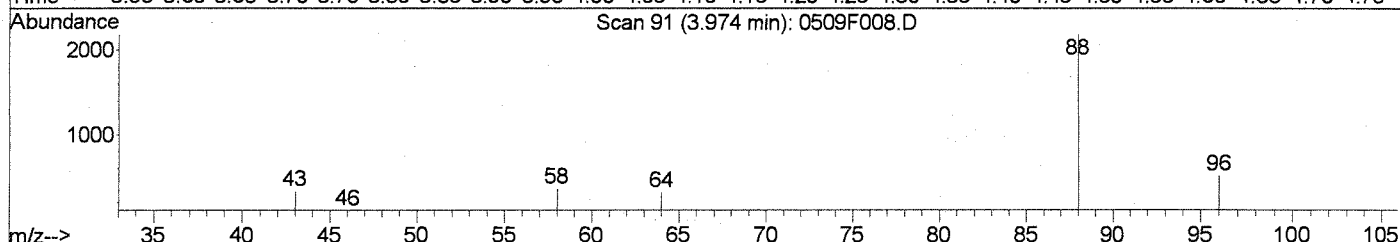
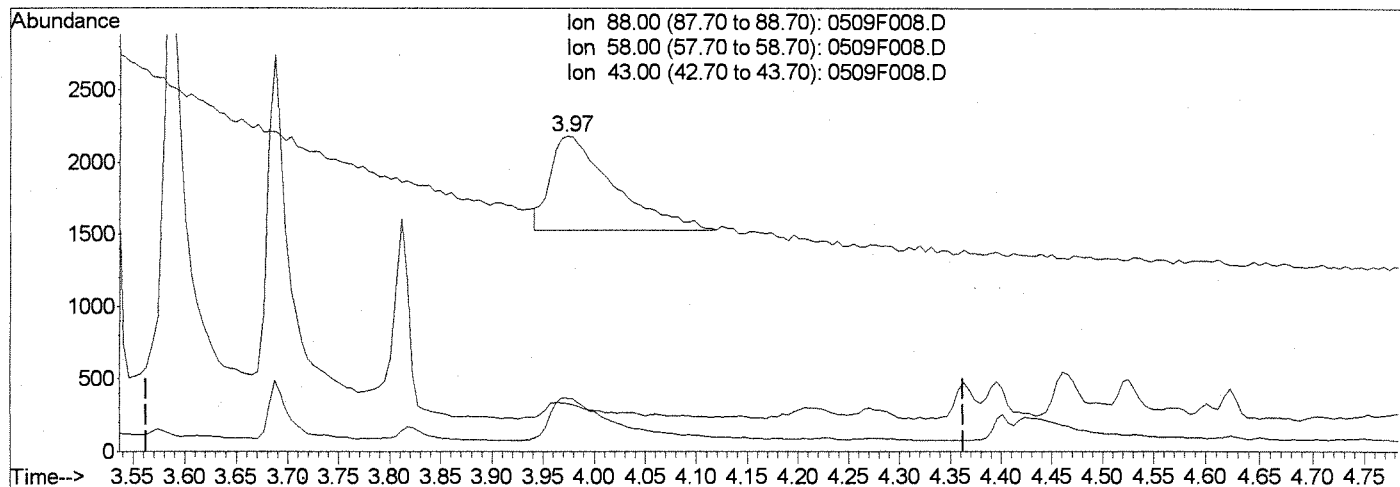
Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:21:18 2011

Response via : Multiple Level Calibration



TIC: 0509F008.D

(3) 1,4-Dioxane (T)

3.97min 4.55ng/ml

response 2811

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	42.09
43.00	15.30	14.90
0.00	0.00	0.00

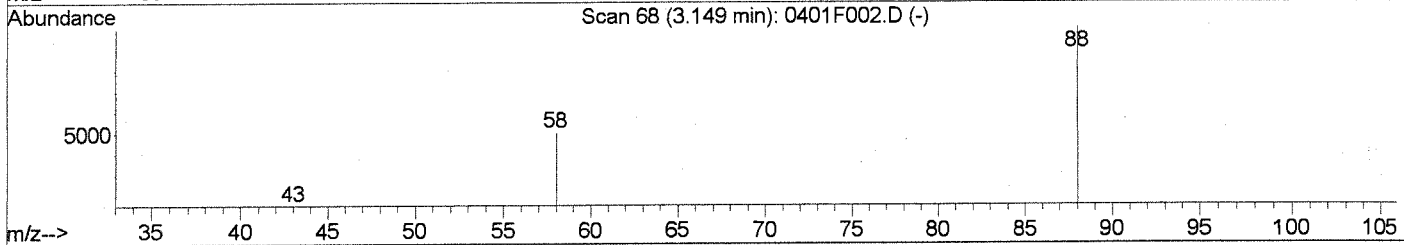
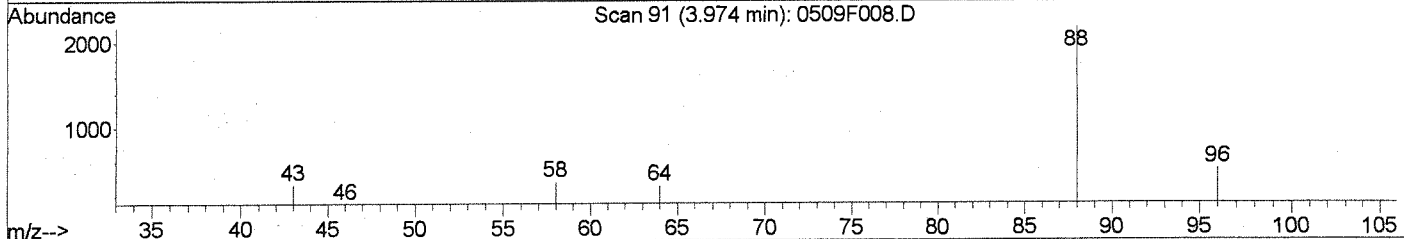
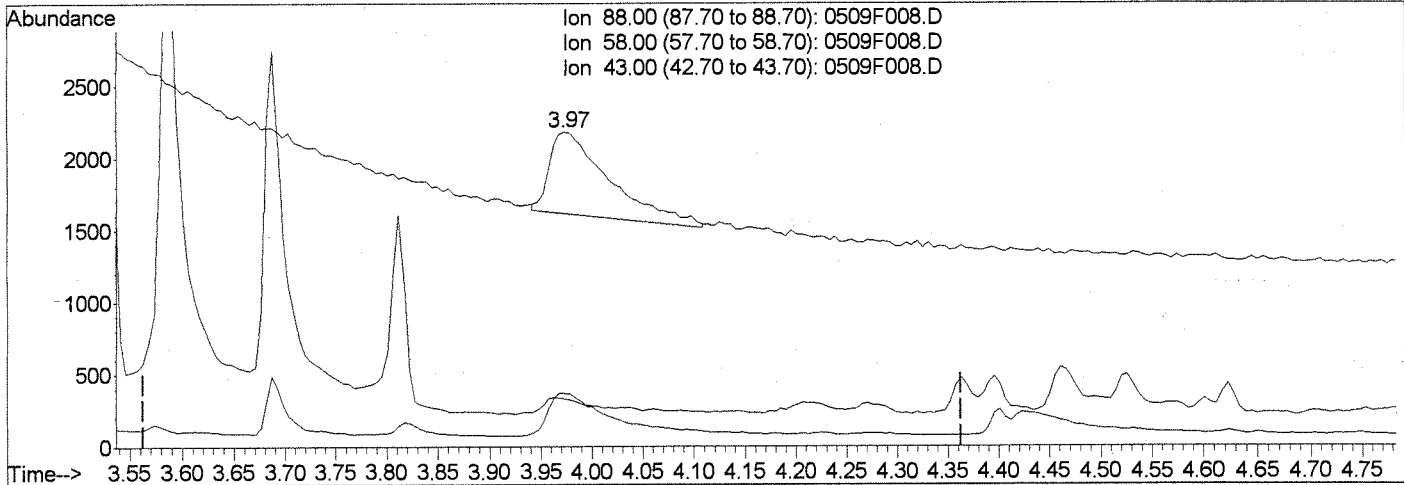
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F008.D
Acq On : 9 May 2011 12:23 pm
Sample : 4.0ng/mL ICAL 1,4-Dioxane | SVM34-56C
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:22 2011

Vial: 4
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:21:18 2011
Response via : Multiple Level Calibration



TIC: 0509F008.D

(3) 1,4-Dioxane (T)
3.97min 3.75ng/ml m
response 2314

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	16.78#
43.00	15.30	15.13
0.00	0.00	0.00

01
LB 5/10/11
04 05.10.11

Data File : J:\MS26\DATA\050911\0509F009.D Vial: 5
 Acq On : 9 May 2011 12:43 pm Operator: KBailey
 Sample : 10ng/mL ICAL 1,4-Dioxane | SVM34-56D Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:30 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	82998	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.95	96	6105	9.90	ng/ml	0.01
Spiked Amount	50.000		Recovery	=	19.80%	
Target Compounds						
3) 1,4-Dioxane	3.97	88	6107m	9.64	ng/ml	Qvalue

KB
5/10/11

04 05'10-11

Data File : J:\MS26\DATA\050911\0509F009.D

Vial: 5

Acq On : 9 May 2011 12:43 pm

Operator: KBailey

Sample : 10ng/mL ICAL 1,4-Dioxane | SVM34-56D

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:22 2011

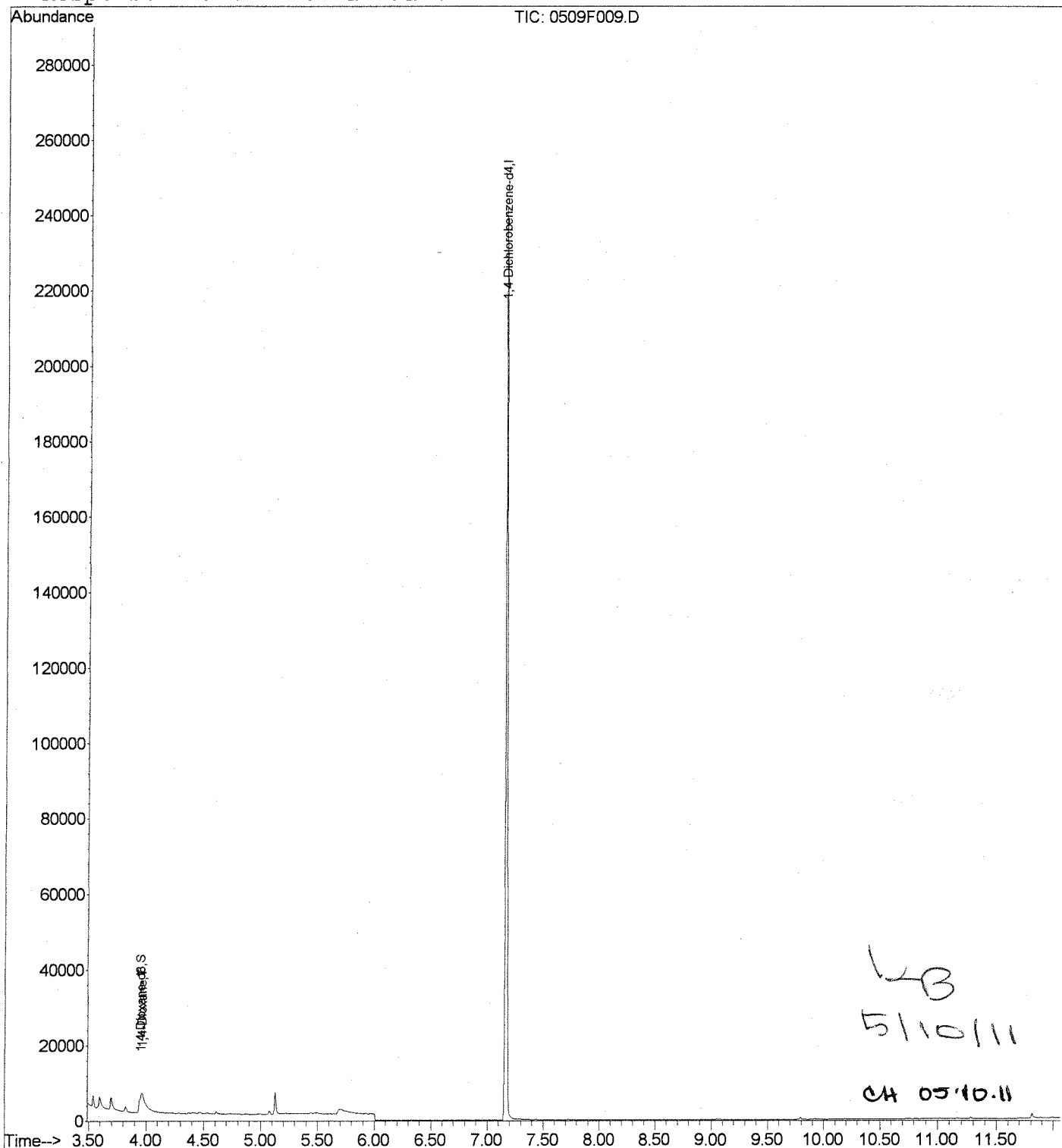
Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:26:14 2011

Response via : Initial Calibration



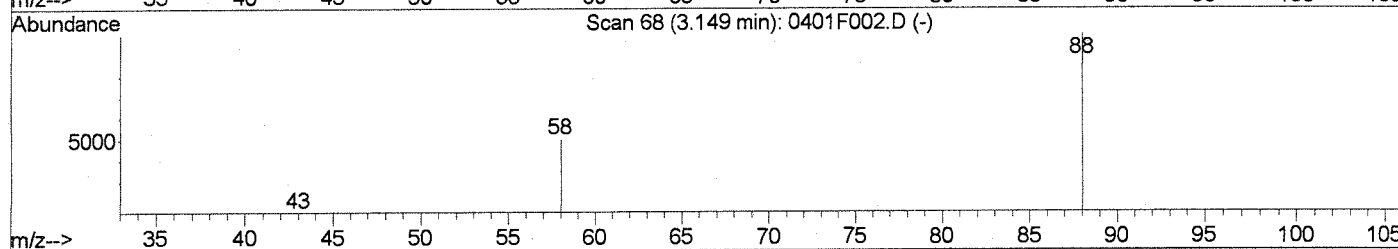
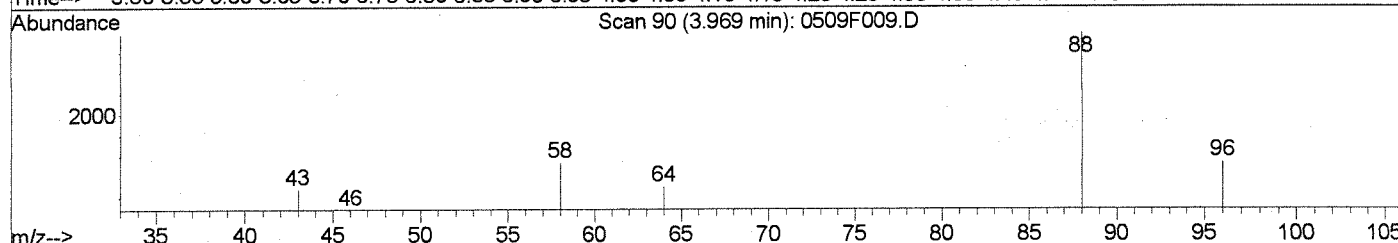
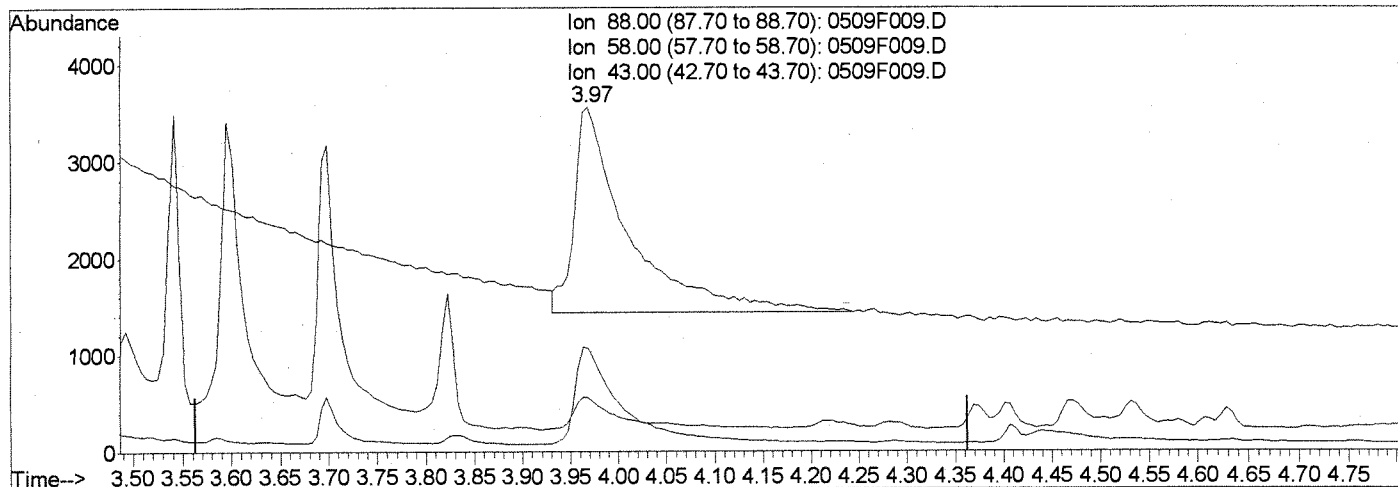
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F009.D
 Acq On : 9 May 2011 12:43 pm
 Sample : 10ng/mL ICAL 1,4-Dioxane | SVM34-56D
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:21 2011

Vial: 5
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F009.D

(3) 1,4-Dioxane (T)

3.97min 13.34ng/ml

response 8447

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	46.26
43.00	15.30	14.95
0.00	0.00	0.00

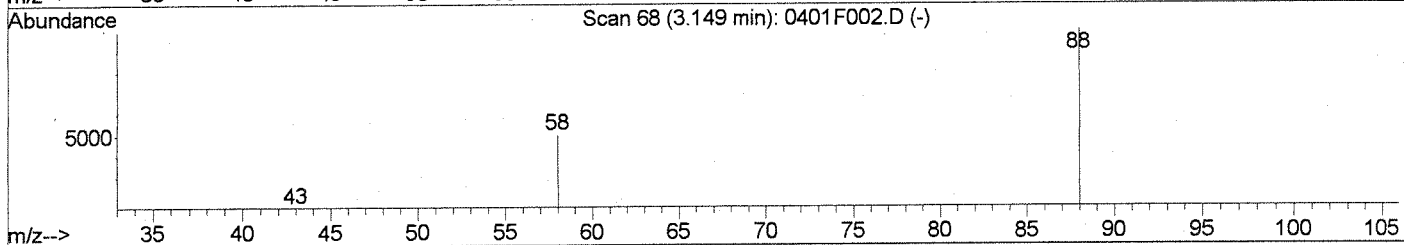
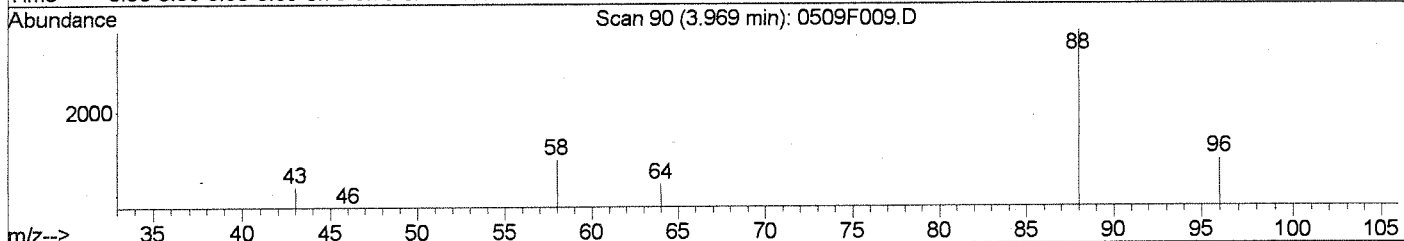
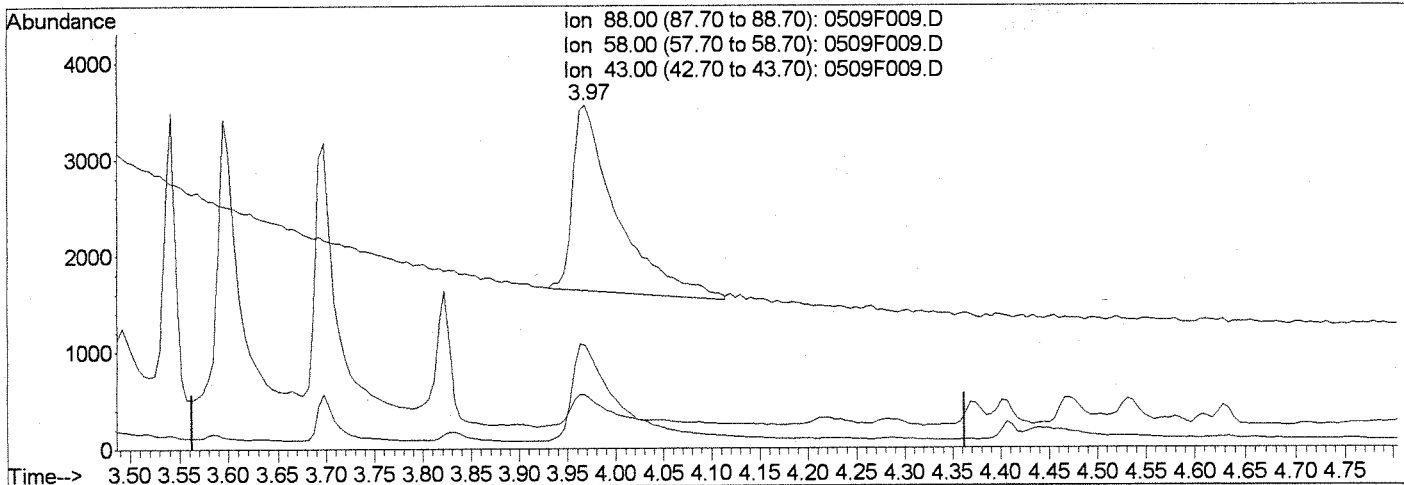
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F009.D
 Acq On : 9 May 2011 12:43 pm
 Sample : 10ng/mL ICAL 1,4-Dioxane | SVM34-56D
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:22 2011

Vial: 5
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F009.D

(3) 1,4-Dioxane (T)		
3.97min	9.64ng/ml m	
response	6107	
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	29.95
43.00	15.30	15.62
0.00	0.00	0.00

01
 KB 5/10/11
 04 05'10'11

Data File : J:\MS26\DATA\050911\0509F010.D Vial: 6
 Acq On : 9 May 2011 1:02 pm Operator: KBailey
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:30 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	84266	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.94	96	13588	21.69	ng/ml	0.00
Spiked Amount	50.000		Recovery	=	43.38%	
Target Compounds						
3) 1,4-Dioxane	3.96	88	13117m	20.40	ng/ml	Qvalue

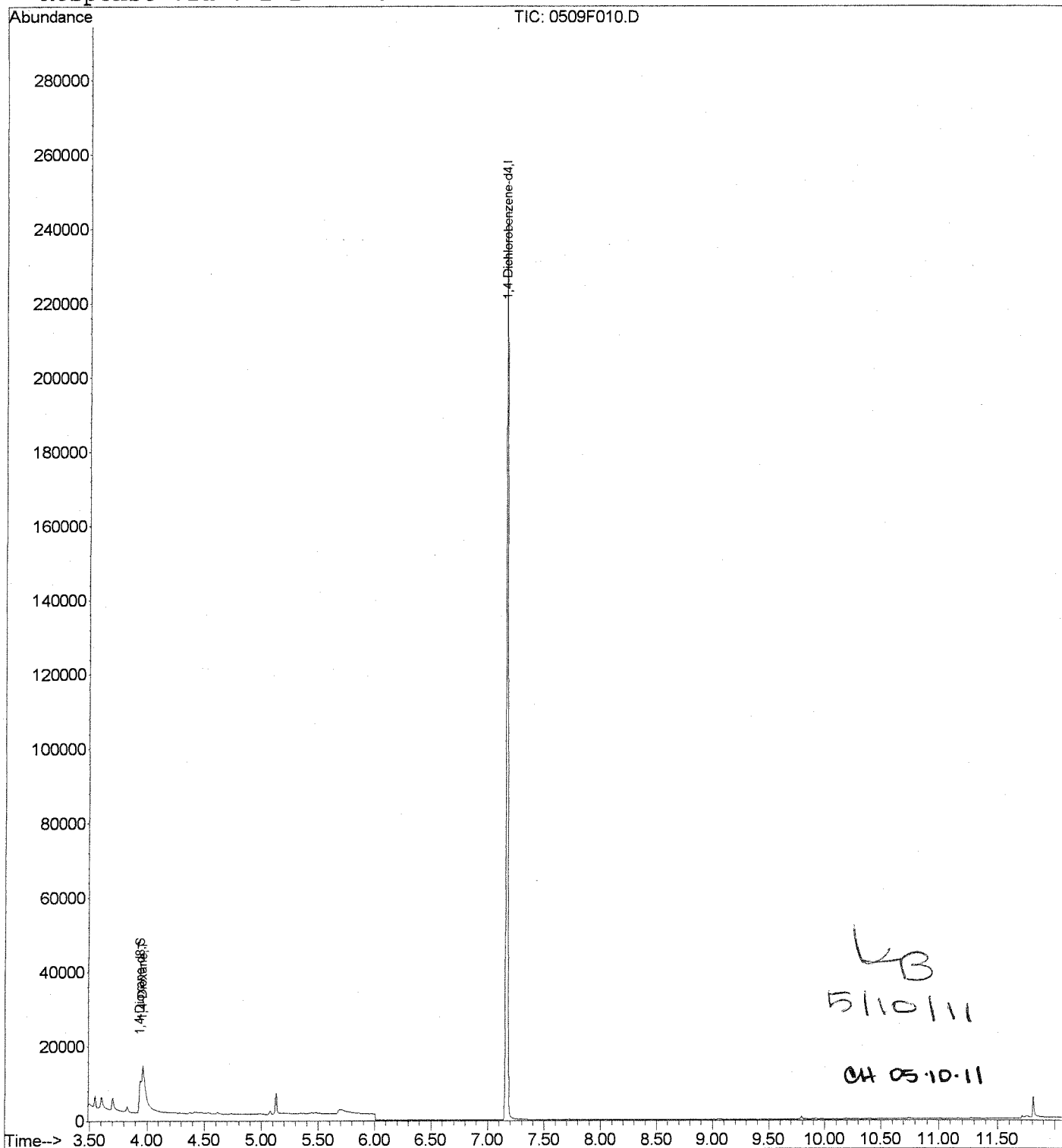
LB
 5/10/11
 CH 05-10-11

Data File : J:\MS26\DATA\050911\0509F010.D
Acq On : 9 May 2011 1:02 pm
Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:23 2011

Vial: 6
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



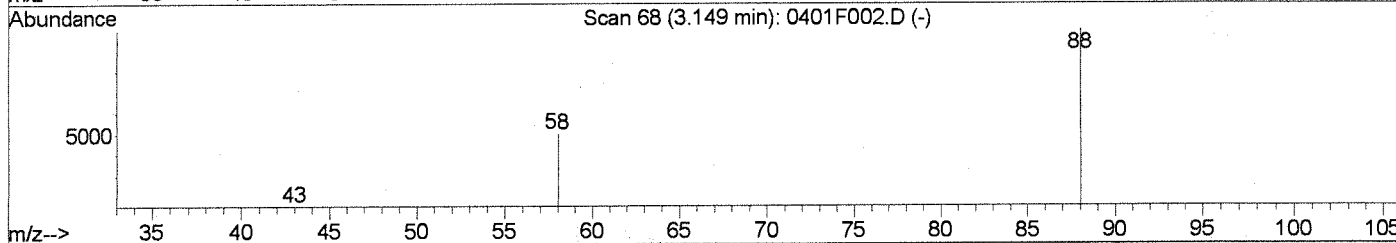
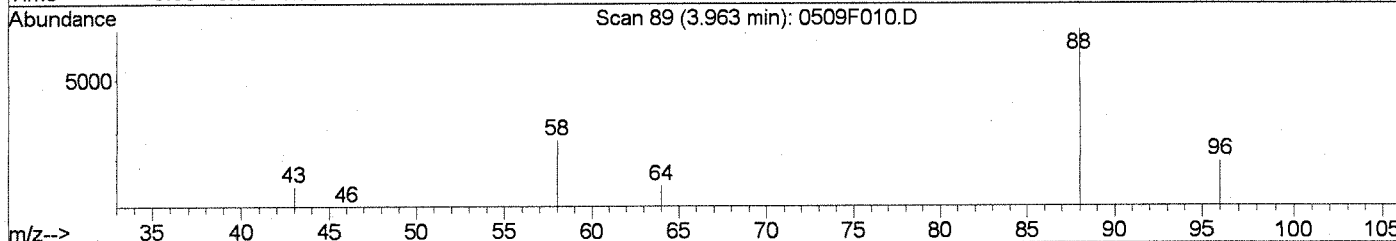
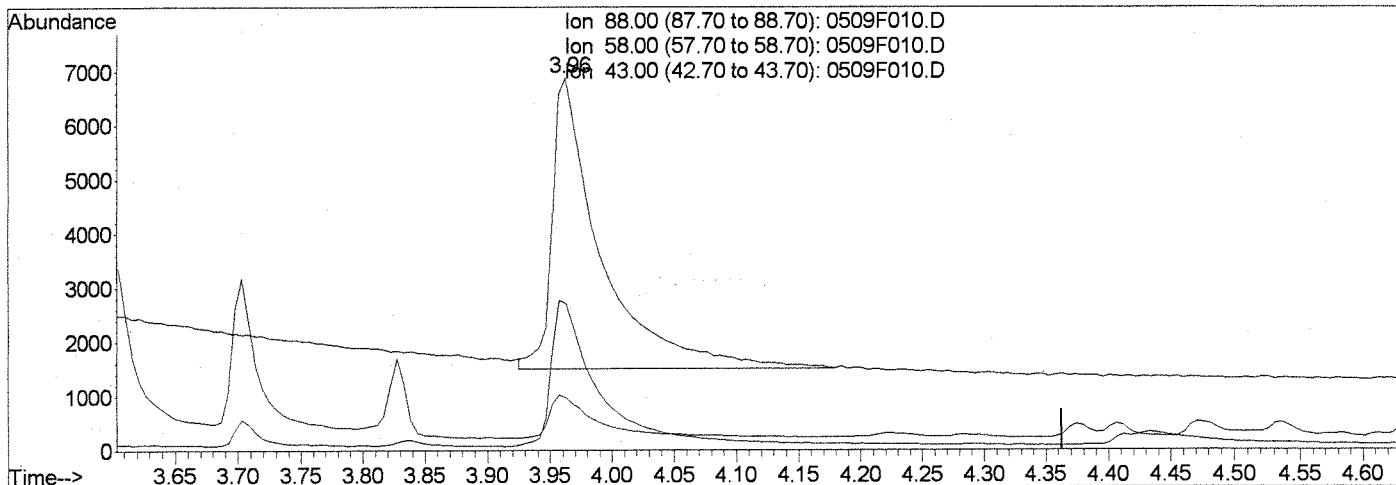
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F010.D
 Acq On : 9 May 2011 1:02 pm
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:21 2011

Vial: 6
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F010.D

(3) 1,4-Dioxane (T)		
3.96min	22.91ng/ml	
response	14729	
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	48.60
43.00	15.30	13.88
0.00	0.00	0.00

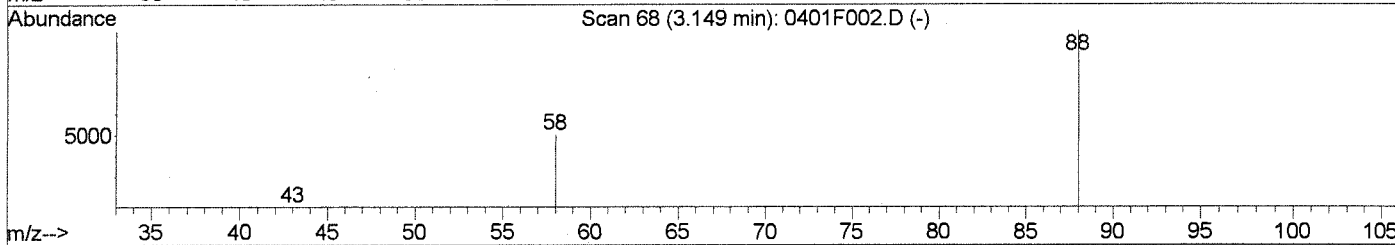
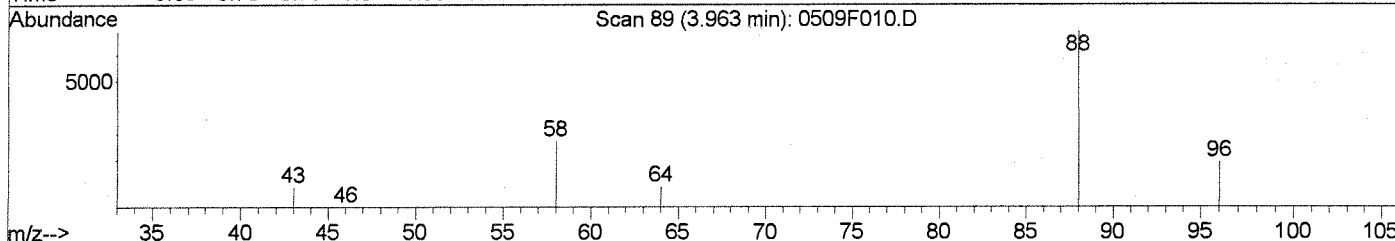
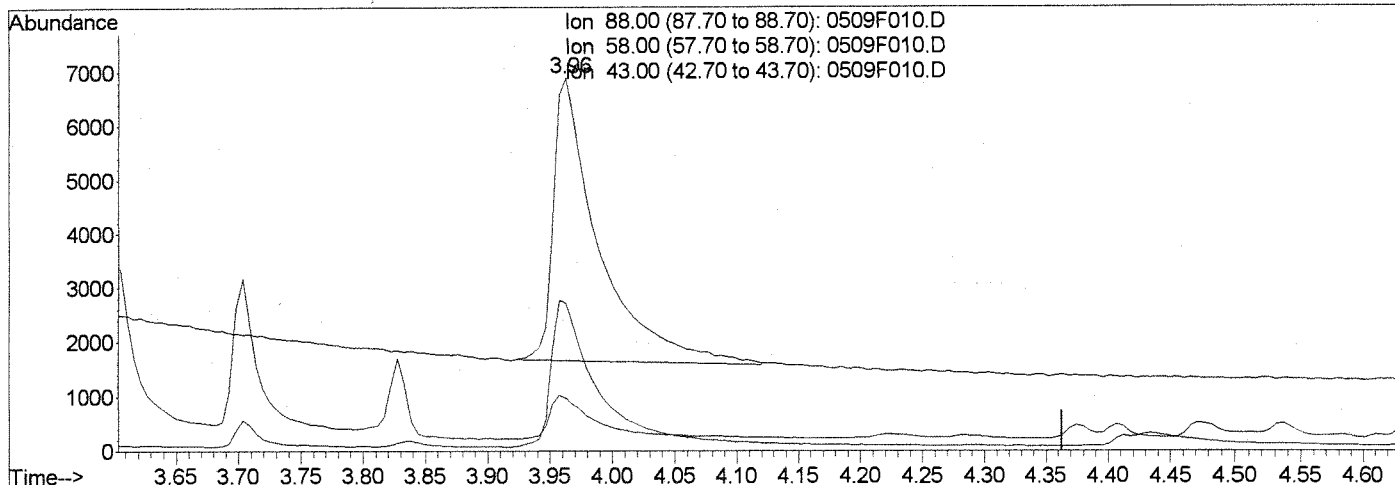
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F010.D
 Acq On : 9 May 2011 1:02 pm
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:23 2011

Vial: 6
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F010.D

(3) 1,4-Dioxane (T)		
3.96min	20.40ng/ml	m
response	13117	
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	39.32
43.00	15.30	14.10
0.00	0.00	0.00

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 LB 5/10/11
 04 05-10-11

Data File : J:\MS26\DATA\050911\0509F011.D Vial: 7
 Acq On : 9 May 2011 1:22 pm Operator: KBailey
 Sample : 50ng/mL ICAL 1,4-Dioxane | SVM34-56F Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:30 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	82310	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.90	96	33167	54.21	ng/ml	-0.04
Spiked Amount	50.000		Recovery	=	108.42%	
Target Compounds						
3) 1,4-Dioxane	3.93	88	35042	55.80	ng/ml	Qvalue 93

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5/10/11

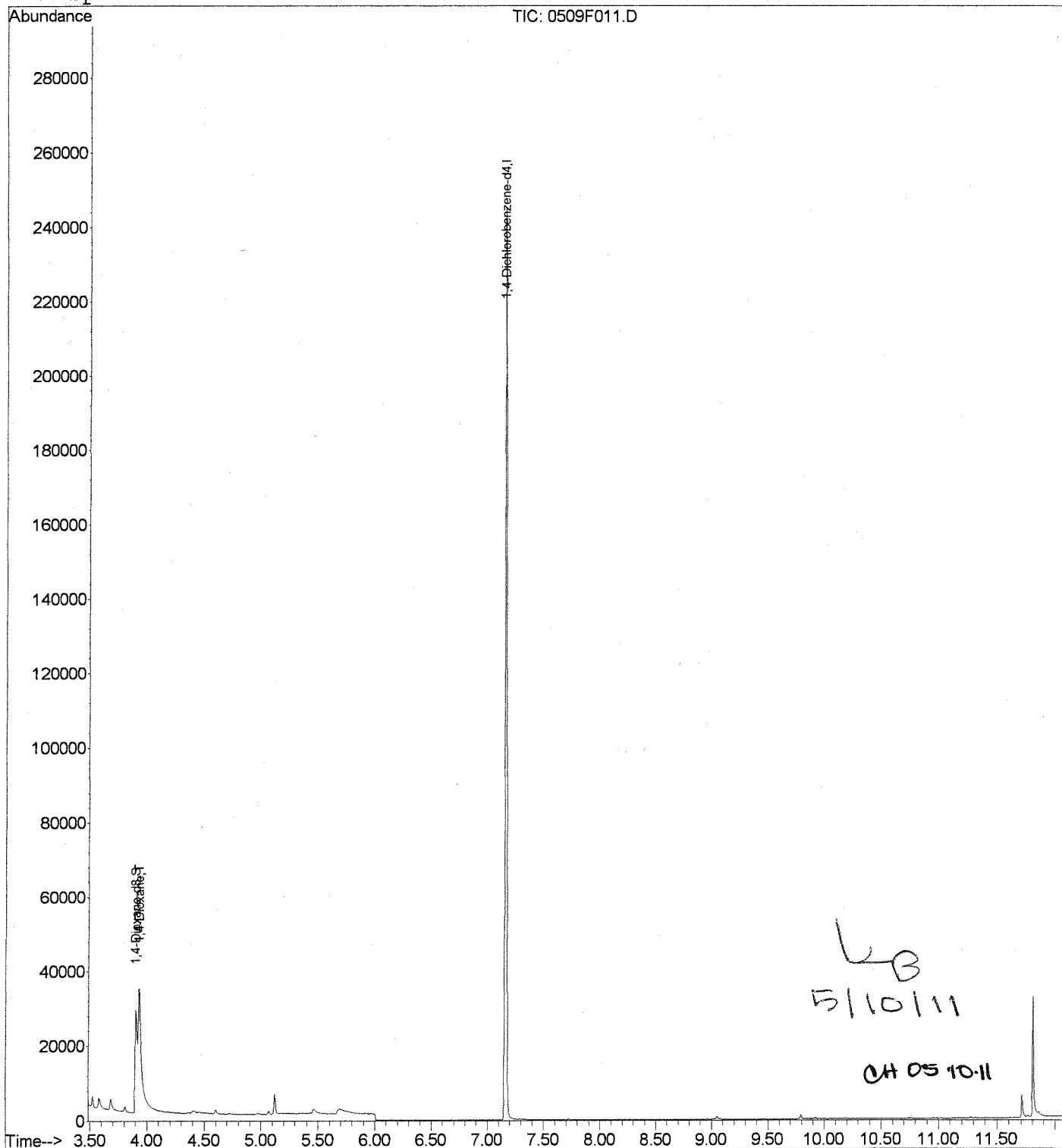
CH 05/10/11

Data File : J:\MS26\DATA\050911\0509F011.D
Acq On : 9 May 2011 1:22 pm
Sample : 50ng/mL ICAL 1,4-Dioxane | SVM34-56F
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:21 2011

Vial: 7
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Data File : J:\MS26\DATA\050911\0509F012.D Vial: 8
 Acq On : 9 May 2011 1:42 pm Operator: KBailey
 Sample : 100ng/mL ICAL 1,4-Dioxane | SVM34-56G Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:31 2011 Quant Results File: 050911_DX.RES

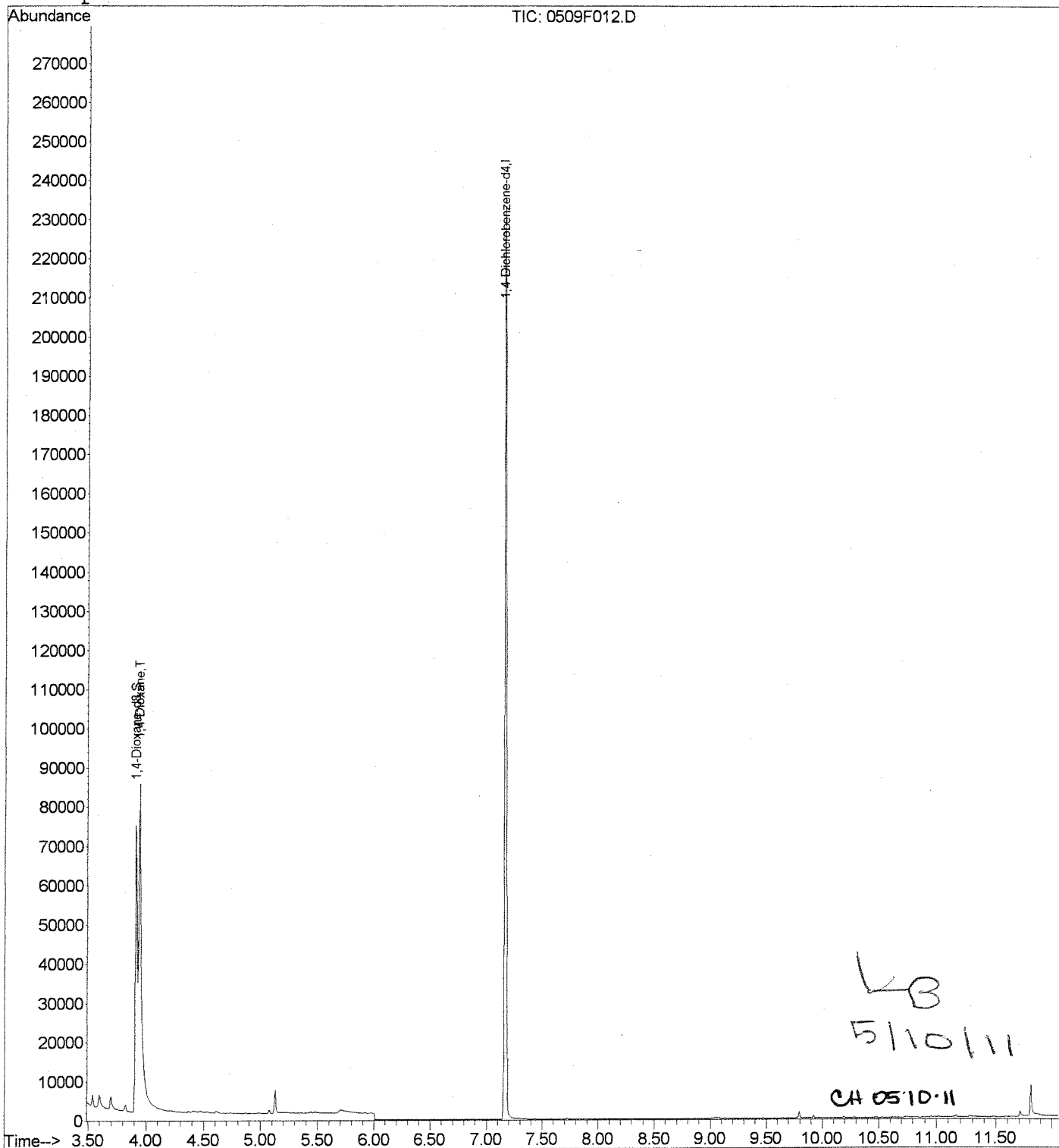
Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	83941	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.90	96	70005	112.19	ng/ml	-0.03
Spiked Amount	50.000		Recovery	=	224.38%	
Target Compounds						
3) 1,4-Dioxane	3.94	88	72508m	113.21	ng/ml	Qvalue

LB
 5/10/11
 CH 05/10/11

Data File : J:\MS26\DATA\050911\0509F012.D Vial: 8
Acq On : 9 May 2011 1:42 pm Operator: KBailey
Sample : 100ng/mL ICAL 1,4-Dioxane | SVM34-56G Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 9 14:23 2011 Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



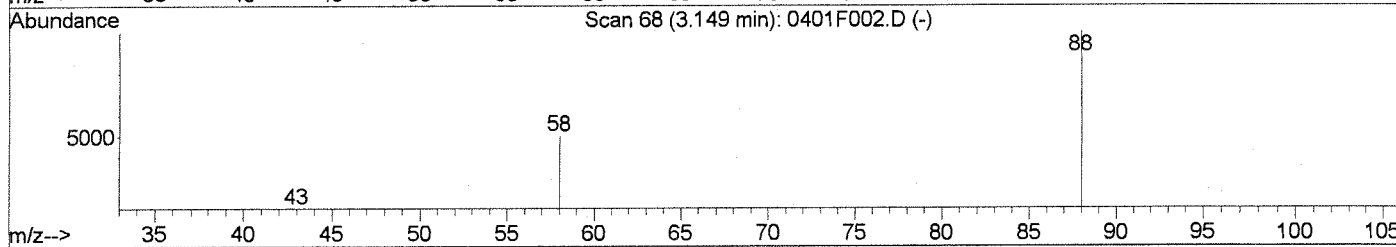
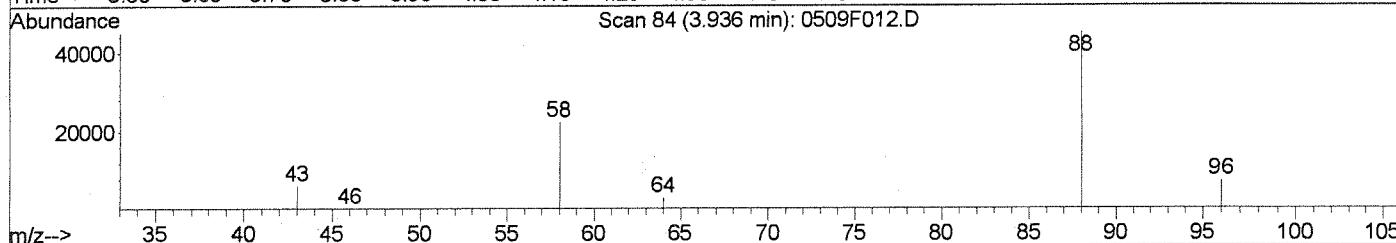
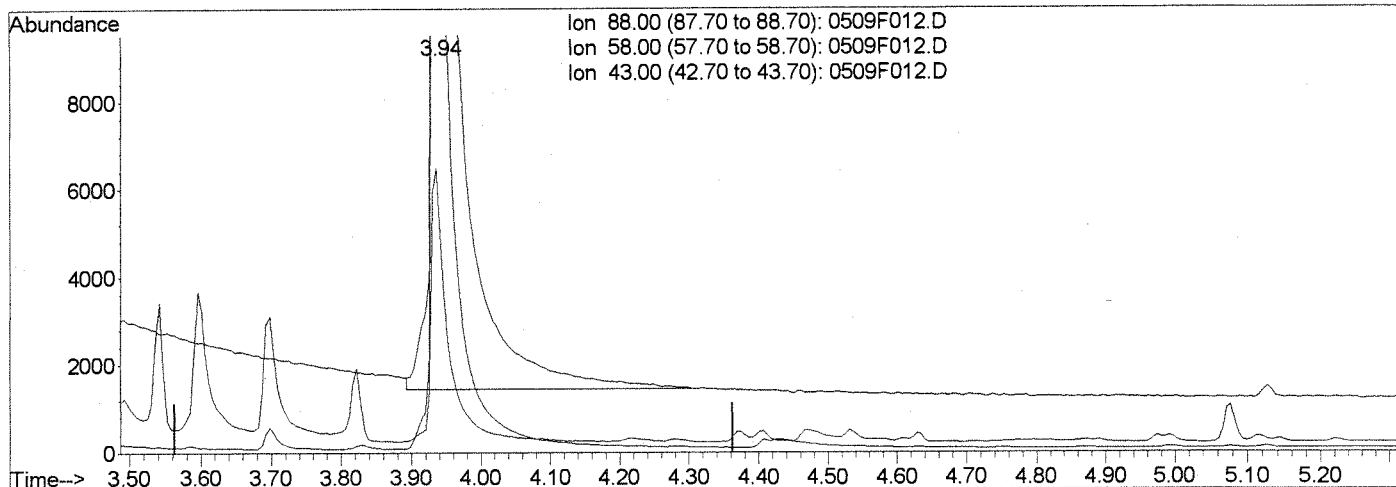
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F012.D
 Acq On : 9 May 2011 1:42 pm
 Sample : 100ng/mL ICAL 1,4-Dioxane | SVM34-56G
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:21 2011

Vial: 8
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F012.D

(3) 1,4-Dioxane (T)			
3.94min	118.97ng/ml		
response	76193		
Ion	Exp%	Act%	
88.00	100	100	
58.00	44.20	51.28	
43.00	15.30	14.29	
0.00	0.00	0.00	

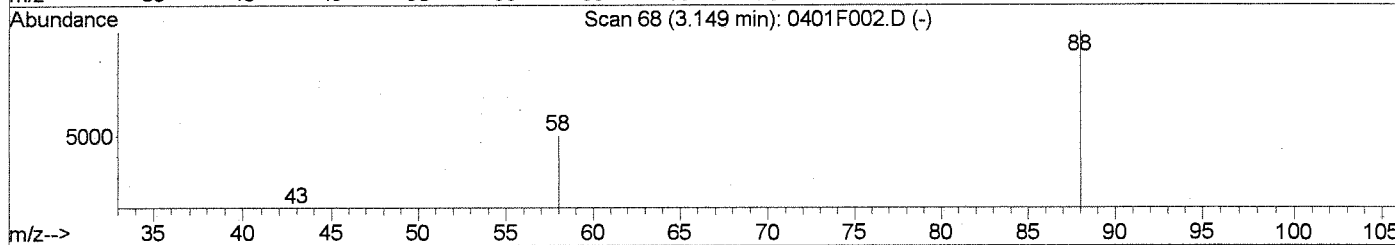
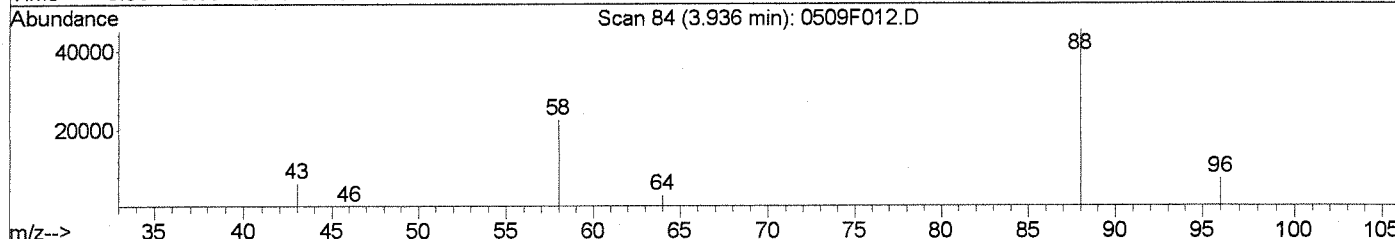
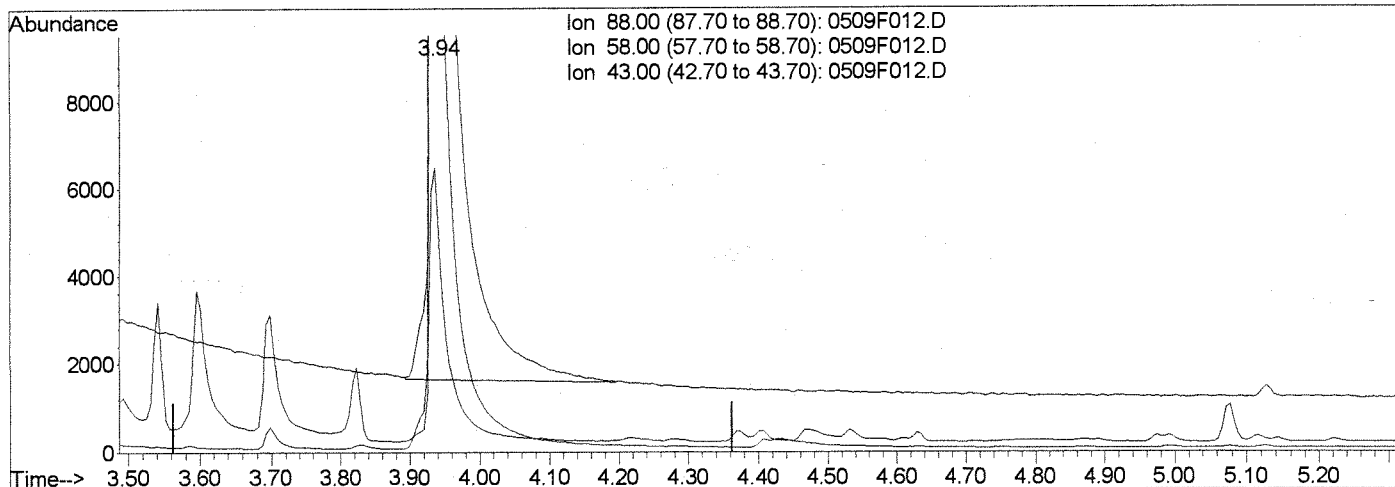
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F012.D
 Acq On : 9 May 2011 1:42 pm
 Sample : 100ng/mL ICAL 1,4-Dioxane | SVM34-56G
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:23 2011

Vial: 8
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F012.D

(3) 1,4-Dioxane (T)			
3.94min	113.21ng/ml	m	
response	72508		
Ion	Exp%	Act%	
88.00	100	100	
58.00	44.20	49.81	
43.00	15.30	14.36	
0.00	0.00	0.00	

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 CA 05-10-11

Data File : J:\MS26\DATA\050911\0509F013.D Vial: 9
 Acq On : 9 May 2011 2:02 pm Operator: KBailey
 Sample : 200ng/mL ICAL 1,4-Dioxane | SVM34-56H Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:31 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	84919	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.90	96	142313	225.45	ng/ml	-0.04
Spiked Amount	50.000		Recovery	=	450.90%	
Target Compounds						
3) 1,4-Dioxane	3.93	88	152893	235.98	ng/ml	Qvalue 89

LB
 5/10/11
 CH 05-10-11

Data File : J:\MS26\DATA\050911\0509F013.D

Vial: 9

Acq On : 9 May 2011 2:02 pm

Operator: KBailey

Sample : 200ng/mL ICAL 1,4-Dioxane | SVM34-56H

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:21 2011

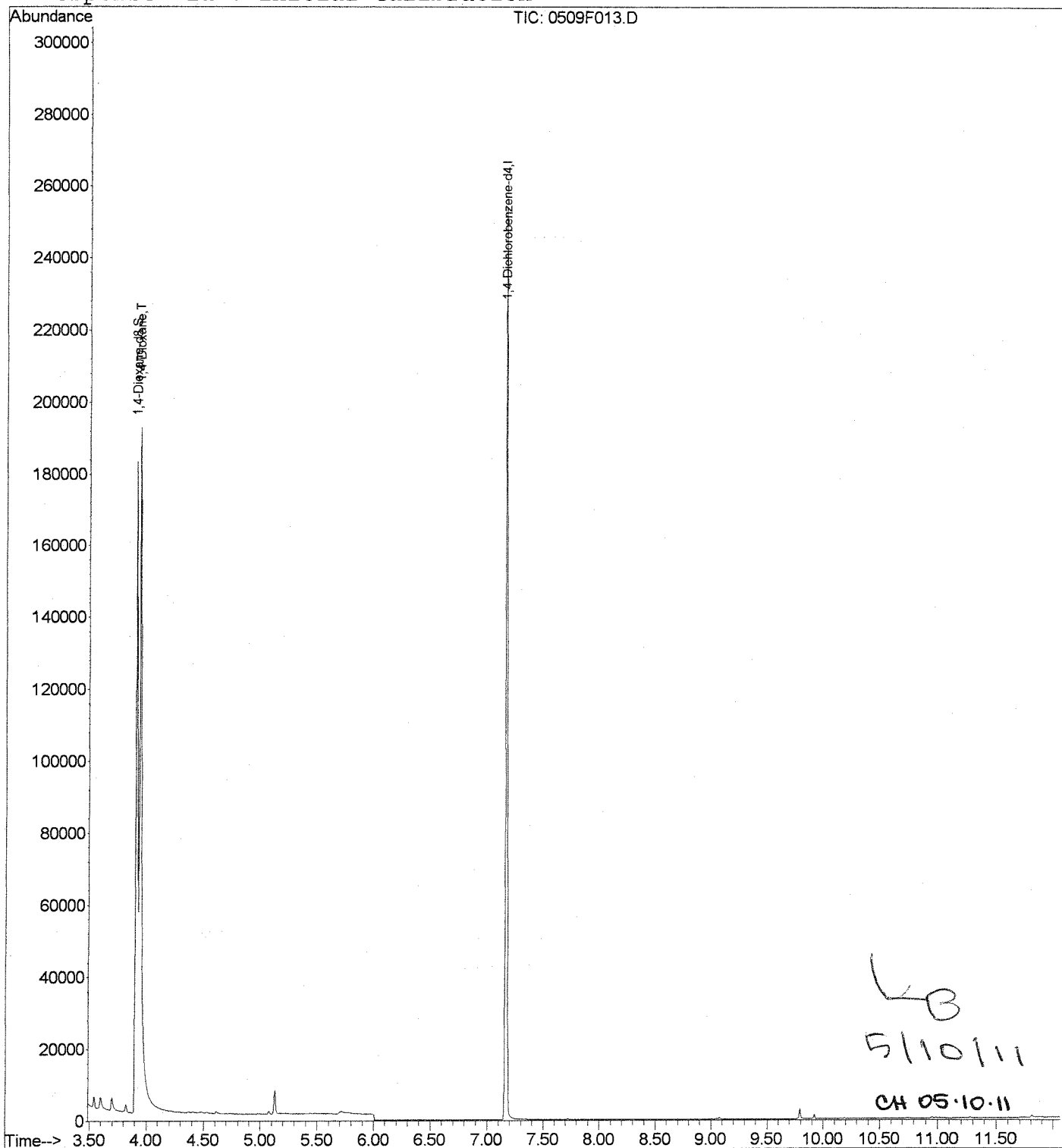
Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:26:14 2011

Response via : Initial Calibration



Data File : J:\MS26\DATA\050911\0509F014.D
 Acq On : 9 May 2011 2:21 pm
 Sample : 20ng/mL ICV 1,4-Dioxane | SVM34-57L
 Misc :

Vial: 10
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

MS Integration Params: RTEINT.P
 Quant Time: May 09 14:38:54 2011

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	79096	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.92	96	14586	23.60	ng/ml	-0.02
Spiked Amount	50.000		Recovery	=	47.20%	
Target Compounds						
3) 1,4-Dioxane	3.94	88	14084	22.41	ng/ml	Qvalue 86

LB
 5/10/11

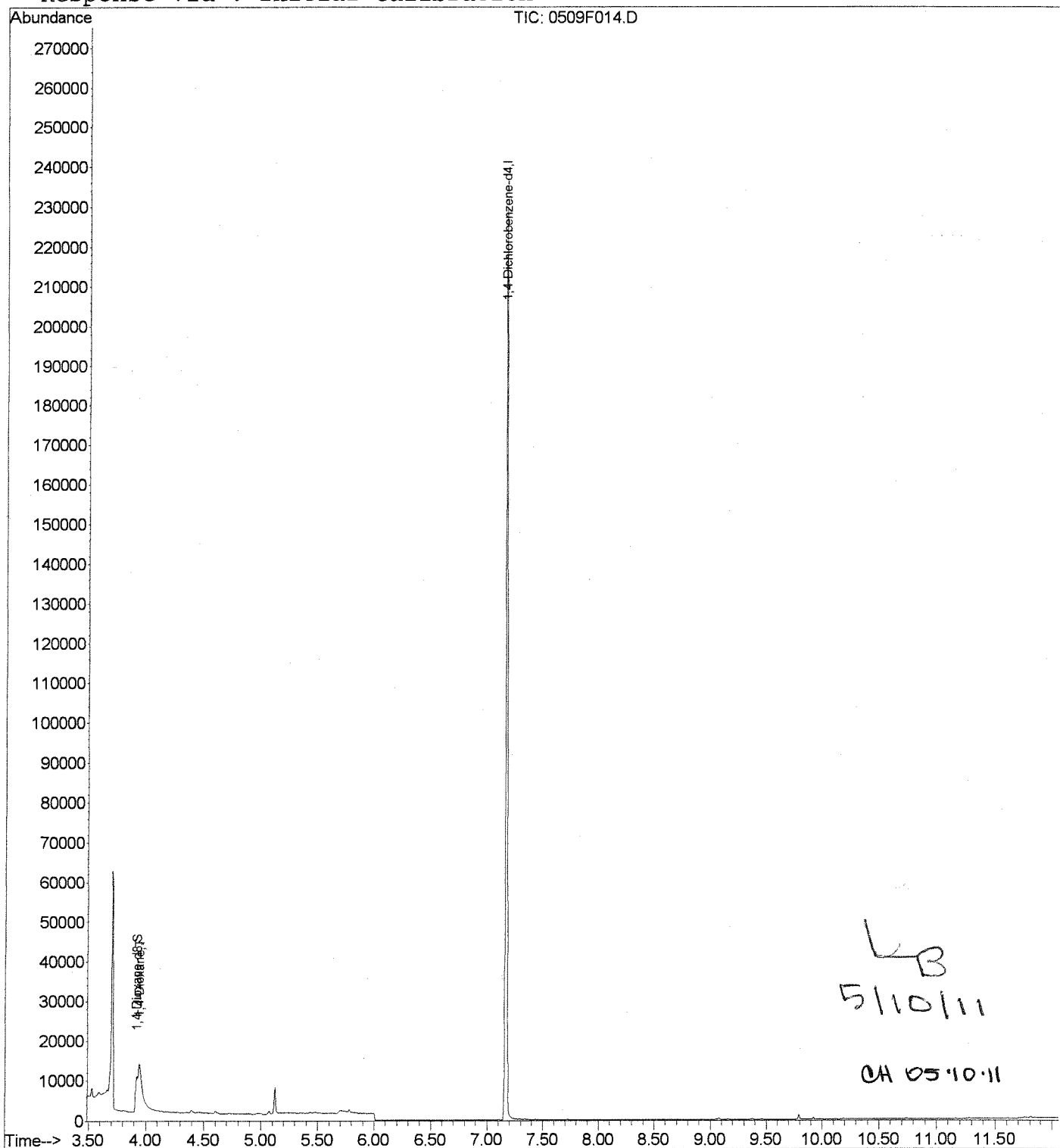
CA 05:10:11

Data File : J:\MS26\DATA\050911\0509F014.D
Acq On : 9 May 2011 2:21 pm
Sample : 20ng/mL ICV 1,4-Dioxane | SVM34-57L
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:38 2011

Vial: 10
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Exception Report

Data File: J:\MS26\DATA\050911A\0509F010.D
Lab ID: KWG1104145-2
Run Type: CCV
Matrix: WATER

Date Acquired: 05/09/2011 13:02
Date Quantitated: 05/09/2011 17:06
Batch ID: KWG1104145
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	

Primary Review: KG 5/10/11

Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID:	Tier:	Matrix:	WATER
Prod Code: 8270C SIM 14_DI	Collect Date:	Receive Date:	05/10/2011

Analysis Lot: KWG1104145	Prep Lot:	Report Group:
Analysis Method: 8270C SIM	Prep Method:	
Prep Ref:	Prep Date:	

Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487
Title:	
Tune Ref: J:\MS26\DATA\050911\0509F005.D	Method ID: MJ402
MB Ref:	Quant based on Method

Data File: J:\MS26\DATA\050911A\0509F010.D	Instrument: MS26
Acqu Date: 05/09/2011 13:02	Quant Date: 05/09/2011 17:06
Run Type: CCV	Vial: 6
Lab ID: KWG1104145-2	Dilution: 1.0
	Soln Conc. Units: ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	84266	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.94			96	13588	20.63		42-112	NA

Target Compounds

							Final Conc. Units:				
							ug/L				
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?	
1	1,4-Dioxane	3.96			88	13696m	20.46				

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Calibration Verification Report

Calibration ID: CAL10487

Method ID: MJ402

DataFile: J:\MS26\DATA\050911A\0509F010.D

<u>Parameter Name</u>	<u>Type</u>	<u>PARM</u> <u>Type</u>	<u>Curve Fit</u>	<u>Method</u> <u>Criteria</u>	<u>Min</u> <u>RF</u>	<u>ICAL</u> <u>RF</u>	<u>CCV</u> <u>RF</u>	<u>%Diff</u>	<u>Sol'n</u> <u>Conc.</u>	<u>True</u> <u>Value</u>	<u>% Drift</u>
1,4-Dioxane-d8		SURR	AverageRF	20	0.01	0.391	0.403	3.2			
1,4-Dioxane		MS	AverageRF	20	0.01	0.397	0.406	2.3			

Evaluate Continuing Calibration Report

Data File : J:\MS26\DATA\050911A\0509F010.D Vial: 6
Acq On : 9 May 2011 1:02 pm Operator: KBailey
Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Multiple Level Calibration

Min. RRF : 0.010 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	1,4-Dichlorobenzene-d4	50.000	50.000	0.0	100	0.00
2 S	1,4-Dioxane-d8	20.000	20.633	-3.2	100	0.00
3 T	1,4-Dioxane	20.000	20.455	-2.3	104	0.00

Data File : J:\MS26\DATA\050911A\0509F010.D Vial: 6
 Acq On : 9 May 2011 1:02 pm Operator: KBailey
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 17:05:24 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

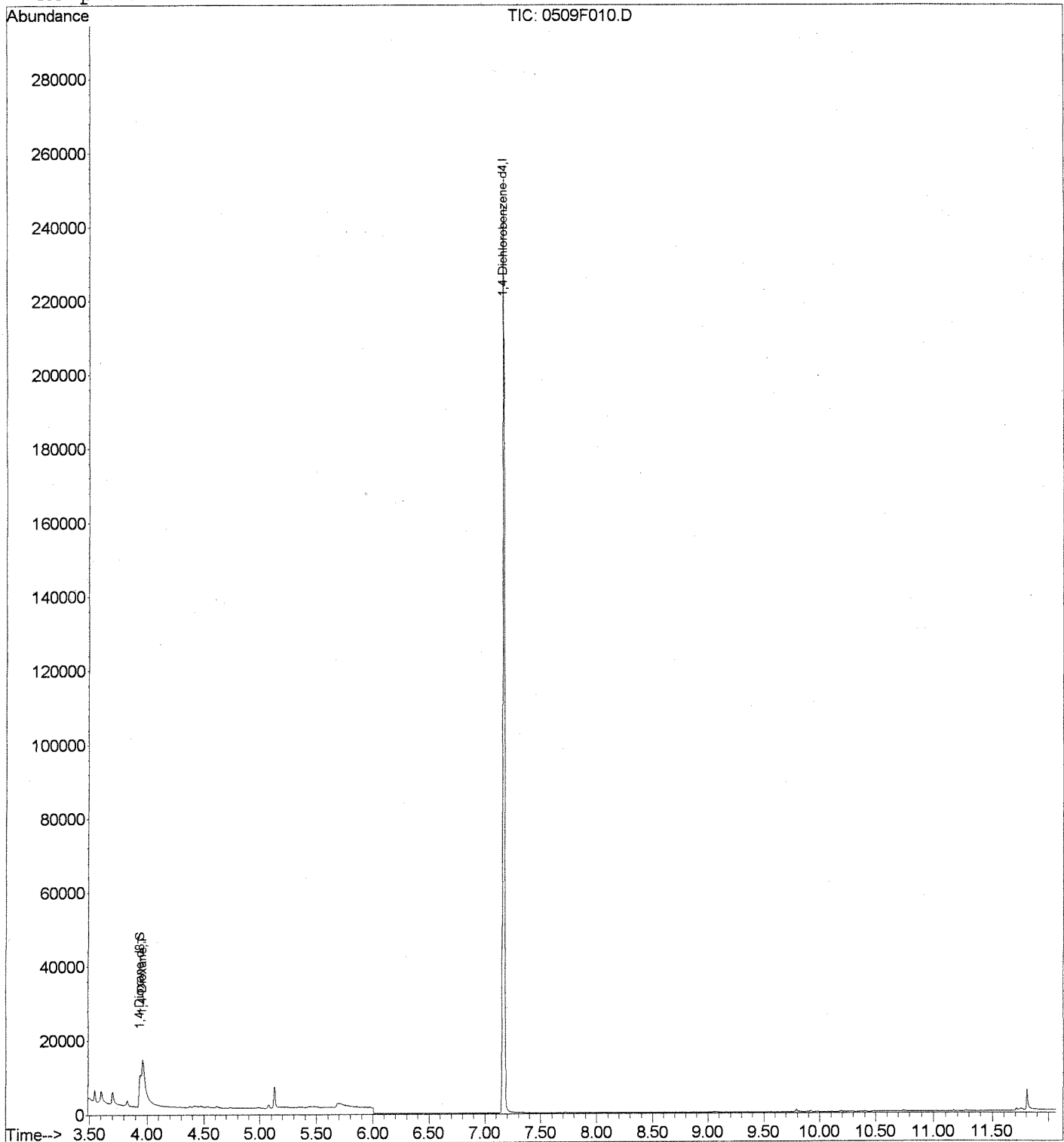
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	84266	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.94	96	13588	20.63	ng/ml	0.00
Spiked Amount	50.000		Recovery	=	41.26%	
Target Compounds						
3) 1,4-Dioxane	3.96	88	13696m	20.46	ng/ml	Qvalue

Data File : J:\MS26\DATA\050911A\0509F010.D
Acq On : 9 May 2011 1:02 pm
Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 17:06 2011

Vial: 6
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



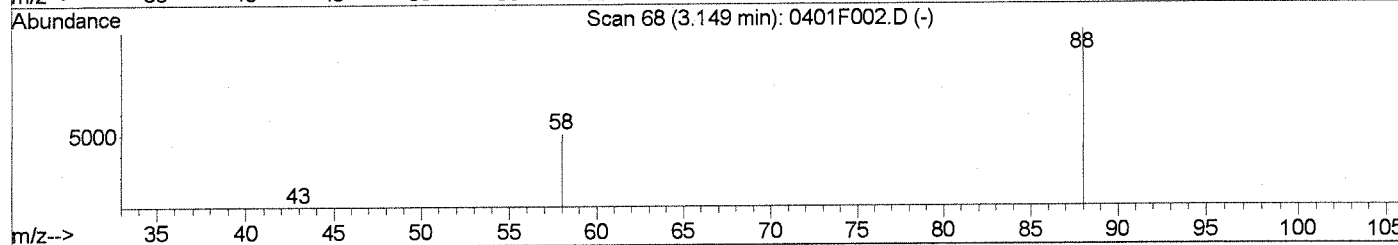
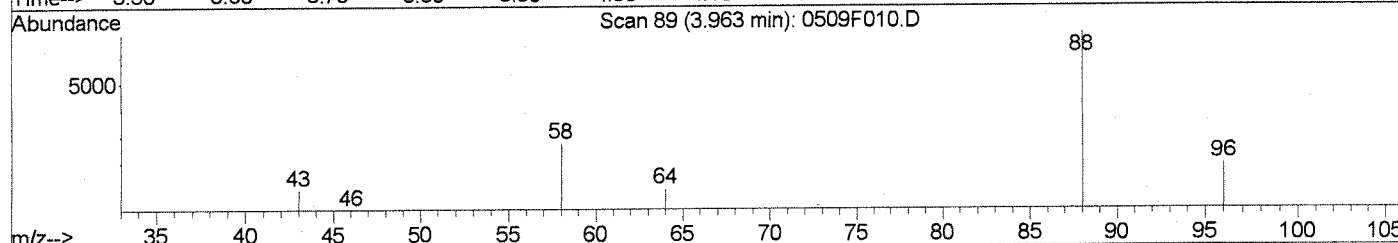
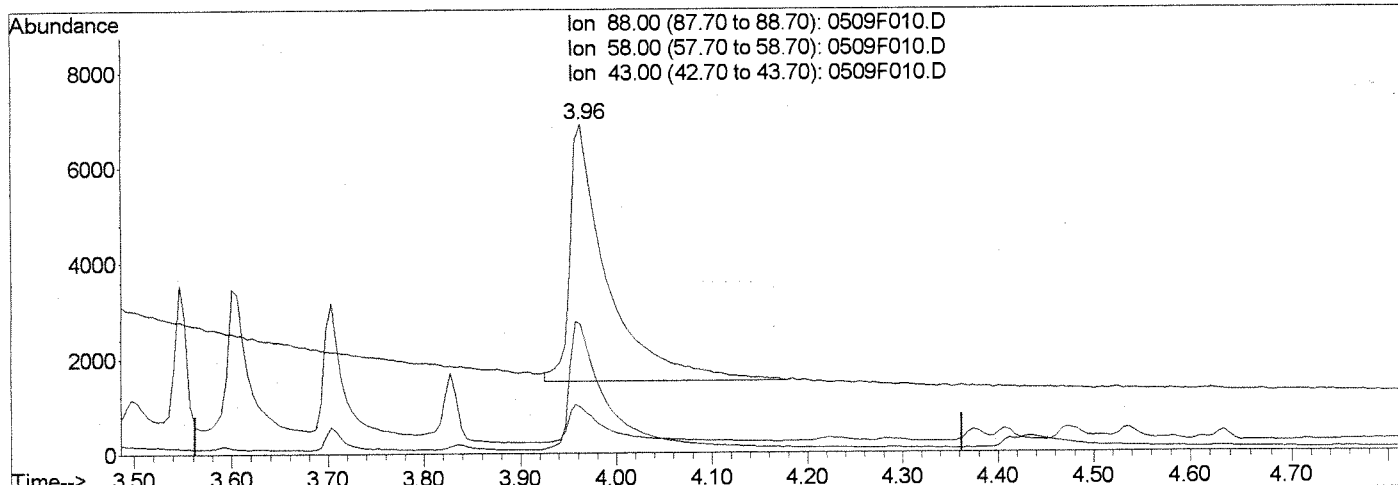
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911A\0509F010.D
 Acq On : 9 May 2011 1:02 pm
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 17:05 2011

Vial: 6
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F010.D

(3) 1,4-Dioxane (T)		
3.96min	22.00ng/ml	
response	14729	
Ion	Exp%	Act%
88.00	100	100
58.00	39.30	48.60
43.00	14.10	13.88
0.00	0.00	0.00

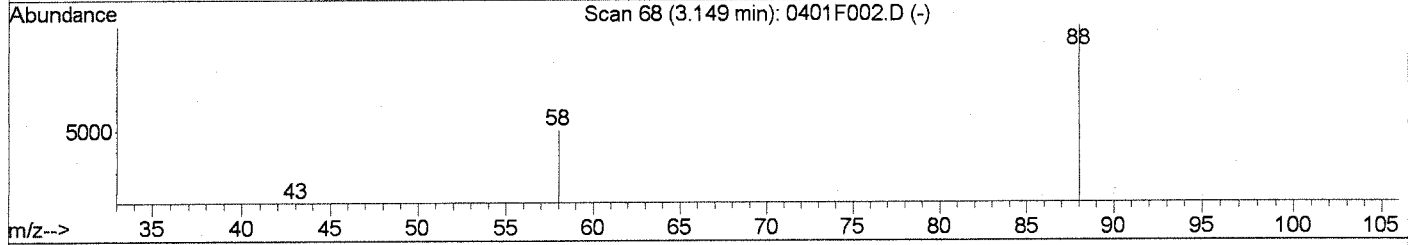
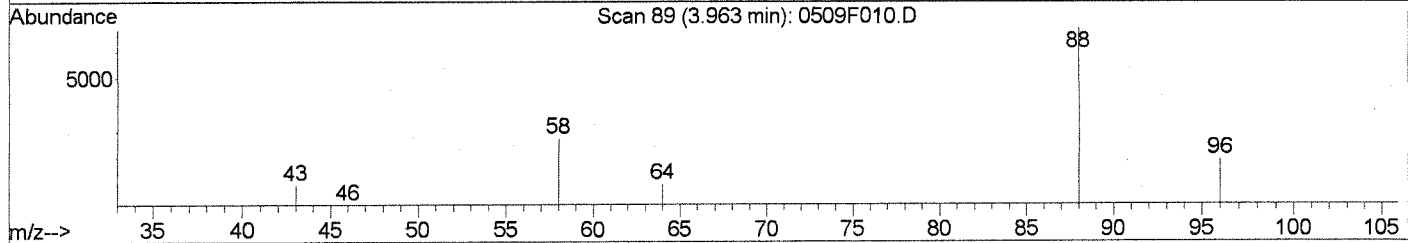
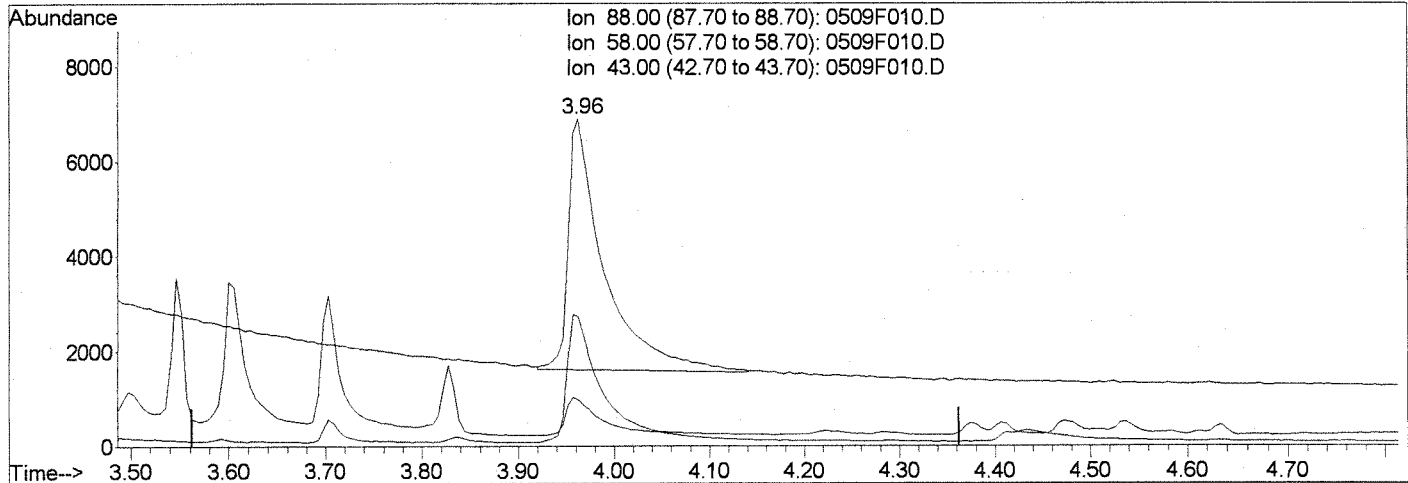
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911A\0509F010.D
Acq On : 9 May 2011 1:02 pm
Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 17:06 2011

Vial: 6
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Multiple Level Calibration



TIC: 0509F010.D

(3) 1,4-Dioxane (T)		
3.96min	20.46ng/ml m	
response	13696	
Ion	Exp%	Act%
88.00	100	100
58.00	39.30	39.32
43.00	14.10	14.10
0.00	0.00	0.00

01
LB 5/10/11
04 05.10.11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101607
Date Analyzed: 05/09/2011

**Continuing Calibration Verification Summary
 1,4-Dioxane by GC/MS**

Calibration Type: Internal Standard
Analysis Method: 8270C SIM

Calibration Date: 05/09/2011
Calibration ID: CAL10487
Analysis Lot: KWG1104145
Units: ng/ml

File ID: J:\MS26\DATA\050911A\0509F010.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
1,4-Dioxane	20	20	0.01	0.397	0.406	2	NA	± 20 %	AverageRF
1,4-Dioxane-d8	20	21	0.01	0.391	0.403	3	NA	± 20 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Exception Report

Data File: J:\MS26\DATA\050911A\0509F010.D
Lab ID: KWG1104145-2
Run Type: CCV
Matrix: WATER

Date Acquired: 05/09/2011 13:02
Date Quantitated: 05/09/2011 17:06
Batch ID: KWG1104145
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	

Primary Review: KG 5/10/11

Secondary Review: CH 05.10.11

Quantitation Report

Bottle ID:	Tier:	Matrix:	WATER
Prod Code: 8270C SIM 14_DI	Collect Date:	Receive Date:	05/10/2011

Analysis Lot: KWG1104145	Prep Lot:	Report Group:
Analysis Method: 8270C SIM	Prep Method:	
Prep Ref:	Prep Date:	

Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487
Title:	
Tune Ref: J:\MS26\DATA\050911\0509F005.D	Method ID: MJ402
MB Ref:	Quant based on Method

Data File: J:\MS26\DATA\050911A\0509F010.D	Instrument: MS26
Acqu Date: 05/09/2011 13:02	Quant Date: 05/09/2011 17:06
Run Type: CCV	Vial: 6
Lab ID: KWG1104145-2	Dilution: 1.0
	Soln Conc. Units: ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.17	0.00?	152	84266	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.94			96	13588	20.63		42-112	NA

Target Compounds

							Final Conc. Units:				
							ug/L				
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?	
1	1,4-Dioxane	3.96			88	13696m	20.46				

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

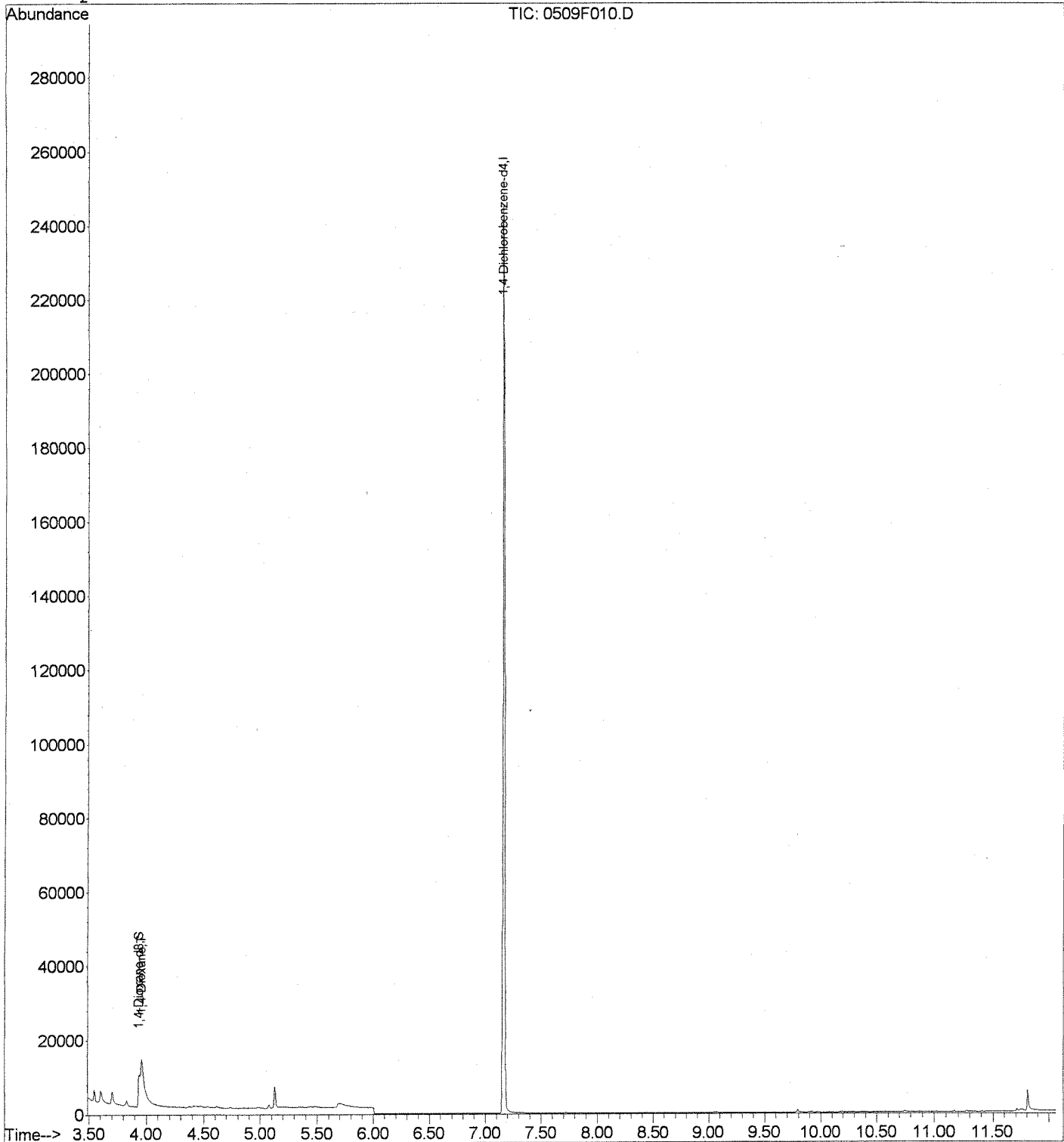
Data File : J:\MS26\DATA\050911A\0509F010.D Vial: 6
 Acq On : 9 May 2011 1:02 pm Operator: KBailey
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 17:05:24 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	84266	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.94	96	13588	20.63	ng/ml	0.00
Spiked Amount	50.000		Recovery	=	41.26%	
Target Compounds						
3) 1,4-Dioxane	3.96	88	13696m	20.46	ng/ml	Qvalue

Data File : J:\MS26\DATA\050911A\0509F010.D Vial: 6
Acq On : 9 May 2011 1:02 pm Operator: KBailey
Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 9 17:06 2011 Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



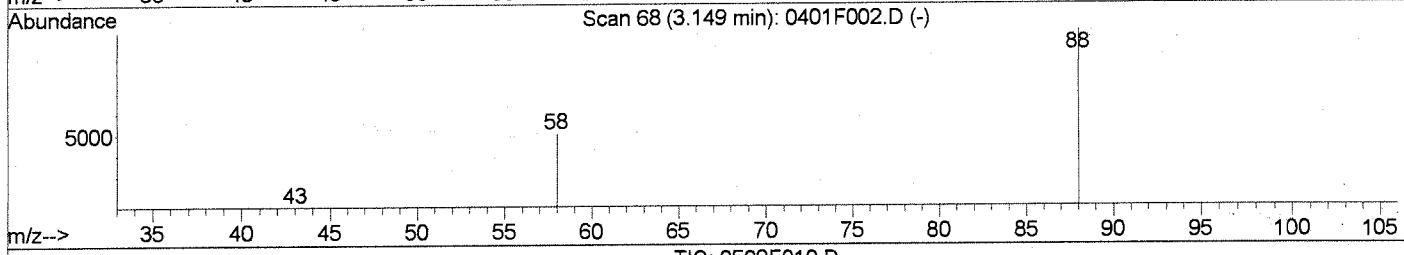
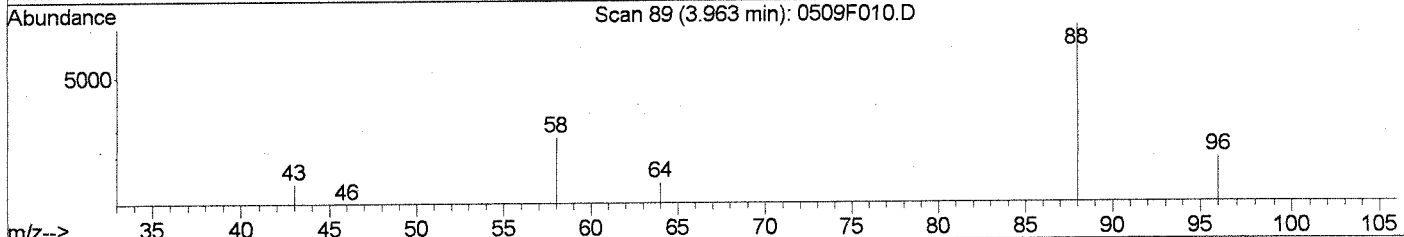
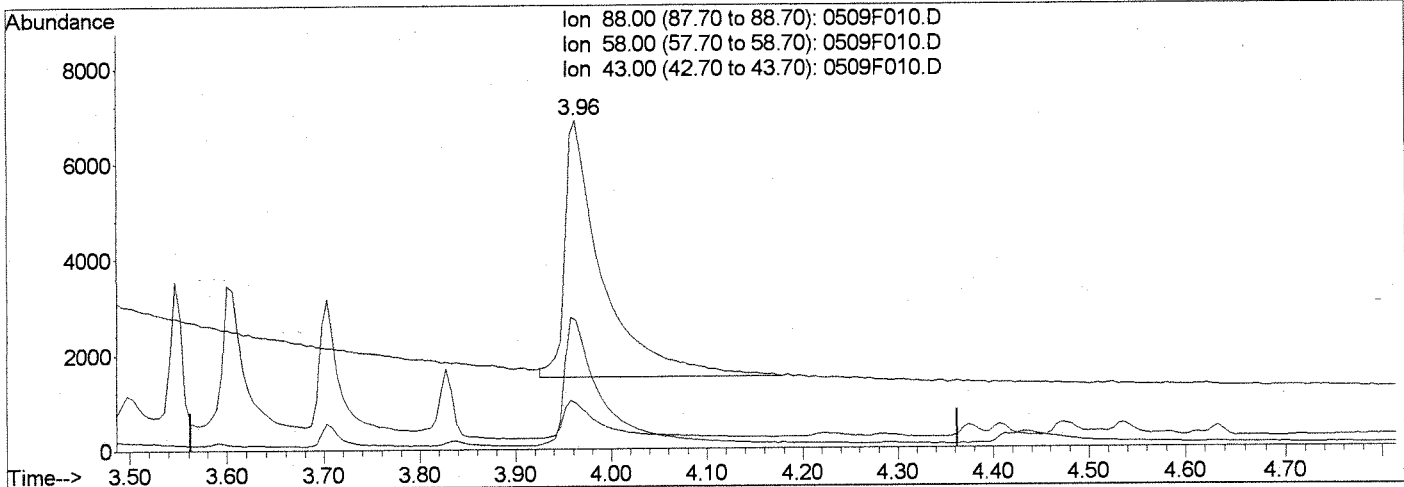
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911A\0509F010.D
 Acq On : 9 May 2011 1:02 pm
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 17:05 2011

Vial: 6
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F010.D

(3) 1,4-Dioxane (T)			
3.96min	22.00ng/ml		
response	14729		
Ion	Exp%	Act%	
88.00	100	100	
58.00	39.30	48.60	
43.00	14.10	13.88	
0.00	0.00	0.00	

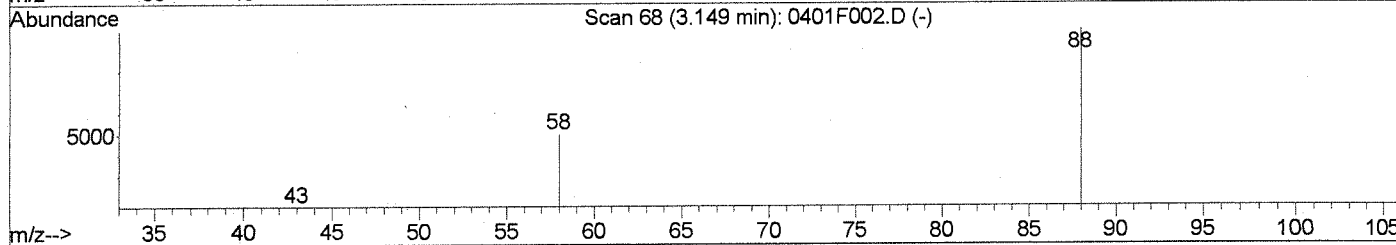
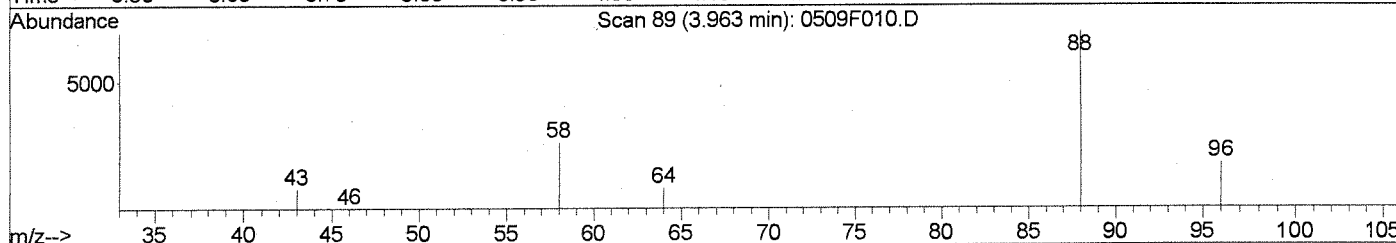
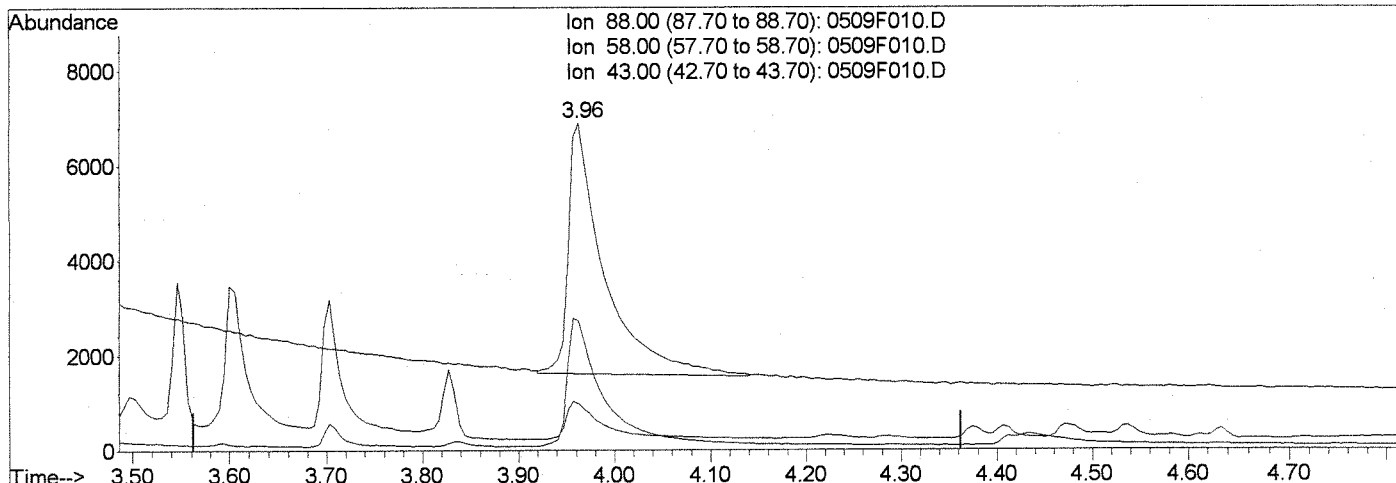
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911A\0509F010.D
 Acq On : 9 May 2011 1:02 pm
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 17:06 2011

Vial: 6
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0509F010.D

(3) 1,4-Dioxane (T)		
3.96min	20.46ng/ml m	
response	13696	
Ion	Exp%	Act%
88.00	100	100
58.00	39.30	39.32
43.00	14.10	14.10
0.00	0.00	0.00

01
 KB 5/10/11
 CA 05.10.11

Organic Analysis:
1,4-Dioxane by GC/MS

Validation Package

Sample Prep and Screen Data

Preparation Information

Group ID: KWG1103961	Prep Method: EPA 3510C	Prep Date: 05/04/11 15:45
Department: Semivoa GCMS		

Lab Code	Client ID	Product	Matrix	Amt. Ext.	Final Vol.
KWG1103961-1	Matrix Spike	8270C SIM 14_DIOXANE	WATER	100ml	50ml
KWG1103961-2	Duplicate Matrix Spike	8270C SIM 14_DIOXANE	WATER	100ml	50ml
KWG1103961-3	Lab Control Sample	8270C SIM 14_DIOXANE	WATER	100ml	50ml
KWG1103961-4	Method Blank	8270C SIM 14_DIOXANE	WATER	100ml	50ml
P1101579-005	MW-24-1	8270C SIM 14_DIOXANE	WATER	100ml	50ml
P1101605-005	MW-4-1	8270C SIM 14_DIOXANE	WATER	100ml	50ml
P1101607-001	MW-13	8270C SIM 14_DIOXANE	WATER	100ml	50ml

Lab Code	Parent Lab Code	Comments
KWG1103961-1	P1101579-005	
KWG1103961-2	P1101579-005	

Lab Code	Prep Event ID	Surrogate Solution ID	Amount Added	Spike Solution ID	Amount Added	Witness
KWG1103961-1	1015803	SVM34-59G	50uL	SVM33-87C	50uL	LBerg
KWG1103961-2	1015804	SVM34-59G	50uL	SVM33-87C	50uL	LBerg
KWG1103961-3	1015805	SVM34-59G	50uL	SVM33-87C	50uL	LBerg
KWG1103961-4	1015806	SVM34-59G	50uL			LBerg
P1101579-005	1015802	SVM34-59G	50uL			LBerg
P1101605-005	1015913	SVM34-59G	50uL			LBerg
P1101607-001	1015912	SVM34-59G	50uL			LBerg

Comments _____

IS: SVM34-59G

Started By: SJones Assisted By: _____ Training Yes No

Completed By: KKerriga Assisted By: _____ Yes No

Reviewed By: [Signature] Date: 5/9/11 Storage: SVM LAB / MS2L

Chain of Custody

Relinquished By: <u>[Signature]</u>	Date: <u>5/6/11</u>	Extracts Examined
Received By: <u>[Signature]</u>	Date: <u>5/9/11</u>	<input checked="" type="radio"/> Yes <input type="radio"/> No

Preparation Information

Group ID:	KWG1103961	Prep Method:	EPA 3510C	Prep Date:	05/04/11 15:45
Department:	Semivoa GCMS				

#	Lab Code	Client ID	B#	√	Product	Matrix	Amt. Ext.	pH	Int. Vol.	Final Vol.	Surr. Added	Spike Added
1	KWG1103961-1	Matrix Spike P1579-5	04		8270C SIM 14_DIOXANE	WATER	100ml	N/A	N/A	50ml	50ul	50ul
2	KWG1103961-2	Duplicate Matrix Spike P1579-5	04		8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	↓
3	KWG1103961-3	Lab Control Sample			8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	↓
4	KWG1103961-4	Method Blank			8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	N/A
5	P1101579-005	MW-24-1	04	/	8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	↓
6	P1101605-005	MW-4-1	04	/	8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	↓
7	P1101607-001	MW-13	04	/	8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	↓

Comments:

#132095

Surrogate ID: SVM34-59G @ 50ug/ml, exp. 10-1-11, 50ul (\$2D) #5-4-11EE

Spike ID: SVM33-87C @ 50ug/ml, exp. 6-21-11, 50ul (2D)

Witness: *Mary Lee* 5-4-11

Started By: S Jones Assisted By: _____

Completed By: *[Signature]* Assisted By: _____

Additional Prep Information For 1,4 Dioxane by EPA 3510

Service Request P1101579, P1101605 Workgroup KWG1103961
+ P1101607

Pre-Prep Information:

DCM Lot DD020

Batch Start (Time/Date/Initial): 15:45/5-4-11/SJ

Batch Stop (Time/Date/Initial): 16:30/5-4-11/SJ

Sulfate Lot # BF1002 Salt Lot # G38343

Extract Storage: Pockleberry

Date Completed: 9:26AM 5/6/11 KZ

Comments/Observations:

Bench Sheet Review Check List	
<input checked="" type="checkbox"/>	Hold Times Met (if no, Reason: _____)
<input checked="" type="checkbox"/>	Prep date, dept, method, product code correct in stealth
<input checked="" type="checkbox"/>	Spike Information correct
<input checked="" type="checkbox"/>	Weights/Volumes and units correct on raw and final bench sheets
<input checked="" type="checkbox"/>	Sample IDs have been checked—Bottle numbers appended if required
<input checked="" type="checkbox"/>	Names present for: Started by, Completed by, relinquished by, and witnessed by.
<input checked="" type="checkbox"/>	Training has been circled
<input checked="" type="checkbox"/>	Extract Storage recorded
<input checked="" type="checkbox"/>	Additional Prep Sheet completely filled out (NA or line out Blanks)
<input checked="" type="checkbox"/>	All clean-ups have been noted on additional prep sheet
<input checked="" type="checkbox"/>	Signed service request with Form V, if applicable, has been attached

Injection Log

Directory: J:\MS26\DATA\050911

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	0509F001.d	1.	PR		9 May 2011 09:4
2	1	0509F002.d	1.	PR		9 May 2011 10:0
3	1	0509F003.d	1.	10ug/mL DFTPP SVM34-33F	NR	9 May 2011 10:2
4	1	0509F004.d	1.	10ug/mL DFTPP SVM34-33F		9 May 2011 10:4
5	1	0509F005.d	1.	10ug/mL DFTPP SVM34-33F	OK - New Tune	9 May 2011 11:1
3	2	0509F006.d	1.	IB		9 May 2011 11:4
7	3	0509F007.d	1.	2.0ng/mL ICAL 1,4-Dioxane SVM34-56B		9 May 2011 12:0
3	4	0509F008.d	1.	4.0ng/mL ICAL 1,4-Dioxane SVM34-56C		9 May 2011 12:2
3	5	0509F009.d	1.	10ng/mL ICAL 1,4-Dioxane SVM34-56D		9 May 2011 12:4
10	6	0509F010.d	1.	20ng/mL ICAL 1,4-Dioxane SVM34-56E		9 May 2011 13:0
11	7	0509F011.d	1.	50ng/mL ICAL 1,4-Dioxane SVM34-56F		9 May 2011 13:2
12	8	0509F012.d	1.	100ng/mL ICAL 1,4-Dioxane SVM34-56G		9 May 2011 13:4
13	9	0509F013.d	1.	200ng/mL ICAL 1,4-Dioxane SVM34-56H		9 May 2011 14:0
14	10	0509F014.d	1.	20ng/mL ICV 1,4-Dioxane SVM34-57L		9 May 2011 14:2
15	11	0509F015.d	1.	KWG1103961-4 MB		9 May 2011 14:4
16	12	0509F016.d	1.	KWG1103961-3 LCS		9 May 2011 15:0
17	13	0509F017.d	1.	KWG1103961-1 MS P1101579-005MS		9 May 2011 15:2
18	14	0509F018.d	1.	KWG1103961-2 DMS P1101579-005DMS		9 May 2011 15:4
19	15	0509F019.d	1.	P1101579-005		9 May 2011 16:0
20	16	0509F020.d	1.	P1101605-005		9 May 2011 16:2
21	17	0509F021.d	1.	P1101607-001		9 May 2011 16:4

Run # 245353

CAL10487

LB 5110111

CA 05.10.11

LABORATORY REPORT

May 9, 2011

David Conner
Battelle
4800 Oak Grove Dr. M/S 180-801
Pasadena, CA 91109

RE: JPL GW Mon 2Q11 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 2, 2011. For your reference, these analyses have been assigned our service request number P1101638.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-10-1; Minnesota Department of Health, NELAP Certificate No. 219474; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.



Sue Anderson
Project Manager

Digitally signed by Sue Anderson
Date: 2011.05.09 10:58:59 -07'00'

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

CAS Project No: P1101638

CASE NARRATIVE

The samples were received intact under chain of custody on May 2, 2011 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

DETAIL SUMMARY REPORT

Client: Battelle
 Project ID: JPL GW Mon 2Q11 / G486090

Service Request: P1101638

Date Received: 5/2/2011
 Time Received: 16:00

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-12-5	P1101638-001	Water	5/2/2011	10:35	X
MW-12-4	P1101638-002	Water	5/2/2011	11:15	X
MW-12-3	P1101638-003	Water	5/2/2011	11:51	X
MW-12-2	P1101638-004	Water	5/2/2011	12:24	X
MW-12-1	P1101638-005	Water	5/2/2011	13:05	X
EB-5-5/2/11	P1101638-006	Water	5/2/2011	12:49	X

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl <i>tert</i> -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLIC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.



An Employee - Owned Company

Water & Soil - Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A
 Simi Valley, California 93065
 Phone (805) 526-7161
 Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. P1101635
 CAS Contract:

Company Name & Address (Reporting Information)
BATTELIE
3990 OLD TOWN AVE. C-205
SAN DIEGO, CA 92110

Project Name
SRP GW. MON. 2011
 Project Number
6486090

Project Manager
DAVID CORVEN

Phone
(619) 726-7311 Fax
(614) 458-6641

Email Address for Result Reporting
Sampler (Print & Sign)

P.O. # / Billing Information
214319 / BATTELIE
ATTN: GERALD TOMPKINS
505 KING AVE
COLUMBUS, OH 43201

Client Sample ID
 Laboratory ID Number
 Date Collected
 Time Collected
 Matrix
 Number of Containers

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatiles	TPH	Semi-Volatiles	Preservative Code	Remarks
MW-12-5	①	5/2/11	1035	W	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
MW-12-4	②	5/2/11	1115	W	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
MW-12-3	③	5/2/11	1151	W	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
MW-12-2	④	5/2/11	1224	W	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
MW-12-1	⑤	5/2/11	1305	W	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
EB-5-5/2/11	⑥	5/2/11	1249	W	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Analysis Method and/or Analytes	Preservative Code	Remarks
Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/> TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted) Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)	0	CR ST (7196)

Report Tier Levels - please select

Tier I - (Results/Default if not specified) _____ Tier III - (Data Validation Package) 10% Surcharge _____
 Tier II - (Results + QC) _____ Tier V - (client specified) _____

MRL required Yes / No _____ EDD required Yes / No _____
 MDL / POL / J required Yes / No _____ Type: _____

Project Requirements (MRLs, QAPP)
 Cooler / Blank / Ice / No Ice _____
 Temperature 30C °C

Relinquished by (Signature) _____ Date: 5/2/11 Time: 1507
 Relinquished by (Signature) _____ Date: 5/2/11 Time: 1507

Client: Battelle **Service Request:** P1101638
Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101638-001.01	7196A	5/2/11	1603	SMO / MZAMORA	
		5/2/11	1604	P-37 / MZAMORA	
		5/2/11	1616	In Lab / SANDERSON	
		5/2/11	1715	P-37 / SANDERSON	
P1101638-002.01	7196A	5/2/11	1603	SMO / MZAMORA	
		5/2/11	1604	P-37 / MZAMORA	
		5/2/11	1616	In Lab / SANDERSON	
		5/2/11	1715	P-37 / SANDERSON	
P1101638-003.01	7196A	5/2/11	1603	SMO / MZAMORA	
		5/2/11	1604	P-37 / MZAMORA	
		5/2/11	1616	In Lab / SANDERSON	
		5/2/11	1715	P-37 / SANDERSON	
P1101638-004.01	7196A	5/2/11	1603	SMO / MZAMORA	
		5/2/11	1604	P-37 / MZAMORA	
		5/2/11	1616	In Lab / SANDERSON	
		5/2/11	1715	P-37 / SANDERSON	
P1101638-005.01	7196A	5/2/11	1603	SMO / MZAMORA	
		5/2/11	1604	P-37 / MZAMORA	
		5/2/11	1616	In Lab / SANDERSON	
		5/2/11	1715	P-37 / SANDERSON	
P1101638-005.02		5/2/11	1604	SMO / MZAMORA	
		5/2/11	1604	P-37 / MZAMORA	
		5/2/11	1616	In Lab / SANDERSON	
		5/2/11	1715	P-37 / SANDERSON	
P1101638-006.01	7196A	5/2/11	1603	SMO / MZAMORA	
		5/2/11	1604	P-37 / MZAMORA	
		5/2/11	1616	In Lab / SANDERSON	
		5/2/11	1715	P-37 / SANDERSON	

Sample Acceptance Check Form

Client: Battelle Work order: P1101638

Project: JPL GW. Mon. 2Q11 / G486090

Sample(s) received on: 5/2/11 Date opened: 5/2/11 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- | | Yes | No | N/A |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were sample containers properly marked with client sample ID? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 Container(s) supplied by CAS ? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 Did sample containers arrive in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 Were chain-of-custody papers used and filled out? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 Did sample container labels and/or tags agree with custody papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 Was sample volume received adequate for analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 Are samples within specified holding times? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 Was proper temperature (thermal preservation) of cooler at receipt adhered to? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cooler Temperature _____ °C Blank Temperature <u>3</u> °C | | | |
| 9 Was a trip blank received? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10 Were custody seals on outside of cooler/Box? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate preservation , according to method/SOP or Client specified information? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are pH preserved? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were VOA vials checked for presence/absence of air bubbles? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12 Tubes: Are the tubes capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Do they contain moisture? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13 Badges: Are the badges properly capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101638-001.01	125mL Plastic NP					
P1101638-002.01	125mL Plastic NP					
P1101638-003.01	125mL Plastic NP					
P1101638-004.01	125mL Plastic NP					
P1101638-005.01	125mL Plastic NP					
P1101638-005.02	125mL Plastic NP					
P1101638-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

Analytical Report

Client : Battelle
 Project Name : JPL GW Mon 2Q11
 Project Number : G486090
 Sample Matrix : WATER

Service Request : P1101638
 Date Collected : 05/02/11
 Date Received : 05/02/11

Chromium, Hexavalent

Prep Method : None
 Analysis Method : 7196A
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-12-5	P1101638-001	0.010	0.003	1	NA	05/02/11 16:50	ND	
MW-12-4	P1101638-002	0.010	0.003	1	NA	05/02/11 16:50	ND	
MW-12-3	P1101638-003	0.010	0.003	1	NA	05/02/11 16:50	ND	
MW-12-2	P1101638-004	0.010	0.003	1	NA	05/02/11 16:50	ND	
MW-12-1	P1101638-005	0.010	0.003	1	NA	05/02/11 16:50	ND	
EB-5-5/2/11	P1101638-006	0.010	0.003	1	NA	05/02/11 16:50	ND	
Method Blank	P1101638-MB	0.010	0.003	1	NA	05/02/11 16:50	ND	

Approved By Kanu Rya Date : 5/3/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101638
Date Analyzed: 05/02/11

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Kanu Rya Date: 5/3/11
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101638
Date Analyzed: 05/02/11

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0500	0.0501	100	90-110
CCV1	0.0500	0.0492	98	90-110
CCV2	0.0500	0.0492	98	90-110

Approved By: Karee Rya Date: 5/3/11
CCV1A/I20594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101638
Date Collected : NA
Date Received : NA
Date Extracted : NA
Date Analyzed : 05/02/11

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name : Laboratory Control Sample
Lab Code : P1101638-LCS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0415	104	90-110	

Approved By

Karen Rya

Date :

5/3/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101638
Date Collected : 05/02/11
Date Received : 05/02/11
Date Extracted : NA
Date Analyzed : 05/02/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-12-1 Units : mg/L (ppm)
Lab Code : P1101638-005MS P1101638-005DMS Basis : NA
Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0424	0.0424	85	85	73-119	<1	

Approved By Kanu Rya Date : 5/3/11

pH Run Log

Service Request #(s): 21101635 1639

Time: 11:30

Sample	VWR lot #	Exp.
pH 2 Buffer	<u>524-11041002</u>	<u>1/20/12</u>
pH 4 Buffer	<u>524-11041003</u>	<u>8/31/12</u>
pH 7 Buffer	<u>524-04271102A</u>	<u>3/20/13</u>
pH 10 Buffer	<u>524-04261102</u>	<u>9/30/12</u>

Slope	Prep.Run #
<u>98.8%</u>	
	Run#

pH in liquid: (1) 9040B, (2) 9040C pH in solid: (3) 9045C, (4) 9045D (Note method number in column labeled # below)

pH adjustment:(5) 7196A,(6) 7199 (Note method # In column labeled #)

Sample	#	pH	Temp. °C
pH 2.000	<u>5</u>	<u>2.002</u>	<u>21.6°</u>
pH 4.000		<u>3.982</u>	<u>21.5°</u>
pH 7.000		<u>6.990</u>	<u>21.5°</u>
pH 10.000		<u>10.016</u>	<u>21.6°</u>
Ref#:		<u>6.406</u>	<u>21.4°</u>
PT		<u>2.072</u>	<u>20.0°</u>
pH 2.000		<u>2.047</u>	<u>21.5°</u>
TIME: <u>1620</u>			
pH 2.000	<u>5</u>	<u>2.022</u>	<u>22.2°</u>
<u>1638-1.01</u>		<u>1.983</u>	<u>10.6°</u>
<u>-2.01</u>		<u>1.931</u>	<u>9.1°</u>
<u>-3.01</u>		<u>2.097</u>	<u>9.0°</u>
<u>-4.01</u>		<u>1.849</u>	<u>9.4°</u>
<u>-5.01</u>		<u>1.992</u>	<u>10.1°</u>
<u>-6.01</u>		<u>1.909</u>	<u>9.6°</u>
<u>1639-1.01</u>		<u>1.978</u>	<u>9.0°</u>
<u>-2.01</u>		<u>1.961</u>	<u>9.5°</u>

Sample	#	pH	Temp. °C
<u>1634-3.01</u>	<u>5</u>	<u>2.091</u>	<u>9.4°</u>
<u>PH 2.000</u>	<u>5</u>	<u>2.024</u>	<u>22.0°</u>

sample not used

pH Adjustments: 7196A: Diluted/Conc H₂SO₄ EXP: 11/20/14
 7199A: Diluted NaOH _____ EXP: _____

Comments: _____

* Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 5/2/11

Note: ATC probe used; therefore, temperature correction calculation is not necessary.

Analyst: [Signature]
Reviewer: [Signature]

Date: 5/2/11
Date: 5/3/11

Service Request#(s): P1101638, 1639 Run#: 244487 Page: 10/2
 Stock#: 524-02281103 T.V.=10PPM EXP: 2/28/12 Prep Run#:
 ICV/CCV#: 524-10157001 T.V.=100PPM EXP: 3/20/12 Conc. H₂SO₄ Lot#: FWO 49784 EXP: 11/20/14
 Coloring Reagent Ref#: 524-04151102 EXP: 5/15/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.999987013
Absorbance @ 540 nm	0.000	0.011	0.058	0.116	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ILB	10ml	—	✓	0.000	0.000	0.000	0.000229	10.00%
ICV 0.05 PPM	—	—	✓	0.000	0.058	0.058	0.0501	100%
MB	—	—	✓	0.000	0.000	0.000	0.000229	10.00%
LCS 0.04 PPM	—	—	✓	0.000	0.048	0.048	0.0415	104%
1638-1.01	—	—	✓	0.005	0.006	0.001	0.00109	10.00%
-1.01/MS 0.05 PPM	—	—	✓	0.005	0.035	0.030	0.0260	87%
-2.01	—	—	✓	0.001	0.002	0.001	0.00109	10.00%
-3.01	—	—	✓	0.002	0.002	0.000	0.000229	10.00%
-4.01	—	—	✓	0.004	0.004	0.000	↓	↓
-5.01	—	—	✓	0.000	0.000	0.000	↓	↓
-5.01/MS 0.05 PPM	—	—	✓	0.000	0.049	0.049	0.0424	85%
MSD	—	—	✓	0.000	0.049	0.049	0.0424	85%
ICV 0.05 PPM	—	—	✓	0.000	0.057	0.057	0.0492	98%
ICV 1	—	—	✓	0.000	0.000	0.000	0.000229	10.00%
1638-6.01	—	—	✓	0.000	0.000	0.000	↓	↓
1639-1.01	—	—	✓	0.000	0.000	0.000	↓	↓
MSD -1.01/MS 0.05 PPM	—	—	✓	0.000	0.047	0.047	0.0406	81%

pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10157001 + 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 + 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of + 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.2 ml of + 10 ml of sample (T.V.= 0.05 ppm)

Comments:

Prepared By: [Signature]

Analyzed By: [Signature]

Reviewed By: [Signature]

Date/Time: 5/2/11 16:35

Date/Time: 5/2/11 16:50

Date: 5/3/11

Hexavalent Chromium (Liquids)

Service Request#(s): 11101638, 1639
 Stock#: 524-02281103 TV=100PPM EXP: 2/28/12
 VICCV#: 524-1015100 TV=100PPM ON: 3/2/12

Run#: 244487
 Prep Run#: _____
 Conc. H₂SO₄ Lot#: EMD 49284 EXP: 4/20/14
 Coloring Reagent Ref#: 574-1015-04151103 EXP: 5/15/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.99998705
Absorbance @ 540 nm	0.000	0.011	0.058	0.116	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1639-1.01MSD	10ml	-	✓	0.000	0.048	0.048	0.0415	83% 2%
-7.01		-	✓	0.002	0.002	0.000	0.000229	10.003
-2.01VSO.03PPM		-	✓	0.002	0.002	0.000		
-3.01		-	✓	0.002	0.032	0.030	0.0260	87%
CUNZ 0.05PPM		-	✓	0.000	0.057	0.0492		98%
CC62		-	✓	0.000	0.000	0.000229		10.003
<p>space not used</p>								

pH Requirement: Method 7196A (2 ± 0.5) Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10151001 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of _____ 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.03 ml of _____ 10 ml of sample (T.V.= 0.03 ppm)

Comments: _____

Prepared By: _____

Date/Time: 5/2/11 @ 16:35

Analyzed By: _____

Date/Time: 5/2/11 @ 16:50

Reviewed By: _____

Date: 5/3/11

100

11/23/09 519-11230902 1000 PPM SO₂ (ICV/COV)
0.1607g Na₂SO₃ (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/ DI
EXP: 5/23/10

11/23/09 519-11230903 A,B,C,D PH REFERENCE
PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 519-11240901 1000 PPM SO₄ Standard
PURCHASED CAT # ICC-006
LOT # K60794
EXP: 9/30/13

11/25/09 519-~~H/25~~ ^{82w 11/25/09} 11250901 0.1N H₂SO₄
56ml conc H₂SO₄ (EMD 47050 EXP: 9/13/10)
EXP: ~~H/25~~ ^{82w 11/25/09} 9/13/10

11/30/09 519-11300901 Cr⁶⁺ Coloring Reagent
0.2500g diphenylcarbohydrazide (EMD 47103EE; EXP:
1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 519-11300902 25133ppb Stock for O₃ in Air
0.05ml Pyridine-4-carboxaldehyde (Alfa Aesar Lot 10140598; EXP 5/11/12)
↑ 500ml deionized H₂O
EXP: 12/14/09

11/30/09 519-11300903 25133ppb ICV/COV for O₃ in Air
0.05ml Pyridine-4-carboxaldehyde (TCI Lot # I61INC; EXP: 5/10/12)
↑ 500ml w/ DI H₂O
EXP: 12/14/09

Reviewed And Approved By:

Initial: HL Date: 12/22/09

10/6/10
SL

524-10061001

25133 ppb Stock for O3

0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar
10146598 :Exp: 8/11/12 up to 500 ml w DI
Water.

EXP: 10/20/10

10/6/10
SL

524-10061002

25133, 2% ION/CCV for O3

0.05 ml Pyridine-4-carboxaldehyde TEI
(ICINE) :Exp: 8/10/12 up to 500 ml w DI
Water.

EXP: 10/20/10

10/6/10
SL

524-10061003

MBTH 50/17

0.5000 g MBTH (Aldrich 54646EX :Exp: 8/7/14) up
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄; EMD 44284; EXP 11/20/10

EXP: 10/7/10

10/15/10
SL

524-10151001

Cr6+ ION/CCV Stock
100 PPM Cr6+
Cut No 2095-16

Purchased
Ricca Chemical Co
500ml Plastic
LOT # 1010177
EXP: 3/20/12

10/15/10
SL

524-10151002

500 PPM NO₂ Stock

Purchased
Ricca Chemical Co
LOT # 1010371
EXP: 4/20/11

Cut No: 5444.5-4
120 ml amber glass

10/28/10 524-10281002 1000 PPM SO₃ ION/CCV
JW

0.1607 Na₂SO₃ (Mallinckrodt Lot #H25469; Exp: 8/11/14) up
to 100 ml w' DI Water.

EXP: 11/11/10

11/1/10 524-11011001 ION/CCV Cr⁶⁺ T.V = 0.579 PPM
JW 0.5 ml 519-04090904 (T.V = 115.8 mg/L ; EXP: 12/2010)
↑ 100 ml w/ DI
EXP: 11/15/10

11/1/10 524-11011002 Cr⁶⁺ Coloring Reagent
JW 0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP:
11/30/13) ↑ 50 ml w/ Acetone (EMD 47154 D, EXP:
9/24/12)
EXP: 11/15/10

11/4/10 524-11041001 A-SE PH Filling Sol'n
JW PURCHASED (3M KCl)
Thermo Scientific P/N 702613-AD2
LOT Code: OR1
EXP: 11/4/11

11/4/10 524-11041002 PH 2.000 Buffer
JW purchased
BDH CAT No: 5010-500 ml
LOT # 1002199
EXP: 1/2012

11/4/10 524-11041003 pH 4.000 Buffer
 purchased
 J.T. Baker Cat No: 5657-01 500 ml
 LOT # J30507
 EXP: 8/31/12

11/4/10 524-11041004 pH 7.000 Buffer
 purchased
 J.T. Baker Cat No: 5656-01 500 ml
 LOT # J35515
 EXP: 9/30/12

11/5/10 524-11051001 MBTH Sol'n
 0.5000 g MBTH (Aldrich 524166K :Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 44884
 EXP: 11/22/14
 EXP: 11/6/10

11/8/10 524-11081001 1000 PPM NH_3
 0.3141g NH_4Cl (EMD 49198931; EXP: 10/19/14) 100 ml
 w/ 524-10231006 EXP: 10/22/11
 EXP: 10/22/11

11/12/10 524-11121001 1000 PPM SO_3 STOCK
 0.1591 Na_2SO_3 (JT Baker Lot #1110627; Exp: 8/31/14) up to
 100 ml w/ DI Water.
 EXP: 11/26/10

54

2/21/11
JL
524-0221101 1:1 H₂SO₄
250ml H₂SO₄ (EMD 49284; EXP: 11/20/14)
ADDED SLOWLY TO 250ml DI. COOL
COMPLETELY
EXP: 2/21/12

2/21/11
JL
524-0221102 Carb + Coloring Reagent
0.2500g 1,5-naphthylcarbonylhydrazide (EMD LOT 4710372,
EXP: 1/30/13) ↑ 50ml w/ Acetone (EMD
LOT #471540, EXP: 9/24/12)
EXP: 3/31/11

2/28/11
JL
524-0228101 0.1 H₂SO₄
5.6ml conc H₂SO₄ (EMD 49284 EXP: 11/20/14) ↑ 2L
w/ DI H₂O
EXP: 2/28/12

2/28/11
JL
524-0228103 1001^{mg/L} Carb
Purchased
Inorganic Ventures CGCR(6)1-1
125ml Clear Glass
LOT# D2-CR03040
EXP: 3/1/2012

2/28/11
JL

524-02281103 10ppm Cr6+ Soln
1.0ml 524-02281102 (100ppm Cr6+; EXP: 3/1/12) ↑
100ml w/ DI H2O
EXP: 2/28/12

3/7/11
JL

524-03071101 Cr6+ Colony Reagent
0.2500g 1,5-Diphenylcarbazide
(END Lot 47103721, EXP: 1/30/12) ↑ 50ml w/
Acetone (END 47154, EXP: 9/24/12).
EXP: 4/7/11

3/7/11
JL

524-03071102 500ppm NO2
Purchased
Ricca Chem Co Cat No 54445-4
Lot # 1102544
EXP: 8/20/11

3/17/11
JL

524-03271101 Alkaline Digestion Soln
20.0g NaOH (END 47022713B; EXP: 10/1/12) + 30.0g
Na2CO3 (END 4622715B; EXP: 10/1/12) ↑ 1L
DI H2O.
EXP: 4/17/11

Reviewed And Approved By:
Initial: JL Date: 3/18/11

4/14/11
JL

524-04141101 ICO2 Eluent
75ml 524-04291002 (100 Conc Eluent, exp 4/29/11)
↑ 750ml w/ DI H2O. DEGAS
EXP: 4/30/11

56

4/15/11
Soc

524-04151101 JCO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EMD 4713321 exp: 1/20/12) in 100 mL Methanol (B&J 2-938K exp: 12/13/12). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 47220 exp: 1/20/12). Bring up to volume w/ DI H2O; mix and degas.

EXP: 4/20/11

4/15/11
Soc

524-04151102 Opt Cloning Reagent

0.250g 1,5-Diphenylcarbohydrazide (EMD 4713321 exp: 1/30/13) + 50 mL w/ Acetone (EMD 471540; exp: 5/24/12)

EXP: 5/15/11

4/12/11
Soc

524-04151103 13.5 N NaOH

100g NaOH (EMD 47022713 exp: 10/1/12) + 100 DI H2O

EXP: 4/15/12

4/18/11
Soc

524-04181101 1000 ppm Cr6+

0.1 mL - 524-02281102 (1000 ppm Cr6+; exp: 3/1/12) ↑
100 mL w/ pH ADJUSTED DI (9.391)

EXP: 3/1/12

4/18/11
Soc

524-04181102 ICN JCO2 25ppb

0.25 mL Ref 524-10151001 @ 0.1% exp: 3/20/12 up to 100 mL with pH adjusted (pH=9.391). degassed DI Water.

EXP: 5/2/11

SAIT-0461102 PH 10,000 Buffer

Purchased

Lot # 133504 Cat No: 5255-01

EXP: 9/30/12

4/26/11

SAIT-0461103 NBS FILING SO-N

Purchased

Lot # 021 Therm Orion

Lot # 021 P/N: 70263-A04

EXP: 4/30/12

4/26/11

SAIT-0461104

EXP: 4/30/12

Lot # 021

Lot # 021

4/26/11

SAIT-0461101

EXP: 4/30/12

Lot # 021

Lot # 021

4/26/11

SAIT-0461101

EXP: 4/30/12

Lot # 021

Lot # 021

4/27/11
 Sp
 524-04271102 A&B pH 7.000 Buffer
 Purchased
 BDH Cat No. BDH5046-500 mL
 Lot # 1103379
 Exp: 3/30/13

4/28/11
 Sp
 524-04281101 0.1N H2SO4
 5.0 ml conc H2SO4 (Lot 49284; Exp: 11/20/14)
 ↑ 2L w/ DI H2O
 Exp: 4/28/12

LABORATORY REPORT

May 10, 2011

David Conner
Battelle
4800 Oak Grove Dr. M/S 180-801
Pasadena, CA 91109

RE: JPL-GW-2Q11 / G005862 / JPL GWM

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 2, 2011. For your reference, these analyses have been assigned our service request number P1101639.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-10-1; Minnesota Department of Health, NELAP Certificate No. 219474; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.



Sue Anderson
Project Manager

Digitally signed by Sue Anderson
Date: 2011.05.10 15:20:36 -07'00'

Client: Battelle
Project: JPL-GW-2Q11 / G005862 / JPL GWM

CAS Project No: P1101639

CASE NARRATIVE

The samples were received intact under chain of custody on may 2, 2011 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

DETAIL SUMMARY REPORT

Client: Battelle
 Project ID: JPL-GW-2Q11 / G005862 / JPL GWM

Service Request: P1101639

Date Received: 5/2/2011
 Time Received: 16:00

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-1	P1101639-001	Water	5/2/2011	10:27	X
DUPE-5-2Q11	P1101639-002	Water	5/2/2011	10:35	X
MW-9	P1101639-003	Water	5/2/2011	13:04	X

Columbia Analytical Services, Inc.

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl <i>tert</i> -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Client: Battelle

Service Request: P1101639

Project: JPL-GW-2Q11/G005862 / JPL GWM

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101639-001.01	7196A	5/2/11	1612	SMO / MZAMORA	
		5/2/11	1612	P-37 / MZAMORA	
		5/2/11	1616	In Lab / SANDERSON	
		5/2/11	1715	P-37 / SANDERSON	
P1101639-002.01	7196A	5/2/11	1612	SMO / MZAMORA	
		5/2/11	1612	P-37 / MZAMORA	
		5/2/11	1616	In Lab / SANDERSON	
		5/2/11	1715	P-37 / SANDERSON	
P1101639-003.01	7196A	5/2/11	1612	SMO / MZAMORA	
		5/2/11	1612	P-37 / MZAMORA	
		5/2/11	1616	In Lab / SANDERSON	
		5/2/11	1715	P-37 / SANDERSON	

Sample Acceptance Check Form

Client: Battelle Work order: P1101639

Project: JPL-GW-2Q11 / G005862/JPL GWM

Sample(s) received on: 5/2/11 Date opened: 5/2/11 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- | | Yes | No | N/A |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were sample containers properly marked with client sample ID? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 Container(s) supplied by CAS ? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 Did sample containers arrive in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 Were chain-of-custody papers used and filled out? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 Did sample container labels and/or tags agree with custody papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 Was sample volume received adequate for analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 Are samples within specified holding times? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 Was proper temperature (thermal preservation) of cooler at receipt adhered to?
Cooler Temperature <u>3</u> °C Blank Temperature _____ °C | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9 Was a trip blank received? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10 Were custody seals on outside of cooler/Box? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate preservation , according to method/SOP or Client specified information? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are pH preserved? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were VOA vials checked for presence/absence of air bubbles? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12 Tubes: Are the tubes capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Do they contain moisture? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13 Badges: Are the badges properly capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101639-001.01	125mL Plastic NP					
P1101639-002.01	125mL Plastic NP					
P1101639-003.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

Analytical Report

Client : Battelle
 Project Name : JPL-GW-2Q11
 Project Number : G005862 / JPL GWM
 Sample Matrix : WATER

Service Request : P1101639
 Date Collected : 05/02/11
 Date Received : 05/02/11

Chromium, Hexavalent

Prep Method : None
 Analysis Method : 7196A
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-1	P1101639-001	0.010	0.003	1	NA	05/02/11 16:50	ND	
DUPE-5-2Q11	P1101639-002	0.010	0.003	1	NA	05/02/11 16:50	ND	
MW-9	P1101639-003	0.010	0.003	1	NA	05/02/11 16:50	ND	
Method Blank	P1101639-MB	0.010	0.003	1	NA	05/02/11 16:50	ND	

Approved By Kam Rya Date : 5/3/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11 / G005862 / JPL GWM

Service Request: P1101639
Date Analyzed: 05/02/11

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Kam Rya Date: 5/3/11
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11 / G005862 / JPL GWM

Service Request: P1101639
Date Analyzed: 05/02/11

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0500	0.0501	100	90-110
CCV1	0.0500	0.0492	98	90-110
CCV2	0.0500	0.0492	98	90-110

Approved By: Karee Ryan Date: 5/3/11
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL-GW-2Q11
Project Number : G005862 / JPL GWM
Sample Matrix : WATER

Service Request : P1101639
Date Collected : NA
Date Received : NA
Date Extracted : NA
Date Analyzed : 05/02/11

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name : Laboratory Control Sample
Lab Code : P1101639-LCS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Chromium, Hexavalent	None	7196A	0.0400	0.0415	104	90-110	

Approved By

Kanu Rya

Date :

5/3/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL-GW-2Q11
Project Number : G005862 / JPL GWM
Sample Matrix : WATER

Service Request : P1101639
Date Collected : 05/02/11
Date Received : 05/02/11
Date Extracted : NA
Date Analyzed : 05/02/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-1 Units : mg/L (ppm)
 Lab Code : P1101639-001MS P1101639-001DMS Basis : NA
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0406	0.0415	81	83	73-119	2	

Approved By *Karen Ryan* Date : *5/3/11*

pH Run Log

Service Request #(s): 21101635 1639

Time: ~~11:30~~ ^{8:57 AM} 11:30

Sample	VWR lot #	Exp.
pH 2 Buffer	524-11041002	1/2012
pH 4 Buffer	524-11041003	8/31/12
pH 7 Buffer	524-04271102A	3/2013
pH 10 Buffer	524-04261102	9/30/12

Slope	Prep.Run #
} 98.8%	
	Run#

pH in liquid: (1) 9040B, (2) 9040C pH in solid: (3) 9045C, (4) 9045D (Note method number in column labeled # below)

pH adjustment:(5) 7196A,(6) 7199 (Note method # in column labeled #)

Sample	#	pH	Temp. °C
pH 2.000	5	2.002	21.6°
pH 4.000		3.982	21.5°
pH 7.000		6.990	21.5°
pH 10.000		10.016	21.6°
Ref#: ^{EXP: 1/2012} 524-71230902D		6.406	21.4°
PT		2.072	20.0°
pH 2.000		2.047	21.5°
TIME: 1620			
pH 2.000	5	2.022	22.2°
1638-1.01		1.983	10.6°
-2.01		1.931	9.1°
-3.01		2.097	9.0°
-4.01		1.849	9.4°
-5.01		1.992	10.1°
-6.01		1.909	9.6°
1639-1.01		1.978	9.0°
-7.01		1.961	9.5°

Sample	#	pH	Temp. °C
1634-3.01	5	2.091	9.4°
pH 2.000	5	2.024	22.0°
<p>sample not used</p>			

pH Adjustments: 7196A: Diluted/Conc H₂SO₄ EXP: 11/2014

7199A: Diluted NaOH _____ EXP: _____

Comments: _____

* Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 5/2/11

Note: ATC probe used; therefore, temperature correction calculation is not necessary.

Analyst: [Signature]

Date: 5/2/11

Reviewer: [Signature]

Date: 5/3/11

Service Request#(s): P1101638, 1639 Run#: 244487 Page: 10/2
 Stock#: 524-02281103 T.V.=10PPM EXP: 2/28/12 Prep Run#:
 ICV/CCV#: 524-10157001 T.V.=100PPM EXP: 3/20/12 Conc. H₂SO₄ Lot#: FWO 49784 EXP: 11/20/14
 Coloring Reagent Ref#: 524-04151102 EXP: 5/15/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.999987013
Absorbance @ 540 nm	0.000	0.011	0.058	0.116	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ILB	10ml	—	✓	0.000	0.000	0.000	0.000229	10.00%
ICV 0.05 PPM	—	—	✓	0.000	0.058	0.058	0.0501	100%
MB	—	—	✓	0.000	0.000	0.000	0.000229	10.00%
LCS 0.04 PPM	—	—	✓	0.000	0.048	0.048	0.0415	104%
1638-1.01	—	—	✓	0.005	0.006	0.001	0.00109	10.00%
-1.01/MS 0.05 PPM	—	—	✓	0.005	0.035	0.030	0.0260	87%
-2.01	—	—	✓	0.001	0.002	0.001	0.00109	10.00%
-3.01	—	—	✓	0.002	0.002	0.000	0.000229	10.00%
-4.01	—	—	✓	0.004	0.004	0.000	↓	↓
-5.01	—	—	✓	0.000	0.000	0.000	↓	↓
-5.01/MS 0.05 PPM	—	—	✓	0.000	0.049	0.049	0.0424	85%
MSD	—	—	✓	0.000	0.049	0.049	0.0424	85%
ICV 0.05 PPM	—	—	✓	0.000	0.057	0.057	0.0492	98%
ICV1	—	—	✓	0.000	0.000	0.000	0.000229	10.00%
1638-6.01	—	—	✓	0.000	0.000	0.000	↓	↓
1639-1.01	—	—	✓	0.000	0.000	0.000	↓	↓
MSD -1.01/MS 0.05 PPM	—	—	✓	0.000	0.047	0.047	0.0406	81%

pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10157001 + 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 + 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of + 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.2 ml of + 10 ml of sample (T.V.= 0.05 ppm)

Comments:

Prepared By: [Signature]

Date/Time: 5/2/11 16:35

Analyzed By: [Signature]

Date/Time: 5/2/11 16:50

Reviewed By: [Signature]

Date: 5/3/11

Hexavalent Chromium (Liquids)



Method EPA 7196A

76

Service Request#(s): 11101638, 1639
 Stock#: 524-02281103 TV=100PPM EXP: 2/28/12
 VICCV#: 524-1015100 TV=100PPM ON: 3/2/12

Run#: 244487
 Prep Run#: _____
 Conc. H₂SO₄ Lot#: EMD 49284 EXP: 4/20/14
 Coloring Reagent Ref#: 574-1015-04151103 EXP: 5/15/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.99998705
Absorbance @ 540 nm	0.000	0.011	0.058	0.116	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1639-1.01MSD	10ml	-	✓	0.000	0.048	0.048	0.0415	83% 2%
-7.01		-	✓	0.002	0.002	0.000	0.000229	10.00%
-2.01VSO.03PPM		-	✓	0.002	0.002	0.000		
-3.01		-	✓	0.002	0.032	0.030	0.0260	87%
CUNZ 0.05PPM		-	✓	0.000	0.057	0.0492		98%
CC62		-	✓	0.000	0.000	0.000229		10.00%
<p>space not used</p>								

pH Requirement: Method 7196A (2 ± 0.5) Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10151001 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of _____ 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.03 ml of _____ 10 ml of sample (T.V.= 0.03 ppm)

Comments: _____

Prepared By: _____

Date/Time: 5/2/11 @ 16:35

Analyzed By: _____

Date/Time: 5/2/11 @ 16:50

Reviewed By: _____

Date: 5/3/11

100

11/23/09 519-11230902 1000 PPM SO₂ (ICV/COV)
0.1607g Na₂SO₃ (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/ DI
EXP: 5/23/10

11/23/09 519-11230903 A,B,C,D PH REFERENCE
PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 519-11240901 1000 PPM SO₄ Standard
PURCHASED CAT # ICC-006
LOT # K60794
EXP: 9/30/13

11/25/09 519-~~H/25~~ ^{82 11/25/09} 11250901 0.1N H₂SO₄
56ml conc H₂SO₄ (EMD 47050 EXP: 9/13/10)
EXP: ~~H/25~~ ^{82 11/25/09} 9/13/10

11/30/09 519-11300901 Cr⁶⁺ Coloring Reagent
0.2500g diphenylcarbohydrazide (EMD 47103EE; EXP:
1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 519-11300902 25133 Ppb Stock for O₃ in Air
0.05ml Pyridine-4-carboxaldehyde (Alfa Aesar Lot 10140598; EXP 5/11/12)
↑ 500ml deionized H₂O
EXP: 12/14/09

11/30/09 519-11300903 25133 Ppb ICV/COV for O₃ in Air
0.05ml Pyridine-4-carboxaldehyde (TCI Lot # I61INC; EXP: 5/10/12)
↑ 500ml w/ DI H₂O
EXP: 12/14/09

Reviewed And Approved By:

Initial: HL Date: 12/22/09

10/6/10
SL

524-10061001

25133 ppb Stock for O3

0.05 ml Pyridine-4-carboxaldehyde

Alfa Aesar

10146598

:Exp: 8/11/12 up to 500 ml w/ DI

Water.

EXP: 10/20/10

10/6/10
SL

524-10061002

25133, 2% ION/CCV for O3

0.05 ml Pyridine-4-carboxaldehyde

TEI

(ICINE)

:Exp: 8/10/12 up to 500 ml w/ DI

Water.

EXP: 10/20/10

10/6/10
SL

524-10061003

MBTH 50/17

0.5000 g MBTH (Aldrich 54646EK :Exp: 8/7/14) up

to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄; EMD 44284; EXP 11/20

EXP: 10/7/10

10/15/10
SL

524-10151001

Cr6+ ION/CCV Stock

Purchased

100 PPM Cr6+

Ricca Chemical Co

Cat No 2095-16

500ml Plastic

LOT # 1010177

EXP: 3/20/12

10/15/10
SL

524-10151002

500 PPM NO₂ Stock

Purchased

Ricca Chemical Co

Cat No: 5444.5-4

LOT # 1010371

EXP: 4/20/11

120 ml amber glass

10/28/10 524-10281002 1000 PPM SO₂ ION/CCV
JW

0.1607 Na₂SO₃ (Mallinckrodt Lot #H25469; Exp: 8/11/14) up
to 100 ml w' DI Water.

EXP: 11/11/10

11/1/10 524-11011001 ION/CCV Cr⁶⁺ T.V = 0.579 PPM
JW 0.5 ml 519-04090904 (T.V = 115.8 mg/L ; EXP: 12/2010)
↑ 100 ml w/ DI
EXP: 11/15/10

11/1/10 524-11011002 Cr⁶⁺ Coloring Reagent
JW 0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP:
11/30/13) ↑ 50 ml w/ Acetone (EMD 47154 D, EXP:
9/24/12)
EXP: 11/15/10

11/4/10 524-11041001 A-SE PH Filling Sol'n
JW PURCHASED (3M KCl) P/N 702613-AD2
Thermo Scientific
LOT Code: OR1
EXP: 11/4/11

11/4/10 524-11041002 PH 2.000 Buffer
JW purchased
BDH CAT No: 5010-500 ml
LOT # 1002199
EXP: 1/2012

11/4/10 524-11041003 pH 4.000 Buffer
 purchased
 J.T. Baker Cat No: 5657-01 500 ml
 LOT # J30507
 EXP: 8/31/12

11/4/10 524-11041004 pH 7.000 Buffer
 purchased
 J.T. Baker Cat No: 5656-01 500 ml
 LOT # J35515
 EXP: 9/30/12

11/5/10 524-11051001 MBTH Sol'n
 0.5000 g MBTH (Aldrich 52416EK :Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 44884
 EXP: 11/22/14
 EXP: 11/6/10

11/8/10 524-11081001 1000 PPM NH_3
 0.3141g NH_4Cl (EMD 49198931; EXP: 10/19/14) 100 ml
 w/ 524-10231006 EXP: 10/22/11
 EXP: 10/22/11

11/12/10 524-11121001 1000 PPM SO_3 STOCK
 0.1591 Na_2SO_3 (JT Baker Lot #1110627; Exp: 8/31/14) up to
 100 ml w/ DI Water.
 EXP: 11/26/10

54

2/21/11
JL
524-0221101 1:1 H₂SO₄
250ml H₂SO₄ (EMD 49284; EXP: 11/20/14)
ADDED SLOWLY TO 250ml DI. COOL
COMPLETELY
EXP: 2/21/12

2/21/11
JL
524-0221102 Carb + Coloring Reagent
0.2500g 1,5-naphthylcarbonylhydrazide (EMD LOT 4710372,
EXP: 1/30/13) ↑ 50ml w/ Acetone (EMD
LOT #471540, EXP: 9/24/12)
EXP: 3/21/11

2/28/11
JL
524-0228101 0.1 H₂SO₄
5.6ml conc H₂SO₄ (EMD 49284 EXP: 11/20/14) ↑ 2L
w/ DI H₂O
EXP: 2/28/12

2/28/11
JL
524-0228103 1001^{MSL} Carb
Purchased
Inorganic Ventures CGCR(6)1-1
125ml Clear Glass
LOT# D2-CR03040
EXP: 3/11/2012

2/28/11
JL

524-02281103 10ppm Cr6+ Soln
1.0ml 524-02281102 (100ppm Cr6+; EXP: 3/1/12) ↑
100ml w/ DI H2O
EXP: 2/28/12

3/7/11
JL

524-03071101 Cr6+ Colormetric Reagent
0.2500g 1,5-Diphenylcarbazide
(END Lot 47103721, EXP: 1/30/12) ↑ 50ml w/
Acetone (END 47154, EXP: 9/24/12).
EXP: 4/7/11

3/7/11
JL

524-03071102 500ppm NO2
Purchased
Ricca Chem Co Cat No 54445-4
LOT # 1102544
EXP: 8/20/11

3/17/11
JL

524-03271101 Alkaline Digestion Soln
20.0g NaOH (END 47022713B; EXP: 10/1/12) + 30.0g
Na2CO3 (END 4622715B; EXP: 10/1/12) ↑ 1L
DI H2O.
EXP: 4/17/11

Reviewed And Approved By:
Initial: JL Date: 3/18/11

4/14/11
JL

524-04141101 ICO2 Eluent
75ml 524-04291002 (100 Conc Eluent, exp 4/29/11)
↑ 750ml w/ DI H2O. DEGAS
EXP: 4/30/11

56

4/15/11
Soc

524-04151101 JCO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EMD 4713321 exp: 1/20/12) in 100 mL Methanol (B&J 2-938K exp: 12/13/12). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 47220 exp: 1/20/12). Bring up to volume w/ DI H2O; mix and degas.

EXP: 4/20/11

4/15/11
Soc

524-04151102 Opt. Cleaning Reagent

0.250g 1,5-Diphenylcarbohydrazide (EMD 4713321 exp: 1/30/13) + 50 mL w/ Acetone (EMD 471540; exp: 5/24/12)

EXP: 5/15/11

4/15/11
Soc

524-04151103 13.5 N NaOH

100g NaOH (EMD 47022713 exp: 10/1/12) + 100 mL DI H2O

EXP: 4/15/12

4/18/11
Soc

524-04181101 1000 ppm Cr6+

0.1 mL - 524-02281102 (1000 ppm Cr6+; exp: 3/1/12) + 100 mL w/ pH ADJUSTED DI (9.391)

EXP: 3/1/12

4/18/11
Soc

524-04181102 ICN JCO2 25ppb

0.25 mL Ref 524-0151001 @ 0.1% exp: 3/20/12 up to 100 mL with pH adjusted (pH=9.391). degassed DI Water.

EXP: 5/2/11

SAIT-0461102 PH 10,000 Buffer

Purchased

Lot # 133504 Cat No: 5255-01

EXP: 9/30/12

4/26/11

SAIT-0461103 NHA FILING SO-N

Purchased

Lot # 021 Thermo Orion

Lot # 021 P/N: 70263-A04

EXP: 4/30/12

4/26/11

SAIT-0461104

Lot # 111 H2SO4

9/4/2011

ADDED STAIN TO 250ml DI H2O

EXP: 11/20/14

4/26/11

SAIT-0461101

Amiee Su Hwa S/n

6.25ml conc H2SO4 (conc 18.4M, exp: 11/20/14) Added to

250ml DI H2O. Let cool.

Dissolve 1.6875g N-N-Dimethyl-2-naphthylamine

in water. (Fisher 1363386 500g, exp: 8/7/14)

in water. Sulfuric acid dilute to 250ml w/

exp: 5/25/11

4/27/11
 Sp
 524-04271102 A&B pH 7.000 Buffer
 Purchased
 BDH Cat No. BDH5046-500 mL
 Lot # 1103379
 Exp: 3/30/13

4/28/11
 Sp
 524-04281101 0.1N H2SO4
 5.0 ml Conc H2SO4 (Lot 49284; Exp: 11/20/14)
 ↑ 2L w/ DI H2O
 Exp: 4/28/12

LABORATORY REPORT

May 10, 2011

David Conner
Battelle
4800 Oak Grove Dr. M/S 180-801
Pasadena, CA 91109

RE: JPL GW Mon 2Q11 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 3, 2011. For your reference, these analyses have been assigned our service request number P1101655.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-10-1; Minnesota Department of Health, NELAP Certificate No. 219474; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.



Digitally signed by Sue Anderson
Date: 2011.05.10 15:25:47 -07'00'

Sue Anderson
Project Manager

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

CAS Project No: P1101655

CASE NARRATIVE

The samples were received intact under chain of custody on May 3, 2011 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

DETAIL SUMMARY REPORT

Client: Battelle
 Project ID: JPL GW Mon 2Q11 / G486090

Service Request: P1101655

Date Received: 5/3/2011
 Time Received: 15:41

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-23-5	P1101655-001	Water	5/3/2011	07:38	X
MW-23-4	P1101655-002	Water	5/3/2011	08:11	X
MW-23-3	P1101655-003	Water	5/3/2011	08:43	X
MW-23-2	P1101655-004	Water	5/3/2011	09:11	X
MW-23-1	P1101655-005	Water	5/3/2011	09:44	X
EB-6-5/3/11	P1101655-006	Water	5/3/2011	09:31	X

Columbia Analytical Services, Inc.

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl <i>tert</i> -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.



Water & Soil - Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A
 Simi Valley, California 93065
 Phone (805) 526-7161
 Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle

1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

Request No. **9910655**

CAS Contact:

Company Name & Address (Reporting Information)
Battelle
 3990 Old Town Ave. C-205
 San Diego, CA 92110

Project Name
SPL.GW.MON. 2 Q11

Project Number
6486090

Project Manager
David Conner

P.O. # / Billing Information
214319 / Battelle
ATTN: GENARO TOMPKINS
505 KING AVE.
COLUMBUS OH 43201

Phone
(619) 726-7311 Fax
(614) 458-6641

Email Address for Result Reporting
Samplers (Print & Sign)

Client Sample ID

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers
MW-23-5	1	5/3/11	738	W	1
MW-23-4	2		811		1
MW-23-3	7		843		1
MW-23-2	4		911		1
MW-23-1	5		944		2
EB-6-5/3/11	6		931		1

Analysis Method and/or Analytes	Preservative Code
Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/> TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted)	0
Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)	(7196)

Preservative Key
0 None
1 HCL
2 HNO3
3 H2SO4
4 NaOH
5 Zn Acetate
6 Asc Acid
7 Other

Remarks
IV QC
M/S / M/S D
EQUIP BLANK

Report Tier Levels - please select

Tier I - (Results/Default if not specified) _____
 Tier II - (Results + QC) _____
 Tier III - (Data Validation Package) 10% Surcharge _____
 Tier V - (client specified) _____

MRL required Yes / No _____
 MDL / PQL / J required Yes / No _____
 EDD required Yes / No _____
 Type: _____

Retrieved by: (Signature) _____ Date: 5/3/11 Time: 5:01

Relinquished by: (Signature) _____ Date: 5/3/11 Time: 5:41

Relinquished by: (Signature) _____ Date: 5/3/11 Time: 5:41

Project Requirements (MRLs, GAPP)
 Cooler / Blank / Ice / No Ice _____
 Temperature _____ °C

Client: Battelle

Service Request: P1101655

Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101655-001.01	7196A	5/3/11	1601	SMO / SSTAPLES	
		5/3/11	1602	P-37 / SSTAPLES	
		5/3/11	1603	P-37 / SSTAPLES	
		5/3/11	1606	In Lab / SANDERSON	
		5/3/11	1716	P-37 / SANDERSON	
P1101655-002.01	7196A	5/3/11	1601	SMO / SSTAPLES	
		5/3/11	1602	P-37 / SSTAPLES	
		5/3/11	1603	P-37 / SSTAPLES	
		5/3/11	1606	In Lab / SANDERSON	
		5/3/11	1716	P-37 / SANDERSON	
P1101655-003.01	7196A	5/3/11	1601	SMO / SSTAPLES	
		5/3/11	1602	P-37 / SSTAPLES	
		5/3/11	1603	P-37 / SSTAPLES	
		5/3/11	1605	In Lab / SANDERSON	
		5/3/11	1716	P-37 / SANDERSON	
P1101655-004.01	7196A	5/3/11	1601	SMO / SSTAPLES	
		5/3/11	1602	P-37 / SSTAPLES	
		5/3/11	1603	P-37 / SSTAPLES	
		5/3/11	1605	In Lab / SANDERSON	
		5/3/11	1716	P-37 / SANDERSON	
P1101655-005.01	7196A	5/3/11	1601	SMO / SSTAPLES	
		5/3/11	1602	P-37 / SSTAPLES	
		5/3/11	1603	P-37 / SSTAPLES	
		5/3/11	1606	In Lab / SANDERSON	
		5/3/11	1716	P-37 / SANDERSON	
P1101655-005.02		5/3/11	1602	SMO / SSTAPLES	
		5/3/11	1603	P-37 / SSTAPLES	
		5/3/11	1606	In Lab / SANDERSON	
		5/3/11	1716	P-37 / SANDERSON	
P1101655-006.01	7196A	5/3/11	1601	SMO / SSTAPLES	

Client: Battelle**Service Request:** P1101655**Project:** JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
		5/3/11	1602	P-37 / SSTAPLES	
		5/3/11	1603	P-37 / SSTAPLES	
		5/3/11	1606	In Lab / SANDERSON	
		5/3/11	1716	P-37 / SANDERSON	

Sample Acceptance Check Form

Client: Battelle Work order: P1101655

Project: JPL GW Mon 2Q11 / G486090

Sample(s) received on: 5/3/11 Date opened: 5/3/11 by: SSTAPLES

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- | | Yes | No | N/A |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were sample containers properly marked with client sample ID? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 Container(s) supplied by CAS ? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 Did sample containers arrive in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 Were chain-of-custody papers used and filled out? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 Did sample container labels and/or tags agree with custody papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 Was sample volume received adequate for analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 Are samples within specified holding times? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 Was proper temperature (thermal preservation) of cooler at receipt adhered to? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cooler Temperature _____ °C Blank Temperature <u>5</u> °C | | | |
| 9 Was a trip blank received? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10 Were custody seals on outside of cooler/Box? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate preservation , according to method/SOP or Client specified information? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Is there a client indication that the submitted samples are pH preserved? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were VOA vials checked for presence/absence of air bubbles? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12 Tubes: Are the tubes capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Do they contain moisture? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13 Badges: Are the badges properly capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101655-001.01	125mL Plastic NP					
P1101655-002.01	125mL Plastic NP					
P1101655-003.01	125mL Plastic NP					
P1101655-004.01	125mL Plastic NP					
P1101655-005.01	125mL Plastic NP					
P1101655-005.02	125mL Plastic NP					
P1101655-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
 Project Name : JPL GW Mon 2Q11
 Project Number : G486090
 Sample Matrix : WATER

Service Request : P1101655
 Date Collected : 05/03/11
 Date Received : 05/03/11

Chromium, Hexavalent

Prep Method : None
 Analysis Method : 7196A
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-23-5	P1101655-001	0.010	0.003	1	NA	05/03/11 16:45	ND	
MW-23-4	P1101655-002	0.010	0.003	1	NA	05/03/11 16:45	ND	
MW-23-3	P1101655-003	0.010	0.003	1	NA	05/03/11 16:45	ND	
MW-23-2	P1101655-004	0.010	0.003	1	NA	05/03/11 16:45	ND	
MW-23-1	P1101655-005	0.010	0.003	1	NA	05/03/11 16:45	ND	
EB-6-5/3/11	P1101655-006	0.010	0.003	1	NA	05/03/11 16:45	ND	
Method Blank	P1101655-MB	0.010	0.003	1	NA	05/03/11 16:45	ND	

Approved By Kam Rya Date : 5/4/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101655
Date Analyzed: 05/03/11

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Kanu Rya Date: 5/4/11
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101655
Date Analyzed: 05/03/11

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0500	0.0499	100	90-110
CCV1	0.0500	0.0499	100	90-110
CCV2	0.0500	0.0508	102	90-110

Approved By: Karee Rya Date: 5/4/11
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101655
Date Collected : NA
Date Received : NA
Date Extracted : NA
Date Analyzed : 05/03/11

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name : Laboratory Control Sample
Lab Code : P1101655-LCS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0430	108	90-110	

Approved By Kanu Rya

Date : 5/4/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
 Project Name : JPL GW Mon 2Q11
 Project Number : G486090
 Sample Matrix : WATER

Service Request : P1101655
 Date Collected : 05/03/11
 Date Received : 05/03/11
 Date Extracted : NA
 Date Analyzed : 05/03/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-23-1 Units : mg/L (ppm)
 Lab Code : P1101655-005MS P1101655-005DMS Basis : NA
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0517	0.0517	103	103	73-119	<1	

Approved By *Kam Rya* Date : 5/4/11

pH Run Log

Service Request #(s): P110/1655, 1652

Time: 0750

Sample	VWR lot #	Exp.
pH 2 Buffer	524-11041002	1/2012
pH 4 Buffer	524-11041003	8/31/12
pH 7 Buffer	524-0429102A	3/2013
pH 10 Buffer	524-04261162	4/2012

Slope	Prep.Run #
98.7%	
	Run#

pH in liquid: (1) 9040B, (2) 9040C pH in solid: (3) 9045C, (4) 9045D (Note method number in column labeled # below)

pH adjustment:(5) 7196A,(6) 7199 (Note method # In column labeled #)

Sample	#	pH	Temp. °C
pH 2.000	5	2.004	22.0°
pH 4.000		3.998	21.9°
pH 7.000		7.000	22.1°
pH 10.000		9.988	21.9°
Ref#: ^{7196-646 Exp: 1/2012} 419-11220963D		6.366	21.9°
DI		2.044	20.6°
pH 2.000	✓	2.017	22.0°
TIME: 1610			
pH 2.000	5	2.020	23.1°
1655-1.01	T	1.848	8.2°
-2.01		2.058	8.0°
-3.01		2.047	6.1°
-4.01		1.853	9.5°
-5.01		2.016	8.3°
✓ -6.01		2.089	9.4°
1655-1.01		2.076	9.5°
pH 2.000	✓	2.024	23.0°

Sample	#	pH	Temp. °C
<p><i>Soil not collected</i></p>			

pH Adjustments: 7196A: Diluted/Conc H₂SO₄EMD 49284 EXP: 11/20/14

7199A: Diluted NaOH _____ EXP: _____

Comments: _____

* Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 5/2/11

Note: ATC probe used; therefore, temperature correction calculation is not necessary.

Analyst: SK

Date: 5/3/11

Reviewer: KR

Date: 5/4/11

Hexavalent Chromium (Liquids)



Method EPA 7196A

77

Service Request#(s): 1101655; 1656
 Stock#: 524-02281103 T.V.= 100ppm EXP: 2/28/11
 CVICCV#: 524-16151001 T.V.= 100ppm EXP: 3/2012

Run#: 244667
 Prep Run#: _____
 Conc. H₂SO₄ Lot#: EMD 49284 EXP: 11/20/14
 Coloring Reagent Ref#: 524-04151102 EXP: 5/15/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.99999418
Absorbance @ 540 nm	0.000	0.002	0.008	0.116	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ICV	0.05ppm	10x	✓	0.000	0.000	0.000	-0.000153	10.003
MB			✓	0.000	0.001	0.001	0.000710	10.003
LCS	0.04ppm		✓	0.000	0.050	0.050	0.0430	108%
MS	-1.01		✓	0.004	0.004	0.000	-0.000153	10.003
	-1.01 VS 0.03ppm		✓	0.004	0.034	0.030	0.0258	86%
	-2.01		✓	0.004	0.004	0.000	-0.000153	10.003
	-3.01		✓	0.003	0.003	0.000	-0.000153	
	-4.01		✓	0.003	0.004	0.001	0.000710	
	-5.01		✓	0.009	0.010	0.001	0.000710	
	-5.01 MS 0.05ppm		✓	0.009	0.069	0.060	0.0517	103% RPD
	-5.01 MSD		✓	0.009	0.069	0.060	0.0517	103% RPD
CCV	0.05ppm		✓	0.000	0.058	0.058	0.0479	100%
CCV			✓	0.000	0.000	0.000	-0.000153	10.003
MS	1655-6.01		✓	0.000	0.000	0.000	-0.000153	
MS	1656 -1.01		✓	0.002	0.004	0.002	0.00157	
	-1.01 VS 0.03ppm		✓	0.002	0.037	0.035	0.0304	100%
	-1.01 MS 0.05ppm		✓	0.002	0.054	0.052	0.0447	89% RPD
	-1.01 MSD		✓	0.002	0.054	0.052	0.0447	89% RPD
CCV			✓	0.000	0.059	0.059	0.0508	102%
CCV			✓	0.000	0.001	0.001	0.000710	10.003

pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-16151001 @ 100 ppm + 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 + 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of _____ + 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of _____ + 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: _____
 Analyzed By: _____
 Reviewed By: _____

Date/Time: 5/3/11 @ 1630
 Date/Time: 5/3/11 @ 1605
 Date: 5/4/11

FOU

11/23/09 519-11230902 1000 PPM SO₂ (ICV/CCV)
JW 0.1607g Na₂SO₃ (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/DI
EXP: 5/23/10

11/23/09 519-11230903 A, B, C, D PH REFERENCE
JW PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/20/12

11/24/09 519-11240901 1000 PPM SO₄ Standard
JW PURCHASED CAT # ICC-006
LOT # K60794
EXP: 9/30/13

11/25/09 519-^{822 11/25/09}~~H/25~~ 11250901 0.1N H₂SO₄
JW 50ml conc H₂SO₄ (EMD 47050 EXP: 9/13/10)
EXP: ~~H/25~~ 9/13/10
^{822 11/25/09}

11/30/09 519-11300901 Cr⁶⁺ Coloring Reagent
JW 0.2500g diphenylcarbohydrazide (EMD 47103EE; EXP:
1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 519-11300902 25133 ppb Stock for O₃ in Air
JW 0.05ml Pyridine-4-carboxaldehyde (Alfa Aesar LOT 10140598; EXP 8/11/12)
↑ 500ml deionized H₂O
EXP: 12/14/09

11/30/09 519-11300903 25133 ppb ICV/CCV FOR O₃ in Air
JW 0.05ml Pyridine-4-carboxaldehyde (TCI LOT # IGIINC; EXP: 8/10/12)
↑ 500ml w/DI H₂O
EXP: 12/14/09

Reviewed And Approved By:
Initial: JK Date: 12/22/09

10/6/10
SL

524-10061001

25133 ppb Stock for O3

0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar
10140598 :Exp: 8/11/12 up to 500 ml w/ DI Water.

EXP: 10/20/10

10/6/10
SL

524-10061002

25133 ppb Stock for O3

0.05 ml Pyridine-4-carboxaldehyde TCI
(IGINE) :Exp: 8/10/12 up to 500 ml w/ DI Water.

EXP: 10/20/10

10/6/10
SL

524-10061003

MBTH 8/17

0.5000 g MBTH (Aldrich ~~54646EK~~) :Exp: 8/7/14 up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ EMD 49284; exp 11/20

EXP: 10/7/10

10/15/10
SL

524-10151001

Cr6+ ION/CON Stock
100PPM Cr6+
Cut No 2095-16

Purchased
FICCA Chemical Co
500ml Plastic
LOT # 1010177
EXP: 3/20/12

10/15/10
SL

524-10151002

500PPM NO₂ Stock

Purchased
FICCA Chemical Co
LOT # 1010271
EXP: 4/20/11

Cut No: 5444.5-4
120ml amber glass

10/28/10 524-10781002 1000 PPM SO3 ION/CCV
JW

0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up
to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 524-11011001 ION/CCV Cu⁶⁺ T.V = 0.579 PPM
JW 0.5 ml 519-04090904 (T.V = 115.8 mg/L; EXP: 12/2010)
↑ 100 ml w/ DI
EXP: 11/15/10

11/1/10 524-11011002 Cr⁶⁺ Coloring Reagent
JW 0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP:
11/30/13) ↑ 50 ml w/ Acetone (EMD 47154 D; EXP:
9/24/12).
EXP: 11/15/10

11/4/10 524-11041001 A-SE PH Filling Sol'n
JW PURCHASED (3M KCl)
Thermo Scientific P/N 702613-AD2
LOT Code: OR1
EXP: 11/4/11

11/4/10 524-11041002 PH 2.000 Buffer
JW purchased
BDH CAT NO: 5010-500 ml
LOT # 1002199
EXP: 1/2012

11/4/10
 JW
521-11041003 pH 4.000 Buffer
 purchased
 JT Baker Cat No: 5657-01 500 ml
 Lot # J30507
 Exp: 8/31/12

11/4/10
 JW
524-11041004 pH 7.000 Buffer
 purchased
 J.T. Baker Cat No: 5656-01 500 ml
 Lot # J35515
 Exp: 9/30/12

11/5/10
 JW
524-11051001 MBTH Soln
 0.5000 g MBTH (Aldrich 5216106K ; Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ (EMD 49884
 Exp: 11/20/14)
 Exp: 11/6/10

11/8/10
 JW
524-11081001 1000 ppm NH₃
 0.3141g NH₄Cl (EMD 49198931; Exp: 10/19/14) 100 ml
 w/ 524-10231006 Exp: 10/22/11
 Exp: 10/22/11

11/12/10
 JW
524-11121001 1000 ppm SO₃ stock
 0.1591 Na₂SO₃ (JT Baker Lot #1110627; Exp: 8/31/14) up to
 100 ml w/ DI Water.
 Exp: 11/26/10

54

2/21/11
JW
524-02211101 1:1 H₂SO₄
250ml H₂SO₄ (EMD 49284; EXP: 11/20/14)
ADDED SLOWLY TO 250ml DI. COOL
COMPLETELY
EXP: 2/21/12

2/21/11
JW
524-02211102 Cr6+ Coloring Reagent
0.2500g 1,5-naphthylcarbonylhydrazide (EMD LOT 4710372)
EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD
LOT #471540; EXP: 9/24/12).
EXP: 3/21/11

2/28/11
JW
524-02281101 0.1 H₂SO₄
5.6 ml conc H₂SO₄ (EMD 49284 EXP: 11/20/14) ↑ 2L
w/ DI H₂O
EXP: 2/28/12

2/28/11
JW
524-02281103 1001^{mg/l} Cr6+
Purchased
Inorganic Ventures CGCR(6)1-1
125ml Clear Glass
LOT# D2-CR03040
EXP: 3/1/2012

2/28/11
JL

524-02281103 10ppm Cr6+ Soln
1.0 ml 524-02281102 (~~1000~~ 10ppm Cr6+; EXP: 3/1/12) ↑
100ml w/ DI H2O
EXP: 2/28/12

3/7/11
JL

524-03071101 Cr6+ Colony Reagent
0.2500g 1,5-Diphenylcarbazide
(EMD Lot 47103721, EXP: 1/30/12) ↑ 50ml w/
Acetone (EMD 47154, EXP: 9/24/12).
EXP: 4/7/11

3/7/11
JL

524-03071102 500ppm NO2
Purchased
Ricca Chem Co Cat No 5444.5-4
Lot # 1162544
EXP: 8/20/11

3/17/11
JL

524-03271101 Alkaline Digestion Soln
20.0g NaOH (EMD 47022713B; EXP: 10/1/12) + 30.0g
Na2CO3 (EMD 46321715B; EXP: 10/1/12) ↑ 1L
w/ DI H2O.
EXP: 4/17/11

Reviewed And Approved By:
Initial: JL Date: 3/18/11

4/14/11
JL

524-04141101 ICO2 Eluent
75ml 524-04291002 (10x Conc Eluent, exp 4/29/11)
↑ 750ml w/ DI H2O. DEGAS
EXP: 4/28/11

56

4/15/11
S

524-04151101 JCO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EMD 471372 exp: 11/20/12) in 100 mL Methanol (B&J 2-9321K exp: 10/1/12). Add to 1 L volumetric flask containing 500 mL DI water - 5.6 mL conc. H2SO4 (EMD 471372 exp: 11/20/12). Bring up to volume w/ DI H2O; mix and degas.

EXP: 4/30/11

4/15/11
S

524-04151102 Cyclo Chlorine Reagent
0.250g 1,5-diphenylcarbohydrazide (EMD 471372 exp: 11/20/12) + 50 mL methanol (EMD 471372 exp: 11/20/12)
EXP: 5/15/11

4/15/11
S

524-04151102 13.5 N NaOH
100g NaOH (EMD 471372 exp: 10/1/12) + 100 mL DI H2O
EXP: 4/15/12

4/18/11
S

524-04181101 1000 ppm Cr6+
0.1 mL - 524-02281102 (1000 ppm Cr6+; EXP 3/1/12) ↑
100 mL w/ pH ADJUSTED DI (9.391)
EXP: 3/1/12

4/18/11
S

524-04181102 ICN JCO2 25ppb

0.25 mL Ref 524-04151001 @ 0.1/10 exp: 3/20/12 up to 100 mL with pH adjusted (pH= 9.391). degassed DI Water.

EXP: 5/2/11

PH 10,000 Butter

504-0461102

Purchased

Lot # 133524

Lot No: 5255-01

(BOML)

EXP: 9/30/12

NHS FINING SOLN

504-0461103

Purchased

Thermo Orion DMN 951002

Lot # 0X1 P/N 70263-404

(COML)

EXP: 4/30/12

504-0461104

9/2/2011

111 H2SO4

250ml conc H2SO4 (Lot # 4984, Exp: 11/30/14)

ADDED slowly to 250ml DI H2O

LET cool

EXP: 4/30/12

504-0461101

6.25ml conc H2SO4 (Lot # 4984, Exp: 11/30/14) Added to 250ml DI H2O. Let cool.

Dissolve 1.6875g p-nitrophenyl-phthalate in 250ml DI H2O. Let cool.

Provide (Folic Acid 1563386 1540820, Exp: 8/7/14) in cooled sulfuric acid and dilute to 250ml DI H2O.

1:1 H2SO4 (524-0461104, Exp: 4/30/12) Exp: 5/25/11

4/26/11

4/26/11

4/26/11

4/26/11

4/27/11
 Sp
 524-04271102 A&B pH 7.000 Buffer
 Purchased
 BDH Cat No. BDH5046-500 mL
 Lot # 1103379
 Exp: 3/30/13

4/28/11
 Sp
 524-04281101 0.1N H2SO4
 5.6 ml conc H2SO4 (CAND 49284; EXP: 11/20/14)
 ↑ 2L w/ DI H2O
 Exp: 4/28/12

LABORATORY REPORT

May 10, 2011

David Conner
Battelle
4800 Oak Grove Dr. M/S 180-801
Pasadena, CA 91109

RE: JPL-GW-2Q11 / G005862 / JPL GWM

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 3, 2011. For your reference, these analyses have been assigned our service request number P1101656.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-10-1; Minnesota Department of Health, NELAP Certificate No. 219474; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.



Digitally signed by Sue Anderson

Date: 2011.05.10 15:30:32 -07'00'

Sue Anderson
Project Manager

Client: Battelle
Project: JPL-GW-2Q11 / G005862 / JPL GWM

CAS Project No: P1101656

CASE NARRATIVE

The samples were received intact under chain of custody on May 3, 2011 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

DETAIL SUMMARY REPORT

Client: Battelle
 Project ID: JPL-GW-2Q11 / G005862 / JPL GWM
 Date Received: 5/3/2011
 Time Received: 15:41

Service Request: P1101656

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-10	P1101656-001	Water	5/3/2011	10:24	X

Columbia Analytical Services, Inc.

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl <i>tert</i> -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

Client: Battelle **Service Request:** P1101656
Project: JPL-GW-2Q11/G005862 / JPL GWM

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101656-001.01	7196A	5/3/11	1613	SMO / SSTAPLES	
		5/3/11	1613	P-37 / SSTAPLES	
		5/3/11	1617	In Lab / SANDERSON	
		5/3/11	1716	P-37 / SANDERSON	

Sample Acceptance Check Form

Client: Battelle Work order: P1101656

Project: JPL-GW-2Q11 / G005862 / JPL GWM

Sample(s) received on: 5/3/11 Date opened: 5/3/11 by: SSTAPLES

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- | | Yes | No | N/A |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were sample containers properly marked with client sample ID? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 Container(s) supplied by CAS ? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 Did sample containers arrive in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 Were chain-of-custody papers used and filled out? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 Did sample container labels and/or tags agree with custody papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 Was sample volume received adequate for analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 Are samples within specified holding times? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 Was proper temperature (thermal preservation) of cooler at receipt adhered to? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cooler Temperature _____ °C Blank Temperature <u>5</u> °C | | | |
| 9 Was a trip blank received? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10 Were custody seals on outside of cooler/Box? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate preservation , according to method/SOP or Client specified information? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Is there a client indication that the submitted samples are pH preserved? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were VOA vials checked for presence/absence of air bubbles? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12 Tubes: Are the tubes capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Do they contain moisture? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13 Badges: Are the badges properly capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101656-001.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

Analytical Report

Client : Battelle
 Project Name : JPL-GW-2Q11
 Project Number : G005862 / JPL GWM
 Sample Matrix : WATER

Service Request : P1101656
 Date Collected : 05/03/11
 Date Received : 05/03/11

Chromium, Hexavalent

Prep Method : None
 Analysis Method : 7196A
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-10	P1101656-001	0.010	0.003	1	NA	05/03/11 16:45	ND	
Method Blank	P1101656-MB	0.010	0.003	1	NA	05/03/11 16:45	ND	

Approved By Karen Rya Date : 5/4/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11 / G005862 / JPL GWM

Service Request: P1101656
Date Analyzed: 05/03/11

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Karen Rya Date: 5/4/11
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11 / G005862 / JPL GWM

Service Request: P1101656
Date Analyzed: 05/03/11

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0500	0.0499	100	90-110
CCV1	0.0500	0.0499	100	90-110
CCV2	0.0500	0.0508	102	90-110

Approved By: Karen Rya Date: 5/4/11
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
 Project Name : JPL-GW-2Q11
 Project Number : G005862 / JPL GWM
 Sample Matrix : WATER

Service Request : P1101656
 Date Collected : NA
 Date Received : NA
 Date Extracted : NA
 Date Analyzed : 05/03/11

Laboratory Control Sample Summary
 Inorganic Parameters

Sample Name : Laboratory Control Sample
 Lab Code : P1101656-LCS
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0430	108	90-110	

Approved By *Kam Rya* Date : 5/4/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
 Project Name : JPL-GW-2Q11
 Project Number : G005862 / JPL GWM
 Sample Matrix : WATER

Service Request : P1101656
 Date Collected : 05/03/11
 Date Received : 05/03/11
 Date Extracted : NA
 Date Analyzed : 05/03/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-10 Units : mg/L (ppm)
 Lab Code : P1101656-001MS P1101656-001DMS Basis : NA
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0447	0.0447	89	89	73-119	<1	

Approved By Karen Rya Date : 5/4/11

pH Run Log

Service Request #(s): P110/1655, 1652

Time: 0750

Sample	VWR lot #	Exp.
pH 2 Buffer	524-11041002	1/2012
pH 4 Buffer	524-11041003	8/31/12
pH 7 Buffer	524-04291102A	3/2013
pH 10 Buffer	524-04261102	4/2012

Slope	Prep.Run #
98.7%	
	Run#

pH in liquid: (1) 9040B, (2) 9040C pH in solid: (3) 9045C, (4) 9045D (Note method number in column labeled # below)

pH adjustment:(5) 7196A,(6) 7199 (Note method # In column labeled #)

Sample	#	pH	Temp. °C
pH 2.000	5	2.004	22.0°
pH 4.000		3.998	21.9°
pH 7.000		7.000	22.1°
pH 10.000		9.988	21.9°
Ref#: ^{719-646 EXP: 1/2010} 419-11220963D		6.366	21.9°
DI		2.044	20.6°
pH 2.000	5	2.017	22.0°
TIME: 1610			
pH 2.000	5	2.020	23.1°
1655-1.01	T	1.848	8.2°
-2.01		2.058	8.0°
-3.01		2.047	6.1°
-4.01		1.853	9.5°
-5.01		2.016	8.3°
✓ -6.01		2.089	9.4°
10556-1.01		2.076	9.5°
pH 2.000		2.024	23.0°

Sample	#	pH	Temp. °C
<p><i>Soil not collected</i></p>			

pH Adjustments: 7196A: Diluted/Conc H₂SO₄EMD 49284 EXP: 11/20/14

7199A: Diluted NaOH _____ EXP: _____

Comments: _____

* Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 5/2/11

Note: ATC probe used; therefore, temperature correction calculation is not necessary.

Analyst: SK

Date: 5/3/11

Reviewer: KR

Date: 5/4/11

Hexavalent Chromium (Liquids)



Method EPA 7196A

77

Service Request#(s): 1101655; 1656
 Stock#: 524-02281103 T.V.= 100ppm EXP: 2/28/11
 CVICCV#: 524-16151001 T.V.= 100ppm EXP: 3/2012

Run#: 244667
 Prep Run#: _____
 Conc. H₂SO₄ Lot#: EMD 49284 EXP: 11/20/14
 Coloring Reagent Ref#: 524-04151102 EXP: 5/15/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.99999418
Absorbance @ 540 nm	0.000	0.002	0.008	0.116	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
ICV	0.05ppm	10x	✓	0.000	0.000	0.000	-0.000153	10.003
MB			✓	0.000	0.001	0.001	0.000710	10.003
LCS	0.04ppm		✓	0.000	0.050	0.050	0.0430	108%
MS/MSD	-1.01		✓	0.004	0.004	0.000	-0.000153	10.003
	-1.01 VS 0.03ppm		✓	0.004	0.034	0.030	0.0258	86%
	-2.01		✓	0.004	0.004	0.000	-0.000153	10.003
	-3.01		✓	0.003	0.003	0.000	-0.000153	
	-4.01		✓	0.003	0.004	0.001	0.000710	
	-5.01		✓	0.009	0.010	0.001	0.000710	
	-5.01 MS 0.05ppm		✓	0.009	0.069	0.060	0.0517	103% RPD
	-5.01 MSD		✓	0.009	0.069	0.060	0.0517	103% RPD
CCV	0.05ppm		✓	0.000	0.058	0.058	0.0479	100%
CCV			✓	0.000	0.000	0.000	-0.000153	10.003
MS/MSD	-6.01		✓	0.000	0.000	0.000	-0.000153	
	-1.01		✓	0.002	0.004	0.002	0.00157	
	-1.01 VS 0.03ppm		✓	0.002	0.037	0.035	0.0304	100%
	-1.01 MS 0.05ppm		✓	0.002	0.054	0.052	0.0447	89% RPD
	-1.01 MSD		✓	0.002	0.024	0.022	0.0177	81% RPD
CCV			✓	0.000	0.059	0.059	0.0508	102%
CCV			✓	0.000	0.001	0.001	0.000710	10.003

pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-16151001 @ 100 ppm + 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 + 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of _____ + 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of _____ + 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: _____
 Analyzed By: _____
 Reviewed By: _____

Date/Time: 5/3/11 @ 1630
 Date/Time: 5/3/11 @ 1605
 Date: 5/4/11

FOU

11/23/09 519-11230902 1000 PPM SO₂ (GC/CCV)
JW 0.1607g Na₂SO₃ (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/DI
EXP: 5/23/10

11/23/09 519-11230903 A,B,C,D PH REFERENCE
JW PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/20/12

11/24/09 519-11240901 1000 PPM SO₄ Standard
JW PURCHASED CAT # ICC-006
LOT # K60794
EXP: 9/30/13

11/25/09 519-~~H/25~~^{8/25 11/25/09} 11250901 0.1N H₂SO₄
JW 50ml conc H₂SO₄ (EMD 47050 EXP: 9/13/10)
EXP: ~~H/25~~^{8/25 11/25/09} 9/13/10

11/30/09 519-11300901 Cr⁶⁺ Coloring Reagent
JW 0.2500g diphenylcarbohydrazide (EMD 47103EE; EXP:
1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 519-11300902 25133 ppb Stock for O₃ in Air
JW 0.05ml Pyridine-4-carboxaldehyde (Alfa Aesar LOT 10140598; EXP 8/11/12)
↑ 500ml deionized H₂O
EXP: 12/14/09

11/30/09 519-11300903 25133 ppb, IGV/CCV FOR O₃ in AIR
JW 0.05ml Pyridine-4-carboxaldehyde (TCI LOT # IGIINC; EXP: 8/10/12)
↑ 500ml w/DI H₂O
EXP: 12/14/09

Reviewed And Approved By:
Initial: JK Date: 12/22/09

10/6/10 524-10061001 25133ppb Stock for O3
0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar
10140598 :Exp: 8/11/12 up to 500 ml w/ DI
Water.

EXP: 10/20/10

10/6/10 524-10061002 25133ppb Stock for O3
0.05 ml Pyridine-4-carboxaldehyde TCI
(IGINE) :Exp: 8/10/12 up to 500 ml w/ DI
Water.

EXP: 10/20/10

10/6/10 524-10061003 MBTH 8/17
0.5000 g MBTH (Aldrich 54646EK :Exp: 8/7/14) up
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ EMD 49284; exp 11/20,

EXP: 10/7/10

10/15/10 524-10151001 Cr6+ ION/CON Stock
Purchased 100PPM Cr6+
FICCA Chemical Co Cut No 2095-16
500ml Plastic
LOT # 1010177
EXP: 3/20/12

10/15/10 524-10151002 500PPM NO₂ Stock
Purchased
FICCA Chemical Co Cut No: 5444.5-4
LOT # 1010271 120ml amber glass
EXP: 4/20/11

10/28/10 524-10781002 1000 PPM SO3 ION/CCV
JW

0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up
to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 524-11011001 ION/CCV Cu⁶⁺ T.V = 0.579 PPM
JW 0.5 ml 519-04090904 (T.V = 115.8 mg/L; EXP: 12/2010)
↑ 100 ml w/ DI
EXP: 11/15/10

11/1/10 524-11011002 Cr⁶⁺ Coloring Reagent
JW 0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP:
11/30/13) ↑ 50 ml w/ Acetone (EMD 47154 D; EXP:
9/24/12).
EXP: 11/15/10

11/4/10 524-11041001 A-SE PH Filling Sol'n
JW PURCHASED (3M KCl)
Thermo Scientific P/N 702613-AD2
LOT Code: OR1
EXP: 11/4/11

11/4/10 524-11041002 PH 2.000 Buffer
JW purchased
BDH CAT NO: 5010-500 ml
LOT # 1002199
EXP: 11/2012

11/4/10
 JW
521-11041003 pH 4.000 Buffer
 purchased
 JT Baker Cat No: 5657-01 500 ml
 Lot # J30507
 Exp: 8/31/12

11/4/10
 JW
524-11041004 pH 7.000 Buffer
 purchased
 J.T. Baker Cat No: 5656-01 500 ml
 Lot # J35515
 Exp: 9/30/12

11/5/10
 JW
524-11051001 MBTH Soln
 0.5000 g MBTH (Aldrich 5216166K :Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ (EMD 498884
 Exp: 11/20/14)
 Exp: 11/6/10

11/8/10
 JW
524-11081001 1000 ppm NH₃
 0.3141g NH₄Cl (EMD 49198931; Exp: 10/19/14) 100 ml
 w/ 524-10231006 Exp: 10/22/11
 Exp: 10/22/11

11/12/10
 JW
524-11121001 1000 ppm SO₃ stock
 0.1591 Na₂SO₃ (JT Baker Lot #1110627; Exp: 8/31/14) up to
 100 ml w/ DI Water.
 Exp: 11/26/10

54

2/21/11
JW
524-02211101 1:1 H₂SO₄
250ml H₂SO₄ (EMD 49284; EXP: 11/20/14)
ADDED SLOWLY TO 250ml DI. COOL
COMPLETELY
EXP: 2/21/12

2/21/11
JW
524-02211102 Cr6+ Coloring Reagent
0.2500g 1,5-naphthylcarbonylhydrazide (EMD LOT 4710372)
EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD
LOT # 471540; EXP: 9/24/12).
EXP: 3/21/11

2/28/11
JW
524-02281101 0.1 H₂SO₄
5.6 ml conc H₂SO₄ (EMD 49284 EXP: 11/20/14) ↑ 2L
w/ DI H₂O
EXP: 2/28/12

2/28/11
JW
524-02281103 1001^{mg} Cr6+
Purchased
Inorganic Ventures CGCR(6)1-1
125ml Clear Glass
LOT# D2-CR03040
EXP: 3/1/2012

2/28/11
JL

524-02281103 10ppm Cr6+ Soln
1.0ml 524-02281102 (~~1000~~ 10ppm Cr6+; EXP: 3/1/12) ↑
100ml w/ DI H2O
EXP: 2/28/12

3/7/11
JL

524-03071101 Cr6+ Colony Reagent
0.2500g 1,5-Diphenylcarbazide
(EMD Lot 47103721, EXP: 1/30/12) ↑ 50ml w/
Acetone (EMD 47154, EXP: 9/24/12).
EXP: 4/7/11

3/7/11
JL

524-03071102 500ppm NO2
Purchased
Ricca Chem Co Cat No 5444.5-4
Lot # 1162544
EXP: 8/20/11

3/17/11
JL

524-03271101 Alkaline Digestion Soln
20.0g NaOH (EMD 47022713B; EXP: 10/1/12) + 30.0g
Na2CO3 (EMD 46321715B; EXP: 10/1/12) ↑ 1L
w/ DI H2O.
EXP: 4/17/11

Reviewed And Approved By:
Initial: JL Date: 3/18/11

4/14/11
JL

524-04141101 ICO2 Eluent
75ml 524-04291002 (10x Conc Eluent, exp 4/29/11)
↑ 750ml w/ DI H2O. DEGAS
EXP: 4/28/11

56

524-04151101 JCO2 PCR

4/15/11
S

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EMD 471372
exp: 1/20/12) in 100 mL Methanol (B&J 2-932K exp: 10/1/12).
Add to 1 L volumetric flask containing 500 mL DI water -
5.6 mL conc. H2SO4 (EMD 471372 exp: 1/20/12). Bring
up to volume w/ DI H2O; mix and degas.

EXP: 4/20/11

524-04151102

Cyberchrome Reagent

4/15/11
S

0.250g 1,5-diphenylcarbohydrazide (EMD 4710372
EXP 1/30/13) + 50 mL methanol, EMD
471540; EXP 9/24/12)

EXP: 5/15/11

524-04151102

13.5 N NaOH

4/15/11
S

100g NaOH (EMD 4702713 EXP 10/1/12) + 100
DI H2O

EXP 4/15/12

524-04181101

1000 ppm Cr6+

4/18/11
S

0.1 mL - 524-02281102 (1000 ppm Cr6+; EXP 3/1/12) ↑
100 mL w/ pH ADJUSTED DI (9.391)
EXP: 3/1/12

524-04181102

ICN JCO2 25ppb

4/18/11
S

0.25 mL Ref 524-0151001 @ 0.1/10 exp: 3/20/12 up to 100
ml. with pH adjusted (pH= 9.391). degassed DI Water.

EXP: 5/2/11

PH 10,000 Butter

504-0461102

Purchased

OT Baker

Lot No: 5255-01

Lot # 133524

EXP: 9/30/12

NHS FINING SOLN

504-0461103

Purchased

Thermo Orion DMN 951002

Lot # 0X1 P/N 70263-404

EXP: 4/30/12

504-0461104

9/21/2011

111 H2SO4

250ml conc H2SO4 (Lot # 4984, Exp: 11/30/14)

ADDED SLOWLY TO 250ml DIH2O

LET COOL

EXP: 4/30/12

504-0461101

Ammonia 8.1% w/w

6.25ml conc H2SO4 (Lot # 4984, Exp: 11/30/14) Added to

3.5ml of H2O. Let Cool.

Dissolve 1.6875g p-nitrophenyl-p-phenylenediamine

oxide (Fluka 1363386 1540824, Exp: 8/7/14)

in cooled sulfuric acid and dilute to 250ml w/

1:1 H2SO4 (524-0461104, Exp: 4/30/12)

Exp: 5/25/11

4/26/11

4/26/11

4/26/11

4/26/11

4/27/11
 Sp
 524-04271102 A&B pH 7.000 Buffer
 Purchased
 BDH Cat No. BDH5046-500 mL
 Lot # 1103379
 Exp: 3/30/13

4/28/11
 Sp
 524-04281101 0.1N H2SO4
 5.0 ml conc H2SO4 (CAND 49284; EXP: 11/20/14)
 ↑ 2L w/ DI H2O
 Exp: 4/28/12

LABORATORY REPORT

May 11, 2011

David Conner
Battelle
4800 Oak Grove Dr. M/S 180-801
Pasadena, CA 91109

RE: JPL GW Mon 2Q11 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 4, 2011. For your reference, these analyses have been assigned our service request number P1101667.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-10-1; Minnesota Department of Health, NELAP Certificate No. 219474; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.



Sue Anderson
Project Manager

Digitally signed by Sue Anderson
Date: 2011.05.11 11:00:45 -07'00'

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

CAS Project No: P1101667

CASE NARRATIVE

The samples were received intact under chain of custody on May 3, 2011 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

DETAIL SUMMARY REPORT

 Client: Battelle
 Project ID: JPL GW Mon 2Q11 / G486090

Service Request: P1101667

 Date Received: 5/4/2011
 Time Received: 12:47

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-11-5	P1101667-001	Water	5/4/2011	08:10	X
MW-11-4	P1101667-002	Water	5/4/2011	08:45	X
MW-11-3	P1101667-003	Water	5/4/2011	09:25	X
MW-11-2	P1101667-004	Water	5/4/2011	09:58	X
MW-11-1	P1101667-005	Water	5/4/2011	10:44	X
EB-7-5/4/11	P1101667-006	Water	5/4/2011	10:25	X

Columbia Analytical Services, Inc.

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl <i>tert</i> -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.



2655 Park Center Drive, Suite A
 Simi Valley, California 93065
 Phone (805) 526-7161
 Fax (805) 526-7270

Water & Soil - Chain of Custody Record & Analytical Service Request

Requested Turnaround Time in Business Days (Surcharges) please circle
 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. 9101467
 CAS Contact: 9101467

Company Name & Address (Reporting Information)
BATTELLE
3990 OLD TOWN AVE. C-205
SAN DIEGO CA 92110

Project Name
JPL G.W. MON. 2011

Project Number
G486096

Project Manager
DAVID CORNEN

Phone
(619) 726-7311

Fax
(619) 458-6641

Email Address for Result Reporting
(619) 726-7311 (619) 458-6641

Sampler (Print & Sign)
DAVID CORNEN

P.O. # / Billing Information
214319 / BATTELLE
ATTN: STEPHAN TOMPKINS
505 KIRK AVE.
COLUMBUS, OH 43201

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Analysis Method and/or Analytes		Preservative Code	Remarks
						Volatiles GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/> TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted) Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)	Other		
MW-11-5	(1)	5/4/11	810	W	1				
MW-11-4	(2)		845		1				
MW-11-3	(3)		925		1				
MW-11-2	(4)		958		1				
MW-11-1	(5)		1044		1				
ES-7-5/4/11	(6)		1025		1				Equip Blank

Report Tier Levels - please select

Tier I - (Results/Default if not specified) _____ Tier III - (Data Validation Package) 10% Surcharge _____

Tier II - (Results + QC) _____ Tier V - (client specified) _____

MRL required Yes / No _____ MDL / POL / J required Yes / No _____

EDD required Yes / No _____ Type: _____

Project Requirements (MRLs, QAPP)

Cooler / Blank / Ice / No Ice _____
 Temperature 20C °C

Client: Battelle

Service Request: P1101667

Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101667-001.01	7196A	5/4/11	1257	SMO / MZAMORA	
		5/4/11	1257	P-37 / MZAMORA	
		5/4/11	1319	In Lab / SANDERSON	
		5/4/11	1510	P-37 / SANDERSON	
P1101667-002.01	7196A	5/4/11	1257	SMO / MZAMORA	
		5/4/11	1257	P-37 / MZAMORA	
		5/4/11	1319	In Lab / SANDERSON	
		5/4/11	1510	P-37 / SANDERSON	
P1101667-003.01	7196A	5/4/11	1257	SMO / MZAMORA	
		5/4/11	1257	P-37 / MZAMORA	
		5/4/11	1319	In Lab / SANDERSON	
		5/4/11	1510	P-37 / SANDERSON	
P1101667-004.01	7196A	5/4/11	1257	SMO / MZAMORA	
		5/4/11	1257	P-37 / MZAMORA	
		5/4/11	1319	In Lab / SANDERSON	
		5/4/11	1510	P-37 / SANDERSON	
P1101667-005.01	7196A	5/4/11	1257	SMO / MZAMORA	
		5/4/11	1257	P-37 / MZAMORA	
		5/4/11	1319	In Lab / SANDERSON	
		5/4/11	1510	P-37 / SANDERSON	
P1101667-006.01	7196A	5/4/11	1257	SMO / MZAMORA	
		5/4/11	1257	P-37 / MZAMORA	
		5/4/11	1319	In Lab / SANDERSON	
		5/4/11	1510	P-37 / SANDERSON	

Sample Acceptance Check Form

Client: Battelle Work order: P1101667

Project: JPL GW. Mon. 2Q11 / G486090

Sample(s) received on: 5/4/11 Date opened: 5/4/11 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- | | Yes | No | N/A |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were sample containers properly marked with client sample ID? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 Container(s) supplied by CAS ? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 Did sample containers arrive in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 Were chain-of-custody papers used and filled out? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 Did sample container labels and/or tags agree with custody papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 Was sample volume received adequate for analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 Are samples within specified holding times? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 Was proper temperature (thermal preservation) of cooler at receipt adhered to?
Cooler Temperature _____ °C Blank Temperature <u>2</u> °C | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9 Was a trip blank received? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10 Were custody seals on outside of cooler/Box?
Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?
Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate preservation , according to method/SOP or Client specified information? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are pH preserved? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were VOA vials checked for presence/absence of air bubbles? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12 Tubes: Are the tubes capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Do they contain moisture? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13 Badges: Are the badges properly capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101667-001.01	125mL Plastic NP					
P1101667-002.01	125mL Plastic NP					
P1101667-003.01	125mL Plastic NP					
P1101667-004.01	125mL Plastic NP					
P1101667-005.01	125mL Plastic NP					
P1101667-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101667
Date Collected : 05/04/11
Date Received : 05/04/11

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-11-5	P1101667-001	0.010	0.003	1	NA	05/04/11 14:30	ND	
MW-11-4	P1101667-002	0.010	0.003	1	NA	05/04/11 14:30	ND	
MW-11-3	P1101667-003	0.010	0.003	1	NA	05/04/11 14:30	ND	
MW-11-2	P1101667-004	0.010	0.003	1	NA	05/04/11 14:30	ND	
MW-11-1	P1101667-005	0.010	0.003	1	NA	05/04/11 14:30	ND	
EB-7-5/4/11	P1101667-006	0.010	0.003	1	NA	05/04/11 14:30	ND	
Method Blank	P1101667-MB	0.010	0.003	1	NA	05/04/11 14:30	ND	

Approved By

Kam Ryz

Date :

5/5/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101667
Date Analyzed: 05/04/11

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: _____

Kam Rya

Date: _____

5/5/11

ICCBMDL120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101667
Date Analyzed: 05/04/11

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0500	0.0501	100	90-110
CCV1	0.0500	0.0492	98	90-110
CCV2	0.0500	0.0492	98	90-110

Approved By: _____

Karen Rya

Date: _____

5/5/11

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101667
Date Collected : NA
Date Received : NA
Date Extracted : NA
Date Analyzed : 05/04/11

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name : Laboratory Control Sample
Lab Code : P1101667-LCS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0396	99	90-110	

Approved By Kam Rya Date : 5/5/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101667
Date Collected : 05/04/11
Date Received : 05/04/11
Date Extracted : NA
Date Analyzed : 05/04/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-11-5 Units : mg/L (ppm)
Lab Code : P1101667-001MS P1101667-001DMS Basis : NA
Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0448	0.0457	90	91	73-119	2	

Approved By Kam Rya Date : 5/5/11

pH Run Log

Service Request #(s): 21101667

Time: 0755

Sample	VWR lot #	Exp.	Slope	Prep.Run #
pH 2 Buffer	524-11041002	1/2012	} 98.00%	—
pH 4 Buffer	524-11041003	8/31/12		Run#
pH 7 Buffer	524-0427102A	3/2013		—
pH 10 Buffer	524-0426102	9/30/12		—

pH in liquid: (1) 9040B, (2) 9040C pH in solid: (3) 9045C, (4) 9045D (Note method number in column labeled # below)

pH adjustment:(5) 7196A,(6) 7199 (Note method # in column labeled #)

Sample	#	pH	Temp. °C	Sample	#	pH	Temp. °C
pH 2.000	5	2.002	22.4°	<p>DI not used</p>			
pH 4.000	—	3.983	22.1°				
pH 7.000	—	6.997	21.8°				
pH 10.000	—	9.993	22.1°				
Ref#	—	6.346	22.7°				
DI	—	1.894	21.2°				
pH 2.000	—	2.018	22.0°				
TIME: 1325	—	—	—				
pH 2.000	5	2.027	23.0°				
16.7-1.01	—	1.998	10.0°				
-2.01	—	2.057	13.2°				
-3.01	—	2.096	13.6°				
-4.01	—	1.852	13.7°				
-5.01	—	1.900	13.5°				
-6.01	—	1.966	14.2°				
pH 2.000	—	2.028	22.6°				

pH Adjustments: 7196A: Diluted/Conc H₂SO₄ EMD 49284 EXP: 11/20/14

7199A: Diluted NaOH _____ EXP: _____

Comments: _____

* Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 5/2/11

Note: ATC probe used; therefore, temperature correction calculation is not necessary.

Analyst: [Signature]

Date: 5/4/11

Reviewer: [Signature]

Date: 5/4/11

Method EPA 7196A

Service Request#(s):

D1101667

Run#:

244790

Stock#: 524-0228103 T.V.=10PPM EXP: 2/28/12

Prep Run#:

CV/CCV#: 524-10151001 T.V.=10PPM EXP: 3/20/12

Conc. H₂SO₄ Lot#: EMD 44284 EXP: 11/20/14

Coloring Reagent Ref#: 524-04151102 EXP: 5/15/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.99999 401
Absorbance @ 540 nm	0.000	0.011	0.057	0.114	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1 ICB	10mL	—	✓	0.000	0.000	0.000	0.000155	10.003
2 ICB 0.05PPM	—	—	✓	0.000	0.057	0.057	0.0501	100%
3 MB	—	—	✓	0.000	0.000	0.000	0.000155	10.003
4 LCS 0.04PPM	—	—	✓	0.000	0.045	0.045	0.0396	99%
5 1667-1.01	—	—	✓	0.009	0.010	0.001	0.00103	10.003
6 -1.01MS 0.05PPM	—	—	✓	0.009	0.060	0.051	0.0448	90% 2
7 -1.01MSD	—	—	✓	0.009	0.061	0.052	0.0457	91% 3
8 -2.01	—	—	✓	0.000	0.000	0.000	0.000155	10.003
9 -2.01MS 0.05PPM	—	—	✓	0.000	0.033	0.033	0.0291	97%
10 -3.01	—	—	✓	0.000	0.000	0.000	0.000155	10.003
11 -4.01	—	—	✓	0.000	0.001	0.001	0.00103	10.003
12 -5.01	—	—	✓	0.000	0.000	0.000	0.000155	10.003
13 CW1 0.05PPM	—	—	✓	0.000	0.056	0.056	0.0492	98%
14 CCB1	—	—	✓	0.000	0.000	0.000	0.000155	10.003
15 1667-6.01	—	—	✓	0.000	0.000	0.000	0.000155	10.003
16 CCV2 0.05PPM	—	—	✓	0.000	0.056	0.056	0.0492	98%
17 CCB2	—	—	✓	0.000	0.000	0.000	0.000155	10.003

pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10151001 + 50 ml of pH adjusted DI WATER (T.V.=0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-0228103 + 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of 524-0228103 + 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of 524-0228103 + 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]

Date/Time: 5/4/11 @ 1416

Analyzed By: [Signature]

Date/Time: 5/4/11 @ 1430

Reviewed By: [Signature]

Date: 5/4/11

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11/23/09 519-11230902 1000 PPM SO₂ (ICV/CCV)
JW 0.1607g Na₂SO₃ (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/DI
EXP: 5/23/10

11/23/09 519-11230903 A,B,C,D PH REFERENCE
JW PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 519-11240901 1000 PPM SO₄ Standard
JW PURCHASED CAT # ICC-006
LOT # K60794
EXP: 9/30/13

11/25/09 519-~~H/25~~ ^{82 11/25/09} 11250901 0.1N H₂SO₄
JW 5.0ml conc H₂SO₄ (EMD 47050 EXP: 9/13/10)
EXP: ~~H/25~~ ^{82 11/25/09} 9/13/10

11/30/09 519-11300901 Cr⁶⁺ Coloring Reagent
JW 0.2500g diphenylcarbohydrazide (EMD 47103EE; EXP:
1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 519-11300902 25133 ppb Stock for O₃ in Air
JW 0.05ml Pyridine-4-carboxaldehyde (Alfa Aesar LOT 10140598; EXP 8/11/12)
↑ 500ml deionized H₂O
EXP: 12/14/09

11/30/09 519-11300903 25133 ppb ICV/CCV for O₃ in Air
JW 0.05ml Pyridine-4-carboxaldehyde (TCT LOT # IGINC; EXP: 8/10/12)
↑ 500ml w/DI H₂O
EXP: 12/14/09

Reviewed And Approved By:
Initial: LL Date: 12/22/09

10/16/10
SL

524-10061001

25133 ppb Stock for 03

0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar
10146598 :Exp: 8/11/12 up to 500 ml w/ DI
Water.

EXP: 10/20/10

10/16/10
SL

524-10061002

25133 ppb ICA/ICV for 03

0.05 ml Pyridine-4-carboxaldehyde TEI
(ICA/ICV) :Exp: 8/10/12 up to 500 ml w/ DI
Water.

EXP: 10/20/10

10/16/10
SL

524-10061003

MBTH Sol/17

0.5000 g MBTH (Aldrich 54646K :Exp: 8/7/14) up
to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ EMD 49284; EXP 11/20

EXP: 10/7/10

10/15/10
SL

524-10151001

Cr6+ ICA/ICV Stock
100ppm Cr6+

Purchased
Ricca Chemical Co
500ml Plastic
LOT # 1010177
EXP: 3/30/13

Cut No 2095-16

10/15/10
SL

524-10151002

500ppm NO₂ Stock

Purchased
Ricca Chemical Co
LOT # 1010271
EXP: 4/20/11

Cut No: 5444.5-4
120ml amber glass

10/28/10 524-10781002 1000 PPM SO₂ ION/CCV
GR

0.1607 Na₂SO₃ (Mallinckrodt Lot #H25469; Exp: 8/11/11) up
to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 524-11011001 ION/CCV Cr⁶⁺ T.V = 0.579 PPM
GR 0.5 ml 519-04090904 (T.V = 115.8 mg/L ; EXP: 12/20/10)
↑ 100 ml w/ DI
EXP: 11/15/10

11/1/10 524-11011002 Cr⁶⁺ Coloring Reagent
GR 0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP:
1/30/13) ↑ 50 ml w/ Acetone (EMD 471543; EXP:
9/24/12).
EXP: 11/15/10

11/4/10 524-11041001 A → E PH Filling Sol'n
GR PURCHASED (3M KCl) P/N 702613-AD2
Thermo Scientific
LOT Code: OR1
EXP: 11/4/11

11/4/10 524-11041002 PH 2.000 Buffer
GR purchased
BDH CAT NO: 5010-500 ml
LOT # 1002199
EXP: 1/2012

11/4/10 524-11041003 PH 4.000 Buffer
 purchased
 JT Baker Cat No: 5657-01 500 ml
 Lot # J30507
 Exp: 8/31/12

11/4/10 524-11041004 PH 7.000 Buffer
 purchased
 J.T. Baker Cat No: 5656-01 500 ml
 Lot # J35515
 Exp: 9/30/12

11/5/10 524-11051001 MBTH Solⁿ
 0.5000 g MBTH (Aldrich 521696K; Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄; EMD 49884
 Exp: 11/20/14
 Exp: 11/6/10

11/8/10 524-11081001 1000 PPM NH₃
 0.3141g NH₄Cl (EMD 49198931; Exp: 10/19/14) 100 ml
 w/ 524-10231006 Exp: 10/22/11
 Exp: 10/22/11

11/12/10 524-11121001 1000 PPM SO₃ STOCK
 0.1591 Na₂SO₃ (JT Baker Lot #1110627; Exp: 8/31/14) up to
 100 ml w/ DI Water.
 Exp: 11/26/10

54

2/21/10
JL
524-0221101 1:1 H₂SO₄
250ml H₂SO₄ (EMD 49284; EXP: 11/20/14)
ADDED SLOWLY TO 250ml DI. COOL
COMPLETELY
EXP: 2/21/12

2/21/11
JL
524-0221102 Cr6+ Coloring Reagent
0.2500g 1,5-naphenylcarbonylhydrazide (EMD Lot 4710372L
EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD
Lot # 47154D; EXP: 9/24/12).
EXP: 3/21/11

2/28/11
JL
524-0228101 0.1 H₂SO₄
5.6 ml Conc H₂SO₄ (EMD 49284 EXP: 11/20/14) ↑ 2L
w/ DI H₂O
EXP: 2/28/12

2/28/11
JL
524-0228102 1001^{mg/L} Cr6+
Purchased
Inorganic Ventures CGCR(6)1-1
125ml Clear Glass
Lot# 02-CR03040
EXP: 3/1/2012

2/28/11
JL

524-02281103 10ppm Cr6+ Soln
1.0ml 524-02281102 (100ppm Cr6+; EXP: 3/1/12) ↑
100ml w/ DI H2O
EXP: 2/28/12

3/7/11
JL

524-03071101 Cr6+ Colormetric Reagent
0.2500g 1,5-Diphenylcarbohydrazide
(EMD Lot 47103721, EXP: 1/30/12) ↑ 50ml w/
Acetone (EMD 47154, EXP: 9/24/12).
EXP: 4/7/11

3/7/11
JL

524-03071102 500ppm NO2
Purchased
Ricca Chem Co Cat No 5444.5-4
Lot # 1162544
EXP: 8/20/11

3/17/11
JL

524-03271101 Alkaline Digestion Soln
20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g
Na2CO3 (EMD 46321715B; EXP: 10/11/12) ↑ 1L
w/ DI H2O.
EXP: 4/17/11

Reviewed And Approved By:
Initial: JL Date: 3/18/11

4/14/11
JL

524-04141101 ICO2 Eluent
75ml 524-04291002 (10x Conc Eluent, exp 4/29/11)
↑ 750ml w/ DI H2O. DEGAS
EXP: 4/28/11

4/15/11
So

524-04151101 ICO2 PCR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EMD 47103791 exp: 1/30/12) in 100 mL Methanol (B&J 2-937K exp: 2/1/12). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 49230 exp: 1/20/12). Bring up to volume w/ DI H2O; mix and degas.

EXP: 4/30/11

4/15/11
So

524-04151102 Cytolysis Reagent

0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103791 exp: 1/30/12) + 50 mL w/ Acetone (EMD 471540; exp: 9/24/12)

EXP: 5/15/11

4/15/11
So

524-04151102

13.5 N NaOH

100g NaOH (EMD 47022713 exp: 10/1/12) + 100 mL DI H2O

EXP: 4/15/12

4/18/11
So

524-04181101

1000 ppm Cr6+

0.1 mL - 524-02281102 (1000 ppm Cr6+; exp: 3/1/12) ↑
100 mL w/ pH ADJUSTED DI (9.391)
EXP: 3/1/12

4/18/11
So

524-04181102

ICN ICO2 2.5ppb

0.25 mL Ref 524-0151001 @ 0.1/10 exp: 3/20/12 up to 100 mL with pH adjusted (pH= 9.741), degassed DI Water.

EXP: 5/2/11

524-04261102 pH 10.000 Buffer
 4/26/11 SV Purchased
 JT Baker Cat No: 5655-01 (500ml)
 LOT # J33524
 EXP: 9/30/12

524-04261103 NH3 FILLING SOLN
 4/26/11 SV Purchased
 Thermo Orion Orion 951202 (60ml)
 LOT # OX1 P/N: 70243-A04
 EXP: 4/26/12

524-04261103^{9/4/20/11} 1:1 H₂SO₄
 4/26/11 SV 250ml conc H₂SO₄ (LMD 49284, EXP: 11/20/14)
 ADDED SLOWLY TO 250ml DI H₂O
 LET COOL
 EXP: 4/26/12

524-04271101 Amico Sulfuric Soln
 4/27/11 SV 6.25ml conc H₂SO₄ (LMD 49284; EXP: 11/20/14) Added to
 2.5ml DI H₂O. Let COOL.
 DISSOLVE 1.6875g N,N-Dimethyl-p-phenylenediamine
 oxalate (Fisher 1363386 13408204; EXP: 8/7/14)
 in cooled sulfuric soln and dilute to 250ml w/
 1:1 H₂SO₄ (524-04261104; EXP: 4/26/12)
 EXP: 5/25/11

4/27/11
 Sp
 524-04271102 A & B pH 7.000 Buffer
 Purchased
 BDH Cat No: BDH5046-500 mL
 Lot # 1103379
 Exp: 3/20/13

4/28/11
 Sp
 524-04281101 0.1N H2SO4
 5.0 mL Conc H2SO4 (Lot # 49284; Exp: 11/20/14)
 ↑ 2L w/ DI H2O
 Exp: 4/28/12

LABORATORY REPORT

May 24, 2011

David Conner
Battelle
4800 Oak Grove Dr. M/S 180-801
Pasadena, CA 91109

RE: JPL-GW-2Q11 / G005862 / JPL GWM

Dear David:

Enclosed are the results of the sample submitted to our laboratory on May 5, 2011. The sample was sent out for partial analysis to our Kelso facility. Please find their report attached. For your reference, these analyses have been assigned our service request number P1101681.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-10-1; Minnesota Department of Health, NELAP Certificate No. 219474; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.



Digitally Signed By Sue Anderson at 9:58 am, May 24, 2011

Sue Anderson
Project Manager

Client: Battelle
Project: JPL-GW-2Q11 / G005862 / JPL GWM

CAS Project No: P1101681

CASE NARRATIVE

The samples were received intact under chain of custody on May 5, 2011 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

DETAIL SUMMARY REPORT

 Client: Battelle
 Project ID: JPL-GW-2Q11 / G005862 / JPL GWM

Service Request: P1101681

 Date Received: 5/5/2011
 Time Received: 12:48

521 - Nitrosamines	7196A - Cr6	8270C SIM - 14_DIOXANE
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Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	521 - Nitrosamines	7196A - Cr6	8270C SIM - 14_DIOXANE
MW-16	P1101681-001	Water	5/5/2011	09:50	X	X	X

Columbia Analytical Services, Inc.

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl <i>tert</i> -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.



2655 Park Center Drive, Suite A
 Simi Valley, California 93065
 Phone (805) 526-7161
 Fax (805) 526-7270

Water & Soil - Chain of Custody Record & Analytical Service Request

Requested Turnaround Time in Business Days (Surcharges) please circle
 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. 2107081
 CAS Contact: _____

Company Name & Address (Reporting Information) Battelle 505 King Ave Columbus OH 43201		Project Name SPL-HW-2011		Project Number 6005862/SPL HW14		P.O. # / Billing Information 214375/Battelle 505 King Ave Columbus OH 43201		Analysis Method and/or Analytes		Preservative Code		Preservative Key					
Project Manager David Lerner		Sampler (Print & Sign) David Lerner / David L		Date Collected 5/5/11		Time Collected 0950		Matrix HQ		Number of Containers 1P 36		Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/> TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted) Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted) X Hexavalent Cr (7196) X Nitrosamines (521) X 1-4 Dioxane (8270C SEM)		0 0 0		0 None HCL HNO3 H2SO4 NaOH Zn Acetate Asc Acid Other	
Phone 619 726-7311		Fax 614 458-10041		Laboratory ID Number		Date Collected		Matrix		Number of Containers		Remarks MS/MSD					
Email Address for Result Reporting comed@battelle.org		Client Sample ID MW-16		Date Collected		Time Collected		Matrix		Number of Containers		Remarks					
Retrieved by (Signature) [Signature]		Retrieved by (Signature) [Signature]		Date 5/5/11		Time 07		Cooler / Blank / Ice / No Ice [Initials]		Temperature [Initials]		Project Requirements (MRLs, QAPP)					

Report Tier Levels - please select

Tier I - (Results/Default if not specified) _____ Tier III - (Data Validation Package) 10% Surcharge MRJ required Yes / No _____ EDD required Yes / No _____
 Tier II - (Results + QC) _____ Tier V - (Client specified) _____ MBL / POL / J required Yes / No _____ Type: _____

Retrieved by (Signature) _____ Date _____ Time _____
 Retrieved by (Signature) _____ Date _____ Time _____

Client: Battelle

Service Request: P1101681

Project: JPL-GW-2Q11/G005862 / JPL GWM

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101681-001.01	521	5/5/11	1255	SMO / SSTAPLES	
		5/5/11	1444	SUBBED / MZAMORA	
		5/6/11	1206	K-Delilah-26 / KSMITH	
		5/11/11	0803	Custodian / DMOORE	
		5/11/11	0803	In Lab / RHAYES	
		5/11/11	1610	K-Delilah-26 / SDAVIS	
P1101681-001.02		5/5/11	1255	SMO / SSTAPLES	
		5/5/11	1444	SUBBED / MZAMORA	
		5/6/11	1206	K-Delilah-26 / KSMITH	
		5/11/11	0803	Custodian / DMOORE	
		5/11/11	0803	In Lab / RHAYES	
		5/11/11	1610	K-Delilah-26 / SDAVIS	
P1101681-001.03	7196A	5/5/11	1255	SMO / SSTAPLES	
		5/5/11	1345	In Lab / SANDERSON	
		5/5/11	1552	P-37 / SANDERSON	
P1101681-001.04	8270C SIM	5/5/11	1255	SMO / SSTAPLES	
		5/5/11	1444	SUBBED / MZAMORA	
		5/6/11	1206	K-Delilah-26 / KSMITH	
		5/11/11	1205	In Lab / RHOLDEN	
		5/11/11	1530	K-Delilah-26 / SMO2	
P1101681-001.05		5/5/11	1259	SMO / SSTAPLES	
		5/5/11	1444	SUBBED / MZAMORA	
		5/6/11	1206	K-Delilah-26 / KSMITH	
P1101681-001.06		5/5/11	1259	SMO / SSTAPLES	
		5/5/11	1444	SUBBED / MZAMORA	
		5/6/11	1206	K-Delilah-26 / KSMITH	
P1101681-001.07		5/5/11	1300	SMO / SSTAPLES	
		5/5/11	1444	SUBBED / MZAMORA	
		5/6/11	1206	K-Delilah-26 / KSMITH	
		5/11/11	1205	In Lab / RHOLDEN	
		5/11/11	1530	K-Delilah-26 / SMO2	
P1101681-001.08		5/5/11	1300	SMO / SSTAPLES	

Client: Battelle **Service Request:** P1101681
Project: JPL-GW-2Q11/G005862 / JPL GWM

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
		5/5/11	1345	In Lab / SANDERSON	
		5/5/11	1552	P-37 / SANDERSON	

Sample Acceptance Check Form

Client: Battelle Work order: P1101681
 Project: JPL-GW-2Q11 / G005862 / JPL GWM
 Sample(s) received on: 5/5/11 Date opened: 5/5/11 by: SSTAPLES

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- | | Yes | No | N/A |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were sample containers properly marked with client sample ID? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 Container(s) supplied by CAS ? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 Did sample containers arrive in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 Were chain-of-custody papers used and filled out? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 Did sample container labels and/or tags agree with custody papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 Was sample volume received adequate for analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 Are samples within specified holding times? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 Was proper temperature (thermal preservation) of cooler at receipt adhered to?
Cooler Temperature _____ °C Blank Temperature <u>5</u> °C | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9 Was a trip blank received? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10 Were custody seals on outside of cooler/Box?
Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container?
Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate preservation , according to method/SOP or Client specified information? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Is there a client indication that the submitted samples are pH preserved? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were VOA vials checked for presence/absence of air bubbles? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12 Tubes: Are the tubes capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Do they contain moisture? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13 Badges: Are the badges properly capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101681-001.01	1000ml AG NP					
P1101681-001.02	1000ml AG NP					
P1101681-001.03	125mL Plastic NP					
P1101681-001.04	500mL AG NP					
P1101681-001.05	1000ml AG NP					
P1101681-001.06	1000ml AG NP					
P1101681-001.07	500mL AG NP					
P1101681-001.08	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

Analytical Report

Client : Battelle
 Project Name : JPL-GW-2Q11
 Project Number : G005862 / JPL GWM
 Sample Matrix : WATER

Service Request : P1101681
 Date Collected : 05/05/11
 Date Received : 05/05/11

Chromium, Hexavalent

Prep Method : None
 Analysis Method : 7196A
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-16	P1101681-001	0.010	0.003	1	NA	05/05/11 14:50	0.005	J
Method Blank	P1101681-MB	0.010	0.003	1	NA	05/05/11 14:50	ND	

J Estimated concentration. The result is less than the PQL but greater than the MDL.

Approved By Kane Rya Date : 5/6/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11 / G005862 / JPL GWM

Service Request: P1101681
Date Analyzed: 05/05/11

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Kanu Rya Date: 5/6/11
ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11 / G005862 / JPL GWM

Service Request: P1101681
Date Analyzed: 05/05/11

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0500	0.0515	103	90-110
CCV1	0.0500	0.0524	105	90-110
CCV2	0.0500	0.0524	105	90-110

Approved By: Kam Rya Date: 5/6/11
CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
 Project Name : JPL-GW-2Q11
 Project Number : G005862 / JPL GWM
 Sample Matrix : WATER

Service Request : P1101681
 Date Collected : NA
 Date Received : NA
 Date Extracted : NA
 Date Analyzed : 05/05/11

Laboratory Control Sample Summary
 Inorganic Parameters

Sample Name : Laboratory Control Sample
 Lab Code : P1101681-LCS
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0387	97	90-110	

Approved By Kam Rya Date : 5/6/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL-GW-2Q11
Project Number : G005862 / JPL GWM
Sample Matrix : WATER

Service Request : P1101681
Date Collected : 05/05/11
Date Received : 05/05/11
Date Extracted : NA
Date Analyzed : 05/05/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-16 Units : mg/L (ppm)
 Lab Code : P1101681-001MS P1101681-001DMS Basis : NA
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	0.0055	0.0507	0.0507	90	90	73-119	<1	J

J Estimated concentration. The result is less than the PQL but greater than the MDL.

Approved By Kanu Rya Date : 5/6/11

pH Run Log

Service Request #(s): P1101488, 1681, 1682

Time: 0830

Sample	VWR lot #	Exp.
pH 2 Buffer	524-11041002	1/2012
pH 4 Buffer	524-11041003	8/31/12
pH 7 Buffer	524-04271102A	3/2013
pH 10 Buffer	524-04261102	9/30/12

Slope	Prep.Run #
97.8%	
	Run#

pH in liquid: (1) 9040B, (2) 9040C pH in solid: (3) 9045C, (4) 9045D (Note method number in column labeled # below)

pH adjustment:(5) 7196A,(6) 7199 (Note method # in column labeled #)

Sample	#	pH	Temp. °C	Sample	#	pH	Temp. °C
pH 2.000	5	2.012	22.7°	1682-2.01	5	2.022	15.8°
pH 4.000		3.997	22.7°	T-4.01		2.022	16.2°
pH 7.000		6.995	22.6°	T-5.01		2.086	16.4°
pH 10.000		9.995	22.8°	-6.01		1.925	16.8°
IV-26.46 EXP: 11/2012 Ref#: 519-11230903D		6.359	22.7°	↓ -7.01		2.011	16.9°
DI		2.066	21.6°	pH 2.000		2.023	22.1°
NA 5/4/11 soil prep		2.160	23.8°				
WCS		2.065	24.4°				
BLS		1.965	24.0°				
1488-1.01		2.060	24.3°				
T-1.01 DWP		1.996	24.3°				
pH 2.000		1.972	22.5°				
TIME: 1410							
pH 2.000	5	2.012	22.5°				
1681-1.01	T	2.095	13.9°				
1682-1.01	T	1.957	15.9°				
T-2.01	↓	1.888	15.5°				

pH Adjustments: 7196A: Diluted/Conc H₂SO₄ cmd 49284 EXP: 11/20/14

7199A: Diluted NaOH _____ EXP: _____

Comments: _____

* Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 5/2/11

Note: ATC probe used: therefore, temperature correction calculation is not necessary.

Analyst: JW

Date: 5/5/11

Reviewer: KR

Date: 5/5/11

Hexavalent Chromium (Liquids)



Method EPA 7196A

page 1 of 2 79

Service Request#(s): P1101681 1682

Run#: 244968

Stock#: 524-02281103 T.V.=100PPM EXP: 2/28/12

Prep Run#: _____

CVICCV#: 524-10151001 T.V.=100PPM EXP: 3/20/12

Conc. H₂SO₄ Lot#: EMD 44284 EXP: 11/20/14

Coloring Reagent Ref#: 524-05051101 EXP: 6/5/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.999980134
Absorbance @ 540 nm	0.000	0.011	0.058	0.117	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1	10ml	—	✓	0.000	0.000	0.000	0.000344	LO.003
2	FEV 0.05PPM	—	✓	0.000	0.060	0.060	0.0515	103%
3	MB	—	✓	0.000	0.000	0.000	0.000344	LO.003
4	LCS 0.04PPM	—	✓	0.000	0.045	0.045	0.0387	97%
5	1681-1.01	—	✓	0.000	0.006	0.006	0.00546	'J'
6	T -1.01 VS 0.03PPM	—	✓	0.000	0.037	0.037	0.0319	88%
7	J -1.01 MS 0.05PPM	—	✓	0.000	0.059	0.059	0.0507	90%
8	↓ -1.01 MSD ↓	—	✓	0.000	0.059	0.059	0.0507	90%
9	1682-001.01	—	✓	0.000	0.000	0.000	0.000344	LO.003
10	T 001.01MS 0.05PPM	—	✓	0.000	0.050	0.050	0.0430	86%
11	↓ 001.01MSD ↓	—	✓	0.000	0.050	0.050	0.0436	86%
12	↓ -2.01	—	✓	0.000	0.000	0.000	0.000344	LO.003
13	CVV 0.05PPM	—	✓	0.000	0.061	0.061	0.0524	105%
14	CVB'	—	✓	0.000	0.000	0.000	0.000344	LO.003
15	1682-3.01	—	✓	0.000	0.001	0.001	0.00120	LO.003
16	T -3.01 VS 0.03PPM	—	✓	0.000	0.032	0.032	0.0276	92%
17	↓ -4.01	—	✓	0.000	0.000	0.000	0.000344	LO.003

pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10151001 @ 10 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of 524-02281103 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of 524-02281103 @ 10 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]

Date/Time: 5/5/11 @ 1435

Analyzed By: [Signature]

Date/Time: 5/5/11 @ 1450

Reviewed By: [Signature]

Date: 5/5/11

Service Request#(s): P1101681 1682

Run#: 244968

Stock#: 524-02281103 T.V.=10PPM EXP: 2/28/12

Prep Run#: _____

CV/CCV#: 524-10151001 T.V.=100PPM EXP: 3/20/13

Conc. H₂SO₄ Lot#: EMD 49284 EXP: 11/20/14

Coloring Reagent Ref#: 524-05051101 EXP: 6/5/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.999980134
Absorbance @ 540 nm	0.000	0.011	0.058	0.117	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1682-5.01	10mL	—	✓	0.002	0.002	0.000	0.000344	LO.003
T-6.01	↓	—	✓	0.002	0.002	0.000	↓	↓
J-7.01	↓	—	✓	0.000	0.000	0.000	↓	↓
CCV2 0.05PPM	↓	—	✓	0.000	0.061	0.061	0.0524	105%
CV2	✓	—	✓	0.000	0.000	0.000	0.000344	LO.003
<p>Spine not used</p>								

pH Requirement: Method 7196A (2 ± 0.5) Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10151001 @ 10 ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 ↑ 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of ↓ ↑ 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of ↓ @ 10 ↑ 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]

Date/Time: 5/5/11 1435

Analyzed By: [Signature]

Date/Time: 5/5/11 1450

Reviewed By: [Signature]

Date: 5/5/11

150

11/23/09 519-11230902 1000 PPM SO₂ (ICV/CCV)
JW 0.1607g Na₂SO₃ (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/ DI
EXP: 5/23/10

11/23/09 519-11230903 A, B, C, D PH REFERENCE
JW PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/20/12

11/24/09 519-11240901 1000 PPM SO₄ Standard
JW PURCHASED CAT # ICC-006
LOT # K60794
EXP: 9/30/13

11/25/09 519-~~H/25~~^{82 11/25/09} 11250901 0.1N H₂SO₄
JW 5.6ml conc H₂SO₄ (EMD 47050 EXP: 9/13/10)
EXP: ~~H/25~~ 9/13/10
^{82 11/25/09}

11/30/09 519-11300901 Cr⁶⁺ Coloring Reagent
JW 0.2500g diphenylcarbohydrazide (EMD 47103EE; EXP:
1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 519-11300902 25133 ppb Stock for O₃ in Air
JW 0.05ml Pyridine-4-carboxaldehyde (Alfa Aesar LOT 10140598; EXP 5/11/12)
↑ 500ml deionized H₂O
EXP: 12/14/09

11/30/09 519-11300903 25133 ppb ICV/CCV for O₃ in Air
JW 0.05ml Pyridine-4-carboxaldehyde (TCI LOT # I61INC; EXP: 5/10/12)
↑ 500ml w/ DI H₂O
EXP: 12/14/09
Reviewed And Approved By:
Initial: LL Date: 12/22/09

10/6/10
 SW
524-10061001 25133 ppb Stock for 03
 0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar
 10140598 :Exp: 8/11/12 up to 500 ml w DI
 Water.
 EXP: 10/20/10

10/6/10
 SW
524-10061002 25133 ppb ION/COV for 03
 0.05 ml Pyridine-4-carboxaldehyde TCI
 ICI INC :Exp: 8/10/12 up to 500 ml w DI
 Water.
 EXP: 10/20/10

10/6/10
 SW
524-10061003 MBTH 50/17
 0.5000 g MBTH (Aldrich 54696EK :Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ EMD 44254; EXP 11/20/10
 EXP: 10/7/10

10/15/10
 SW
524-10151001 Cr6+ ION/COV Stock
 Purchased 100ppm Cr6+
 RICCA Chemical Co Cut No 2095-16
 500ml Plastic
 LOT # 1010177
 EXP: 3/20/12

10/15/10
 SW
524-10151002 500ppm NO₂ Stock
 Purchased
 RICCA Chemical Co Cut No: 5444.5-4
 LOT # 1010371 120ml amber glass
 EXP: 4/20/11

10/28/10 524-10781002 1000 PPM SO3 ICV/CCV
JW

0.1607 Na2SO3 (Mallinckrodt Lot #1125469; Exp: 8/1/14) up
to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 524-11011001 ICV/CCV Cr⁶⁺ T.V = 0.579 PPM
JW 0.5 ml 519-04090904 (T.V = 115.8 mg/L; EXP: 12/2010)
↑ 100 ml w/ DI
EXP: 11/15/10

11/1/10 524-11011002 Cr⁶⁺ Coloring Reagent
JW 0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP:
1/30/13) ↑ 50 ml w/ Acetone (EMD 471542; EXP:
9/24/12).
EXP: 11/15/10

11/4/10 524-11041001 A-SE PH Filling Sol'n
JW PURCHASED (3M KCl) P/N 702613-AD2
Thermo Scientific
LOT Code: OR1
EXP: 11/4/11

11/4/10 524-11041002 PH 2.000 Buffer
JW purchased
BDH CAT NO: 5010-500 ml
LOT # 1002199
EXP: 1/2012

11/4/10 S24-11041003 pH 4.00 Buffer
 purchased
 J.T. Baker Cat No: 5657-01 500 ml
 Lot # J30507
 Exp: 8/31/12

11/4/10 S24-11041004 pH 7.00 Buffer
 purchased
 J.T. Baker Cat No: 5656-01 500 ml
 Lot # J35515
 Exp: 9/30/12

11/5/10 S24-11051001 MBTH Solⁿ
 0.5000 g MBTH (Aldrich 521696EK; Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ EMD 49884
 Exp: 11/22/14
 Exp: 11/6/10

11/8/10 S24-11081001 1000 PPM NH₃
 0.3141g NH₄Cl (EMD 49198931; Exp: 10/19/14) 100 ml
 w/ S24-10221006 Exp: 10/22/11
 Exp: 10/22/11

11/12/10 S24-11121001 1000 PPM SO₂ STOCK
 0.1591 Na₂SO₃ (JT Baker Lot #1110627; Exp: 8/31/14) up to
 100 ml w/ DI Water.
 Exp: 11/26/10

54

2/21/11
JW
524-0221101 1:1 H₂SO₄
250ml H₂SO₄ (EMD 49284; EXP: 11/20/14)
ADDED SLOWLY TO 250ml DI. COOL
COMPLETELY
EXP: 2/21/12

2/21/11
JW
524-0221102 Cr6+ Coloring Reagent
0.2500g 4,5-nitroxy-carbonylhydrazide (EMD lot 4710372)
EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD
lot #471540; EXP: 9/24/12).
EXP: 3/31/11

2/28/11
JW
524-0228101 0.1 H₂SO₄
5.6ml conc H₂SO₄ (EMD 49284 EXP: 11/20/14) ↑ 2L
w/ DI H₂O
EXP: 2/28/12

2/28/11
JW
524-0228102 1001^{mg/l} Cr6+
Purchased
Inorganic Ventures CGCR (6)1-1
125ml Clear Glass
LOT# D2-CR03040
EXP: 3/1/2012

2/28/11
JL

524-02281103 10ppm Cr6+ Sol'n
1.0 ml 524-02281102 (100ppm Cr6+; EXP: 3/1/12) ↑
100ml w/ DI H2O
EXP: 2/28/12

3/7/11
JL

524-03071101 Cr6+ Colony Reagent
0.2500g 1,5-Diphenylcarbazide
(EMD Lot 47103721, EXP: 1/30/13) ↑ 50ml w/
Acetone (EMD 47154, EXP: 9/24/12).
EXP: 4/7/11

3/7/11
JL

524-03071102 500ppm NO2
Purchased
RILCA Chem Co Cat No 5444.5-4
Lot # 1102544
EXP: 8/20/11

3/17/11
JL

524-03271101 Alkaline Digestion Sol'n
20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g
Na2CO3 (EMD 46321715B; EXP: 10/11/12) ↑ 1L
w/ DI H2O.
EXP: 4/17/11

Reviewed And Approved By:
Initial: JK Date: 3/18/11

4/14/11
JL

524-04141101 ICO2 Eluent
75ml 524-04291003 (100 Conc Eluent, EXP: 4/29/11)
↑ 750ml w/ DI H2O. DEGAS
EXP: 4/28/11

PH 10.000 Buffer

SAI-0461103

Purchased

OT Baker

Lot No: 5055-01

Lot # 13354

EXP: 9/30/12

SAI-0461103 NBS Fixing Soln

Purchased

Thermo Orion

Lot # 0X1

EXP: 4/30/12

SAI-0461103

9/20/11

1:1 H2SO4

250ml conc H2SO4 (Lot # 4984, Exp: 11/30/14)

ADDED SLOWLY TO 250ml DI H2O

LET CUL

EXP: 4/30/12

SAI-0461101

6.25ml conc H2SO4 (Lot # 4984, Exp: 11/30/14) Added to

2.5ml DI H2O. Let CUL

Dissolve 1.6875g N-N-Dimethyl-p-Toluidine

Oxide (Lot # 136386, Exp: 8/7/14)

in water sulfate Soln and dilute to 250ml w/

1:1 H2SO4 (Lot # 4984, Exp: 11/30/14)

EXP: 5/25/11

SAI
4/27/11

SAI
4/27/11

SAI
4/27/11

SAI
4/27/11

4/27/11 524-04271102 A&B pH 7.00 Buffer
 Purchased
 BDH Cat No. BDH5046 - 500 mL
 Lot # 1103379
 Exp: 3/30/13

4/28/11 524-04281101 0.1N H₂SO₄
 5.6 ml conc H₂SO₄ (EMD 49284; exp: 11/20/14)
 ↑ 2L w/ DI H₂O
 Exp: 4/28/12

5/4/11 524-05041101 Alkaline Digestion Sol'n
 20.0g NaOH (EMD 47022713; exp: 10/11/12) +
 30.0g Na₂CO₃ (EMD 46321715B; exp: 10/11/12)
 ↑ 1L w/ DI H₂O
 Exp: 06/04/11

5/6/11 524-05051101 Violet Coloring reagent
 0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05041;
 exp: 06/15/15) ↑ 50ml w/ Acetone (EMD 47154 D;
 exp: 9/24/12)
 Exp: 06/05/11

5/5/11 524-05051102 ICO₂ Eluent
 100 ml 524-04191101 (14x conc eluent; exp: 9/32/11)
 ↑ 1L w/ DI H₂O - Degassed
 Exp: 5/19/11

May 20, 2011

Analytical Report for Service Request No: P1101681

Sue Anderson
Columbia Analytical Services
2655 Park Center Drive
Suite A
Simi Valley, CA 93065-6209

RE: JPL-GW-2Q11/G005862 / JPL GWM

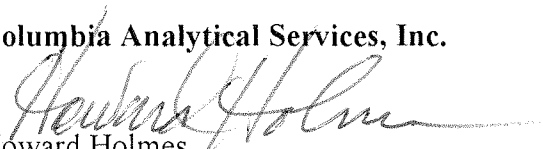
Dear Sue:

Enclosed are the results of the sample submitted to our laboratory on May 05, 2011. For your reference, these analyses have been assigned our service request number P1101681.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3364. You may also contact me via Email at HHolmes@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.
Howard Holmes
Project Chemist

HH/jw

Page 1 of 21

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Agency	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DEQ	WA100010
South Carolina DHEC	61002
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water
Service Request No.: P1101681
Date Received: 5/5/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

One water sample was received for analysis at Columbia Analytical Services on 5/5/11. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Nitrosamines by EPA 521

No anomalies associated with the analysis of these samples were observed.

1,4-Dioxane by EPA Method 8270C SIM

No anomalies associated with the analysis of these samples were observed.

Approved by  Date 5-23-11

Chain of Custody

CAS Contact: Sue Anderson

Project Name: JPL-GW-2Q11
 Project Number: G005862 / JPL GWM
 Project Manager: David Conner
 Company: Battelle

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample			Send To	
				Date	Time	Date Received		
P1101681-001	MW-16	6	Water	5/5/11	0950	5/5/11	KELSO	
							14_DIOXANE 8270C SIM	IV
							Nitrosamines 521	IV

Test Comments
 Nitrosamines - 521 P1101681-001 NDMA
 MS/MSD on this sample
 14_DIOXANE - 8270C SIM P1101681-001 MS/MSD on this sample

Special Instructions/Comments		Turnaround Requirements <input type="checkbox"/> RUSH (Surcharges Apply) PLEASE CIRCLE WORK DAYS 1 2 3 4 5 <input checked="" type="checkbox"/> STANDARD Requested FAX Date: _____ Requested Report Date: 05/22/11		Report Requirements <input type="checkbox"/> I. Results Only <input type="checkbox"/> II. Results + QC Summaries <input type="checkbox"/> III. Results + QC and Calibration Summaries <input checked="" type="checkbox"/> IV. Data Validation Report with Raw Data POL/MDL/J <input type="checkbox"/> Y <input type="checkbox"/> Y EDD <input type="checkbox"/> Y <input type="checkbox"/> Y		Invoice Information PO# P1101681 Bill to	
-------------------------------	--	---	--	--	--	--	--

Relinquished By: *[Signature]* 05/05/11 Received By: *[Signature]* Airbill Number: _____
 1430

**Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form**

PC H2

Client / Project: Sims Valley Service Request KIT P1101681
 Received: 5/6/11 Opened: 5/6/11 By: AJ Unloaded: 5/6/11 By: AJ

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered
 2. Samples were received in: (circle) Cooler Box Envelope Other _____ NA
 3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	NA	Tracking Number	NA	Filed
0.4		295			1778905X0142361061		

7. Packing material used. Inserts Baggies Bubble Wrap Gel Packs Wet Ice Sleeves Other _____
 8. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
 9. Did all bottles arrive in good condition (unbroken)? Indicate in the table below. NA Y N
 10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
 11. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA Y N
 12. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
 13. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below. NA Y N
 14. Were VOA vials received without headspace? Indicate in the table below. NA Y N
 15. Was C12/Res negative? NA Y N

Branch Lab

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Out of	Head-	Broke	pH	Reagent	Volume	Reagent Lot	Initials	Time
	Bottle Type	Temp	space				added	Number		

Notes, Discrepancies, & Resolutions: _____

Nitrosamines

Organic Analysis:
Nitrosamines by EPA 521

Summary Package

Sample and QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681

Cover Page - Organic Analysis Data Package
Nitrosamines by EPA 521

Sample Name	Lab Code	Date Collected	Date Received
MW-16MS	KWG1104201-1	05/05/2011	05/05/2011
MW-16DMS	KWG1104201-2	05/05/2011	05/05/2011
MW-16	P1101681-001	05/05/2011	05/05/2011

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Loren E. Portwood

Name: Loren Portwood

Date: 5/20/11

Title: Scientist

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Collected: 05/05/2011
Date Received: 05/05/2011

Nitrosamines by EPA 521

Sample Name: MW-16
Lab Code: P1101681-001
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND	U	2.0	0.32	1	05/11/11	05/16/11	KWG1104201	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	93	70-130	05/16/11	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101681
Date Collected: NA
Date Received: NA

Nitrosamines by EPA 521

Sample Name: Method Blank
Lab Code: KWG1104201-4
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND	U	2.0	0.32	1	05/11/11	05/16/11	KWG1104201	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	75	70-130	05/16/11	Acceptable

Comments: _____

Client: Battelle
 Project: JPL-GW-2Q11/G005862 / JPL GWM
 Sample Matrix: Water

Service Request: P1101681

Surrogate Recovery Summary
 Nitrosamines by EPA 521

Extraction Method: METHOD
 Analysis Method: 521

Units: ng/L
 Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
MW-16	P1101681-001	93
Method Blank	KWG1104201-4	75
MW-16MS	KWG1104201-1	94
MW-16DMS	KWG1104201-2	88
Lab Control Sample	KWG1104201-3	96

Surrogate Recovery Control Limits (%)

Sur1 = N-Nitrosodimethylamine-d6 70-130

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

Client: Battelle
 Project: JPL-GW-2Q11/G005862 / JPL GWM
 Sample Matrix: Water

Service Request: P1101681
 Date Extracted: 05/11/2011
 Date Analyzed: 05/16/2011

Matrix Spike/Duplicate Matrix Spike Summary
Nitrosamines by EPA 521

Sample Name: MW-16
 Lab Code: P1101681-001
 Extraction Method: METHOD
 Analysis Method: 521

Units: ng/L
 Basis: NA
 Level: Low
 Extraction Lot: KWG1104201

Analyte Name	Sample Result	MW-16MS KWG1104201-1 Matrix Spike			MW-16DMS KWG1104201-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
N-Nitrosodimethylamine	ND	18.5	20.0	92	17.0	20.0	85	70-130	8	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/16/2011

**Lab Control Spike Summary
 Nitrosamines by EPA 521**

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low
Extraction Lot: KWG1104201

Lab Control Sample
 KWG1104201-3
 Lab Control Spike

Analyte Name	Result	Expected	%Rec	%Rec Limits
N-Nitrosodimethylamine	23.9	20.0	119	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/16/2011
Time Analyzed: 18:22

Method Blank Summary
Nitrosamines by EPA 521

Sample Name: Method Blank
Lab Code: KWG1104201-4

File ID: J:\MS16\DATA\051611-521\0516015.D
Instrument ID: MS16

Extraction Method: METHOD
Analysis Method: 521

Level: Low
Extraction Lot: KWG1104201

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1104201-3	J:\MS16\DATA\051611-521\0516016.D	05/16/11	19:01
MW-16	P1101681-001	J:\MS16\DATA\051611-521\0516017.D	05/16/11	19:40
MW-16MS	KWG1104201-1	J:\MS16\DATA\051611-521\0516018.D	05/16/11	20:19
MW-16DMS	KWG1104201-2	J:\MS16\DATA\051611-521\0516019.D	05/16/11	20:58

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/16/2011
Time Analyzed: 19:01

Lab Control Sample Summary
Nitrosamines by EPA 521

Sample Name: Lab Control Sample
Lab Code: KWG1104201-3
Extraction Method: METHOD
Analysis Method: 521

File ID: J:\MS16\DATA\051611-521\0516016.D
Instrument ID: MS16
Level: Low
Extraction Lot: KWG1104201

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1104201-4	J:\MS16\DATA\051611-521\0516015.D	05/16/11	18:22
MW-16	P1101681-001	J:\MS16\DATA\051611-521\0516017.D	05/16/11	19:40
MW-16MS	KWG1104201-1	J:\MS16\DATA\051611-521\0516018.D	05/16/11	20:19
MW-16DMS	KWG1104201-2	J:\MS16\DATA\051611-521\0516019.D	05/16/11	20:58

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Calibration Date: 05/12/2011

Initial Calibration Summary
Nitrosamines by EPA 521

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS16\DATA\051211-521\0512015.D	E	J:\MS16\DATA\051211-521\0512019.D
B	J:\MS16\DATA\051211-521\0512016.D	F	J:\MS16\DATA\051211-521\0512020.D
C	J:\MS16\DATA\051211-521\0512017.D		
D	J:\MS16\DATA\051211-521\0512018.D		

Analyte Name	Level			Level			Level			Level			Level		
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF
N-Nitrosodimethylamine-d6	A	1.0	3.06	B	2.0	3.45	C	5.0	4.25	D	10	4.54	E	20	5.21
	F	50	7.35												
N-Nitrosodimethylamine	A	1.0	1.11	B	2.0	1.01	C	5.0	1.35	D	10	1.24	E	20	1.38
	F	50	2.25												

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Calibration Date: 05/12/2011

Initial Calibration Summary
Nitrosamines by EPA 521

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

Analyte Name	Compound Type	Calibration Evaluation					RRF Evaluation		
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
N-Nitrosodimethylamine-d6	SURR	Quadratic	COD	1.000		≥ 0.99	4.64		
N-Nitrosodimethylamine	MS	Quadratic	COD	0.999		≥ 0.99	1.39		

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Calibration Date: 05/12/2011
Date Analyzed: 05/12/2011

Second Source Calibration Verification
Nitrosamines by EPA 521

Calibration Type: Internal Standard
Analysis Method: 521

Calibration ID: CAL10502
Units: ug/L

File ID: J:\MS16\DATA\051211-521\0512021.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine	10	7.6	1.39	0.877	NA	-24	± 30 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Date Analyzed: 05/16/2011

**Continuing Calibration Verification Summary
 Nitrosamines by EPA 521**

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/12/2011
Calibration ID: CAL10502
Analysis Lot: KWG1104374
Units: ug/L

File ID: J:\MS16\DATA\051611-521\0516013.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	10	9.4		4.64	4.19	NA	-6	± 50 %	Quadratic
N-Nitrosodimethylamine	10	11		1.39	1.32	NA	8	± 50 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Date Analyzed: 05/16/2011

Continuing Calibration Verification Summary
Nitrosamines by EPA 521

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/12/2011
Calibration ID: CAL10502
Analysis Lot: KWG1104374
Units: ug/L

File ID: J:\MS16\DATA\051611-521\0516021.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	5.0	6.1		4.64	5.12	NA	22	± 50 %	Quadratic
N-Nitrosodimethylamine	5.0	5.0		1.39	1.11	NA	0	± 50 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681

Analysis Run Log
Nitrosamines by EPA 521

Analysis Method: 521

Analysis Lot: KWG1104374
Instrument ID: MS16

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
521\0516.D	GC/MS Tuning - Decafluorotriphenylph	KWG1104374-1	5/16/2011	08:37		5/16/2011	09:06
\0516002.D	Continuing Calibration Verification	KWG1104374-2	5/16/2011	09:55		5/16/2011	10:24
\0516004.D	ZZZZZZ	ZZZZZZ	5/16/2011	11:14		5/16/2011	11:43
\0516005.D	ZZZZZZ	ZZZZZZ	5/16/2011	11:53		5/16/2011	12:22
\0516006.D	ZZZZZZ	ZZZZZZ	5/16/2011	12:32		5/16/2011	13:01
\0516007.D	ZZZZZZ	ZZZZZZ	5/16/2011	13:11		5/16/2011	13:40
\0516008.D	ZZZZZZ	ZZZZZZ	5/16/2011	13:50		5/16/2011	14:19
\0516009.D	ZZZZZZ	ZZZZZZ	5/16/2011	14:29		5/16/2011	14:58
\0516010.D	ZZZZZZ	ZZZZZZ	5/16/2011	15:08		5/16/2011	15:37
\0516011.D	ZZZZZZ	ZZZZZZ	5/16/2011	15:47		5/16/2011	16:16
\0516013.D	Continuing Calibration Verification	KWG1104374-3	5/16/2011	17:05		5/16/2011	17:34
\0516015.D	Method Blank	KWG1104201-4	5/16/2011	18:22		5/16/2011	18:51
\0516016.D	Lab Control Sample	KWG1104201-3	5/16/2011	19:01		5/16/2011	19:30
\0516017.D	MW-16	P1101681-001	5/16/2011	19:40		5/16/2011	20:09
\0516018.D	MW-16MS	KWG1104201-1	5/16/2011	20:19		5/16/2011	20:48
\0516019.D	MW-16DMS	KWG1104201-2	5/16/2011	20:58		5/16/2011	21:27
\0516021.D	Continuing Calibration Verification	KWG1104374-4	5/16/2011	22:16		5/16/2011	22:45

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Extracted: 05/11/2011

Extraction Prep Log
Nitrosamines by EPA 521

Extraction Method: METHOD
Analysis Method: 521

Extraction Lot: KWG1104201
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
MW-16	P1101681-001	05/05/11	05/05/11	500ml	1ml	NA	
Method Blank	KWG1104201-4	NA	NA	500ml	1ml	NA	
MW-16MS	KWG1104201-1	05/05/11	05/05/11	500ml	1ml	NA	
MW-16DMS	KWG1104201-2	05/05/11	05/05/11	500ml	1ml	NA	
Lab Control Sample	KWG1104201-3	NA	NA	500ml	1ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Organic Analysis:
Nitrosamines by EPA 521

Validation Package

Organic Analysis:
Nitrosamines by EPA 521

Validation Package

QC Reports

Client: Battelle
 Project: JPL-GW-2Q11/G005862 / JPL GWM
 Sample Matrix: Water

Service Request: P1101681

**Surrogate Recovery Summary
 Nitrosamines by EPA 521**

Extraction Method: METHOD
 Analysis Method: 521

Units: ng/L
 Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
MW-16	P1101681-001	93
Method Blank	KWG1104201-4	75
MW-16MS	KWG1104201-1	94
MW-16DMS	KWG1104201-2	88
Lab Control Sample	KWG1104201-3	96

Surrogate Recovery Control Limits (%)

Sur1 = N-Nitrosodimethylamine-d6 70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/16/2011

Matrix Spike/Duplicate Matrix Spike Summary
Nitrosamines by EPA 521

Sample Name: MW-16
Lab Code: P1101681-001
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low
Extraction Lot: KWG1104201

Analyte Name	Sample Result	MW-16MS KWG1104201-1 Matrix Spike			MW-16DMS KWG1104201-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
N-Nitrosodimethylamine	ND	18.5	20.0	92	17.0	20.0	85	70-130	8	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/16/2011

**Lab Control Spike Summary
 Nitrosamines by EPA 521**

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low
Extraction Lot: KWG1104201

Analyte Name	Lab Control Sample KWG1104201-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
N-Nitrosodimethylamine	23.9	20.0	119	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/16/2011
Time Analyzed: 18:22

**Method Blank Summary
 Nitrosamines by EPA 521**

Sample Name: Method Blank **File ID:** J:\MS16\DATA\051611-521\0516015.D
Lab Code: KWG1104201-4 **Instrument ID:** MS16
Extraction Method: METHOD **Level:** Low
Analysis Method: 521 **Extraction Lot:** KWG1104201

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1104201-3	J:\MS16\DATA\051611-521\0516016.D	05/16/11	19:01
MW-16	P1101681-001	J:\MS16\DATA\051611-521\0516017.D	05/16/11	19:40
MW-16MS	KWG1104201-1	J:\MS16\DATA\051611-521\0516018.D	05/16/11	20:19
MW-16DMS	KWG1104201-2	J:\MS16\DATA\051611-521\0516019.D	05/16/11	20:58

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/16/2011
Time Analyzed: 19:01

Lab Control Sample Summary
Nitrosamines by EPA 521

Sample Name: Lab Control Sample
Lab Code: KWG1104201-3
Extraction Method: METHOD
Analysis Method: 521

File ID: J:\MS16\DATA\051611-521\0516016.D
Instrument ID: MS16
Level: Low
Extraction Lot: KWG1104201

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1104201-4	J:\MS16\DATA\051611-521\0516015.D	05/16/11	18:22
MW-16	P1101681-001	J:\MS16\DATA\051611-521\0516017.D	05/16/11	19:40
MW-16MS	KWG1104201-1	J:\MS16\DATA\051611-521\0516018.D	05/16/11	20:19
MW-16DMS	KWG1104201-2	J:\MS16\DATA\051611-521\0516019.D	05/16/11	20:58

Organic Analysis:
Nitrosamines by EPA 521

Validation Package

Raw Data

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Collected: 05/05/2011
Date Received: 05/05/2011

Nitrosamines by EPA 521

Sample Name: MW-16
Lab Code: P1101681-001
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND	U	2.0	0.32	1	05/11/11	05/16/11	KWG1104201	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	93	70-130	05/16/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\051611-521\0516017.D
Lab ID: P1101681-001
RunType: SMPL
Matrix: WATER

Date Acquired: 05/16/2011 19:40
Date Quantitated: 05/17/2011 08:51
Batch ID: KWG1104374
Analysis Method: 521
ListJoinID: LJ11419

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
Preparation Holding Time	NA	NA	NA	x	
Pre-Preparation Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Method Blank	NA	NA	NA	x	
MB Surrogate Recovery	NA	NA	NA	x	
Lab Control Spike	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: ASTPM
 Secondary Review: W

Quantitation Report

Bottle ID:	Tier: IV	Matrix: WATER
Prod Code: 521 Nitrosamine	Collect Date: 05/05/2011	Receive Date: 05/05/2011

Analysis Lot: KWG1104374	Prep Lot: KWG1104201	Report Group: P1101681
Analysis Method: 521	Prep Method: METHOD	
Prep Ref: 1017597	Prep Date: 05/11/2011	

Quant Method: J:\MS16\METHODS\051211_D14.M	Calibration ID: CAL10502
Title: Nitrosamines by EPA 521	Report List ID: LJ11419
Tune Ref: J:\MS16\DATA\051611-521\0516.D	Method ID: MJ808
MB Ref: J:\MS16\DATA\051611-521\0516015.D	Quant based on Report List

Data File: J:\MS16\DATA\051611-521\0516017.D	Instrument: MS16
Acqu Date: 05/16/2011 19:40	Quant Date: 05/17/2011 08:51
Run Type: SMPL	Vial: 13
Lab ID: P1101681-001	Dilution: 1.0
	Soln Conc. Units: ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.14	0.02	97	28632	50.00	OK ✓

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.46	0.02	0.00	50	23581	9.26	93	70-130	OK ✓

Target Compounds

							Final Conc. Units: ng/L			
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine	10.57	0.01	0.00	47	156	0.0200	0.32	U	

Prep Amount: 500 ml **Dilution:** 1.0
Prep Final Vol: 1 ml **Unit Factor:** 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS16\DATA\051611-521\0516017.D
 Acq On : 16 May 11 19:40
 Sample : P1101681-001
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 17 07:48:51 2011

Vial: 13
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL_10502
 Last Update : Fri May 13 10:05:05 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

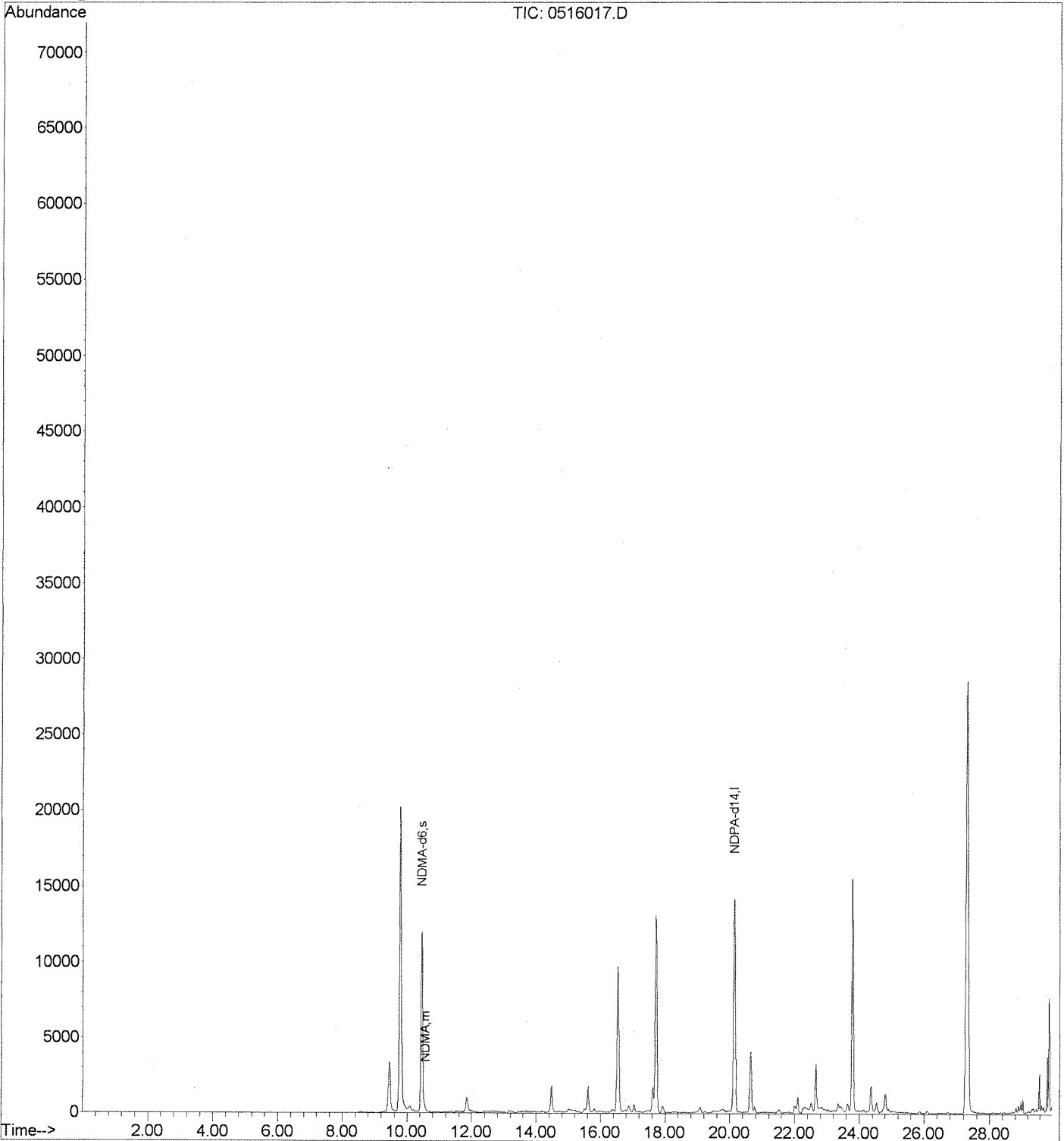
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) NDPA-d14	20.14	97	28632	50.00	ug/L	0.03
System Monitoring Compounds						
3) NDMA-d6	10.46	50	23581	9.26	ug/L	0.02
Target Compounds						
4) NDMA	10.57	47	156	0.02	ug/L	Qvalue 76

Data File : J:\MS16\DATA\051611-521\0516017.D
Acq On : 16 May 11 19:40
Sample : P1101681-001
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 17 8:51 2011

Vial: 13
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL_10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101681
Date Collected: NA
Date Received: NA

Nitrosamines by EPA 521

Sample Name: Method Blank
Lab Code: KWG1104201-4
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND U	2.0	0.32	1	05/11/11	05/16/11	KWG1104201	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	75	70-130	05/16/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\051611-521\0516015.D
Lab ID: KWG1104201-4
RunType: MB
Matrix: DRINKING WATER

Date Acquired: 05/16/2011 18:22
Date Quantitated: 05/17/2011 08:50
Batch ID: KWG1104374
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: AST/PM

Secondary Review: W

Quantitation Report

Bottle ID:	Tier:	Matrix:	DRINKING WATE
Prod Code: 521 Nitrosamine	Collect Date:	Receive Date:	05/11/2011

Analysis Lot: KWG1104374	Prep Lot: KWG1104201	Report Group:	
Analysis Method: 521	Prep Method: METHOD		
Prep Ref: 1017601	Prep Date: 05/11/2011		

Quant Method: J:\MS16\METHODS\051211_D14.M	Calibration ID: CAL10502
Title:	
Tune Ref: J:\MS16\DATA\051611-521\0516.D	Method ID: MJ808
MB Ref:	Quant based on Method

Data File: J:\MS16\DATA\051611-521\0516015.D	Instrument: MS16
Acqu Date: 05/16/2011 18:22	Quant Date: 05/17/2011 08:50
Run Type: MB	Vial: 11
Lab ID: KWG1104201-4	Dilution: 1.0
	Soln Conc. Units: ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.12	0.00	97	31596	50.00	OK
1	N-Nitrosodiethylamine-d10			81	0d		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.46	0.02	0.00	50	20559	7.54	75	70-130	OK

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine				47	0		0.32	U	
1	N-Nitrosomethylethylamine				61	0		0.50	U	
1	N-Nitrosodiethylamine				75	0		0.76	U	
1	N-Nitrosodi-n-propylamine				89	0		0.76	U	
1	N-Nitrosopyrrolidine				55	0d		0.61	U	
1	N-Nitrosopiperidine				69	0d		0.55	U	
1	N-Nitrosodi-n-butylamine				57	0d		0.77	U	

Prep Amount: 500 ml Dilution: 1.0
 Prep Final Vol: 1 ml Unit Factor: 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS16\DATA\051611-521\0516015.D
 Acq On : 16 May 11 18:22
 Sample : 051111-MB
 Misc :

Vial: 11
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

MS Integration Params: RTEINT.P
 Quant Time: May 17 07:48:50 2011

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL 10502
 Last Update : Fri May 13 10:05:05 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

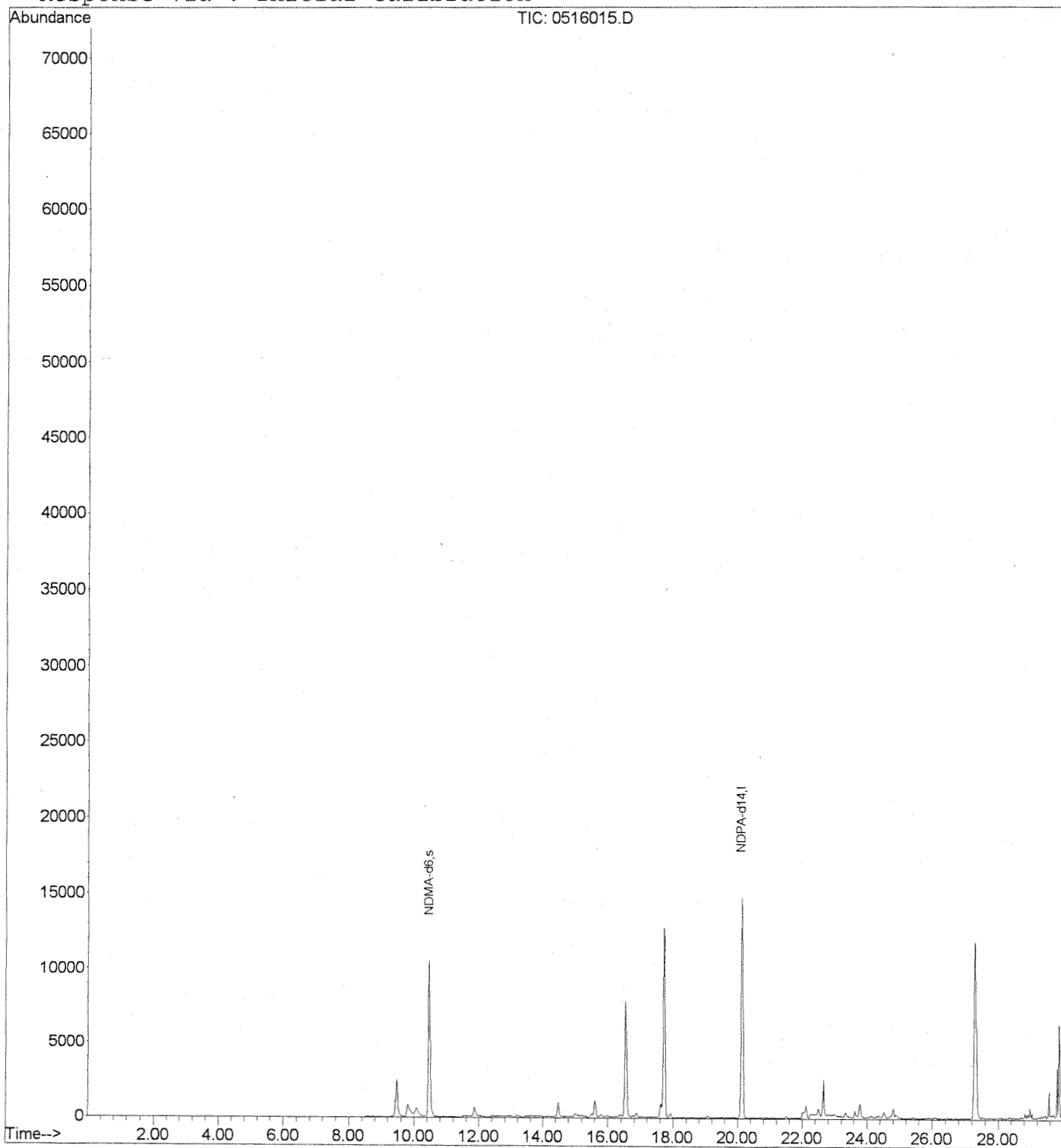
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) NDPA-d14	20.12	97	31596	50.00	ug/L	0.01
System Monitoring Compounds						
3) NDMA-d6	10.46	50	20559	7.54	ug/L	0.03
Target Compounds						Qvalue

Data File : J:\MS16\DATA\051611-521\0516015.D
Acq On : 16 May 11 18:22
Sample : 051111-MB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 17 8:50 2011

Vial: 11
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Collected: 05/05/2011
Date Received: 05/05/2011

Nitrosamines by EPA 521

Sample Name: MW-16MS **Units:** ng/L
Lab Code: KWG1104201-1 **Basis:** NA
Extraction Method: METHOD **Level:** Low
Analysis Method: 521

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	18.5		2.0	0.32	1	05/11/11	05/16/11	KWG1104201	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	94	70-130	05/16/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\051611-521\0516018.D
Lab ID: KWG1104201-1 -- P1101681-001MS
RunType: MS
Matrix: WATER

Date Acquired: 05/16/2011 20:19
Date Quantitated: 05/17/2011 08:51
Batch ID: KWG1104374
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: ASW/M

Secondary Review: 1

Quantitation Report

Bottle ID:	Tier:	Matrix:	WATER
Prod Code: 521 Nitrosamine	Collect Date:	Receive Date:	05/11/2011

Analysis Lot: KWG1104374	Prep Lot: KWG1104201	Report Group:
Analysis Method: 521	Prep Method: METHOD	
Prep Ref: 1017598	Prep Date: 05/11/2011	

Quant Method: J:\MS16\METHODS\051211_D14.M	Calibration ID: CAL10502
Title:	
Tune Ref: J:\MS16\DATA\051611-521\0516.D	Method ID: MJ808
MB Ref: J:\MS16\DATA\051611-521\0516015.D	Quant based on Method

Data File: J:\MS16\DATA\051611-521\0516018.D	Instrument: MS16
Acqu Date: 05/16/2011 20:19	Quant Date: 05/17/2011 08:51
Run Type: MS	Vial: 14
Lab ID: KWG1104201-1 -- P1101681-001MS	Dilution: 1.0
	Soln Conc. Units: ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.13	0.01	97	24683	50.00	OK
1	N-Nitrosodiethylamine-d10			81	0d		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.44	0.00	0.00	50	20646	9.38	94	70-130	OK /

Target Compounds

Final Conc. Units: ng/L

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine	10.57	0.01	0.00	47	5455	9.23	18.5		
1	N-Nitrosomethylethylamine	13.13	-0.01	0.00	61	32971	7.29	14.6		
1	N-Nitrosodiethylamine	15.26	0.01	0.00	75	4933	8.32	16.6		
1	N-Nitrosodi-n-propylamine	20.44	0.01	0.00	89	5229	8.13	16.3		
1	N-Nitrosopyrrolidine	22.77		0.00	55	38319	8.61	17.2		
1	N-Nitrosopiperidine	23.68	-0.01	0.00	69	64073	8.30	16.6		
1	N-Nitrosodi-n-butylamine	25.85	-0.01	0.00	57	20576	7.60	15.2		

Prep Amount: 500 ml Dilution: 1.0
 Prep Final Vol: 1 ml Unit Factor: 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS16\DATA\051611-521\0516018.D
 Acq On : 16 May 11 20:19
 Sample : P1101681-001 MS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 17 07:48:51 2011

Vial: 14
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL 10502
 Last Update : Fri May 13 10:05:05 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

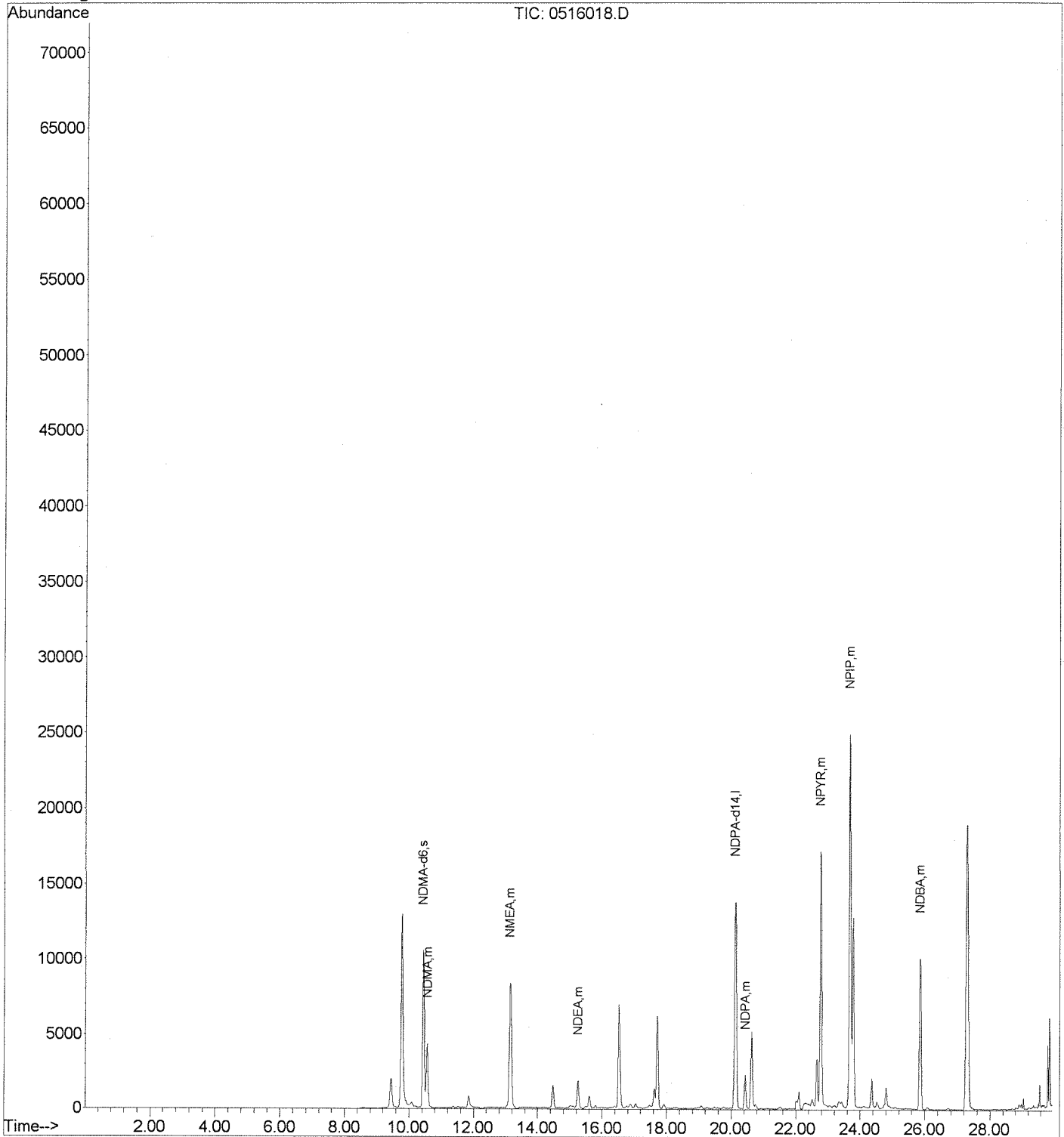
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.13	97	24683	50.00	ug/L	0.02
System Monitoring Compounds						
3) NDMA-d6	10.44	50	20646	9.38	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.57	47	5455	9.23	ug/L	73
5) NMEA	13.13	61	32971	7.29	ug/L	97
6) NDEA	15.26	75	4933	8.32	ug/L	83
7) NDPA	20.44	89	5229	8.13	ug/L #	43
8) NPYR	22.77	55	38319	8.61	ug/L	98
9) NPIP	23.68	69	64073	8.30	ug/L	88
10) NDBA	25.85	57	20576	7.60	ug/L	55

Data File : J:\MS16\DATA\051611-521\0516018.D
Acq On : 16 May 11 20:19
Sample : P1101681-001 MS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 17 8:51 2011

Vial: 14
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Collected: 05/05/2011
Date Received: 05/05/2011

Nitrosamines by EPA 521

Sample Name: MW-16DMS
Lab Code: KWG1104201-2
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	17.0		2.0	0.32	1	05/11/11	05/16/11	KWG1104201	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	88	70-130	05/16/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\051611-521\0516019.D
Lab ID: KWG1104201-2 -- P1101681-001DMS
RunType: DMS
Matrix: WATER

Date Acquired: 05/16/2011 20:58
Date Quantitated: 05/17/2011 08:51
Batch ID: KWG1104374
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: ASTM

Secondary Review: W

Quantitation Report

Bottle ID:	Tier:	Matrix:	WATER
Prod Code: 521 Nitrosamine	Collect Date:	Receive Date:	05/11/2011

Analysis Lot: KWG1104374	Prep Lot: KWG1104201	Report Group:	
Analysis Method: 521	Prep Method: METHOD		
Prep Ref: 1017599	Prep Date: 05/11/2011		

Quant Method: J:\MS16\METHODS\051211_D14.M	Calibration ID: CAL10502
Title:	
Tune Ref: J:\MS16\DATA\051611-521\0516.D	Method ID: MJ808
MB Ref: J:\MS16\DATA\051611-521\0516015.D	Quant based on Method

Data File: J:\MS16\DATA\051611-521\0516019.D	Instrument: MS16		
Acqu Date: 05/16/2011 20:58	Quant Date: 05/17/2011 08:51	Vial: 15	
Run Type: DMS		Dilution: 1.0	
Lab ID: KWG1104201-2 -- P1101681-001DMS		Soln Conc. Units: ug/L	

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.13	0.01	97	28225	50.00	OK ✓
1	N-Nitrosodiethylamine-d10			81	0d		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.45	0.01	0.00	50	21787	8.75	88	70-130	OK ✓

Target Compounds

										Final Conc. Units: ng/L
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine	10.57	0.01	0.00	47	5670	8.51	17.0 ✓		
1	N-Nitrosomethylethylamine	13.15	0.01	0.00	61	38587	7.44	14.9		
1	N-Nitrosodiethylamine	15.26	0.01	0.00	75	5345	7.92	15.8		
1	N-Nitrosodi-n-propylamine	20.43		0.00	89	5504	7.54	15.1		
1	N-Nitrosopyrrolidine	22.77		0.00	55	41295	8.16	16.3		
1	N-Nitrosopiperidine	23.68	-0.01	0.00	69	71854	8.15	16.3		
1	N-Nitrosodi-n-butylamine	25.86		0.00	57	23444	7.57	15.1		

Prep Amount: 500 ml Dilution: 1.0
 Prep Final Vol: 1 ml Unit Factor: 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS16\DATA\051611-521\0516019.D
 Acq On : 16 May 11 20:58
 Sample : P1101681-001 DMS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 17 07:48:51 2011

Vial: 15
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL_10502
 Last Update : Fri May 13 10:05:05 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

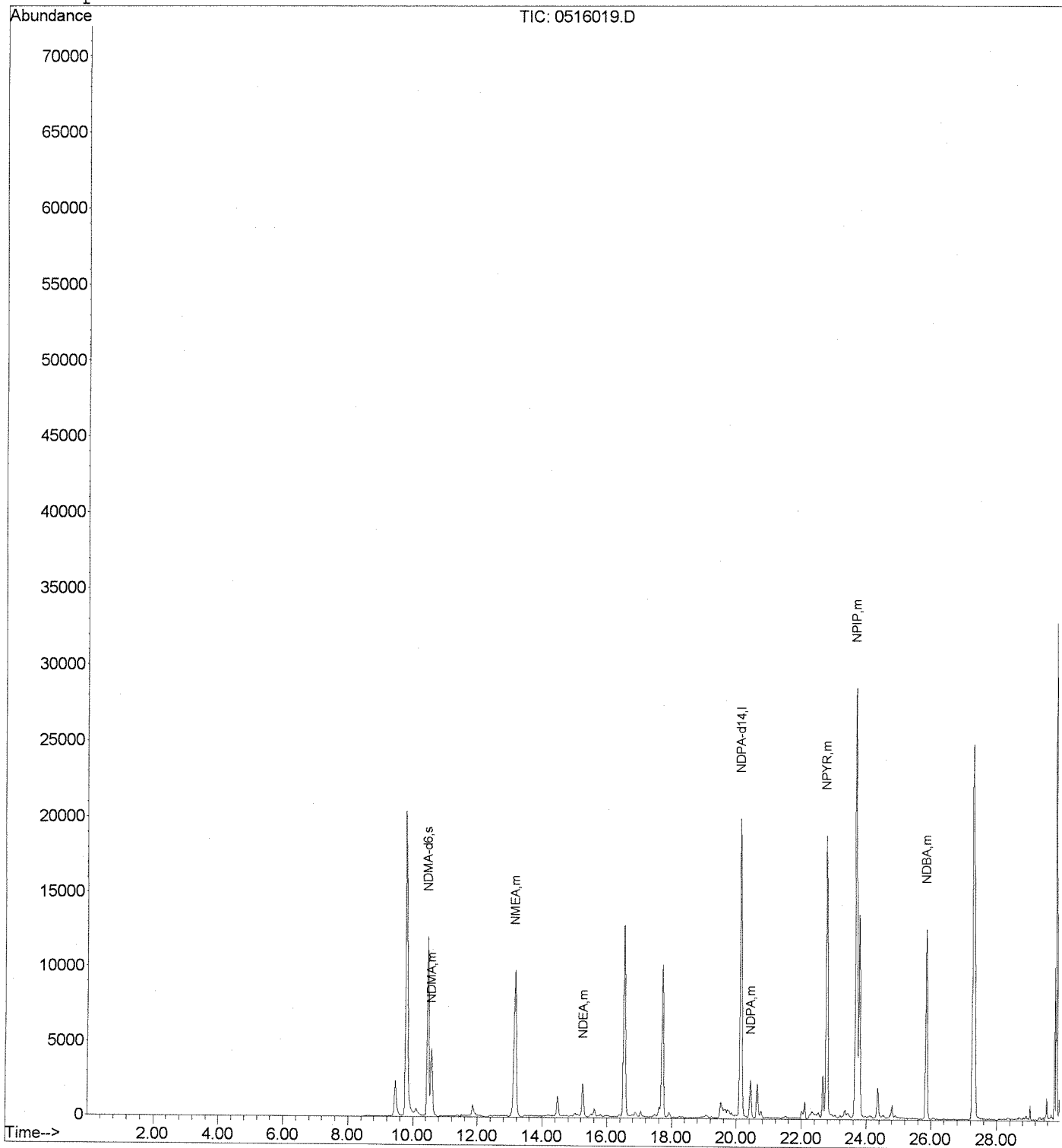
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.13	97	28225	50.00	ug/L	0.02
System Monitoring Compounds						
3) NDMA-d6	10.45	50	21787	8.75	ug/L	0.02
Target Compounds						
4) NDMA	10.57	47	5670	8.51	ug/L	Qvalue 88
5) NMEA	13.15	61	38587	7.44	ug/L	85
6) NDEA	15.26	75	5345	7.92	ug/L	68
7) NDPA	20.43	89	5504	7.54	ug/L #	18
8) NPYR	22.77	55	41295	8.16	ug/L	93
9) NPIP	23.68	69	71854	8.15	ug/L	85
10) NDBA	25.86	57	23444	7.57	ug/L #	37

Data File : J:\MS16\DATA\051611-521\0516019.D
Acq On : 16 May 11 20:58
Sample : P1101681-001 DMS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 17 8:51 2011

Vial: 15
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL_10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Drinking water

Service Request: P1101681
Date Collected: NA
Date Received: NA

Nitrosamines by EPA 521

Sample Name: Lab Control Sample
Lab Code: KWG1104201-3
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	23.9		2.0	0.32	1	05/11/11	05/16/11	KWG1104201	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	96	70-130	05/16/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\051611-521\0516016.D
Lab ID: KWG1104201-3
RunType: LCS
Matrix: DRINKING WATER

Date Acquired: 05/16/2011 19:01
Date Quantitated: 05/17/2011 08:50
Batch ID: KWG1104374
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: CSW

Secondary Review: 1

Quantitation Report

Bottle ID:	Tier:	Matrix:
Prod Code: 521 Nitrosamine	Collect Date:	DRINKING WATE
		Receive Date: 05/11/2011

Analysis Lot: KWG1104374	Prep Lot: KWG1104201	Report Group:
Analysis Method: 521	Prep Method: METHOD	
Prep Ref: 1017600	Prep Date: 05/11/2011	

Quant Method: J:\MS16\METHODS\051211_D14.M	Calibration ID: CAL10502
Title:	
Tune Ref: J:\MS16\DATA\051611-521\0516.D	Method ID: MJ808
MB Ref: J:\MS16\DATA\051611-521\0516015.D	Quant based on Method

Data File: J:\MS16\DATA\051611-521\0516016.D	Instrument: MS16
Acqu Date: 05/16/2011 19:01	Quant Date: 05/17/2011 08:50
Run Type: LCS	Vial: 12
Lab ID: KWG1104201-3	Dilution: 1.0
	Soln Conc. Units: ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.13	0.01	97	30320	50.00	OK
1	N-Nitrosodiethylamine-d10			81	0d		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.45	0.01	0.00	50	26060	9.60	96	70-130	OK ✓

Target Compounds

								Final Conc. Units:			
								ng/L			
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?	
1	N-Nitrosodimethylamine	10.57	0.01	0.00	47	9131	11.94	23.9	✓		
1	N-Nitrosomethylethylamine	13.15	0.01	0.00	61	35597	6.48	13.0			
1	N-Nitrosodiethylamine	15.26	0.01	0.00	75	5739	7.91	15.8			
1	N-Nitrosodi-n-propylamine	20.44	0.01	0.00	89	5757	7.35	14.7			
1	N-Nitrosopyrrolidine	22.78	0.01	0.00	55	40685	7.53	15.1			
1	N-Nitrosopiperidine	23.70	0.01	0.00	69	69051	7.35	14.7			
1	N-Nitrosodi-n-butylamine	25.87	0.01	0.00	57	22370	6.82	13.6			

Prep Amount: 500 ml Dilution: 1.0
 Prep Final Vol: 1 ml Unit Factor: 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS16\DATA\051611-521\0516016.D
 Acq On : 16 May 11 19:01
 Sample : 051111-LCS
 Misc :

Vial: 12
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

MS Integration Params: RTEINT.P
 Quant Time: May 17 07:48:50 2011

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL 10502
 Last Update : Fri May 13 10:05:05 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

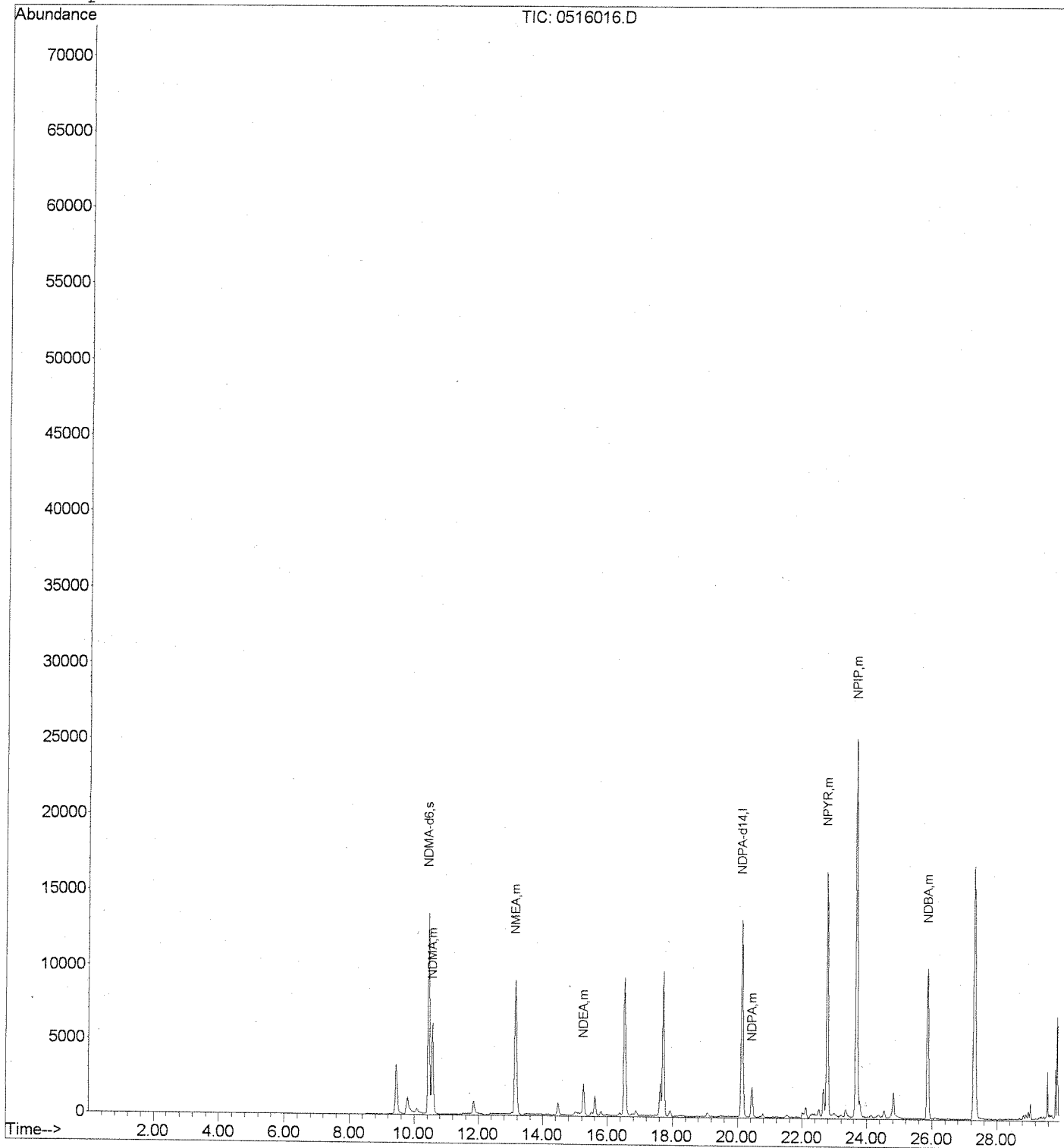
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) NDPA-d14	20.13	97	30320	50.00	ug/L	0.02
System Monitoring Compounds						
3) NDMA-d6	10.45	50	26060	9.60	ug/L	0.02
Target Compounds						Qvalue
4) NDMA	10.57	47	9131	11.94	ug/L	# 47
5) NMEA	13.15	61	35597	6.48	ug/L	88
6) NDEA	15.26	75	5739	7.91	ug/L	84
7) NDPA	20.44	89	5757	7.35	ug/L	100
8) NPYR	22.78	55	40685	7.53	ug/L	83
9) NPIP	23.70	69	69051	7.35	ug/L	90
10) NDBA	25.87	57	22370	6.82	ug/L	96

Data File : J:\MS16\DATA\051611-521\0516016.D
Acq On : 16 May 11 19:01
Sample : 051111-LCS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 17 8:50 2011

Vial: 12
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



Organic Analysis:
Nitrosamines by EPA 521

Validation Package

Standards Data

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Calibration Date: 05/12/2011

**Initial Calibration Summary
 Nitrosamines by EPA 521**

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS16\DATA\051211-521\0512015.D	E	J:\MS16\DATA\051211-521\0512019.D
B	J:\MS16\DATA\051211-521\0512016.D	F	J:\MS16\DATA\051211-521\0512020.D
C	J:\MS16\DATA\051211-521\0512017.D		
D	J:\MS16\DATA\051211-521\0512018.D		

Analyte Name	Level			Level			Level			Level					
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF			
N-Nitrosodimethylamine-d6	A	1.0	3.06	B	2.0	3.45	C	5.0	4.25	D	10	4.54	E	20	5.21
	F	50	7.35												
N-Nitrosodimethylamine	A	1.0	1.11	B	2.0	1.01	C	5.0	1.35	D	10	1.24	E	20	1.38
	F	50	2.25												

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Calibration Date: 05/12/2011

**Initial Calibration Summary
 Nitrosamines by EPA 521**

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

Analyte Name	Compound Type	Calibration Evaluation					RRF Evaluation		
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
N-Nitrosodimethylamine-d6	SURR	Quadratic	COD	1.000		≥ 0.99	4.64		
N-Nitrosodimethylamine	MS	Quadratic	COD	0.999		≥ 0.99	1.39		

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Calibration Date: 05/12/2011
Date Analyzed: 05/12/2011

Second Source Calibration Verification
Nitrosamines by EPA 521

Calibration Type: Internal Standard
Analysis Method: 521

Calibration ID: CAL10502
Units: ug/L

File ID: J:\MS16\DATA\051211-521\0512021.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine	10	7.6	1.39	0.877	NA	-24	± 30 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Injection Log

Directory: J:\MS16\DATA\051211-521

CAL 60502

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1		0512.D	1.	IB		12 May 2011 20:1
2	1	0512001.D	1.	5-11B 521 1 PPB		12 May 2011 20:5
3	2	0512002.D	1.	5-11C 521 2 PPB		12 May 2011 21:3
4	3	0512003.D	1.	5-11D 521 5 PPB		12 May 2011 22:1
5	4	0512004.D	1.	5-11E 521 10 PPB		12 May 2011 22:4
6	5	0512005.D	1.	5-11F 521 20 PPB		12 May 2011 23:2
7	6	0512006.D	1.	5-11G 521 50 PPB		12 May 2011 12:0
8	7	0512007.D	1.	5-11H 521 ICV10 PPB		12 May 2011 12:4
9	5	0512008.D	1.	5-11F 521 20 PPB		12 May 2011 25:2
10	7	0512009.D	1.	5-11H 521 ICV10 PPB		12 May 2011 26:0
11		0512010.D	1.	IB		12 May 2011 26:4
12	3	0512011.D	1.	5-11D 521 5 PPB		12 May 2011 27:2
13	8	0512012.D	1.	050211-MB		12 May 2011 28:0
14	2	0512013.D	1.	5-11C 521 2 PPB		12 May 2011 28:4
15		0512014.D	1.	IB		12 May 2011 30:2
16	1	0512015.D	1.	5-11B 521 1 PPB		12 May 2011 30:5
17	2	0512016.D	1.	5-11C 521 2 PPB		12 May 2011 31:3
18	3	0512017.D	1.	5-11D 521 5 PPB		12 May 2011 32:1
19	4	0512018.D	1.	5-11E 521 10 PPB		12 May 2011 32:5
20	5	0512019.D	1.	5-11F 521 20 PPB		12 May 2011 33:3
21	6	0512020.D	1.	5-11G 521 50 PPB		12 May 2011 34:1
22	7	0512021.D	1.	5-11H 521 ICV10 PPB		12 May 2011 34:5
23		0512022.D	1.	IB		12 May 2011 35:3
24	3	0512023.D	1.	5-11D 521 5 PPB		13 May 2011 12:1
25	3	0512024.D	1.	5-11D 521 5 PPB		13 May 2011 12:4
26	8	0512025.D	1.	050211-MB		13 May 2011 13:2
27	2	0512026.D	1.	5-11C 521 2 PPB		13 May 2011 14:0
28	8	0512027.D	1.	050211-MB		13 May 2011 14:4
29	9	0512028.D	1.	050211-LCS		13 May 2011 15:2

051211 *25/5/11*

DATA ANALYSIS PARAMETERS

Method Name: J:\MS16\METHODS\051211_D14.M

Percent Report Settings

Sort By: Signal

Output Destination

Screen: Yes
Printer: No
File: No

Integration Events: Meth Default

Generate Report During Run Method: No

Signal Correlation Window: 0.020

Qualitative Report Settings

Peak Location of Unknown: Apex

Library to Search Minimum Quality
L:\DATABASE\NIST98.L 0

Integration Events: Meth Default

Report Type: Summary

Output Destination

Screen: No
Printer: Yes
File: No

Generate Report During Run Method: No

Quantitative Report Settings

Report Type: Summary

Output Destination

Screen: No
Printer: Yes
File: No

Generate Report During Run Method: Yes

Reference Window: 0.60 Minutes
Non-Reference Window: 1.00 Minutes
Correlation Window: 0.05 minutes
Default Multiplier: 1.00
Default Sample Concentration: 0.00

Compound Information

1) NDPA-d14 (ISTD)

Ret. Time 20.11 min., Extract & Integrate from 19.81 to 20.41 min.

Signal	Rel Resp.	Pct. Unc. (abs)	Integration
Tgt 97.00			*** METH DEFAULT ***
Q1 145.00	27.70	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	50.000	33124
2	50.000	32642
3	50.000	33027
4	50.000	34066
5	50.000	30941
6	50.000	30878

Qualifier Peak Analysis OFF ISTD conc: 50.000 ug/L
Curve Fit: Avg. RF

2) NDEA-d10 ()

Ret. Time 14.98 min., Extract & Integrate from 14.68 to 15.28 min.

Signal	Rel Resp.	Pct. Unc. (abs)	Integration
Tgt 81.00			*** METH DEFAULT ***
Q1 113.00	4.70	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	50.000	-1
2	50.000	-1
3	50.000	-1
4	50.000	-1
5	50.000	-1
6	50.000	-1

Qualifier Peak Analysis OFF
Curve Fit: Avg. RF

3) NDMA-d6 ()

Ret. Time 10.43 min., Extract & Integrate from 10.13 to 10.73 min.

Signal	Rel Resp.	Pct. Unc. (abs)	Integration
Tgt 50.00			*** METH DEFAULT ***

Q1 81.00 8.40 20.0

*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	2027
2	2.000	4501
3	5.000	14037
4	10.000	30941
5	20.000	64495
6	50.000	226827

Qualifier Peak Analysis OFF
Curve Fit: Quadratic

4) NDMA ()

Ret. Time 10.55 min., Extract & Integrate from 10.25 to 10.85 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 47.00			*** METH DEFAULT ***
Q1 75.00	12.60	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	736
2	2.000	1325
3	5.000	4463
4	10.000	8429
5	20.000	17071
6	50.000	69326

Qualifier Peak Analysis OFF
Curve Fit: Quadratic

5) NMEA ()

Ret. Time 13.13 min., Extract & Integrate from 12.82 to 13.43 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 61.00			*** METH DEFAULT ***
Q1 89.00	9.40	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	4469
2	2.000	9214
3	5.000	29471
4	10.000	60836
5	20.000	126903
6	50.000	353142

Qualifier Peak Analysis OFF
Curve Fit: Quadratic

6) NDEA ()

Ret. Time 15.24 min., Extract & Integrate from 14.94 to 15.54 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 75.00			*** METH DEFAULT ***
Q1 103.00	13.00	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
--------	-------------	----------

1	1.000	543
2	2.000	1201
3	5.000	3824
4	10.000	7990
5	20.000	15844
6	50.000	41484

Qualifier Peak Analysis OFF
Curve Fit: Quadratic

7) NDPA ()

Ret. Time 20.42 min., Extract & Integrate from 20.12 to 20.72 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 89.00			*** METH DEFAULT ***
Q1 131.00	9.80	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	565
2	2.000	1341
3	5.000	4167
4	10.000	8465
5	20.000	17439
6	50.000	45632

Qualifier Peak Analysis OFF
Curve Fit: Quadratic

8) NPYR ()

Ret. Time 22.75 min., Extract & Integrate from 22.45 to 23.05 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 55.00			*** METH DEFAULT ***
Q1 101.00	12.10	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	4102
2	2.000	9115
3	5.000	26752
4	10.000	59611
5	20.000	119028
6	50.000	303697

Qualifier Peak Analysis OFF
Curve Fit: Quadratic

9) NPIP ()

Ret. Time 23.66 min., Extract & Integrate from 23.36 to 23.96 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 69.00			*** METH DEFAULT ***
Q1 115.00	12.60	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	7526
2	2.000	15898
3	5.000	47284

4	10.000	102967
5	20.000	206391
6	50.000	519935

Qualifier Peak Analysis OFF
Curve Fit: Quadratic

10) NDBA

()

Ret. Time 25.83 min., Extract & Integrate from 25.53 to 26.13 min.

Signal	Rel Resp.	Pct. Unc.(abs)	Integration
Tgt 57.00			*** METH DEFAULT ***
Q1 159.00	14.10	20.0	*** METH DEFAULT ***

Lvl ID	Conc (ug/L)	Response
1	1.000	1432
2	2.000	4540
3	5.000	16066
4	10.000	34476
5	20.000	79619
6	50.000	192628

Qualifier Peak Analysis OFF
Curve Fit: Quadratic

END OF DATA ANALYSIS PARAMETERS

Fri May 13 10:00:11 2011

Data File : J:\MS16\DATA\051211-521\0512015.D
 Acq On : 12 May 11 18:58
 Sample : 5-11B 521 1 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 08:15:12 2011

Vial: 1
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL 10500
 Last Update : Thu May 12 17:17:45 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) NDPA-d14	20.10	97	33124	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	2027	1.14	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.54	47	736	0.71	ug/L	82
5) NMEA	13.13	61	4469	1.11	ug/L	95
6) NDEA	15.22	75	543	0.73	ug/L	90
7) NDPA	20.39	89	565	0.69	ug/L	89
8) NPYR	22.73	55	4102	0.79	ug/L	99
9) NPIP	23.65	69	7526	0.83	ug/L	96
10) NDBA	25.83	57	1432	2.06	ug/L	87

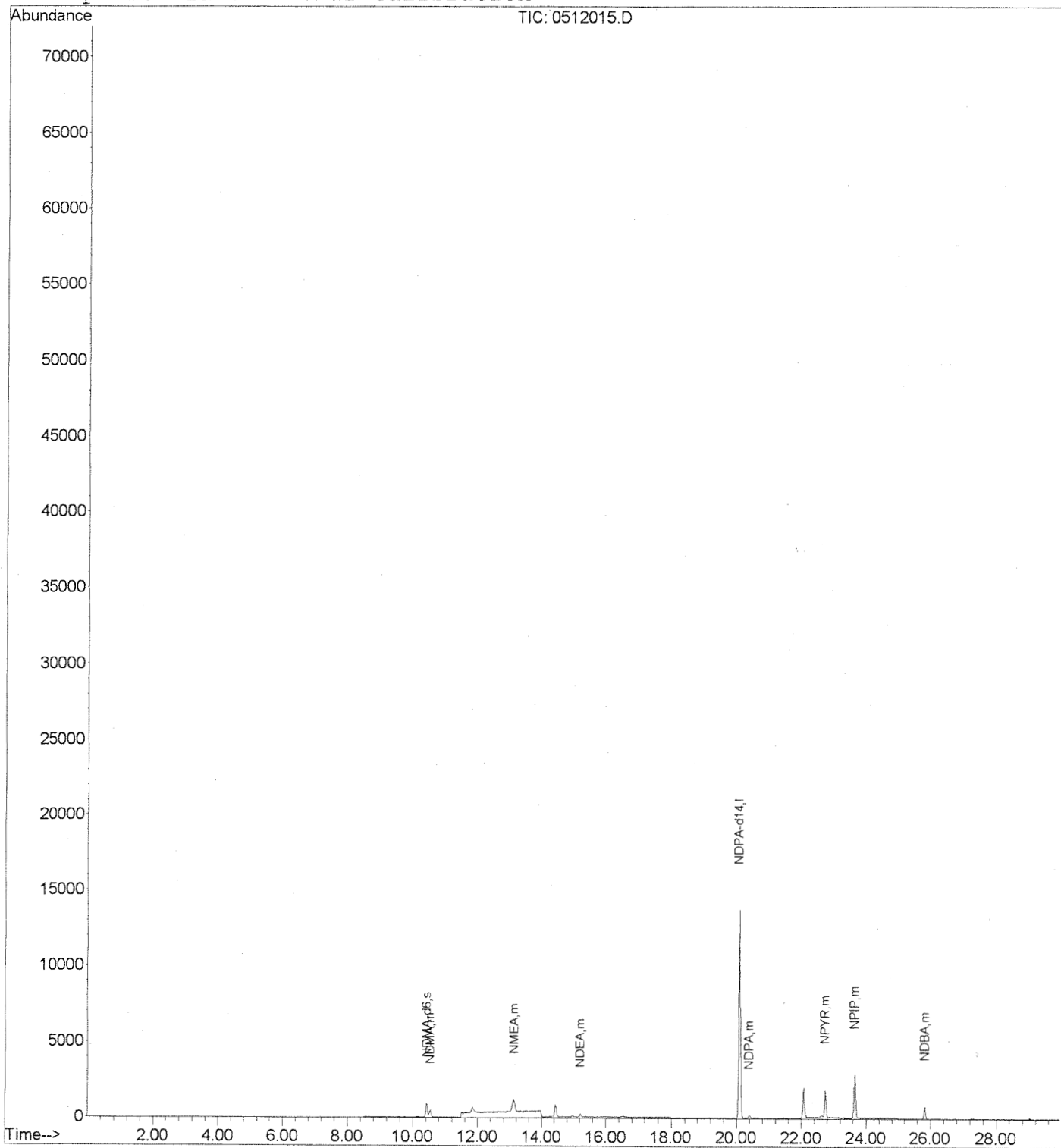
6-5-11

Data File : J:\MS16\DATA\051211-521\0512015.D
Acq On : 12 May 11 18:58
Sample : 5-11B 521 1 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011

Vial: 1
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL 10500
Last Update : Fri May 13 08:21:18 2011
Response via : Initial Calibration



WST/BLM

Data File : J:\MS16\DATA\051211-521\0512016.D
 Acq On : 12 May 11 19:37
 Sample : 5-11C 521 2 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 08:15:12 2011

Vial: 2
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL_10500
 Last Update : Thu May 12 17:20:23 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) NDPA-d14	20.11	97	32642	50.00	ug/L	0.00
System Monitoring Compounds						
3) NDMA-d6	10.41	50	4501	1.93	ug/L	-0.02
Target Compounds						Qvalue
4) NDMA	10.54	47	1325	1.30	ug/L	86
5) NMEA	13.12	61	9214	1.88	ug/L	90
6) NDEA	15.22	75	1201	1.64	ug/L	86
7) NDPA	20.39	89	1341	1.66	ug/L	98
8) NPYR	22.74	55	9115	1.77	ug/L	90
9) NPIP	23.64	69	15898	1.77	ug/L	97
10) NDBA	25.81	57	4540	2.57	ug/L	97

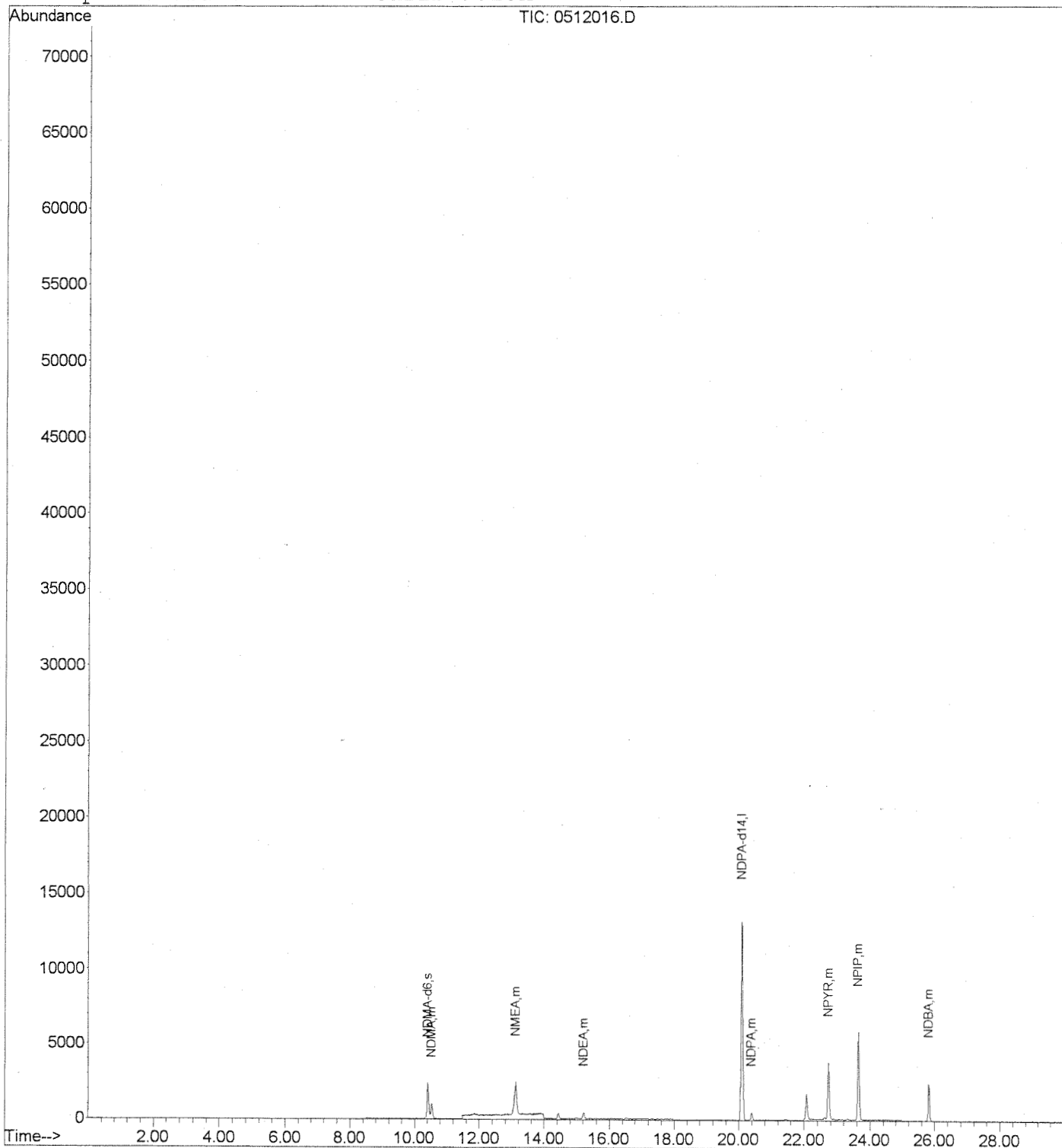
Handwritten signature

Data File : J:\MS16\DATA\051211-521\0512016.D
Acq On : 12 May 11 19:37
Sample : 5-11C 521 2 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011

Vial: 2
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL_10500
Last Update : Fri May 13 08:21:18 2011
Response via : Initial Calibration



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Data File : J:\MS16\DATA\051211-521\0512017.D
 Acq On : 12 May 11 20:16
 Sample : 5-11D 521 5 PPB
 Misc :

Vial: 3
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

MS Integration Params: RTEINT.P
 Quant Time: May 13 08:15:13 2011

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL_10500
 Last Update : Thu May 12 17:20:23 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) NDPA-d14	20.09	97	33027	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	14037	4.91	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.54	47	4463	4.38	ug/L	68
5) NMEA	13.12	61	29471	5.09	ug/L	93
6) NDEA	15.22	75	3824	5.15	ug/L	76
7) NDPA	20.41	89	4167	5.10	ug/L	73
8) NPYR	22.73	55	26752	5.15	ug/L	81
9) NPIP	23.64	69	47284	5.21	ug/L	94
10) NDBA	25.82	57	16066	4.47	ug/L	88

CSA

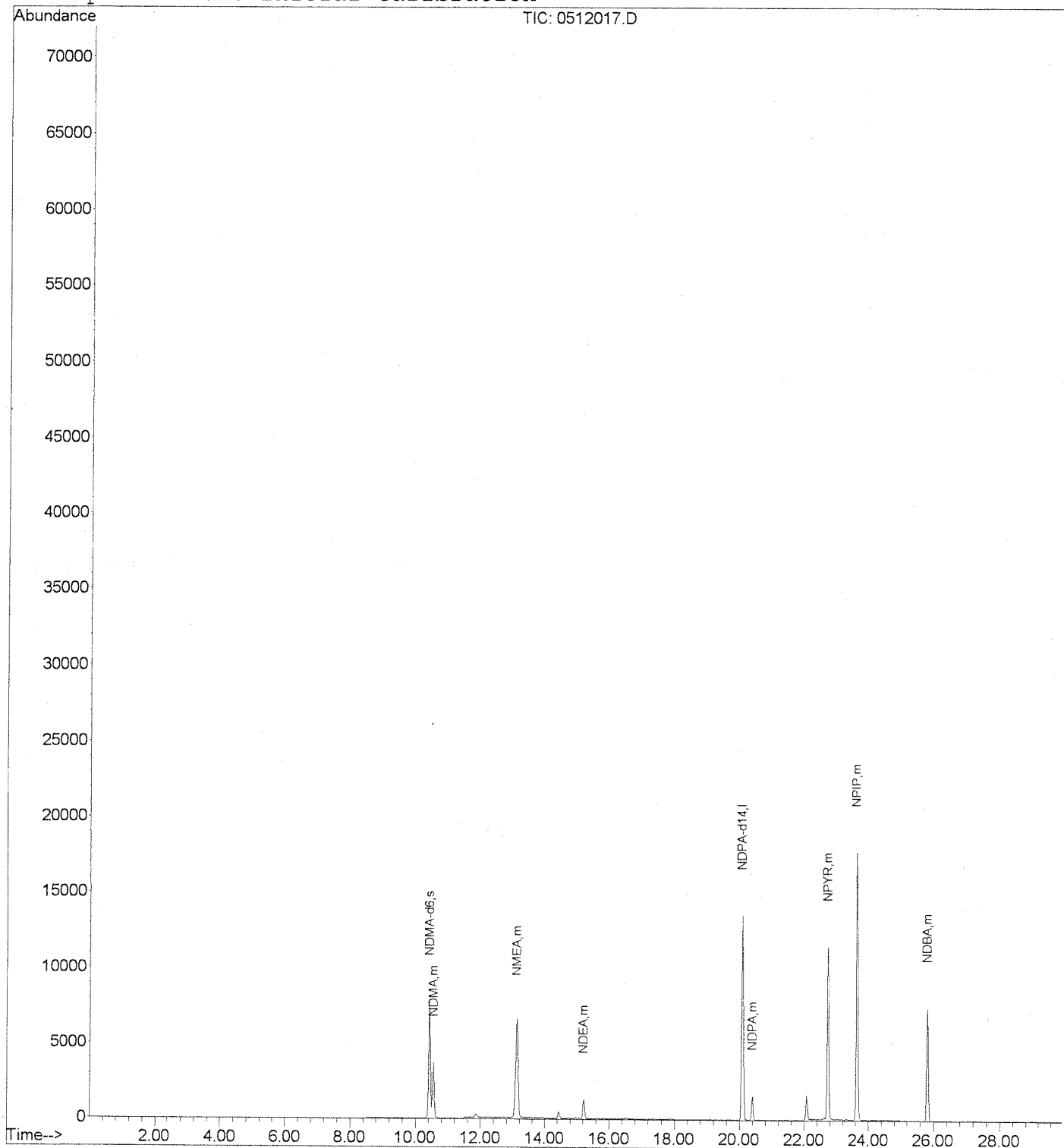
Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512017.D
Acq On : 12 May 11 20:16
Sample : 5-11D 521 5 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011

Vial: 3
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL 10500
Last Update : Fri May 13 08:21:18 2011
Response via : Initial Calibration



Data File : J:\MS16\DATA\051211-521\0512018.D
 Acq On : 12 May 11 20:55
 Sample : 5-11E 521 10 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 08:15:13 2011

Vial: 4
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL 10500
 Last Update : Thu May 12 17:20:23 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)	
1) NDPA-d14	20.09	97	34066	50.00	ug/L	-0.02	
System Monitoring Compounds							
3) NDMA-d6	10.43	50	30941	10.05	ug/L	0.00	
Target Compounds							
4) NDMA	10.53	47	8429	8.17	ug/L		Qvalue 67
5) NMEA	13.11	61	60836	9.78	ug/L		87
6) NDEA	15.21	75	7990	10.43	ug/L		55
7) NDPA	20.39	89	8465	10.04	ug/L		87
8) NPYR	22.73	55	59611	11.12	ug/L		76
9) NPIP	23.64	69	102967	11.00	ug/L		90
10) NDBA	25.81	57	34476	7.48	ug/L		87

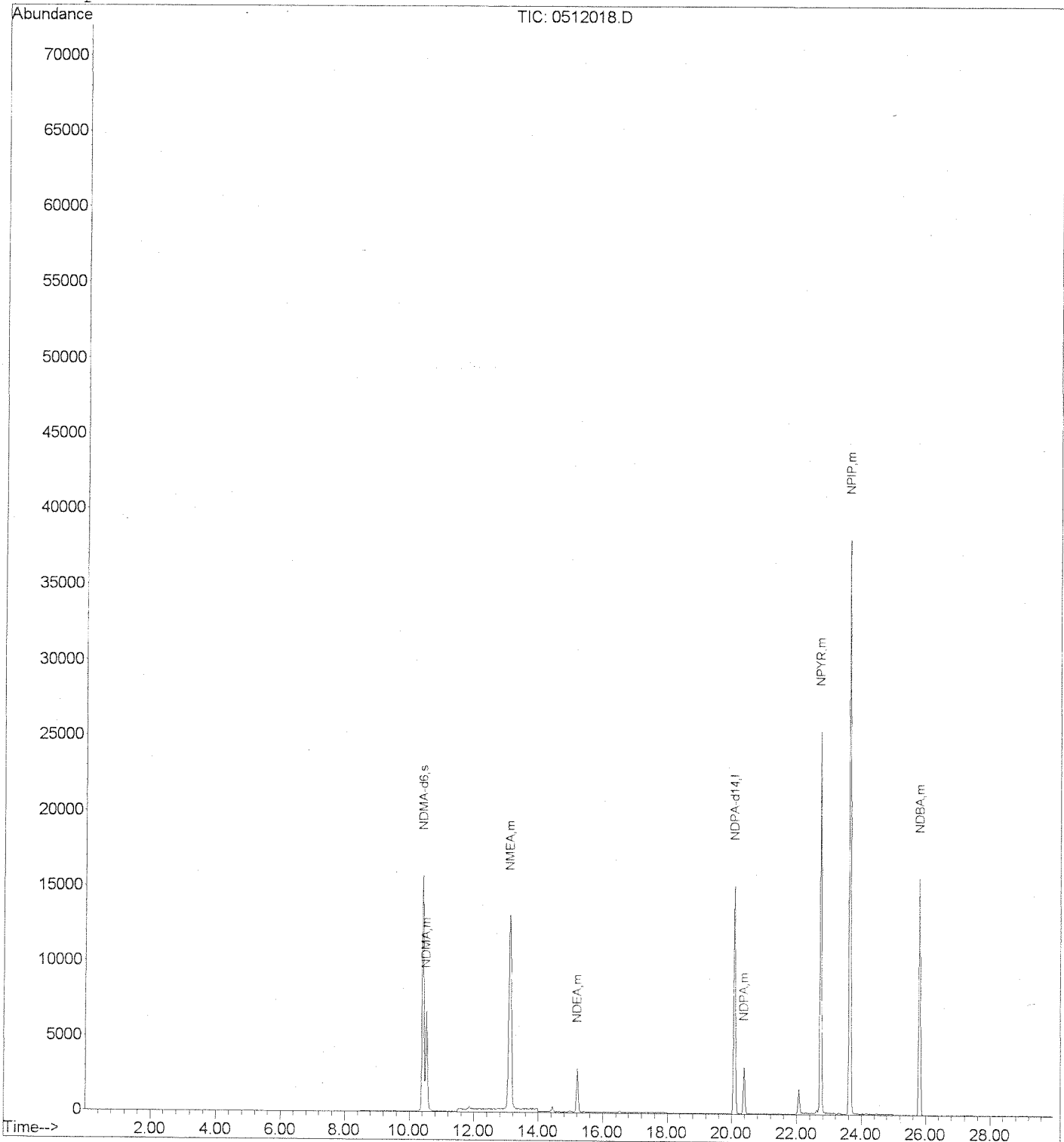
Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512018.D
Acq On : 12 May 11 20:55
Sample : 5-11E 521 10 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011

Vial: 4
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL 10500
Last Update : Fri May 13 08:21:18 2011
Response via : Initial Calibration



Data File : J:\MS16\DATA\051211-521\0512019.D
 Acq On : 12 May 11 21:34
 Sample : 5-11F 521 20 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 08:15:13 2011

Vial: 5
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL_10500
 Last Update : Thu May 12 17:20:23 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

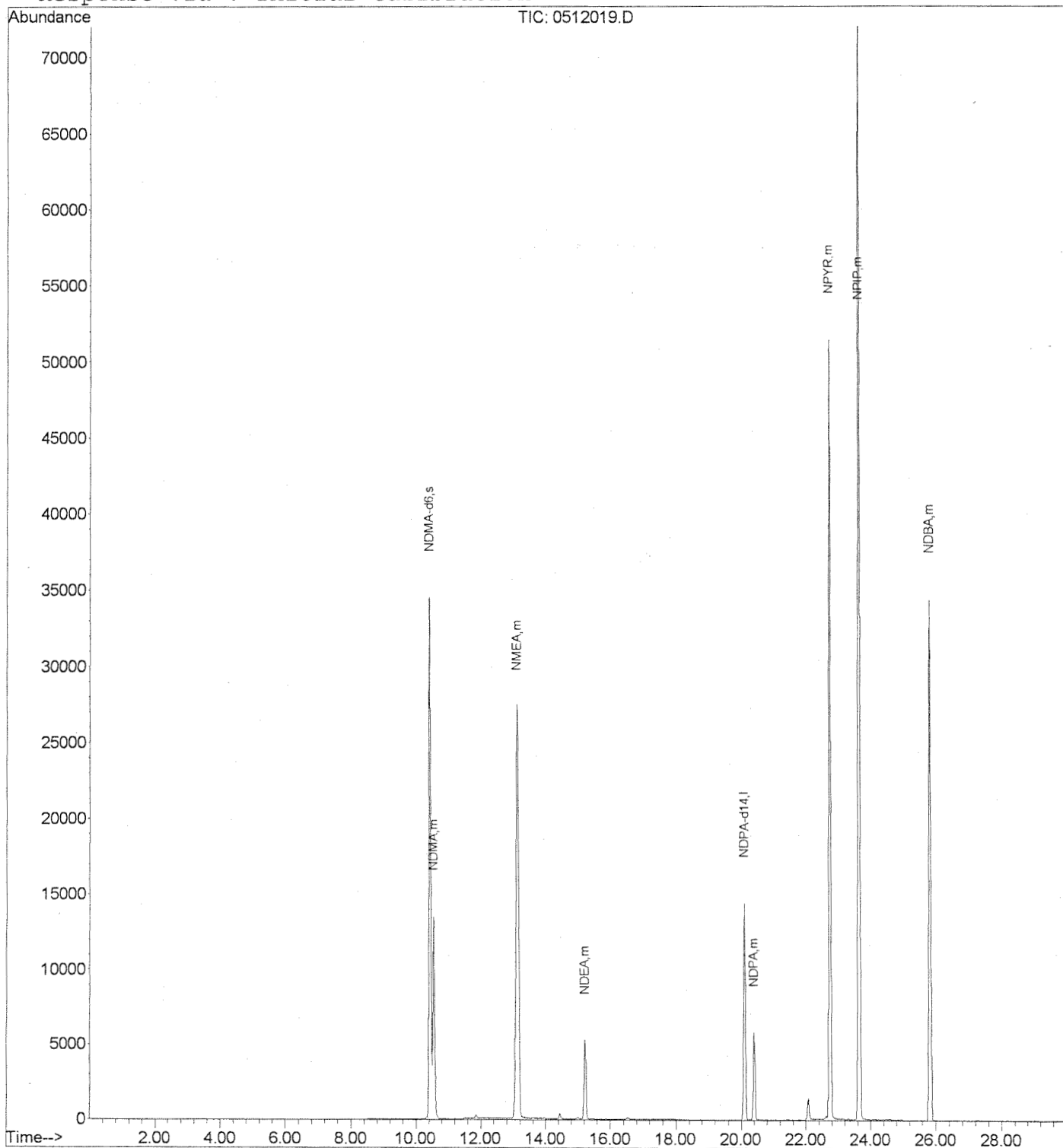
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	30941	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	64495	23.27	ug/L	0.00
Target Compounds						
4) NDMA	10.55	47	17071	19.26	ug/L	Qvalue # 22
5) NMEA	13.13	61	126903	21.89	ug/L	88
6) NDEA	15.21	75	15844	22.76	ug/L	71
7) NDPA	20.39	89	17439	22.78	ug/L	95
8) NPYR	22.73	55	119028	24.45	ug/L	75
9) NPIP	23.64	69	206391	24.28	ug/L	90
10) NDBA	25.81	57	79619	17.80	ug/L	87

Data File : J:\MS16\DATA\051211-521\0512019.D
Acq On : 12 May 11 21:34
Sample : 5-11F 521 20 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 8:18 2011

Vial: 5
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL 10500
Last Update : Fri May 13 08:21:18 2011
Response via : Initial Calibration



Handwritten signature/initials

Data File : J:\MS16\DATA\051211-521\0512020.D
 Acq On : 12 May 11 22:13
 Sample : 5-11G 521 50 PPB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 13 08:15:13 2011

Vial: 6
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL 10500
 Last Update : Thu May 12 17:20:23 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) NDPA-d14	20.10	97	30878	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.42	50	226827	109.62	ug/L	-0.01
Target Compounds						Qvalue
4) NDMA	10.54	47	69326	Below Cal		59
5) NMEA	13.11	61	353142	59.78	ug/L	80
6) NDEA	15.21	75	41484	59.72	ug/L	51
7) NDPA	20.39	89	45632	59.73	ug/L	80
8) NPYR	22.74	55	303697	62.51	ug/L	55
9) NPIP	23.64	69	519935	61.28	ug/L	76
10) NDBA	25.82	57	192628	Below Cal		96

Handwritten signature

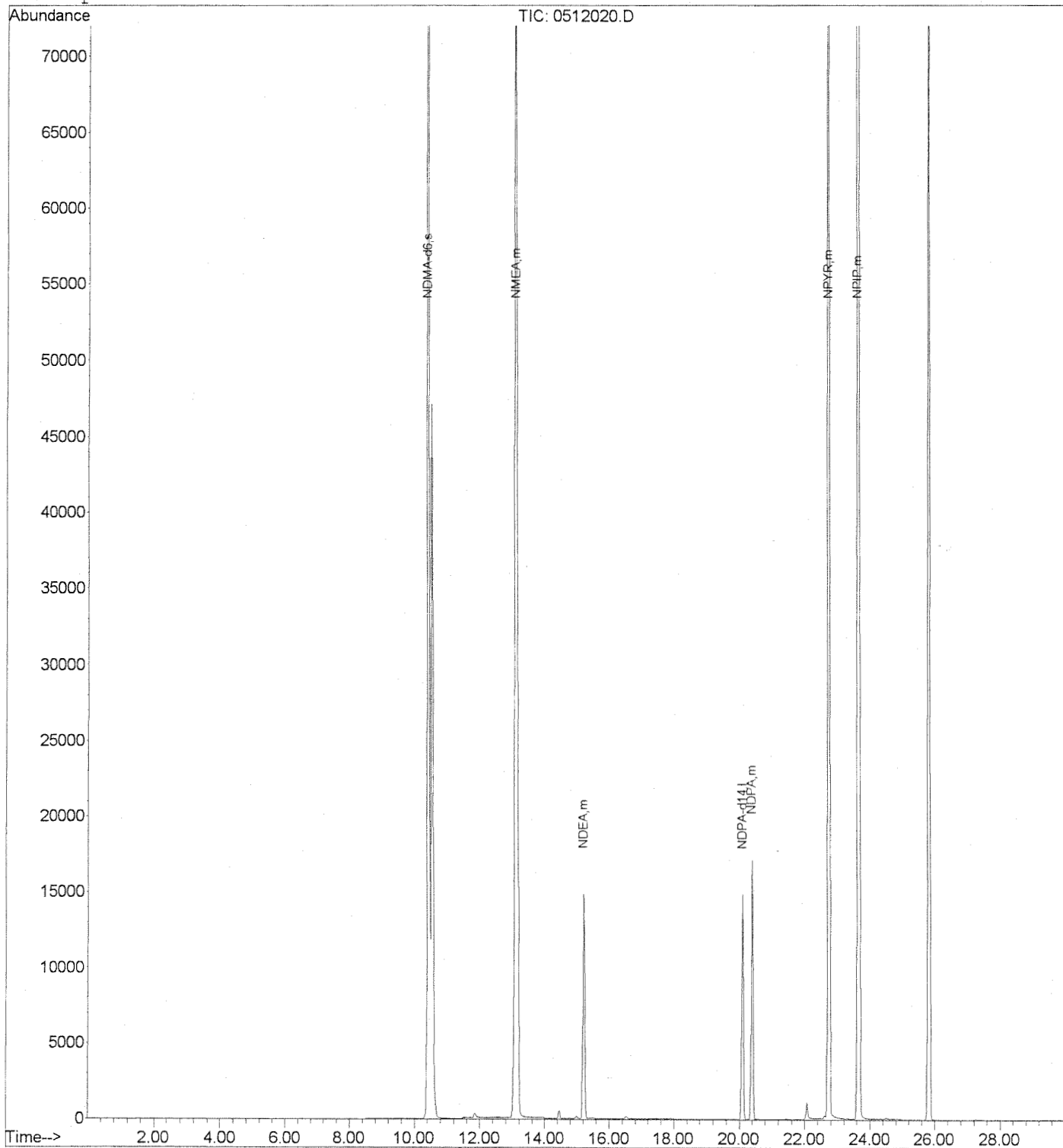
Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512020.D
Acq On : 12 May 11 22:13
Sample : 5-11G 521 50 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 8:18 2011

Vial: 6
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL 10500
Last Update : Fri May 13 08:21:18 2011
Response via : Initial Calibration



051211

Data File : J:\MS16\DATA\051211-521\0512021.D
 Acq On : 12 May 11 22:52
 Sample : 5-11H 521 ICV10 PPB
 Misc :

Vial: 7
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

MS Integration Params: RTEINT.P
 Quant Time: May 13 09:55:22 2011

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL 10500
 Last Update : Fri May 13 09:55:14 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	31927	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	0.00	50	0	0.00	ug/L	
Target Compounds						Qvalue
4) NDMA	10.56	47	5601	7.57	ug/L #	1
5) NMEA	13.12	61	47068	7.97	ug/L	65
6) NDEA	15.21	75	6866	8.91	ug/L #	21
7) NDPA	20.40	89	6440	7.77	ug/L	88
8) NPYR	22.74	55	48532	8.45	ug/L	85
9) NPIP	23.64	69	85018	8.49	ug/L	93
10) NDBA	25.81	57	27438	7.81	ug/L	86

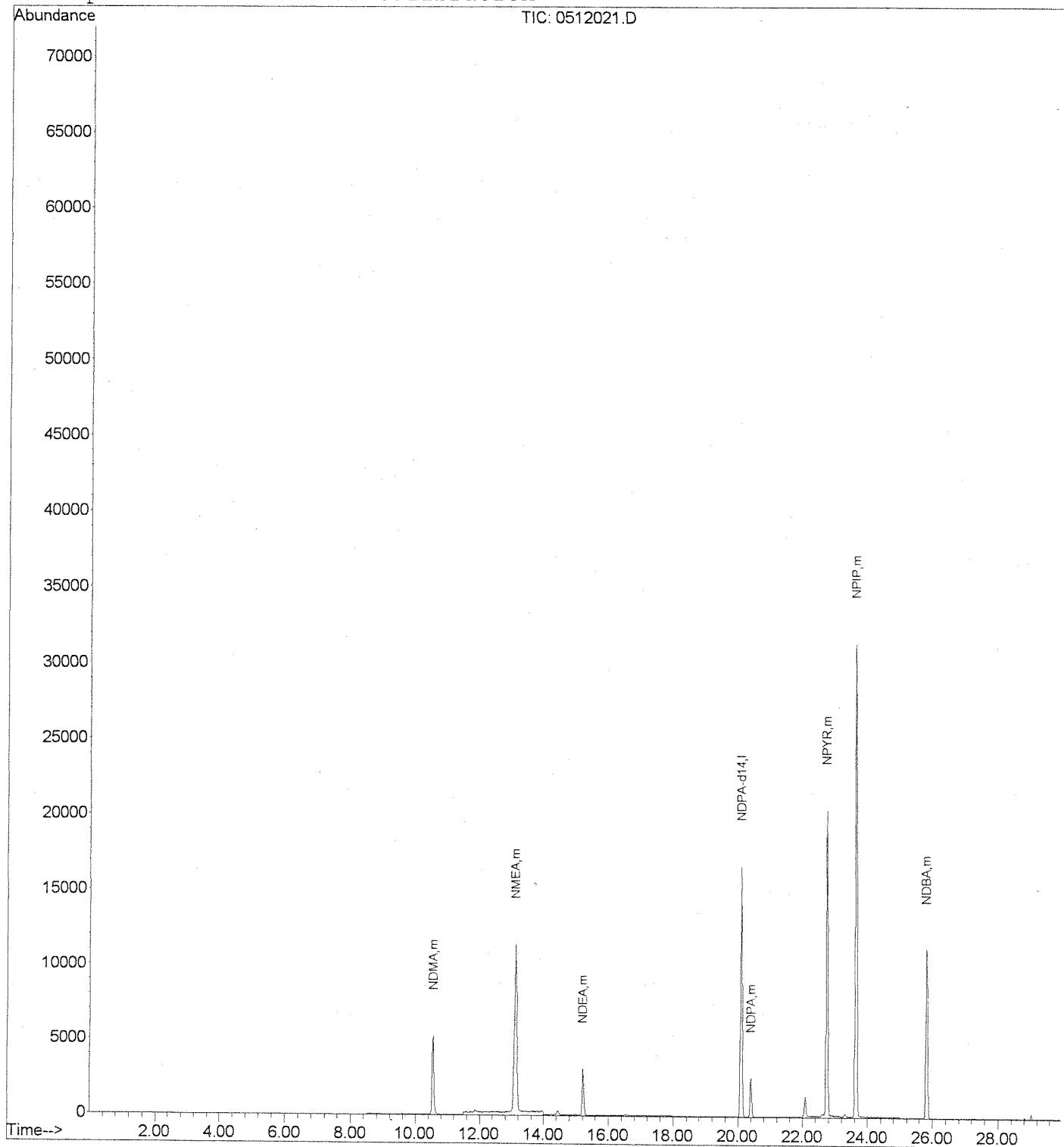
Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512021.D
Acq On : 12 May 11 22:52
Sample : 5-11H 521 ICV10 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 13 9:55 2011

Vial: 7
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL 10500
Last Update : Fri May 13 09:55:14 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Date Analyzed: 05/16/2011

Continuing Calibration Verification Summary
Nitrosamines by EPA 521

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/12/2011
Calibration ID: CAL10502
Analysis Lot: KWG1104374
Units: ug/L

File ID: J:\MS16\DATA\051611-521\0516013.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	10	9.4		4.64	4.19	NA	-6	± 50 %	Quadratic
N-Nitrosodimethylamine	10	11		1.39	1.32	NA	8	± 50 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Quantitation Report

Bottle ID:	Tier:	Matrix:	NOT APPLICABLE
Prod Code: 521 NITROSAMINE	Collect Date:	Receive Date:	05/17/2011

Analysis Lot: KWG1104374	Prep Lot:	Report Group:
Analysis Method: 521	Prep Method:	
Prep Ref:	Prep Date:	

Quant Method: J:\MS16\METHODS\051211_D14.M	Calibration ID: CAL10502
Title:	
Tune Ref: J:\MS16\DATA\051611-521\0516.D	Method ID: MJ808
MB Ref:	Quant based on Method

Data File: J:\MS16\DATA\051611-521\0516013.D	Instrument: MS16
Acqu Date: 05/16/2011 17:05	Quant Date: 05/16/2011 18:03
Run Type: CCV	Vial: 2
Lab ID: KWG1104374-3	Dilution: 1.0
	Soln Conc. Units: ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.12	0.03	97	33399	50.00	OK
1	N-Nitrosodiethylamine-d10			81	0		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.44			50	27968	9.39		70-130	NA

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc. Units: ng/L	
								Final Conc	Q Rpt?
1	N-Nitrosodimethylamine	10.56			47	8846	10.75		
1	N-Nitrosomethylethylamine	13.14			61	58562	9.33		
1	N-Nitrosodiethylamine	15.25			75	7569	9.36		
1	N-Nitrosodi-n-propylamine	20.43			89	8666	9.81		
1	N-Nitrosopyrrolidine	22.77			55	66630	10.88		
1	N-Nitrosopiperidine	23.69			69	128957	12.04		
1	N-Nitrosodi-n-butylamine	25.86			57	42647	11.19		

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS16\DATA\051611-521\0516013.D
 Acq On : 16 May 11 17:05
 Sample : 5-11E 521 10 PPB
 Misc :

Vial: 2
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 16 18:03:49 2011

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)

Title : 051211_D14.m MJ808 CAL 10502

Last Update : Fri May 13 10:05:05 2011

Response via : Initial Calibration

DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) NDPA-d14	20.12	97	33399	50.00	ug/L	0.01

System Monitoring Compounds

3) NDMA-d6	10.44	50	27968	9.39	ug/L	0.00
------------	-------	----	-------	------	------	------

Target Compounds

	R.T.	QIon	Response	Conc	Units	Qvalue
4) NDMA	10.56	47	8846	10.75	ug/L	70
5) NMEA	13.14	61	58562	9.33	ug/L	98
6) NDEA	15.25	75	7569	9.36	ug/L	99
7) NDPA	20.43	89	8666	9.81	ug/L	88
8) NPYR	22.77	55	66630	10.88	ug/L	90
9) NPIP	23.69	69	128957	12.04	ug/L	87
10) NDDBA	25.86	57	42647	11.19	ug/L	92

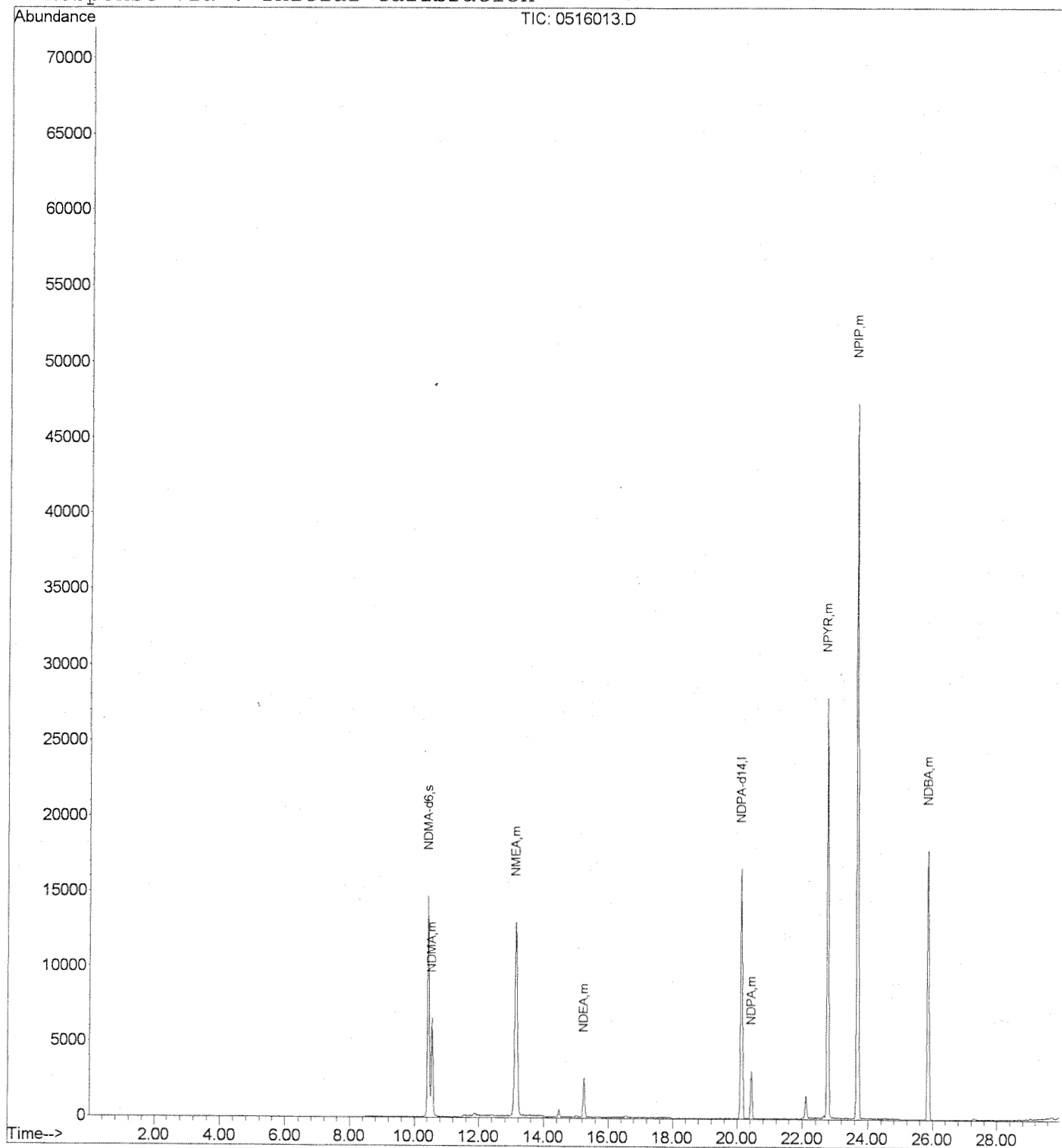
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Data File : J:\MS16\DATA\051611-521\0516013.D
Acq On : 16 May 11 17:05
Sample : 5-11E 521 10 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 16 18:03 2011

Vial: 2
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Date Analyzed: 05/16/2011

**Continuing Calibration Verification Summary
 Nitrosamines by EPA 521**

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/12/2011
Calibration ID: CAL10502
Analysis Lot: KWG1104374
Units: ug/L

File ID: J:\MS16\DATA\051611-521\0516021.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	5.0	6.1		4.64	5.12	NA	22	± 50 %	Quadratic
N-Nitrosodimethylamine	5.0	5.0		1.39	1.11	NA	0	± 50 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Exception Report

Data File: J:\MS16\DATA\051611-521\0516021.D
Lab ID: KWG1104374-4
RunType: CCV
Matrix: NOT APPLICABLE

Date Acquired: 05/16/2011 22:16
Date Quantitated: 05/17/2011 07:48
Batch ID: KWG1104374
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	

Primary Review: ASMM
Secondary Review: _____

Quantitation Report

Bottle ID:	Tier:	Matrix:	NOT APPLICABLE
Prod Code: 521 NITROSAMINE	Collect Date:	Receive Date:	05/17/2011

Analysis Lot: KWG1104374	Prep Lot:	Report Group:
Analysis Method: 521	Prep Method:	
Prep Ref:	Prep Date:	

Quant Method: J:\MS16\METHODS\051211_D14.M	Calibration ID: CAL10502
Title:	
Tune Ref: J:\MS16\DATA\051611-521\0516.D	Method ID: MJ808
MB Ref:	Quant based on Method

Data File: J:\MS16\DATA\051611-521\0516021.D	Instrument: MS16
Acqu Date: 05/16/2011 22:16	Quant Date: 05/17/2011 07:48
Run Type: CCV	Vial: 1
Lab ID: KWG1104374-4	Dilution: 1.0
	Soln Conc. Units: ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.14	0.05	97	30446	50.00	OK
1	N-Nitrosodiethylamine-d10			81	0		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.46			50	15600	6.11		70-130	NA

Target Compounds

							Final Conc. Units: ng/L			
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine	10.57			47	3389	5.01			
1	N-Nitrosomethylethylamine	13.15			61	29339	5.43			
1	N-Nitrosodiethylamine	15.26			75	3625	5.18			
1	N-Nitrosodi-n-propylamine	20.43			89	4287	5.61			
1	N-Nitrosopyrrolidine	22.78			55	28131	5.39			
1	N-Nitrosopiperidine	23.69			69	48166	5.29			
1	N-Nitrosodi-n-butylamine	25.86			57	18208	5.68			

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS16\DATA\051611-521\0516021.D
 Acq On : 16 May 11 22:16
 Sample : 5-11D 521 5 PPB
 Misc :

Vial: 1
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

MS Integration Params: RTEINT.P
 Quant Time: May 17 07:48:51 2011

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 051211_D14.m MJ808 CAL_10502
 Last Update : Fri May 13 10:05:05 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.14	97	30446	50.00	ug/L	0.03
System Monitoring Compounds						
3) NDMA-d6	10.46	50	15600	6.11	ug/L	0.02
Target Compounds						Qvalue
4) NDMA	10.57	47	3389	5.01	ug/L #	4
5) NMEA	13.15	61	29339	5.43	ug/L	67
6) NDEA	15.26	75	3625	5.18	ug/L #	4
7) NDPA	20.43	89	4287	5.61	ug/L	53
8) NPYR	22.78	55	28131	5.39	ug/L	92
9) NPIP	23.69	69	48166	5.29	ug/L	73
10) NDBA	25.86	57	18208	5.68	ug/L #	40

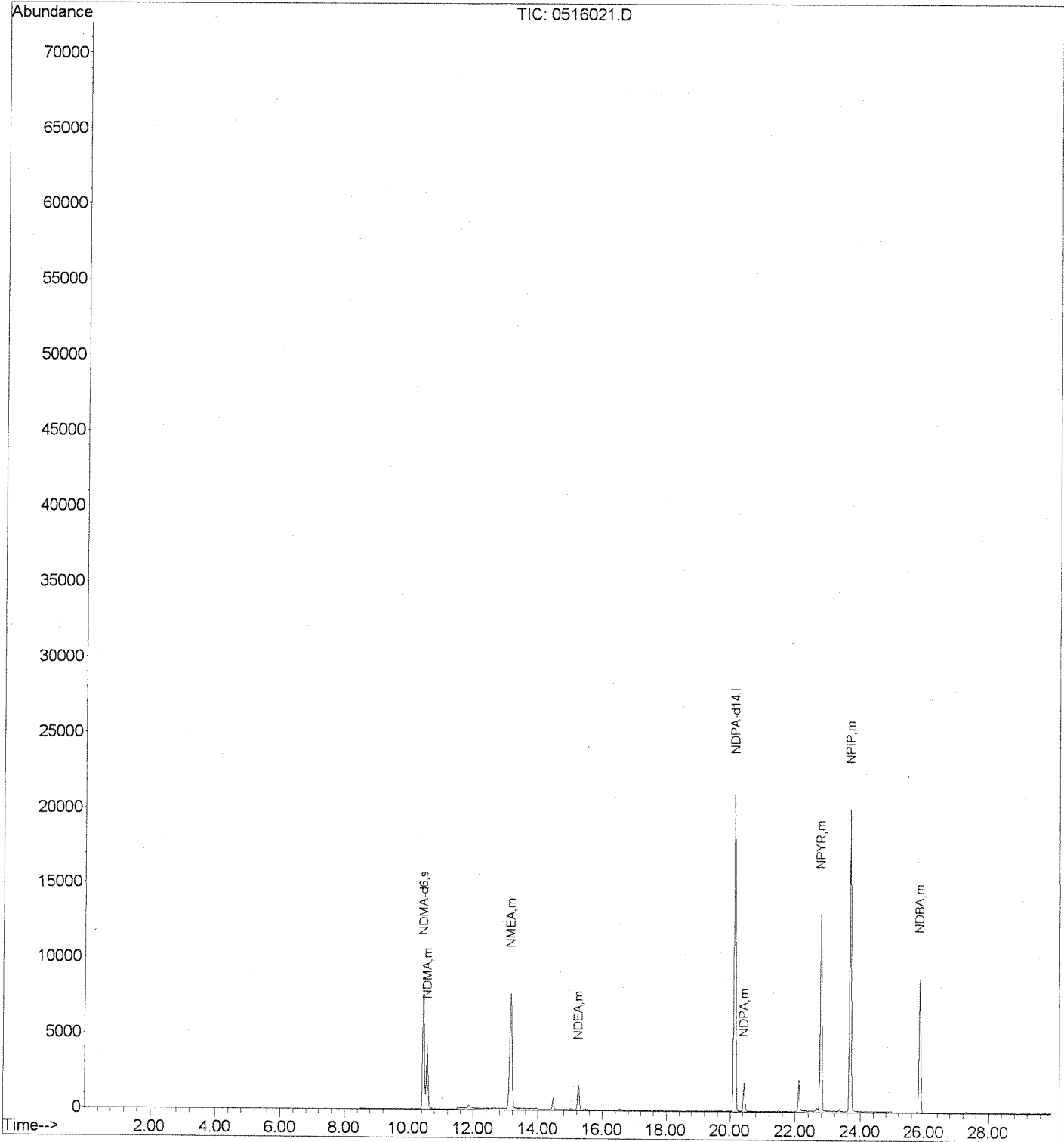
 (#) = qualifier out of range (m) = manual integration
 0516021.D 051211_D14.M Tue May 17 08:56:52 2011

Data File : J:\MS16\DATA\051611-521\0516021.D
Acq On : 16 May 11 22:16
Sample : 5-11D 521 5 PPB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 17 7:48 2011

Vial: 1
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant. Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration



Organic Analysis:
Nitrosamines by EPA 521

Validation Package

Sample Prep and Screen Data

Preparation Information

Group ID: KWG1104201	Prep Method: METHOD	Prep Date: 05/11/11 08:00
Department: Semivoa GC		

Lab Code	Client ID	Product	Matrix	Amt. Ext.	Final Vol.
KWG1104201-1	Matrix Spike	521 Nitrosamines	WATER	500ml	1ml
KWG1104201-2	Duplicate Matrix Spike	521 Nitrosamines	WATER	500ml	1ml
KWG1104201-3	Lab Control Sample	521 Nitrosamines	DRINKING	500ml	1ml
KWG1104201-4	Method Blank	521 Nitrosamines	DRINKING	500ml	1ml
P1101681-001	MW-16	521 Nitrosamines	WATER	500ml	1ml

Lab Code	Parent Lab Code	Comments
KWG1104201-1	P1101681-001	
KWG1104201-2	P1101681-001	

Lab Code	Prep Event ID	Surrogate Solution ID	Amount Added	Spike Solution ID	Amount Added	Witness
KWG1104201-1	1017598	DWSTD05-11A	10uL	DWSTD05-8 I	100uL	
KWG1104201-2	1017599	DWSTD05-11A	10uL	DWSTD05-8 I	100uL	
KWG1104201-3	1017600	DWSTD05-11A	10uL	DWSTD05-8 I	100uL	
KWG1104201-4	1017601	DWSTD05-11A	10uL			
P1101681-001	1017597	DWSTD05-11A	10uL			

Comments: _____

Started By: RHayes **Assisted By:** _____ **Training:** Yes No

Completed By: RHayes **Assisted By:** _____ **Training:** Yes No

Reviewed By: W **Date:** 5/17/11 **Storage:** 215A-F-06

Chain of Custody

Relinquished By: <u>[Signature]</u>	Date: <u>5/10/11</u>	Extracts Examined
Received By: <u>[Signature]</u>	Date: <u>5/16/11</u>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

COLUMBIA ANALYTICAL SERVICES, INC.

Service Request No.: As Listed

Date Extracted: 5-11-11

Analyst: Rob Hayes

Method: EPA 521

StarLims Run : _____

Nitrosoamines in Water

Lab ID	Client ID	Sample Volume	Surr	MS	Residual Chlorine	Final Volume
P1101681-001	5570	500mL	10ul	/	<0.1	1mL
MB	↓	↓	↓	/	↓	↓
LCS						
P1101681-001	ms	↓	↓	↓	↓	↓
P1101681-001	Dms					

Comments: _____

DCM Lot # DD020 MeOH Lot # DD471 Sulfate Lot # 3/15/11-BF1002

SPE Cartridge Lot # 903180-EL

Surrogate ID: DWST005-11A 1ppm xP 11/11/11

Spike ID: DWST005-8 I 100ppb xP 10-18-11 5570-DWST004-99.0 5ppm xP 8/17/11

Vial: Amber Extract Storage: 25A-F-06 Extracts Received: 6/5/11/11

Reviewed By: <u>[Signature]</u>	Date: <u>5/17/11</u>
---------------------------------	----------------------

Preparation Information Benchsheet

Prep Run#: 133596

Prep Workflow: OrgExtDW(14/28)

Status: Draft

Team: Semivoa GC

Prep Method: Method

Prep Date/Time: 5/11/11 08:13 AM

Number of Copies to make: 1

#	Lab Code	Client ID	B#	✓	Test	Matrix	Amt Ext.	pH	Int Vol	Final Vol	Surr Added	Spike Added
1	P1101681-001	MW-16	.01	✓	521/Nitrosamines	Water						

Comments: used for ID only

Surrogate ID: _____ Spike ID: _____

Witnessed By: _____

Analyst: _____ Assisted By: _____

1,4-Dioxane

Organic Analysis:
1,4-Dioxane by GC/MS

Summary Package

Sample and QC Results


Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681

Cover Page - Organic Analysis Data Package
1,4-Dioxane by GC/MS

Sample Name	Lab Code	Date Collected	Date Received
MW-16MS	KWG1104188-1	05/05/2011	05/05/2011
MW-16DMS	KWG1104188-2	05/05/2011	05/05/2011
MW-16	P1101681-001	05/05/2011	05/05/2011

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: 
Date: 5/18/11

Name: Carl Deque
Title: SWC Supervisor

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Collected: 05/05/2011
Date Received: 05/05/2011

1,4-Dioxane by GC/MS

Sample Name: MW-16
Lab Code: P1101681-001
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	0.83	J	1.0	0.16	1	05/11/11	05/17/11	KWG1104188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	72	42-112	05/17/11	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Collected: NA
Date Received: NA

1,4-Dioxane by GC/MS

Sample Name: Method Blank
Lab Code: KWG1104188-4
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	ND	U	1.0	0.16	1	05/11/11	05/17/11	KWG1104188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	86	42-112	05/17/11	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681

Surrogate Recovery Summary
1,4-Dioxane by GC/MS

Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
MW-16	P1101681-001	72
Method Blank	KWG1104188-4	86
MW-16MS	KWG1104188-1	87
MW-16DMS	KWG1104188-2	85
Lab Control Sample	KWG1104188-3	76

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Dioxane-d8 42-112

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Date Analyzed: 05/17/2011
Time Analyzed: 14:22

Internal Standard Area and RT Summary
1,4-Dioxane by GC/MS

File ID: J:\MS26\DATA\051711\0517F010.D
Instrument ID: MS26
Analysis Method: 8270C SIM

Lab Code: KWG1104446-2
Analysis Lot: KWG1104446

1,4-Dichlorobenzene-d4		
	<u>Area</u>	<u>RT</u>
Results ==>	47,308	7.18
Upper Limit ==>	94,616	7.68
Lower Limit ==>	23,654	6.68
ICAL Result ==>	84,266	7.17

Associated Analyses

Method Blank	KWG1104188-4	46,165	7.18
Lab Control Sample	KWG1104188-3	35,787	7.19
MW-16	P1101681-001	42,622	7.18
MW-16MS	KWG1104188-1	47,403	7.18
MW-16DMS	KWG1104188-2	38,708	7.19

Results flagged with an asterisk (*) indicate values outside control criteria.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/17/2011

**Matrix Spike/Duplicate Matrix Spike Summary
 1,4-Dioxane by GC/MS**

Sample Name: MW-16
Lab Code: P1101681-001
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1104188

Analyte Name	Sample Result	MW-16MS KWG1104188-1 Matrix Spike			MW-16DMS KWG1104188-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
1,4-Dioxane	0.83	24.6	25.0	95	20.5	25.0	79	40-114	18	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/17/2011

Lab Control Spike Summary
1,4-Dioxane by GC/MS

Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1104188

Analyte Name	Lab Control Sample KWG1104188-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
1,4-Dioxane	19.6	25.0	79	52-105

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/17/2011
Time Analyzed: 14:44

Method Blank Summary
1,4-Dioxane by GC/MS

Sample Name: Method Blank
Lab Code: KWG1104188-4
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

File ID: J:\MS26\DATA\051711\0517F011.D
Instrument ID: MS26
Level: Low
Extraction Lot: KWG1104188

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1104188-3	J:\MS26\DATA\051711\0517F012.D	05/17/11	15:04
MW-16	P1101681-001	J:\MS26\DATA\051711\0517F013.D	05/17/11	15:23
MW-16MS	KWG1104188-1	J:\MS26\DATA\051711\0517F014.D	05/17/11	15:43
MW-16DMS	KWG1104188-2	J:\MS26\DATA\051711\0517F015.D	05/17/11	16:03

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Date Analyzed: 05/17/2011
Time Analyzed: 14:01

**Tune Summary
1,4-Dioxane by GC/MS**

File ID: J:\MS26\DATA\051711\0517F009.D
Instrument ID: MS26
Column:

Analysis Method: 8270C SIM
Analysis Lot: KWG1104446

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	16.1	555869	PASS
68	69	0	2	1.4	10034	PASS
69	198	0	100	20.2	697373	PASS
70	69	0	2	0.5	3334	PASS
127	198	10	80	37.7	1302606	PASS
197	198	0	2	0.2	8535	PASS
198	442	30	100	54.0	3452650	PASS
199	198	5	9	6.5	224497	PASS
275	198	10	60	31.1	1072106	PASS
365	442	1	50	2.7	174669	PASS
441	443	0	100	72.3	1076074	PASS
442	442	100	100	100.0	6395904	PASS
443	442	15	24	23.3	1488341	PASS

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
Continuing Calibration Verification	KWG1104446-2	J:\MS26\DATA\051711\0517F010.D	05/17/2011	14:22	
Method Blank	KWG1104188-4	J:\MS26\DATA\051711\0517F011.D	05/17/2011	14:44	
Lab Control Sample	KWG1104188-3	J:\MS26\DATA\051711\0517F012.D	05/17/2011	15:04	
MW-16	P1101681-001	J:\MS26\DATA\051711\0517F013.D	05/17/2011	15:23	
MW-16MS	KWG1104188-1	J:\MS26\DATA\051711\0517F014.D	05/17/2011	15:43	
MW-16DMS	KWG1104188-2	J:\MS26\DATA\051711\0517F015.D	05/17/2011	16:03	

Results flagged with an asterisk (*) indicate the analysis performed outside specified tune window

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Calibration Date: 05/09/2011

**Initial Calibration Summary
 1,4-Dioxane by GC/MS**

Calibration ID: CAL10487
Instrument ID: MS26

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS26\DATA\050911\0509F007.D	E	J:\MS26\DATA\050911\0509F011.D
B	J:\MS26\DATA\050911\0509F008.D	F	J:\MS26\DATA\050911\0509F012.D
C	J:\MS26\DATA\050911\0509F009.D	G	J:\MS26\DATA\050911\0509F013.D
D	J:\MS26\DATA\050911\0509F010.D		

Analyte Name	Level			Level			Level			Level			Level		
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF
1,4-Dioxane	A	2.0	0.359	B	4.0	0.357	C	10	0.368	D	20	0.389	E	50	0.426
	F	100	0.432	G	200	0.450									
1,4-Dioxane-d8	A	2.0	0.369	B	4.0	0.357	C	10	0.368	D	20	0.403	E	50	0.403
	F	100	0.417	G	200	0.419									

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Calibration Date: 05/09/2011

**Initial Calibration Summary
 1,4-Dioxane by GC/MS**

Calibration ID: CAL10487
Instrument ID: MS26

Column: MS

Analyte Name	Compound Type	Calibration Evaluation				RRF Evaluation			
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
1,4-Dioxane	MS	AverageRF	% RSD	9.6		≤ 15	0.397		0.01
1,4-Dioxane-d8	SURR	AverageRF	% RSD	6.6		≤ 15	0.391		0.01

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Calibration Date: 05/09/2011
Date Analyzed: 05/09/2011

Second Source Calibration Verification
 1,4-Dioxane by GC/MS

Calibration Type: Internal Standard
Analysis Method: 8270C SIM

Calibration ID: CAL10487
Units: ng/ml

File ID: J:\MS26\DATA\050911\0509F014.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
1,4-Dioxane	20	22	0.397	0.445	12	NA	± 20 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Date Analyzed: 05/17/2011

**Continuing Calibration Verification Summary
 1,4-Dioxane by GC/MS**

Calibration Type: Internal Standard
Analysis Method: 8270C SIM

Calibration Date: 05/09/2011
Calibration ID: CAL10487
Analysis Lot: KWG1104446
Units: ng/ml

File ID: J:\MS26\DATA\051711\0517F010.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
1,4-Dioxane	20	21	0.01	0.397	0.418	5	NA	± 20 %	AverageRF
1,4-Dioxane-d8	20	19	0.01	0.391	0.373	-5	NA	± 20 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681

**Analysis Run Log
 1,4-Dioxane by GC/MS**

Analysis Method: 8270C SIM

Analysis Lot: KWG1104446
Instrument ID: MS26

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0517F009.D	GC/MS Tuning - Generic	KWG1104446-1	5/17/2011	14:01		5/17/2011	14:13
0517F010.D	Continuing Calibration Verification	KWG1104446-2	5/17/2011	14:22		5/17/2011	14:34
0517F011.D	Method Blank	KWG1104188-4	5/17/2011	14:44		5/17/2011	14:56
0517F012.D	Lab Control Sample	KWG1104188-3	5/17/2011	15:04		5/17/2011	15:16
0517F013.D	MW-16	P1101681-001	5/17/2011	15:23		5/17/2011	15:35
0517F014.D	MW-16MS	KWG1104188-1	5/17/2011	15:43		5/17/2011	15:55
0517F015.D	MW-16DMS	KWG1104188-2	5/17/2011	16:03		5/17/2011	16:15
0517F016.D	ZZZZZZ	ZZZZZZ	5/17/2011	16:23		5/17/2011	16:35
0517F017.D	ZZZZZZ	ZZZZZZ	5/17/2011	16:43		5/17/2011	16:55
0517F018.D	ZZZZZZ	ZZZZZZ	5/17/2011	17:03		5/17/2011	17:15
0517F019.D	ZZZZZZ	ZZZZZZ	5/17/2011	17:23		5/17/2011	17:35
0517F020.D	ZZZZZZ	ZZZZZZ	5/17/2011	17:43		5/17/2011	17:55
0517F021.D	ZZZZZZ	ZZZZZZ	5/17/2011	18:03		5/17/2011	18:15
0517F022.D	ZZZZZZ	ZZZZZZ	5/17/2011	18:22		5/17/2011	18:34
0517F023.D	ZZZZZZ	ZZZZZZ	5/17/2011	18:42		5/17/2011	18:54
0517F024.D	ZZZZZZ	ZZZZZZ	5/17/2011	19:02		5/17/2011	19:14
0517F025.D	ZZZZZZ	ZZZZZZ	5/17/2011	19:22		5/17/2011	19:34
0517F026.D	ZZZZZZ	ZZZZZZ	5/17/2011	19:42		5/17/2011	19:54
0517F027.D	ZZZZZZ	ZZZZZZ	5/17/2011	20:02		5/17/2011	20:14
0517F028.D	ZZZZZZ	ZZZZZZ	5/17/2011	20:22		5/17/2011	20:34
0517F029.D	ZZZZZZ	ZZZZZZ	5/17/2011	20:42		5/17/2011	20:54
0517F030.D	ZZZZZZ	ZZZZZZ	5/17/2011	21:02		5/17/2011	21:14
0517F031.D	ZZZZZZ	ZZZZZZ	5/17/2011	21:22		5/17/2011	21:34

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Extracted: 05/11/2011

**Extraction Prep Log
 1,4-Dioxane by GC/MS**

Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Extraction Lot: KWG1104188
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
MW-16	P1101681-001	05/05/11	05/05/11	100ml	50ml	NA	
Method Blank	KWG1104188-4	NA	NA	100ml	50ml	NA	
MW-16MS	KWG1104188-1	05/05/11	05/05/11	100ml	50ml	NA	
MW-16DMS	KWG1104188-2	05/05/11	05/05/11	100ml	50ml	NA	
Lab Control Sample	KWG1104188-3	NA	NA	100ml	50ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Organic Analysis:
1,4-Dioxane by GC/MS

Validation Package

Organic Analysis:
1,4-Dioxane by GC/MS

Validation Package

QC Reports

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681

Surrogate Recovery Summary
1,4-Dioxane by GC/MS

Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
MW-16	P1101681-001	72
Method Blank	KWG1104188-4	86
MW-16MS	KWG1104188-1	87
MW-16DMS	KWG1104188-2	85
Lab Control Sample	KWG1104188-3	76

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Dioxane-d8 42-112

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Date Analyzed: 05/17/2011
Time Analyzed: 14:22

Internal Standard Area and RT Summary
1,4-Dioxane by GC/MS

File ID: J:\MS26\DATA\051711\0517F010.D
Instrument ID: MS26
Analysis Method: 8270C SIM

Lab Code: KWG1104446-2
Analysis Lot: KWG1104446

	1,4-Dichlorobenzene-d4	
	<u>Area</u>	<u>RT</u>
Results ==>	47,308	7.18
Upper Limit ==>	94,616	7.68
Lower Limit ==>	23,654	6.68
ICAL Result ==>	84,266	7.17

Associated Analyses

Method Blank	KWG1104188-4	46,165	7.18
Lab Control Sample	KWG1104188-3	35,787	7.19
MW-16	P1101681-001	42,622	7.18
MW-16MS	KWG1104188-1	47,403	7.18
MW-16DMS	KWG1104188-2	38,708	7.19

Results flagged with an asterisk (*) indicate values outside control criteria.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/17/2011

**Matrix Spike/Duplicate Matrix Spike Summary
 1,4-Dioxane by GC/MS**

Sample Name: MW-16
Lab Code: P1101681-001
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1104188

Analyte Name	Sample Result	MW-16MS KWG1104188-1 Matrix Spike			MW-16DMS KWG1104188-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
1,4-Dioxane	0.83	24.6	25.0	95	20.5	25.0	79	40-114	18	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/17/2011

**Lab Control Spike Summary
 1,4-Dioxane by GC/MS**

Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1104188

Lab Control Sample
 KWG1104188-3
 Lab Control Spike

Analyte Name	Result	Expected	%Rec	%Rec Limits
1,4-Dioxane	19.6	25.0	79	52-105

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/17/2011
Time Analyzed: 14:44

Method Blank Summary
1,4-Dioxane by GC/MS

Sample Name: Method Blank
Lab Code: KWG1104188-4
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM
File ID: J:\MS26\DATA\051711\0517F011.D
Instrument ID: MS26
Level: Low
Extraction Lot: KWG1104188

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1104188-3	J:\MS26\DATA\051711\0517F012.D	05/17/11	15:04
MW-16	P1101681-001	J:\MS26\DATA\051711\0517F013.D	05/17/11	15:23
MW-16MS	KWG1104188-1	J:\MS26\DATA\051711\0517F014.D	05/17/11	15:43
MW-16DMS	KWG1104188-2	J:\MS26\DATA\051711\0517F015.D	05/17/11	16:03

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Extracted: 05/11/2011
Date Analyzed: 05/17/2011
Time Analyzed: 15:04

Lab Control Sample Summary
1,4-Dioxane by GC/MS

Sample Name: Lab Control Sample
Lab Code: KWG1104188-3
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

File ID: J:\MS26\DATA\051711\0517F012.D
Instrument ID: MS26
Level: Low
Extraction Lot: KWG1104188

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1104188-4	J:\MS26\DATA\051711\0517F011.D	05/17/11	14:44
MW-16	P1101681-001	J:\MS26\DATA\051711\0517F013.D	05/17/11	15:23
MW-16MS	KWG1104188-1	J:\MS26\DATA\051711\0517F014.D	05/17/11	15:43
MW-16DMS	KWG1104188-2	J:\MS26\DATA\051711\0517F015.D	05/17/11	16:03

Organic Analysis:
1,4-Dioxane by GC/MS

Validation Package

Raw Data

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Collected: 05/05/2011
Date Received: 05/05/2011

1,4-Dioxane by GC/MS

Sample Name: MW-16
Lab Code: P1101681-001
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	0.83 J	1.0	0.16	1	05/11/11	05/17/11	KWG1104188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	72	42-112	05/17/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\051711\0517F013.D
Lab ID: P1101681-001
RunType: SMPL
Matrix: WATER

Date Acquired: 05/17/2011 15:23
Date Quantitated: 05/18/2011 11:00
Batch ID: KWG1104446
Analysis Method: 8270C SIM
ListJoinID: LJ2865

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
Preparation Holding Time	NA	NA	NA	x	
Pre-Preparation Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Method Blank	NA	NA	NA	x	
MB Surrogate Recovery	NA	NA	NA	x	
Lab Control Spike	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: LB 5/18/11
 Secondary Review: CH 05.18.11

Quantitation Report

Bottle ID:		Tier:	IV	Matrix:	WATER
Prod Code:	8270C SIM 14_DI	Collect Date:	05/05/2011	Receive Date:	05/05/2011

Analysis Lot:	KWG1104446	Prep Lot:	KWG1104188	Report Group:	P1101681
Analysis Method:	8270C SIM	Prep Method:	EPA 3510C		
Prep Ref:	1017527	Prep Date:	05/11/2011		

Quant Method:	J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID:	CAL10487
Title:	1,4-Dioxane by GC/MS	Report List ID:	LJ2865
Tune Ref:	J:\MS26\DATA\051711\0517F009.D	Method ID:	MJ402
MB Ref:	J:\MS26\DATA\051711\0517F011.D	Quant based on Report List	

Data File:	J:\MS26\DATA\051711\0517F013.D	Instrument:	MS26
Acqu Date:	05/17/2011 15:23	Quant Date:	05/18/2011 11:00
Run Type:	SMPL	Vial:	6
Lab ID:	P1101681-001	Dilution:	1.0
		Soln Conc. Units:	ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.18	0.00?	152	42622	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.97	-0.02	0.00	96	11933	35.82	72	42-112	OK

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane	4.02		0.00	88	563m	1.66	0.83	J	

Prep Amount: 100 ml Dilution: 1.0
 Prep Final Vol: 50 ml Unit Factor: 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 F: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\051711\0517F013.D
 Acq On : 17 May 2011 3:23 pm
 Sample : P1101681-001
 Misc :

Vial: 6
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

MS Integration Params: RTEINT.P
 Quant Time: May 18 10:59:29 2011

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Wed May 18 10:59:17 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

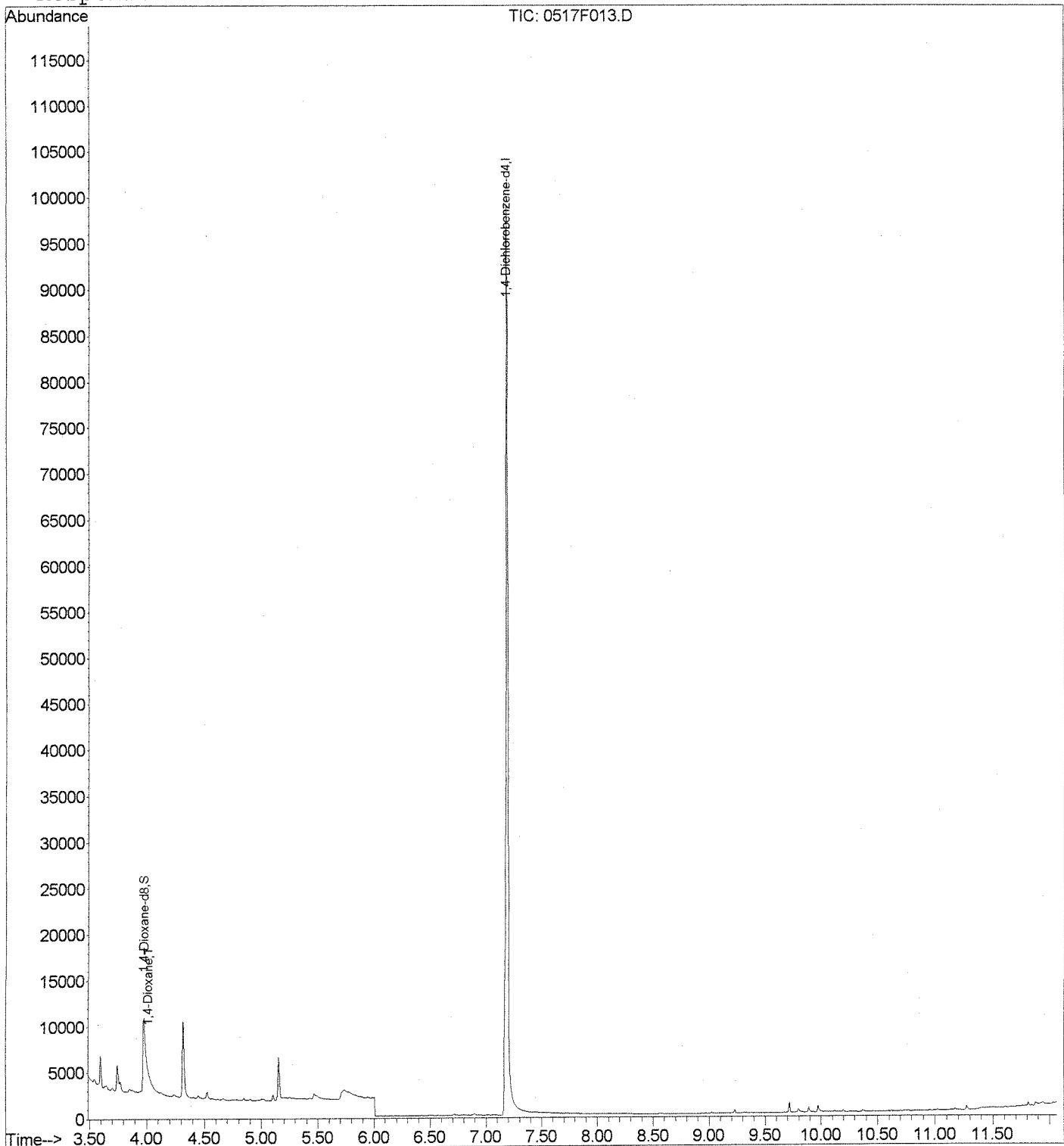
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.18	152	42622	50.00	ng/ml	0.02
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.97	96	11933	35.82	ng/ml	0.04
Spiked Amount	50.000		Recovery	=	71.64%	
Target Compounds						
3) 1,4-Dioxane	4.02	88	563m	1.66	ng/ml	Qvalue

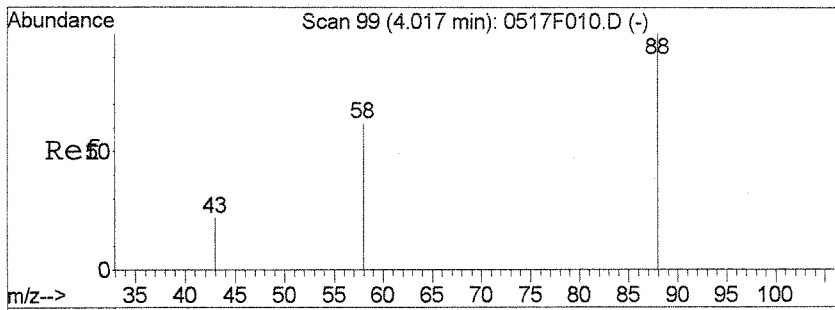
Data File : J:\MS26\DATA\051711\0517F013.D
Acq On : 17 May 2011 3:23 pm
Sample : P1101681-001
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 18 11:00 2011

Vial: 6
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

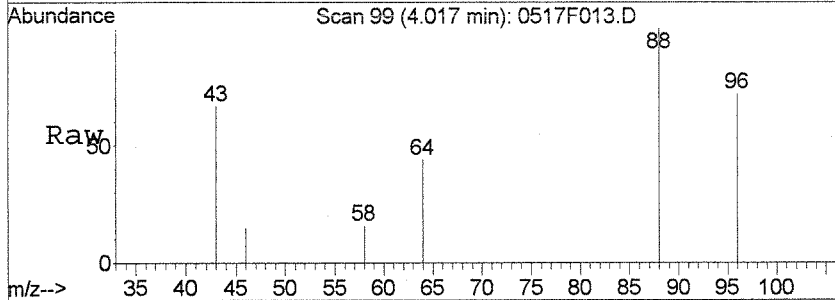
Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Wed May 18 10:59:17 2011
Response via : Initial Calibration



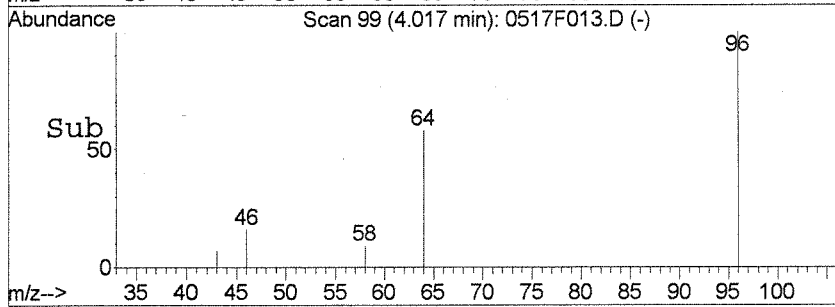
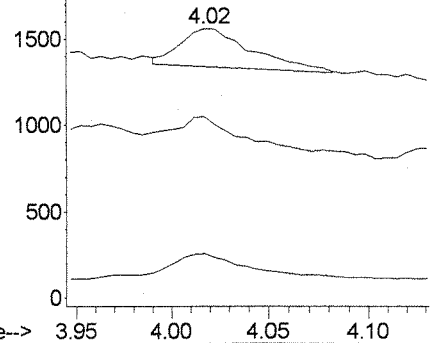


#3
 1,4-Dioxane
 Concen: 1.66 ng/ml m
 RT: 4.02 min Scan# 99
 Delta R.T. 0.05 min
 Lab File: 0517F013.D
 Acq: 17 May 2011 3:23 pm

Tgt Ion	Resp	Lower	Upper
88	563		
58	16.5	19.3	59.3#
43	67.2	0.0	34.1#



Abundance Ion 88.00 (87.70 to 88.70): 0517F013.
 Ion 58.00 (57.70 to 58.70): 0517F013.
 Ion 43.00 (42.70 to 43.70): 0517F013.



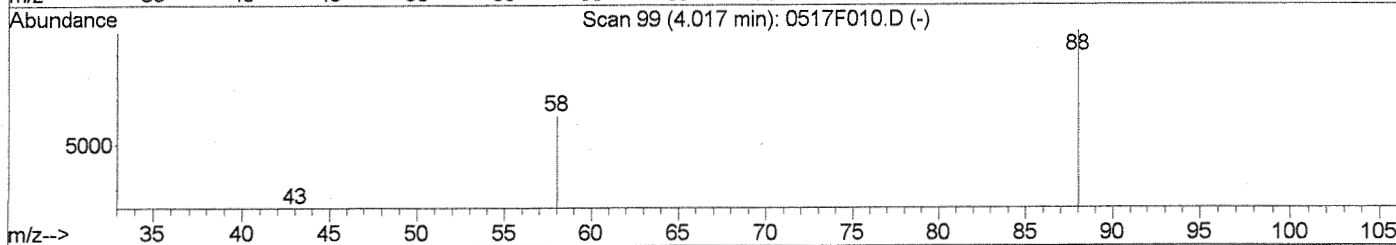
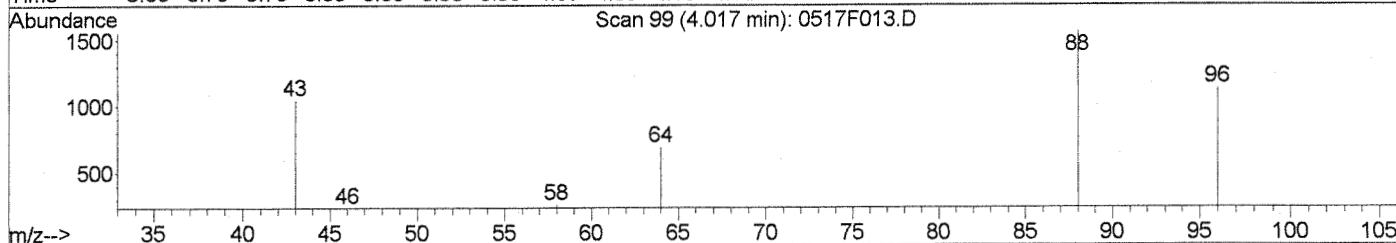
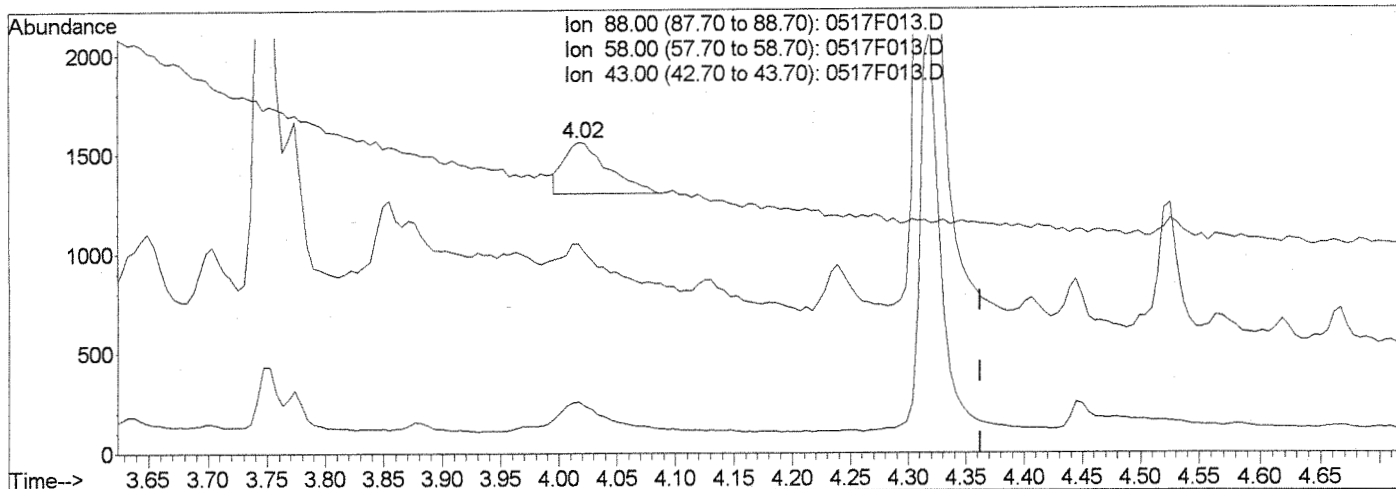
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\051711\0517F013.D
 Acq On : 17 May 2011 3:23 pm
 Sample : P1101681-001
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 18 10:59 2011

Vial: 6
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Wed May 18 10:59:17 2011
 Response via : Multiple Level Calibration



TIC: 0517F013.D

(3) 1,4-Dioxane (T)
 4.02min 2.04ng/ml
 response 690

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	52.33
43.00	14.10	77.13#
0.00	0.00	0.00

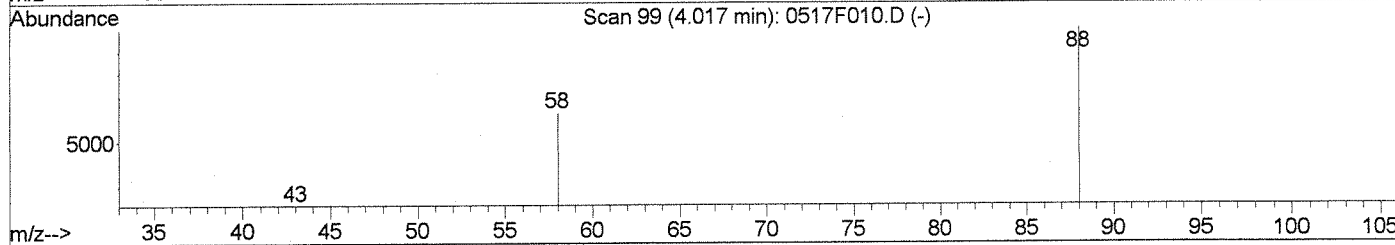
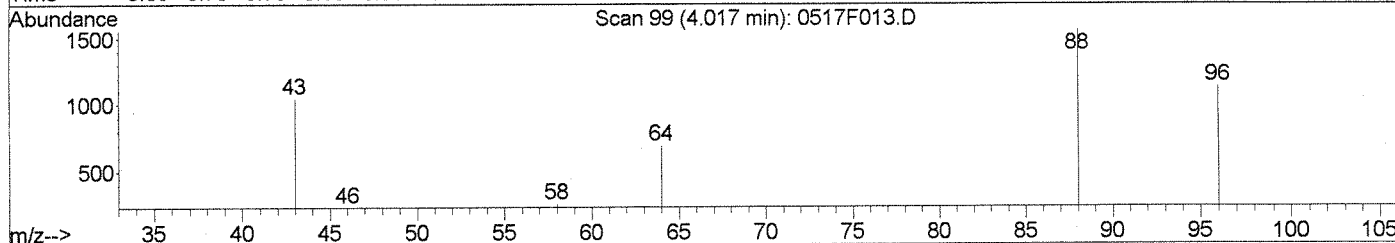
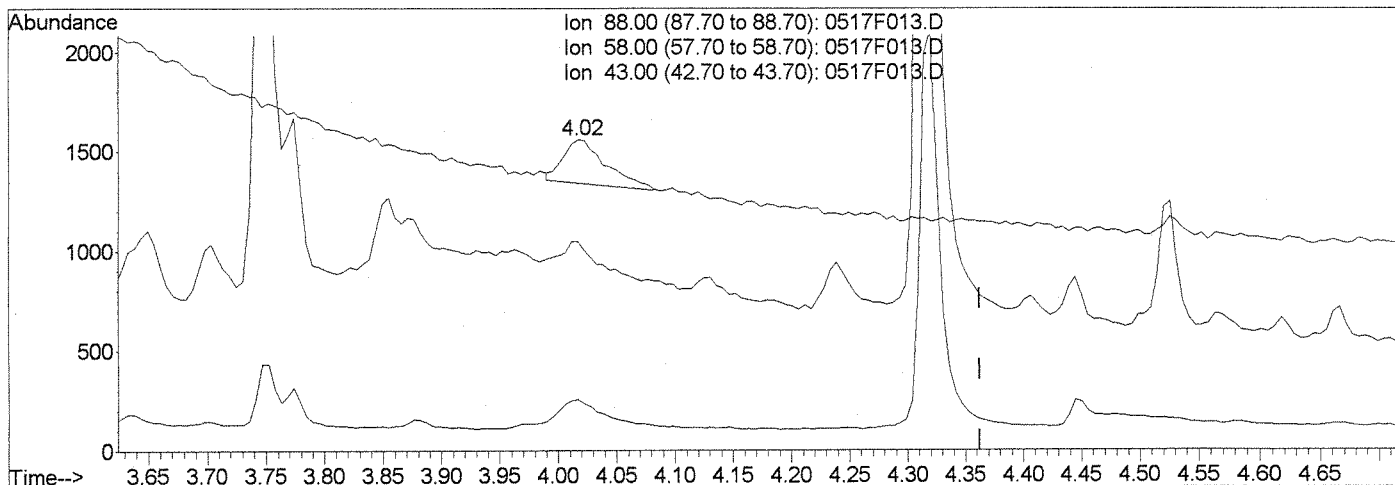
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\051711\0517F013.D
 Acq On : 17 May 2011 3:23 pm
 Sample : P1101681-001
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 18 11:00 2011

Vial: 6
 Operator: K Bailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Wed May 18 10:59:17 2011
 Response via : Multiple Level Calibration



TIC: 0517F013.D

(3) 1,4-Dioxane (T)
 4.02min 1.66ng/ml m
 response 563

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	16.48#
43.00	14.10	67.22#
0.00	0.00	0.00

01
 LB 5/18/11
 @H 05.18.11

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Collected: NA
Date Received: NA

1,4-Dioxane by GC/MS

Sample Name: Method Blank
Lab Code: KWG1104188-4
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	ND	U	1.0	0.16	1	05/11/11	05/17/11	KWG1104188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	86	42-112	05/17/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\051711\0517F011.D
Lab ID: KWG1104188-4
Run Type: MB
Matrix: WATER

Date Acquired: 05/17/2011 14:44
Date Quantitated: 05/18/2011 10:59
Batch ID: KWG1104446
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

P1081

Primary Review: LB511811

Secondary Review: CH 05-18-11

Quantitation Report

Bottle ID: Prod Code: 8270C SIM 14_DI	Tier: Collect Date:	Matrix: WATER Receive Date: 05/13/2011
Analysis Lot: KWG1104446 Analysis Method: 8270C SIM Prep Ref: 1017531	Prep Lot: KWG1104188 Prep Method: EPA 3510C Prep Date: 05/11/2011	Report Group:
Quant Method: J:\MS26\METHODS\SIM\050911_DX.M Title: Tune Ref: J:\MS26\DATA\051711\0517F009.D MB Ref:	Calibration ID: CAL10487 Method ID: MJ402 Quant based on Method	
Data File: J:\MS26\DATA\051711\0517F011.D Acqu Date: 05/17/2011 14:44 Run Type: MB Lab ID: KWG1104188-4	Quant Date: 05/18/2011 10:59	Instrument: MS26 Vial: 4 Dilution: 1.0 Soln Conc. Units: ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.18	0.00?	152	46165	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.97	-0.02	0.00	96	15583	43.19	86	42-112	OK

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane				88	0		0.16	U	

Prep Amount: 100 ml **Dilution:** 1.0
Prep Final Vol: 50 ml **Unit Factor:** 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\051711\0517F011.D
 Acq On : 17 May 2011 2:44 pm
 Sample : KWG1104188-4 | MB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 18 10:59:28 2011

Vial: 4
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.18	152	46165	50.00	ng/ml	0.02

System Monitoring Compounds	R.T.	QIon	Response	Conc	Units	Dev(Min)
2) 1,4-Dioxane-d8	3.97	96	15583	43.19	ng/ml	0.03
Spiked Amount	50.000		Recovery	=	86.38%	

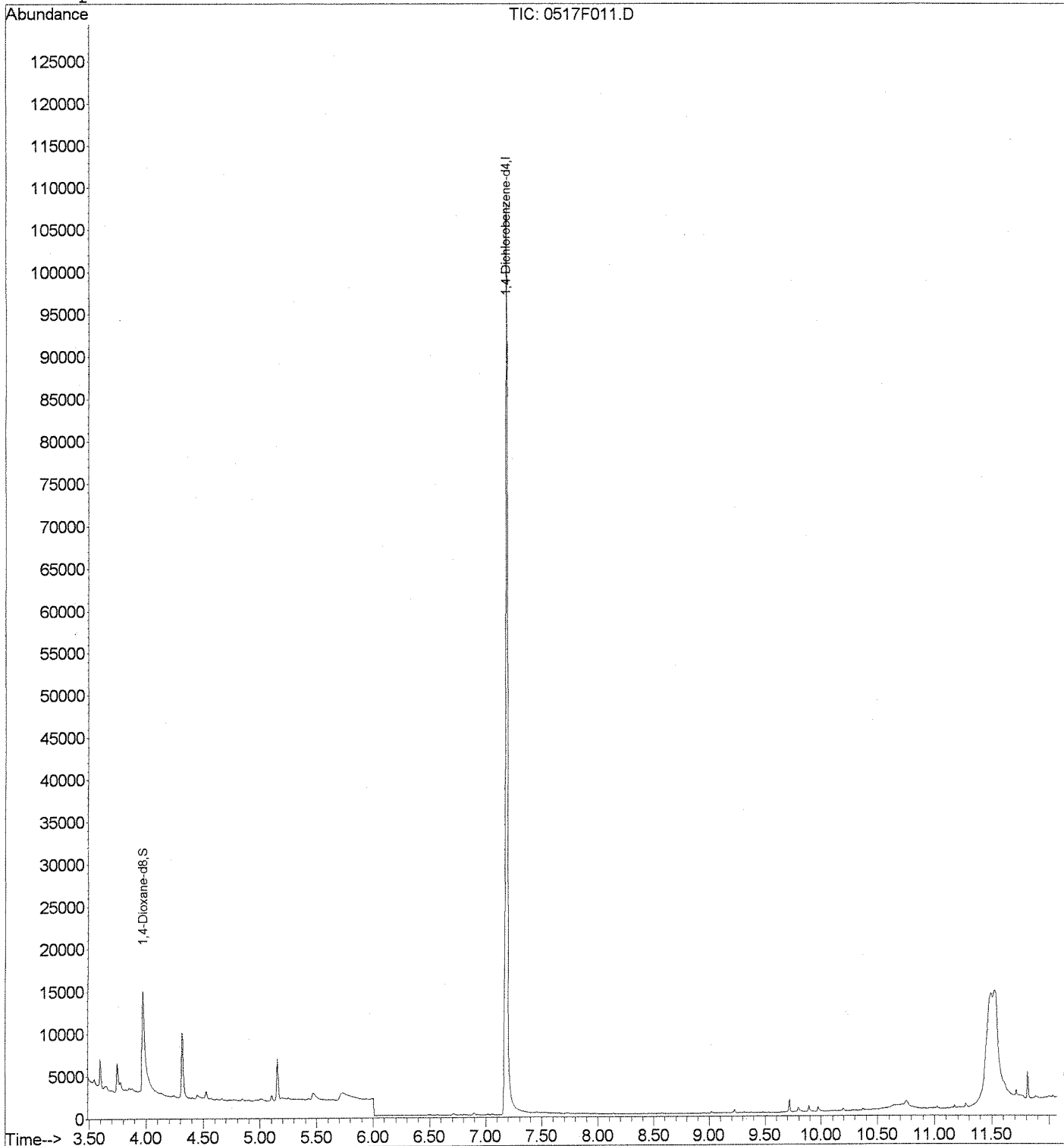
Target Compounds Qvalue

Data File : J:\MS26\DATA\051711\0517F011.D
Acq On : 17 May 2011 2:44 pm
Sample : KWG1104188-4 | MB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 18 10:59 2011

Vial: 4
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Wed May 18 10:59:17 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Collected: 05/05/2011
Date Received: 05/05/2011

1,4-Dioxane by GC/MS

Sample Name: MW-16MS
Lab Code: KWG1104188-1
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	24.6		1.0	0.16	1	05/11/11	05/17/11	KWG1104188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	87	42-112	05/17/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\051711\0517F014.D
Lab ID: KWG1104188-1 -- MS
RunType: MS
Matrix: WATER

P1101281

Date Acquired: 05/17/2011 15:43
Date Quantitated: 05/18/2011 11:01
Batch ID: KWG1104446
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: LB 5/18/11
 Secondary Review: CH 05-18-11

Quantitation Report

Bottle ID: Prod Code: 8270C SIM 14_DI	Tier: Collect Date:	Matrix: WATER Receive Date: 05/13/2011
Analysis Lot: KWG1104446 Analysis Method: 8270C SIM Prep Ref: 1017528	Prep Lot: KWG1104188 Prep Method: EPA 3510C Prep Date: 05/11/2011	Report Group:
Quant Method: J:\MS26\METHODS\SIM\050911_DX.M Title: Tune Ref: J:\MS26\DATA\051711\0517F009.D MB Ref: J:\MS26\DATA\051711\0517F011.D		Calibration ID: CAL10487 Method ID: MJ402 Quant based on Method
Data File: J:\MS26\DATA\051711\0517F014.D Acqu Date: 05/17/2011 15:43 Run Type: MS Lab ID: KWG1104188-1 -- MS	Quant Date: 05/18/2011 11:01	Instrument: MS26 Vial: 7 Dilution: 1.0 Soln Conc. Units: ng/ml

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.18	0.00?	152	47403	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.97	-0.02	0.00	96	16055	43.34	87	42-112	OK

Target Compounds

							Final Conc. Units: ug/L			
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane	4.01	-0.01	0.00	88	18559m	49.27	24.6		

Prep Amount: 100 ml **Dilution:** 1.0
Prep Final Vol: 50 ml **Unit Factor:** 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\051711\0517F014.D
 Acq On : 17 May 2011 3:43 pm
 Sample : KWG1104188-1 | MS P1101681-001MS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 18 10:59:29 2011

Vial: 7
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Wed May 18 10:59:17 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

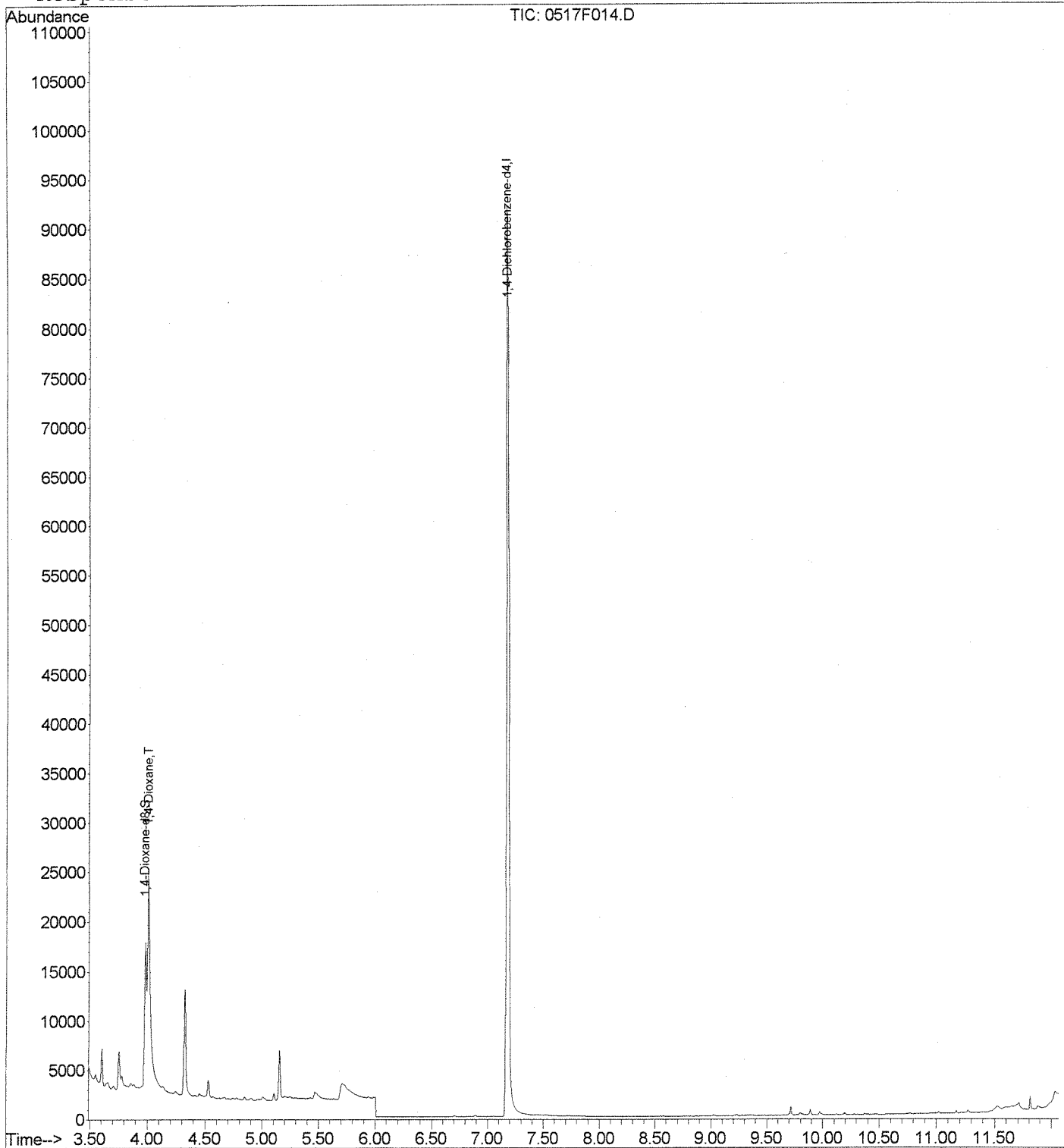
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.18	152	47403	50.00	ng/ml	0.01
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.97	96	16055	43.34	ng/ml	0.04
Spiked Amount	50.000		Recovery	=	86.68%	
Target Compounds						
3) 1,4-Dioxane	4.01	88	18559m	49.27	ng/ml	Qvalue

Data File : J:\MS26\DATA\051711\0517F014.D
Acq On : 17 May 2011 3:43 pm
Sample : KWG1104188-1 | MS P1101681-001MS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 18 11:01 2011

Vial: 7
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Wed May 18 10:59:17 2011
Response via : Initial Calibration



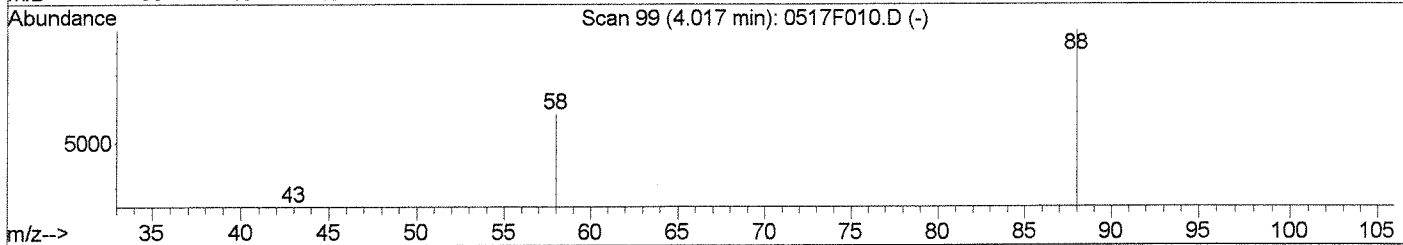
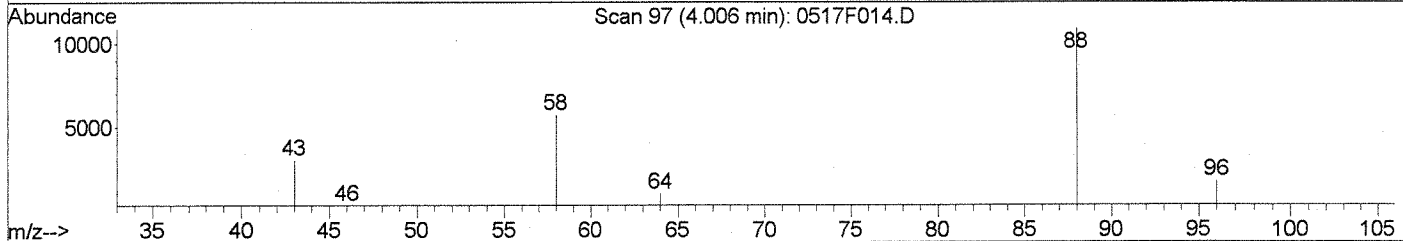
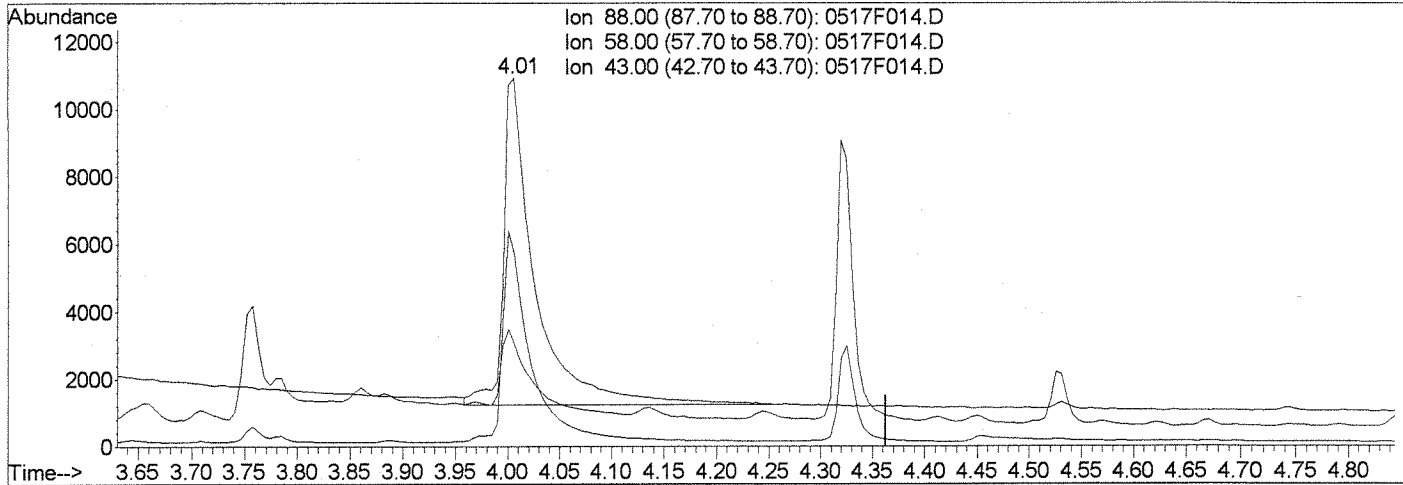
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\051711\0517F014.D
 Acq On : 17 May 2011 3:43 pm
 Sample : KWG1104188-1 | MS P1101681-001MS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 18 10:59 2011

Vial: 7
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Wed May 18 10:59:17 2011
 Response via : Multiple Level Calibration



TIC: 0517F014.D

(3) 1,4-Dioxane (T)

4.01min 54.32ng/ml

response 20460

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	57.57
43.00	14.10	22.51
0.00	0.00	0.00

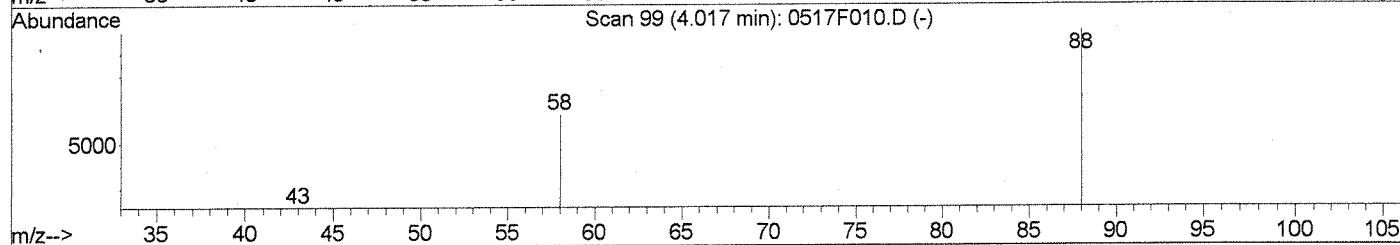
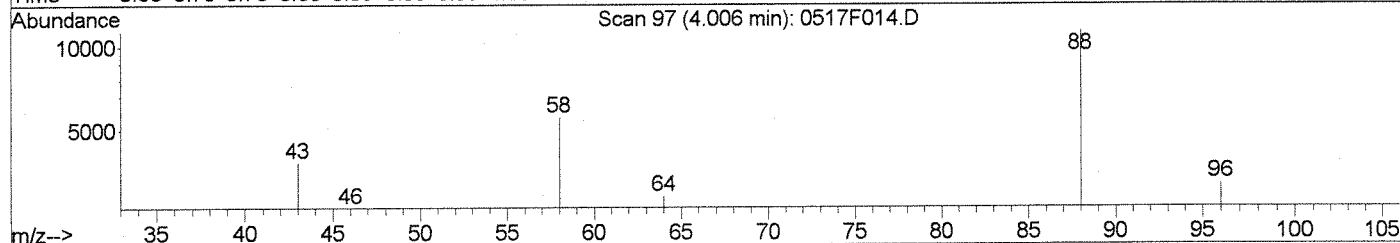
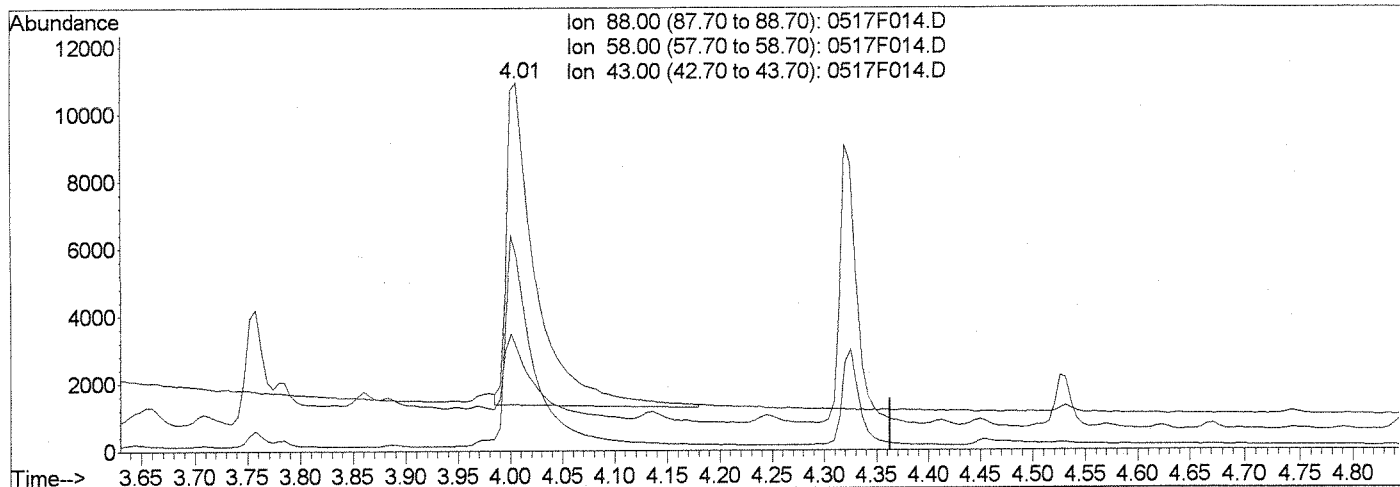
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\051711\0517F014.D
 Acq On : 17 May 2011 3:43 pm
 Sample : KWG1104188-1 | MS P1101681-001MS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 18 11:01 2011

Vial: 7
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Wed May 18 10:59:17 2011
 Response via : Multiple Level Calibration



TIC: 0517F014.D

(3) 1,4-Dioxane (T)

4.01min 49.27ng/ml m

response 18559

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	52.44
43.00	14.10	27.92
0.00	0.00	0.00

01
 LB 5/18/11
 CH 05-18-11

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Collected: 05/05/2011
Date Received: 05/05/2011

1,4-Dioxane by GC/MS

Sample Name: MW-16DMS
Lab Code: KWG1104188-2
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	20.5		1.0	0.16	1	05/11/11	05/17/11	KWG1104188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	85	42-112	05/17/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\051711\0517F015.D
Lab ID: KWG1104188-2 -- DMS
RunType: DMS
Matrix: WATER

Date Acquired: 05/17/2011 16:03
Date Quantitated: 05/18/2011 11:01
Batch ID: KWG1104446
Analysis Method: 8270C SIM
MethodJoinID: MJ402

P1101281

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: LE 5/18/11
 Secondary Review: CH 05/18/11

Quantitation Report

Bottle ID:	Tier:	Matrix:
Prod Code: 8270C SIM 14_DI	Collect Date:	WATER
		Receive Date: 05/13/2011

Analysis Lot: KWG1104446	Prep Lot: KWG1104188	Report Group:
Analysis Method: 8270C SIM	Prep Method: EPA 3510C	
Prep Ref: 1017529	Prep Date: 05/11/2011	

Quant Method: J:\MS26\METHODS\SIM050911_DX.M	Calibration ID: CAL10487
Title:	
Tune Ref: J:\MS26\DATA\051711\0517F009.D	Method ID: MJ402
MB Ref: J:\MS26\DATA\051711\0517F011.D	Quant based on Method

Data File: J:\MS26\DATA\051711\0517F015.D	Instrument: MS26	Vial: 8
Acqu Date: 05/17/2011 16:03	Quant Date: 05/18/2011 11:01	Dilution: 1.0
Run Type: DMS		Soln Conc. Units: ng/ml
Lab ID: KWG1104188-2 -- DMS		

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.19	0.01?	152	38708	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.96	-0.03	0.00	96	12865	42.53	85	42-112	OK

Target Compounds

							Final Conc. Units: ug/L			
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane	4.00	-0.02	0.00	88	12625m	41.05	20.5		

Prep Amount: 100 ml Dilution: 1.0
 Prep Final Vol: 50 ml Unit Factor: 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ? : Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\051711\0517F015.D Vial: 8
 Acq On : 17 May 2011 4:03 pm Operator: KBailey
 Sample : KWG1104188-2 | DMS P1101681-001DMS Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 18 10:59:29 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Wed May 18 10:59:17 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

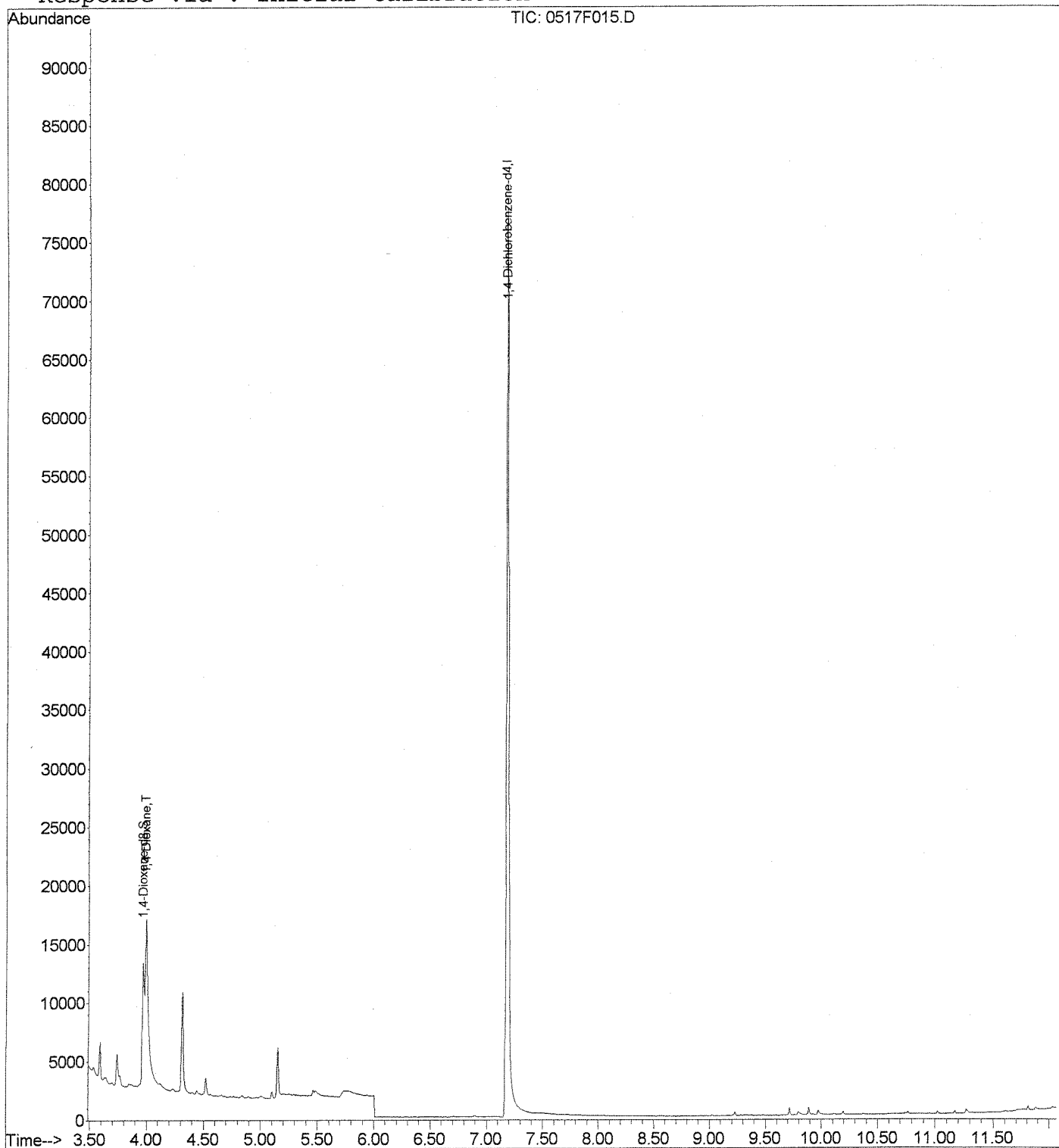
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.19	152	38708	50.00	ng/ml	0.02
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.96	96	12865	42.53	ng/ml	0.03
Spiked Amount	50.000		Recovery	=	85.06%	
Target Compounds						
3) 1,4-Dioxane	4.00	88	12625m	41.05	ng/ml	Qvalue

Data File : J:\MS26\DATA\051711\0517F015.D
Acq On : 17 May 2011 4:03 pm
Sample : KWG1104188-2 | DMS P1101681-001DMS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 18 11:01 2011

Vial: 8
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Wed May 18 10:59:17 2011
Response via : Initial Calibration



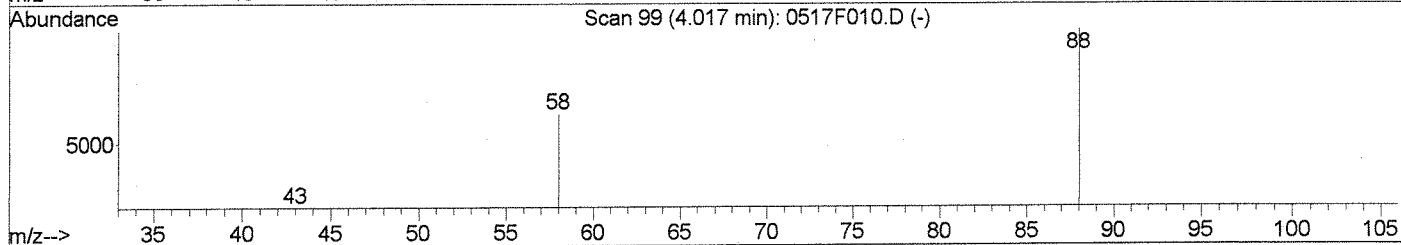
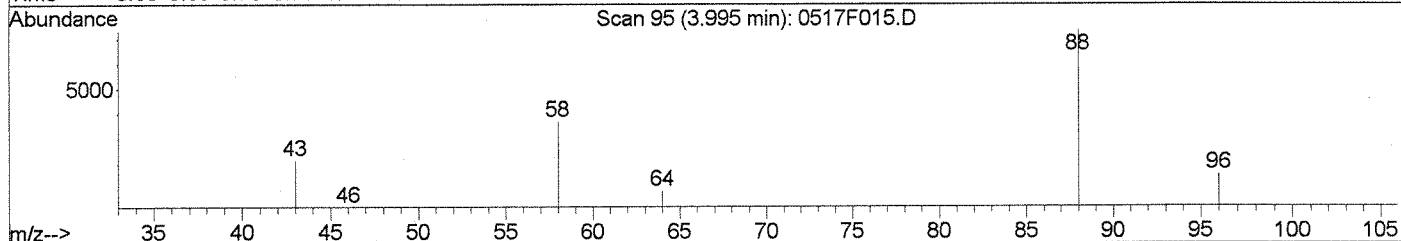
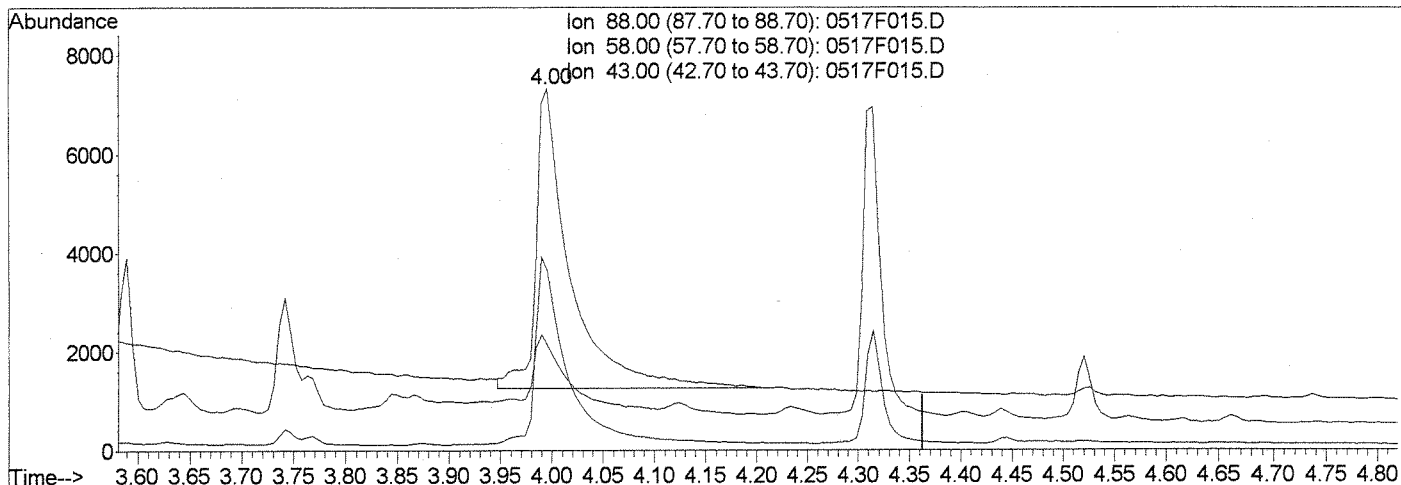
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\051711\0517F015.D
 Acq On : 17 May 2011 4:03 pm
 Sample : KWG1104188-2 | DMS P1101681-001DMS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 18 10:59 2011

Vial: 8
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Wed May 18 10:59:17 2011
 Response via : Multiple Level Calibration



TIC: 0517F015.D

(3) 1,4-Dioxane (T)
 4.00min 46.05ng/ml
 response 14164

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	57.87
43.00	14.10	23.26
0.00	0.00	0.00

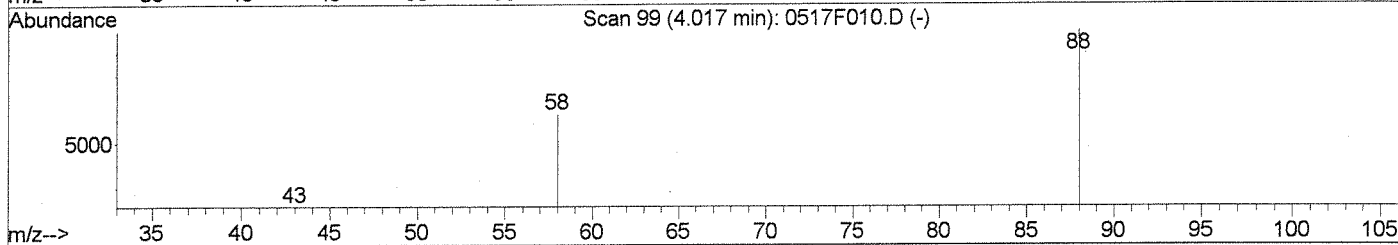
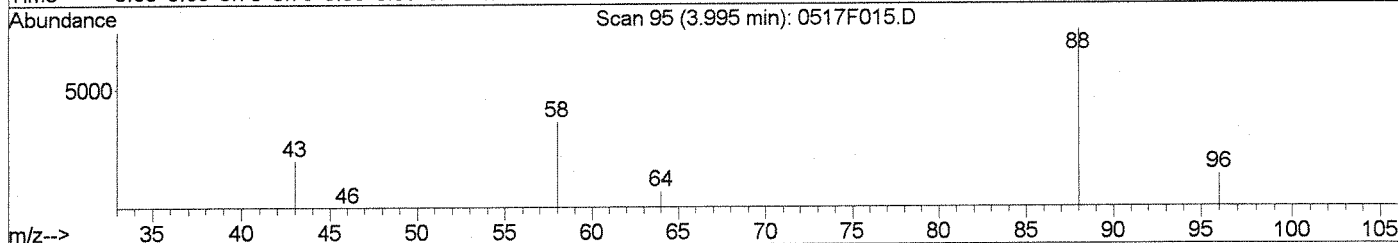
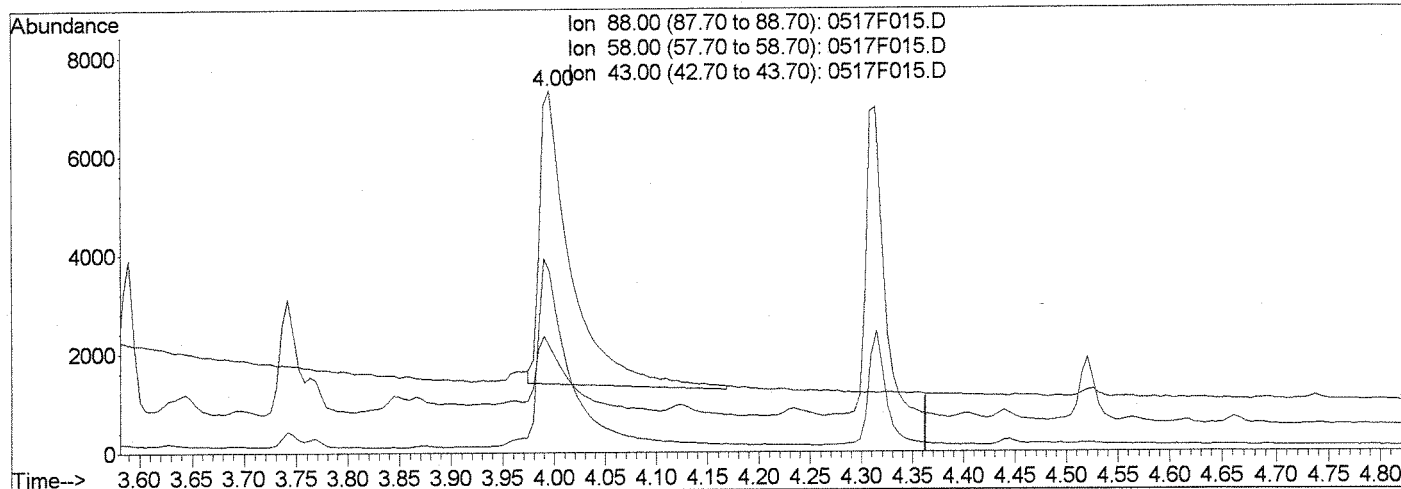
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\051711\0517F015.D
 Acq On : 17 May 2011 4:03 pm
 Sample : KWG1104188-2 | DMS P1101681-001DMS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 18 11:01 2011

Vial: 8
 Operator: K Bailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Wed May 18 10:59:17 2011
 Response via : Multiple Level Calibration



TIC: 0517F015.D

(3) 1,4-Dioxane (T)

4.00min 41.05ng/ml m

response 12625

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	49.95
43.00	14.10	29.14
0.00	0.00	0.00

01
 KB 5/18/11
 CH 05-18-11

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM
Sample Matrix: Water

Service Request: P1101681
Date Collected: NA
Date Received: NA

1,4-Dioxane by GC/MS

Sample Name: Lab Control Sample
Lab Code: KWG1104188-3
Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,4-Dioxane	19.6		1.0	0.16	1	05/11/11	05/17/11	KWG1104188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Dioxane-d8	76	42-112	05/17/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS26\DATA\051711\0517F012.D
Lab ID: KWG1104188-3
Run Type: LCS
Matrix: WATER

Date Acquired: 05/17/2011 15:04
Date Quantitated: 05/18/2011 11:00
Batch ID: KWG1104446
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

P1281

Primary Review: LE 5/18/11
 Secondary Review: CH 05-18-11

Quantitation Report

Bottle ID:	Tier:	Matrix:	WATER
Prod Code: 8270C SIM 14_DI	Collect Date:	Receive Date:	05/13/2011
Analysis Lot: KWG1104446	Prep Lot: KWG1104188	Report Group:	
Analysis Method: 8270C SIM	Prep Method: EPA 3510C		
Prep Ref: 1017530	Prep Date: 05/11/2011		
Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487		
Title:			
Tune Ref: J:\MS26\DATA\051711\0517F009.D	Method ID: MJ402		
MB Ref: J:\MS26\DATA\051711\0517F011.D	Quant based on Method		
Data File: J:\MS26\DATA\051711\0517F012.D	Instrument: MS26		
Acqu Date: 05/17/2011 15:04	Quant Date: 05/18/2011 11:00	Vial: 5	
Run Type: LCS	Dilution: 1.0		
Lab ID: KWG1104188-3	Soln Conc. Units: ng/ml		

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.19	0.01?	152	35787	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.96	-0.03	0.00	96	10673	38.16	76	42-112	OK

Target Compounds

							Final Conc. Units: ug/L			
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane	3.99	-0.03	0.00	88	11163m	39.26	19.6		

Prep Amount: 100 ml Dilution: 1.0
 Prep Final Vol: 50 ml Unit Factor: 1

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 C: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\051711\0517F012.D
 Acq On : 17 May 2011 3:04 pm
 Sample : KWG1104188-3 | LCS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 18 10:59:29 2011

Vial: 5
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Wed May 18 10:59:17 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

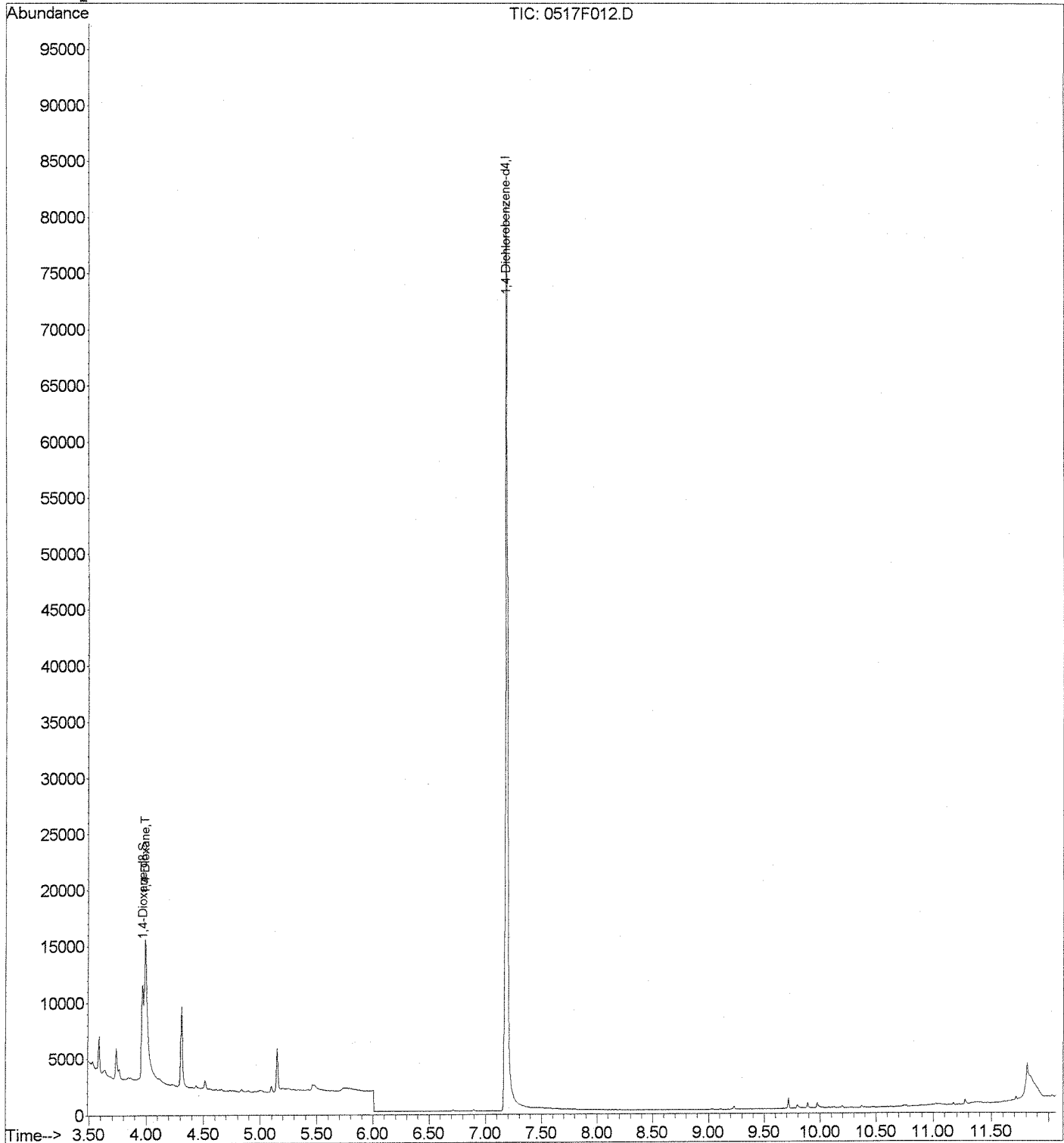
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.19	152	35787	50.00	ng/ml	0.02
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.96	96	10673	38.16	ng/ml	0.03
Spiked Amount	50.000		Recovery	=	76.32%	
Target Compounds						
3) 1,4-Dioxane	3.99	88	11163m	39.26	ng/ml	Qvalue

Data File : J:\MS26\DATA\051711\0517F012.D
Acq On : 17 May 2011 3:04 pm
Sample : KWG1104188-3 | LCS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 18 11:00 2011

Vial: 5
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Wed May 18 10:59:17 2011
Response via : Initial Calibration



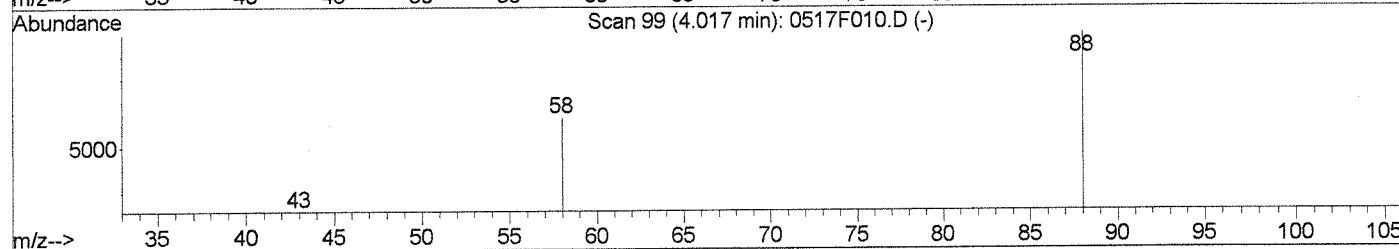
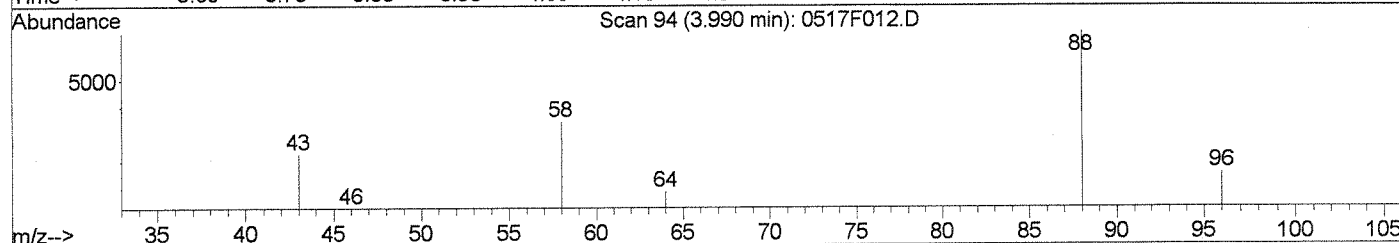
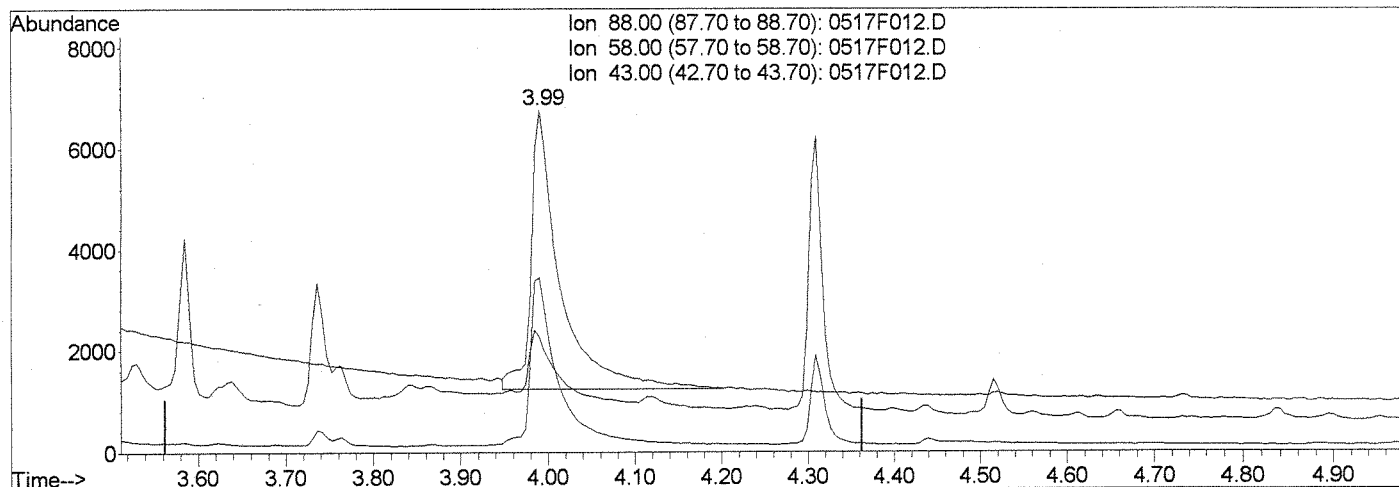
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\051711\0517F012.D
 Acq On : 17 May 2011 3:04 pm
 Sample : KWG1104188-3 | LCS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 18 10:59 2011

Vial: 5
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Wed May 18 10:59:17 2011
 Response via : Multiple Level Calibration



TIC: 0517F012.D

(3) 1,4-Dioxane (T)

3.99min 44.80ng/ml

response 12740

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	59.68#
43.00	14.10	25.42
0.00	0.00	0.00

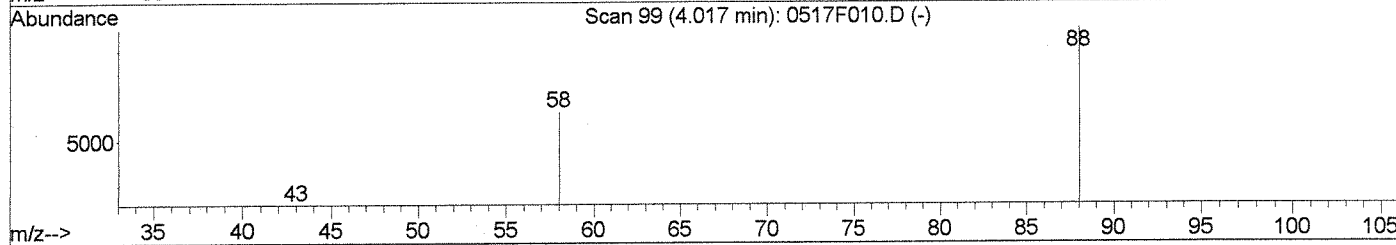
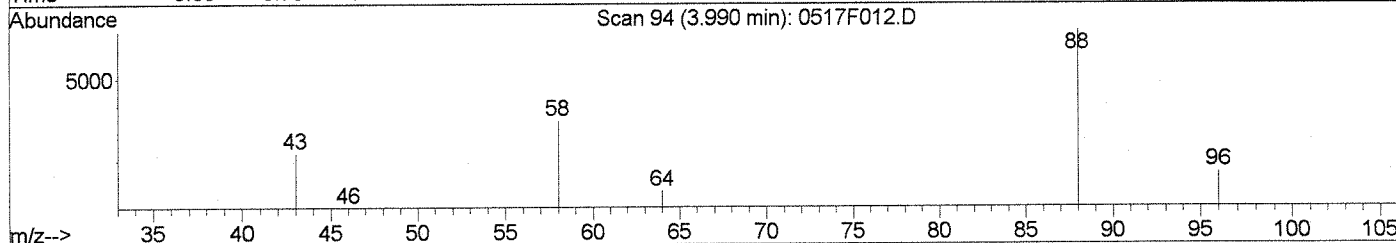
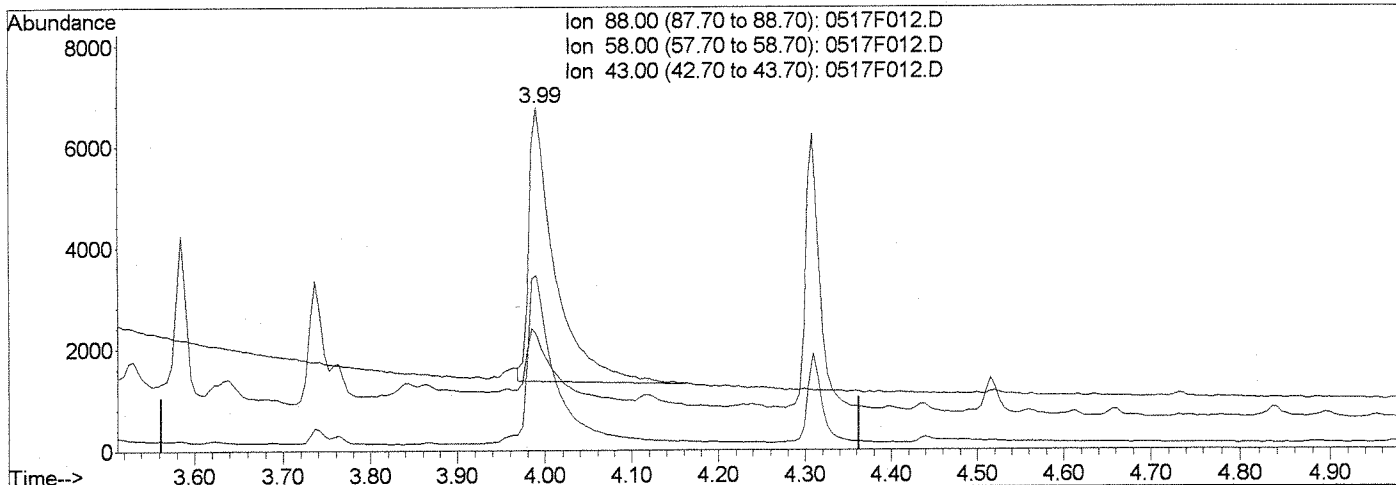
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\051711\0517F012.D
Acq On : 17 May 2011 3:04 pm
Sample : KWG1104188-3 | LCS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 18 11:00 2011

Vial: 5
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Wed May 18 10:59:17 2011
Response via : Multiple Level Calibration



TIC: 0517F012.D

(3) 1,4-Dioxane (T)		
3.99min	39.26ng/ml m	
response	11163	
Ion	Exp%	Act%
88.00	100	100
58.00	39.30	50.98
43.00	14.10	33.55
0.00	0.00	0.00

01
LB 5/18/11
04 05.18.11

Organic Analysis:
1,4-Dioxane by GC/MS

Validation Package

Standards Data

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Date Analyzed: 05/17/2011
Time Analyzed: 14:01

Tune Summary
1,4-Dioxane by GC/MS

File ID: J:\MS26\DATA\051711\0517F009.D
Instrument ID: MS26
Column:

Analysis Method: 8270C SIM
Analysis Lot: KWG1104446

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
198	442	30	100	54.0	3452650	PASS
199	198	5	9	6.5	224497	PASS
275	198	10	60	31.1	1072106	PASS
365	442	1	50	2.7	174669	PASS
441	443	0	100	72.3	1076074	PASS
442	442	100	100	100.0	6395904	PASS
443	442	15	24	23.3	1488341	PASS
51	198	10	80	16.1	555869	PASS
68	69	0	2	1.4	10034	PASS
69	198	0	100	20.2	697373	PASS
70	69	0	2	0.5	3334	PASS
127	198	10	80	37.7	1302606	PASS
197	198	0	2	0.2	8535	PASS

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
Continuing Calibration Verification	KWG1104446-2	J:\MS26\DATA\051711\0517F010.D	05/17/2011	14:22	
Method Blank	KWG1104188-4	J:\MS26\DATA\051711\0517F011.D	05/17/2011	14:44	
Lab Control Sample	KWG1104188-3	J:\MS26\DATA\051711\0517F012.D	05/17/2011	15:04	
MW-16	P1101681-001	J:\MS26\DATA\051711\0517F013.D	05/17/2011	15:23	
MW-16MS	KWG1104188-1	J:\MS26\DATA\051711\0517F014.D	05/17/2011	15:43	
MW-16DMS	KWG1104188-2	J:\MS26\DATA\051711\0517F015.D	05/17/2011	16:03	

Results flagged with an asterisk (*) indicate the analysis performed outside specified tune window

Exception Report

Data File: J:\MS26\DATA\051711\0517F009.D
Lab ID: KWG1104446-1
RunType: TUNE
Matrix: WATER

Date Acquired: 05/17/2011 14:01
Date Quantitated:
Batch ID: KWG1104446
Analysis Method: DFTPP
ListJoinID: LJ1965

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Ion Ratio	NA	NA	NA	x	

Primary Review: LB 5/18/11

Secondary Review: CH 05.18.11

Quantitation Report

Bottle ID:	Tier:	Matrix:
Prod Code: 8270C SIM 14_DI	Collect Date:	WATER
		Receive Date: 05/18/2011

Analysis Lot: KWG1104446	Prep Lot:	Report Group:
Analysis Method: DFTPP	Prep Method:	
Prep Ref:	Prep Date:	

Quant Method: J:\MS26\METHODS\SIMA_DFTPP.M	Calibration ID: CAL10487
Title:	Report List ID: LJ1965
Tune Ref:	Method ID: MJ190
MB Ref:	Quant based on Report List

Data File: J:\MS26\DATA\051711\0517F009.D	Instrument: MS26
Acqu Date: 05/17/2011 14:01	Quant Date:
Run Type: TUNE	Vial: 2
Lab ID: KWG1104446-1	Dilution: 1.0
	Soln Conc. Units:

Tune Results

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	16.1	555869	Pass
68	69	0	2	1.4	10034	Pass
69	198	0	100	20.2	697373	Pass
70	69	0	2	0.5	3334	Pass
127	198	10	80	37.7	1302606	Pass
197	198	0	2	0.2	8535	Pass
198	442	30	100	54.0	3452650	Pass
199	198	5	9	6.5	224497	Pass
275	198	10	60	31.1	1072106	Pass
365	442	1	50	2.7	174669	Pass
441	443	0.01	100	72.3	1076074	Pass
442	442	100	100	100.0	6395904	Pass
443	442	15	24	23.3	1488341	Pass

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

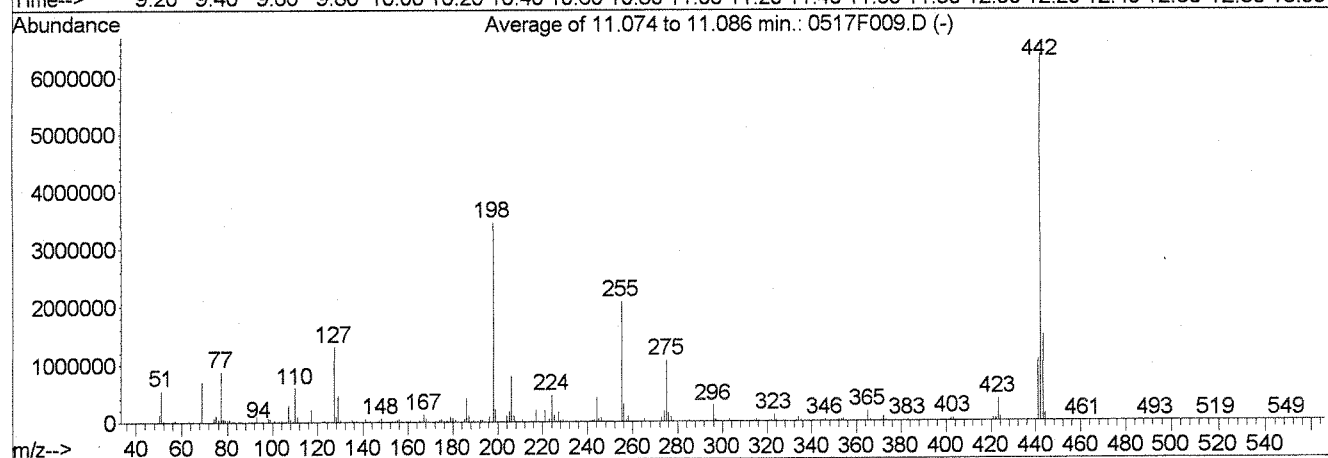
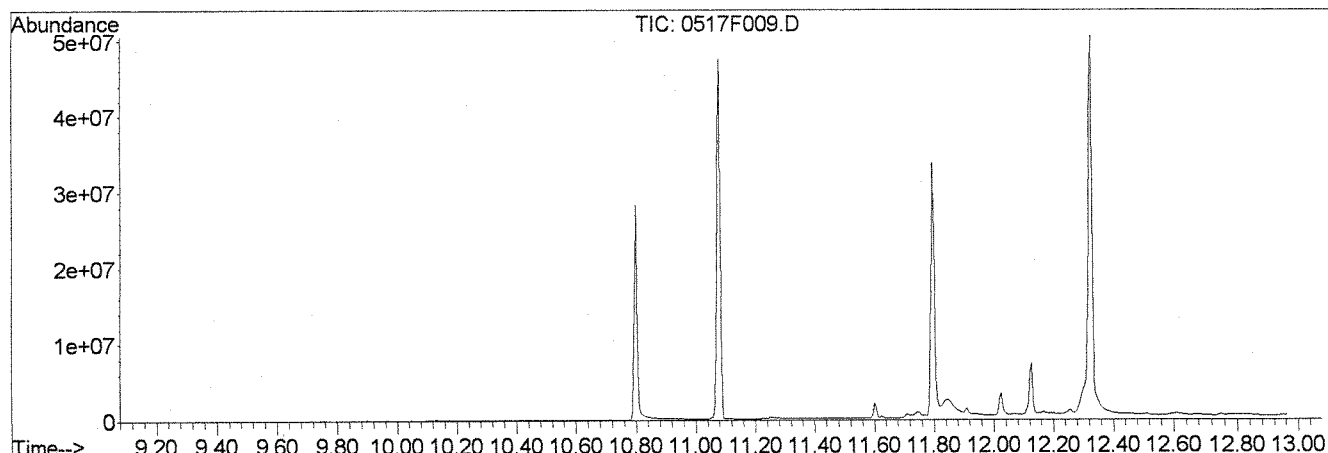
D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

DFTPP

Data File : J:\MS26\DATA\051711\0517F009.D
 Acq On : 17 May 2011 2:01 pm
 Sample : 10ug/mL DFTPP | SVM34-95A
 Misc :
 MS Integration Params: rteint.p
 Method : J:\MS26\METHODS\SIM\A_DFTPP.M (RTE Integrator)
 Title : dftpp tune mix

Vial: 2
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00



AutoFind: Scans 1326, 1327, 1328; Background Corrected with Scan 1314

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	16.1	555869	PASS
68	69	0.00	2	1.4	10034	PASS
69	198	0.00	100	20.2	697373	PASS
70	69	0.00	2	0.5	3334	PASS
127	198	10	80	37.7	1302606	PASS
197	198	0.00	2	0.2	8535	PASS
198	442	30	100	54.0	3452650	PASS
199	198	5	9	6.5	224497	PASS
275	198	10	60	31.1	1072106	PASS
365	442	1	50	2.7	174669	PASS
441	443	0.01	100	72.3	1076074	PASS
442	442	30	100	100.0	6395904	PASS
443	442	15	24	23.3	1488341	PASS

Average of 11.074 to 11.086 min.: 0517F009.D

10ug/mL DFTPP | SVM34-95A

Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
50.10	137936	62.05	8097	74.05	67525	85.05	9915
51.05	555869	63.05	23549	75.05	111913	86.00	15957
52.05	28609	64.10	3568	76.10	40572	87.00	7093
53.05	941	65.05	12763	77.10	883419	88.05	3762
55.00	1467	66.00	626	78.05	60926	89.00	1208
56.05	14977	67.05	47	79.05	47707	89.95	193
57.05	38093	68.10	10034	80.00	38589	91.00	12510
58.00	1551	69.00	697373	81.05	55182	92.10	14074
59.05	318	70.05	3334	82.05	13855	93.00	89785
60.00	191	72.05	85	83.10	14314	93.95	6216
61.10	6644	73.05	4535	84.00	764	95.05	637

Average of 11.074 to 11.086 min.: 0517F009.D

10ug/mL DFTPP | SVM34-95A

Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
96.10	4376	107.05	301758	118.00	16405	129.05	457552
97.10	1160	108.05	48925	119.05	1930	130.00	37529
98.05	69820	109.10	7485	120.05	3950	131.05	6797
99.05	59722	110.00	592023	121.05	1339	132.05	3544
100.00	5278	111.10	85572	122.05	19513	132.90	401
101.00	37259	112.10	10947	123.05	29871	133.10	475
102.05	2010	113.05	3228	124.00	13871	134.00	12209
103.00	11841	114.30	850	125.10	13926	135.10	36405
104.00	21981	115.00	584	126.15	4581	136.05	14443
105.05	20945	116.05	15673	127.10	1302606	137.10	18727
106.05	6761	117.05	214421	128.05	93046	138.00	4148

Average of 11.074 to 11.086 min.: 0517F009.D

10ug/mL DFTPP | SVM34-95A

Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
139.10	2192	150.05	4417	159.10	8425	170.05	3657
140.10	5001	151.00	35	160.05	18175	171.05	4861
141.00	54832	151.25	7883	161.05	29860	172.05	11028
142.05	19475	151.90	2369	162.05	9137	173.05	15423
143.00	13618	152.10	403	163.05	2393	174.10	28299
144.05	3666	153.00	19075	164.00	3583	175.05	54454
145.05	3506	154.05	14798	165.00	20354	176.10	16251
146.10	10500	155.10	35804	166.10	18910	177.10	23336
147.10	29605	156.05	55110	167.05	132255	178.05	7471
148.05	65316	157.10	11042	168.10	65867	179.00	96754
149.10	13662	158.00	10780	169.05	11198	180.05	71287

Average of 11.074 to 11.086 min.: 0517F009.D

10ug/mL DFTPP | SVM34-95A

Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
181.05	34738	192.05	33611	204.05	104384	215.10	7472
182.10	5463	193.10	36558	205.05	184179	216.10	16429
183.00	2702	194.05	7897	206.05	794660	217.10	206365
184.10	7422	195.15	4489	207.10	101821	218.10	26608
185.10	48276	196.10	95466	208.10	22728	219.10	2595
186.10	403661	196.90	8535	209.10	7340	221.05	202625
187.10	115472	198.10	3452650	210.30	6839	223.10	47938
188.10	11223	199.05	224497	211.05	30735	224.10	465661
189.05	21365	200.10	17388	211.80	461	225.10	117992
190.05	3369	201.60	16135	213.10	2127	226.10	11826
191.10	10213	203.05	18433	214.05	801	227.10	171759

Average of 11.074 to 11.086 min.: 0517F009.D

10ug/mL DFTPP | SVM34-95A

Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
228.05	24283	239.10	6549	250.10	2612	261.10	4003
229.05	39565	240.10	5593	251.10	2867	262.15	726
230.05	5304	241.10	10566	252.10	3329	263.15	1142
231.05	17025	242.10	26031	253.05	7536	263.95	910
232.05	2597	243.10	27128	254.15	12115	265.05	42859
233.10	3324	244.10	414282	255.05	2087365	265.95	4342
234.10	10995	245.10	53845	256.10	303434	267.05	1158
235.10	13141	246.10	67456	257.10	22916	269.20	173
236.05	8323	247.10	13958	258.10	106973	269.95	1262
237.05	14969	248.10	3187	259.10	17231	271.05	3945
238.05	2187	249.10	14526	260.10	3411	272.05	5228

Average of 11.074 to 11.086 min.: 0517F009.D

10ug/mL DFTPP | SVM34-95A

Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
273.10	68613	284.10	6278	295.10	5346	306.20	416
274.10	185048	285.10	14865	296.10	278456	307.10	450
275.10	1072106	286.10	2818	297.10	38542	308.10	4606
276.10	143445	287.05	535	298.10	2739	309.10	2916
277.10	76904	288.05	901	299.10	817	310.10	4227
278.10	12806	289.05	3362	300.10	354	311.10	964
279.10	2816	290.15	2833	301.10	3763	312.05	957
280.05	588	291.10	1808	302.10	5320	313.10	3040
281.05	442	292.20	3991	303.15	34996	314.10	14932
282.10	2051	293.10	20388	304.15	9403	315.10	32158
283.10	8848	294.10	4867	305.10	1359	316.10	19040

Average of 11.074 to 11.086 min.: 0517F009.D

10ug/mL DFTPP | SVM34-95A

Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
317.10	3800	328.10	11227	340.10	1976	350.15	1010
318.10	436	329.10	2136	341.15	13606	351.10	1964
319.05	624	330.15	732	342.15	3672	352.10	38210
320.10	1162	331.10	499	343.15	624	353.15	25933
321.10	11105	332.10	8114	344.05	306	354.15	42256
322.10	5424	333.10	10934	344.90	68	355.10	7284
323.15	113778	334.10	72520	345.20	337	356.10	647
324.15	21033	335.10	19022	346.10	29708	356.50	75
325.20	2224	336.10	2600	347.05	5140	357.15	612
326.10	2037	337.20	197	348.05	738	358.00	378
327.10	20722	339.10	2031	349.15	181	358.20	412

Average of 11.074 to 11.086 min.: 0517F009.D

10ug/mL DFTPP | SVM34-95A

Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
359.10	3387	369.00	190	380.90	64	391.15	8045
360.15	615	370.10	4262	381.95	228	392.15	6065
361.10	741	371.10	11058	382.20	235	393.15	989
362.20	204	372.15	77909	383.10	21805	395.05	744
362.95	155	373.15	19166	384.10	6242	396.10	592
363.25	290	374.10	2408	385.15	1966	397.05	1177
364.15	1380	375.15	177	386.00	321	398.05	183
365.10	174669	377.10	2277	387.10	129	400.20	116
366.10	26625	378.00	253	388.20	72	401.15	5345
367.05	1791	378.20	260	389.00	695	402.10	35485
368.20	212	379.00	270	390.10	11831	403.10	52704

Average of 11.074 to 11.086 min.: 0517F009.D

10ug/mL DFTPP | SVM34-95A

Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
404.15	18938	416.30	244	435.50	70	445.20	7625
405.15	2545	419.10	222	437.20	101	446.15	384
406.05	151	420.10	889	437.90	245	461.25	145
407.30	52	421.10	49082	439.10	245	475.00	79
408.15	461	422.15	45976	439.30	781	493.20	100
408.95	403	423.15	385749	440.05	549	519.20	76
410.15	1590	424.15	76669	440.30	1904	549.25	145
411.15	379	425.15	7323	441.15	1076074		
414.30	60	426.15	546	442.20	6395904		
415.05	2724	427.05	252	443.20	1488341		
416.10	263	427.30	86	444.20	135378		

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Calibration Date: 05/09/2011

Initial Calibration Summary
1,4-Dioxane by GC/MS

Calibration ID: CAL10487
Instrument ID: MS26

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS26\DATA\050911\0509F007.D	E	J:\MS26\DATA\050911\0509F011.D
B	J:\MS26\DATA\050911\0509F008.D	F	J:\MS26\DATA\050911\0509F012.D
C	J:\MS26\DATA\050911\0509F009.D	G	J:\MS26\DATA\050911\0509F013.D
D	J:\MS26\DATA\050911\0509F010.D		

Analyte Name	Level			Level			Level			Level			Level		
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF
1,4-Dioxane	A	2.0	0.359	B	4.0	0.357	C	10	0.368	D	20	0.389	E	50	0.426
	F	100	0.432	G	200	0.450									
1,4-Dioxane-d8	A	2.0	0.369	B	4.0	0.357	C	10	0.368	D	20	0.403	E	50	0.403
	F	100	0.417	G	200	0.419									

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Calibration Date: 05/09/2011

**Initial Calibration Summary
 1,4-Dioxane by GC/MS**

Calibration ID: CAL10487
Instrument ID: MS26

Column: MS

Analyte Name	Compound Type	Calibration Evaluation				RRF Evaluation			
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
1,4-Dioxane	MS	AverageRF	% RSD	9.6		≤ 15	0.397		0.01
1,4-Dioxane-d8	SURR	AverageRF	% RSD	6.6		≤ 15	0.391		0.01

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
 Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
 Calibration Date: 05/09/2011
 Date Analyzed: 05/09/2011

Second Source Calibration Verification
 1,4-Dioxane by GC/MS

Calibration Type: Internal Standard
 Analysis Method: 8270C SIM

Calibration ID: CAL10487
 Units: ng/ml

File ID: J:\MS26\DATA\050911\0509F014.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
1,4-Dioxane	20	22	0.397	0.445	12	NA	± 20 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	0509F001.d	1.	PR		9 May 2011 09:4
1	1	0509F002.d	1.	PR		9 May 2011 10:0
1	1	0509F003.d	1.	10ug/mL DFTPP SVM34-33F		9 May 2011 10:2
1	1	0509F004.d	1.	10ug/mL DFTPP SVM34-33F		9 May 2011 10:4
1	1	0509F005.d	1.	10ug/mL DFTPP SVM34-33F	OK - NEW TUNE	9 May 2011 11:1
2	2	0509F006.d	1.	IB		9 May 2011 11:4
3	3	0509F007.d	1.	2.0ng/mL ICAL 1,4-Dioxane SVM34-56B		9 May 2011 12:0
4	4	0509F008.d	1.	4.0ng/mL ICAL 1,4-Dioxane SVM34-56C		9 May 2011 12:2
5	5	0509F009.d	1.	10ng/mL ICAL 1,4-Dioxane SVM34-56D		9 May 2011 12:4
0	6	0509F010.d	1.	20ng/mL ICAL 1,4-Dioxane SVM34-56E		9 May 2011 13:0
1	7	0509F011.d	1.	50ng/mL ICAL 1,4-Dioxane SVM34-56F		9 May 2011 13:2
2	8	0509F012.d	1.	100ng/mL ICAL 1,4-Dioxane SVM34-56G		9 May 2011 13:4
3	9	0509F013.d	1.	200ng/mL ICAL 1,4-Dioxane SVM34-56H		9 May 2011 14:0
4	10	0509F014.d	1.	20ng/mL ICV 1,4-Dioxane SVM34-57L		9 May 2011 14:2
5	11	0509F015.d	1.	KWG1103961-4 MB		9 May 2011 14:4
6	12	0509F016.d	1.	KWG1103961-3 LCS		9 May 2011 15:0
7	13	0509F017.d	1.	KWG1103961-1 MS P1101579-005MS		9 May 2011 15:2
8	14	0509F018.d	1.	KWG1103961-2 DMS P1101579-005DMS		9 May 2011 15:4
9	15	0509F019.d	1.	P1101579-005		9 May 2011 16:0
0	16	0509F020.d	1.	P1101605-005		9 May 2011 16:2
1	17	0509F021.d	1.	P1101607-001		9 May 2011 16:4

Run # 245353

CAL10487

LB 5110111

QA 05.10.11

Exception Report

Data File: J:\MS26\DATA\050911\0509F005.D
Lab ID: KWG1104145-1
Run Type: TUNE
Matrix: WATER

Date Acquired: 05/09/2011 11:15
Date Quantitated:
Batch ID: KWG1104145
Analysis Method: DFTPP
ListJoinID: LJ1965

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Ion Ratio	NA	NA	NA	x	

Primary Review: LG 5/10/11
Secondary Review: CH 05-10-11

Quantitation Report

Bottle ID:	Tier:	Matrix:
Prod Code: 8270C SIM 14_DI	Collect Date:	WATER
		Receive Date: 05/10/2011
Analysis Lot: KWG1104145	Prep Lot:	Report Group:
Analysis Method: DFTPP	Prep Method:	
Prep Ref:	Prep Date:	
Quant Method: J:\MS26\METHODS\SIMAA_DFTPP.M	Calibration ID: CAL10487	
Title:	Report List ID: LJ1965	
Tune Ref:	Method ID: MJ190	
MB Ref:	Quant based on Report List	
Data File: J:\MS26\DATA\050911\0509F005.D	Instrument: MS26	
Acqu Date: 05/09/2011 11:15	Quant Date:	Vial: 1
Run Type: TUNE		Dilution: 1.0
Lab ID: KWG1104145-1		Soln Conc. Units:

Tune Results

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	12.7	700992	Pass
68	69	0	2	1.4	13150	Pass
69	198	0	100	17.7	972672	Pass
70	69	0	2	0.5	5066	Pass
127	198	10	80	36.3	1997824	Pass
197	198	0	2	0.0	0	Pass
198	442	30	100	69.9	5508096	Pass
199	198	5	9	6.8	373632	Pass
275	198	10	60	28.3	1558528	Pass
365	442	1	50	2.5	200064	Pass
441	443	0.01	100	70.8	1123328	Pass
442	442	100	100	100.0	7877632	Pass
443	442	15	24	20.1	1586688	Pass

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

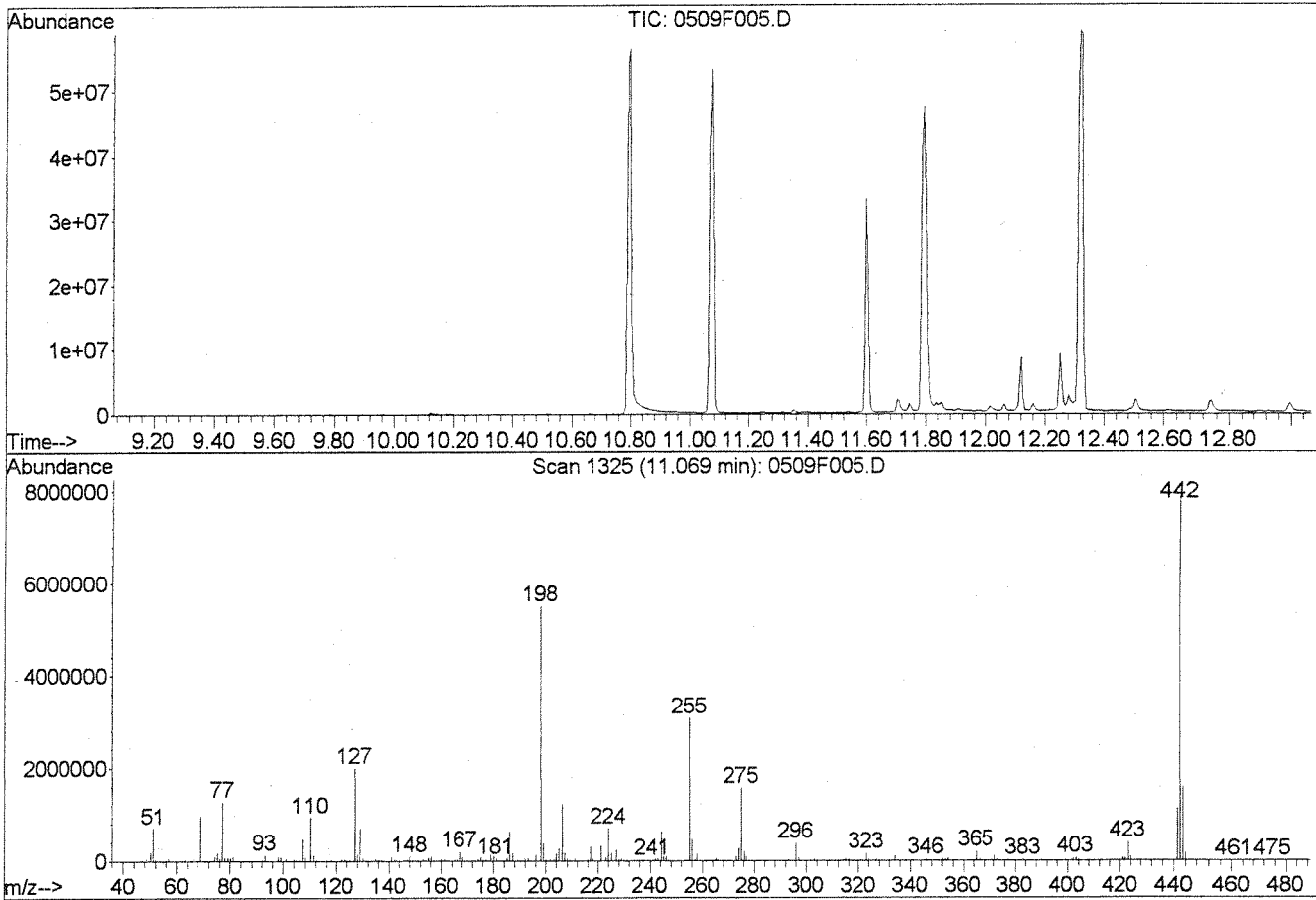
D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

DFTPP

Data File : J:\MS26\DATA\050911\0509F005.D
 Acq On : 9 May 2011 11:15 am
 Sample : 10ug/mL DFTPP | SVM34-33F
 Misc :
 MS Integration Params: rteint.p
 Method : J:\MS26\METHODS\SIM\A_DFTPP.M (RTE Integrator)
 Title : dftpp tune mix

Vial: 1
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00



Spectrum Information: Scan 1325

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	12.7	700992	PASS
68	69	0.00	2	1.4	13150	PASS
69	198	0.00	100	17.7	972672	PASS
70	69	0.00	2	0.5	5066	PASS
127	198	10	80	36.3	1997824	PASS
197	198	0.00	2	0.0	0	PASS
198	442	30	100	69.9	5508096	PASS
199	198	5	9	6.8	373632	PASS
275	198	10	60	28.3	1558528	PASS
365	442	1	50	2.5	200064	PASS
441	443	0.01	100	70.8	1123328	PASS
442	442	30	100	100.0	7877632	PASS
443	442	15	24	20.1	1586688	PASS

LB
5110111

Scan 1325 (11.069 min): 0509F005.D
0.0ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
50.10	175744	61.10	9076	72.10	684	83.10	22992
51.10	700992	62.10	11282	73.00	6516	84.00	2283
52.10	35816	63.10	33064	74.10	92872	85.10	16584
53.20	1660	64.10	4802	75.10	158656	86.10	23512
54.00	206	65.10	19008	76.10	57568	87.10	11469
55.10	4620	66.00	1436	77.10	1275392	88.10	5655
56.10	20432	67.10	1532	78.10	85416	89.10	2049
57.10	52136	68.10	13150	79.10	69640	90.10	748
58.00	2316	69.00	972672	80.10	55336	91.10	20104
59.10	671	70.10	5066	81.10	82528	92.10	21040
60.00	1086	71.10	3191	82.10	21000	93.10	133760

Scan 1325 (11.069 min): 0509F005.D
0.0ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
94.10	9002	105.00	33480	116.10	23712	127.10	1997824
95.10	5186	106.10	10305	117.00	311872	128.10	145920
96.10	8648	107.10	464576	118.10	24432	129.10	695488
97.20	4742	108.10	73896	119.10	4496	130.10	60976
98.10	104632	109.10	12483	120.10	6355	131.10	12409
99.10	85880	110.00	935744	121.00	2248	132.10	8242
100.10	8736	111.10	135424	122.00	28304	132.90	3695
101.00	57824	112.10	17488	123.10	47232	134.10	19000
102.00	3428	113.10	5707	124.00	21672	135.10	58984
103.10	16928	114.10	1498	125.10	22248	136.10	21792
104.00	33208	115.00	2220	126.10	5253	137.10	28872

Scan 1325 (11.069 min): 0509F005.D
0.0ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
138.10	6356	149.10	21408	160.00	27552	171.00	8490
139.00	3889	150.10	6395	161.10	47376	172.00	17232
140.00	7545	151.10	11578	162.00	13040	173.10	22032
141.00	85744	151.90	8398	163.10	4006	174.10	42288
142.10	29288	153.00	28504	164.00	4599	175.10	81264
143.00	21792	154.10	22976	165.00	34784	176.10	25232
144.00	5918	155.10	54680	166.10	28944	177.00	34312
145.00	6165	156.10	83888	167.10	196224	178.00	10661
146.10	14761	157.10	18992	168.10	86648	179.00	143296
147.10	45120	158.00	16257	169.10	18456	180.10	105424
148.00	94488	159.00	13164	170.00	6344	181.10	51984

Scan 1325 (11.069 min): 0509F005.D
0.0ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
182.10	7779	193.10	54272	206.10	1212416	219.10	3402
183.10	5240	194.10	11832	207.10	163136	221.10	312576
184.10	11434	195.10	7602	208.10	36088	223.00	70152
185.10	71120	196.10	139840	209.00	11104	224.10	696768
186.10	621952	198.00	5508096	211.00	45936	225.10	175744
187.10	175616	199.00	373632	213.00	3013	226.00	17760
188.10	17128	200.00	29040	214.00	1209	227.00	241088
189.00	31152	201.60	24672	215.00	10591	228.00	37952
190.10	5072	203.00	28320	216.00	24008	229.00	58712
191.10	16100	204.10	156416	217.00	303872	230.00	10364
192.10	48024	205.10	274688	218.00	40896	231.10	25608

LB
5/10/11
04 05 10 11

Scan 1325 (11.069 min): 0509F005.D
.0ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
232.10	5831	243.10	41064	254.00	14230	265.00	59384
233.00	4850	244.10	636288	255.00	3073536	265.90	30712
234.00	15479	245.10	88480	256.00	457216	267.00	2334
235.00	20808	246.00	98752	257.10	34264	267.90	14490
236.00	13169	247.00	20184	258.00	150784	268.90	1366
237.00	21880	248.00	5311	259.00	24240	269.90	7072
238.00	3265	249.00	21888	260.00	4355	271.00	5192
239.00	10927	250.00	3815	261.10	5748	272.00	8114
240.00	7773	251.00	4575	262.00	1214	273.00	98288
241.00	15098	252.10	4798	263.10	1351	274.00	263936
242.00	38320	253.00	10498	263.90	16329	275.00	1558528

Scan 1325 (11.069 min): 0509F005.D
.0ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
276.10	212416	287.10	382	298.10	4030	308.00	6187
277.00	107512	288.10	1444	299.00	1199	309.10	3898
278.00	18200	289.00	4600	299.90	452	310.10	6102
279.00	3914	290.00	4222	301.00	5986	311.00	1534
280.10	906	291.00	2804	302.10	6855	312.00	1665
281.00	948	292.10	5797	303.10	46608	313.10	4237
282.00	2769	293.00	29104	304.10	14524	314.10	20048
283.00	13477	294.00	7352	305.00	1752	315.00	42928
284.00	9076	295.00	6824	305.90	420	316.10	28368
285.10	21248	296.00	385152	306.90	697	317.10	5455
286.10	4317	297.10	53152	307.10	695	318.00	453

Scan 1325 (11.069 min): 0509F005.D
.0ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
319.00	892	330.10	823	342.10	4747	354.10	51624
319.90	1534	331.00	562	343.00	709	355.10	9842
321.00	14730	332.00	10118	344.10	194	356.00	1059
322.00	6633	333.00	13546	345.10	275	357.10	559
323.10	155200	334.10	94632	346.00	36384	358.00	1167
324.10	30440	335.10	26248	347.00	6600	359.00	4007
325.10	2768	336.10	3662	348.00	968	360.00	872
326.00	3322	337.10	357	350.00	1134	361.10	877
327.00	27848	338.90	2300	351.00	2721	362.40	152
328.10	14191	340.10	2342	352.00	49672	363.10	465
329.00	2792	341.00	19096	353.10	33536	364.00	1713

Scan 1325 (11.069 min): 0509F005.D
.0ug/mL DFTPP | SVM34-33F

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
365.00	200064	377.00	2907	390.00	14038	403.10	56624
366.00	30624	378.00	476	391.00	9254	404.10	21000
367.00	2358	379.10	223	392.10	7346	405.00	3137
369.00	169	380.80	209	393.10	895	406.00	249
370.00	5178	382.00	422	395.00	927	408.00	544
371.00	13788	383.00	26472	395.90	504	409.00	407
372.10	94496	384.00	7987	396.90	1324	410.00	2120
373.10	24680	385.00	2088	397.90	177	411.00	422
374.10	2996	385.90	367	398.30	208	415.00	2812
375.00	290	387.80	285	401.00	5642	416.10	464
375.90	212	389.00	862	402.00	39496	419.00	373

511011
CH 05.10.11

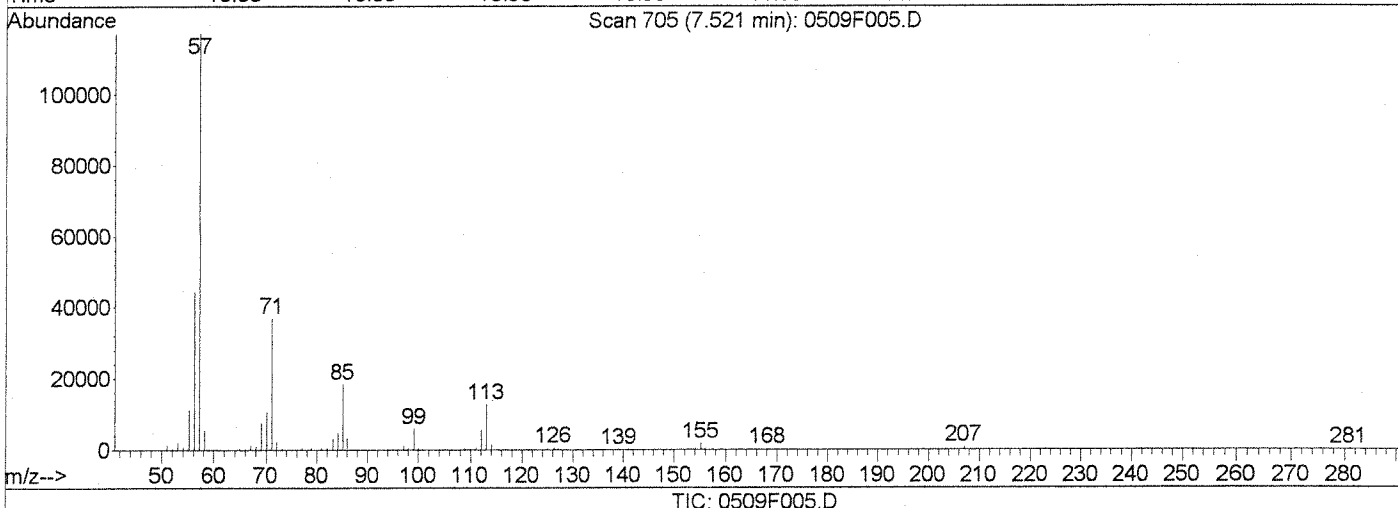
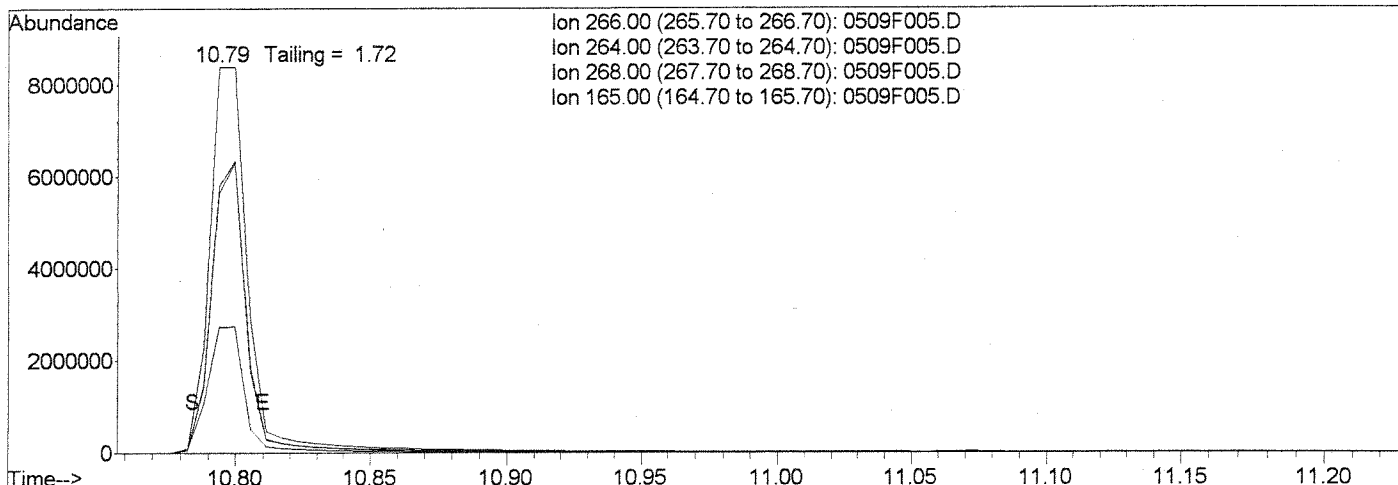
m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
420.00	596	441.10	1123328				
421.00	52856	442.10	7877632				
422.00	44800	443.10	1586688				
423.00	397248	444.10	152320				
424.10	79880	445.10	9102				
425.10	7945	445.90	497				
426.00	625	460.90	163				
427.00	384	475.10	206				
438.10	158						
439.10	657						
439.90	755						

LB
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Data File : J:\MS26\DATA\050911\0509F005.D
Acq On : 9 May 2011 11:15 am
Sample : 10ug/mL DFTPP | SVM34-33F
Misc :
MS Integration Params: rteint.p

Vial: 1
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Method : J:\MS26\METHODS\SIM\A_DFTPP.M (RTE Integrator)
Title : dftpp tune mix
Last Update : Tue Nov 30 13:38:58 2010
Response via : Initial Calibration



(1) Pentachlorophenol

Exp R.T. 7.52min

response 0

Ion	Exp%	Act%
266.00	100	0
264.00	63.70	0.00
268.00	63.30	0.00
165.00	71.50	0.00

LB
5/10/11
CH 05/10/11

Data File : J:\MS26\DATA\050911\0509F006.D
 Acq On : 9 May 2011 11:43 am
 Sample : IB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:56:54 2011

Vial: 2
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	76813	50.00	ng/ml	0.00

System Monitoring Compounds

2) 1,4-Dioxane-d8	0.00	96	0	0.00	ng/ml	
Spiked Amount	50.000		Recovery	=	0.00%	

Target Compounds

Qvalue

KB
 5/10/11

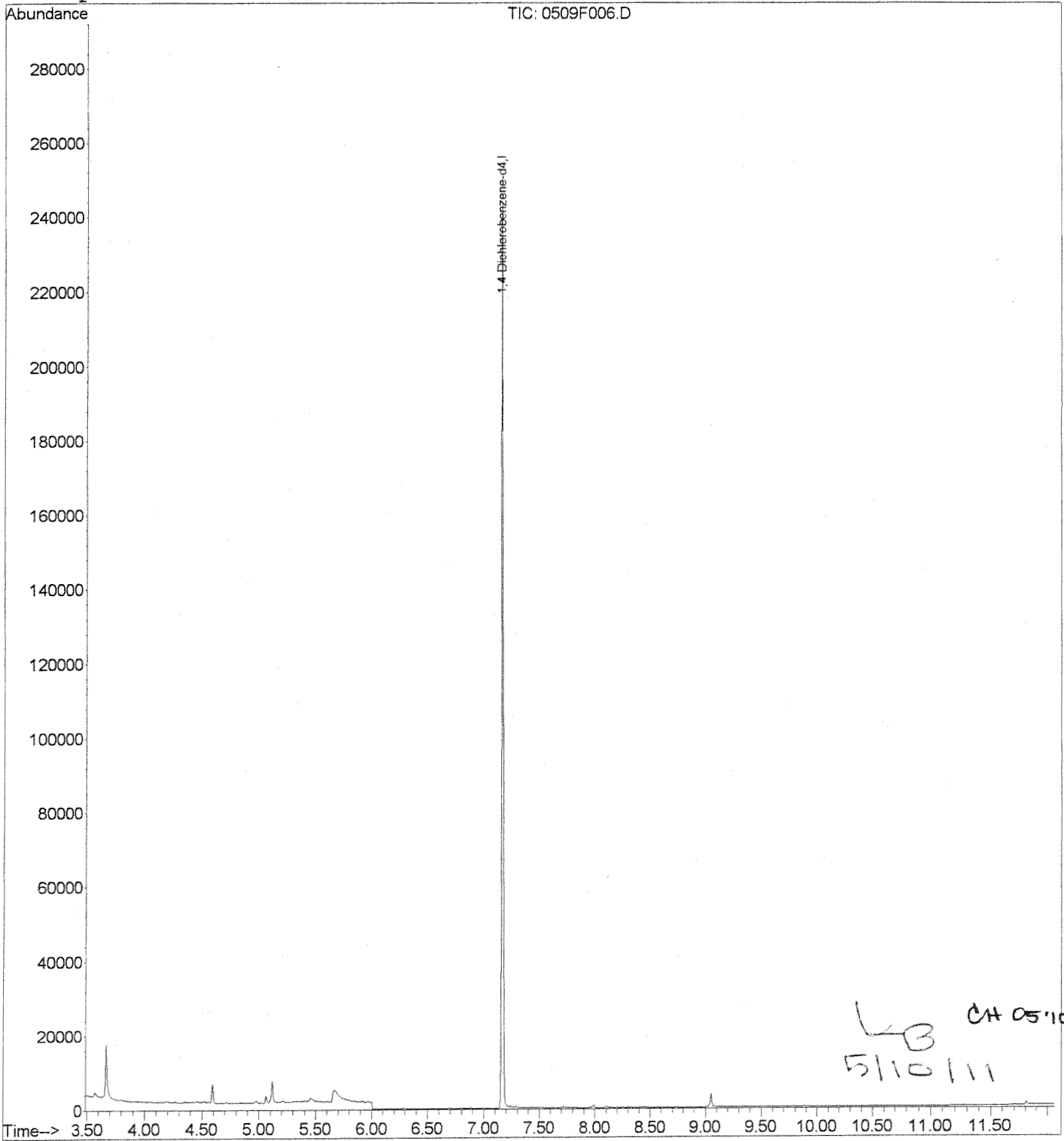
CH 05/10/11

Data File : J:\MS26\DATA\050911\0509F006.D
Acq On : 9 May 2011 11:43 am
Sample : IB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:56 2011

Vial: 2
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Data File : J:\MS26\DATA\050911\0509F007.D Vial: 3
Acq On : 9 May 2011 12:03 pm Operator: KBailey
Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 09 14:21:30 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:21:18 2011
Response via : Initial Calibration
DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.16	152	81459	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.98	96	1201m	1.98	ng/ml	0.04
Spiked Amount	50.000		Recovery	=	3.96%	
Target Compounds						
3) 1,4-Dioxane	3.99	88	1170m	1.88	ng/ml	Qvalue

CA 051011

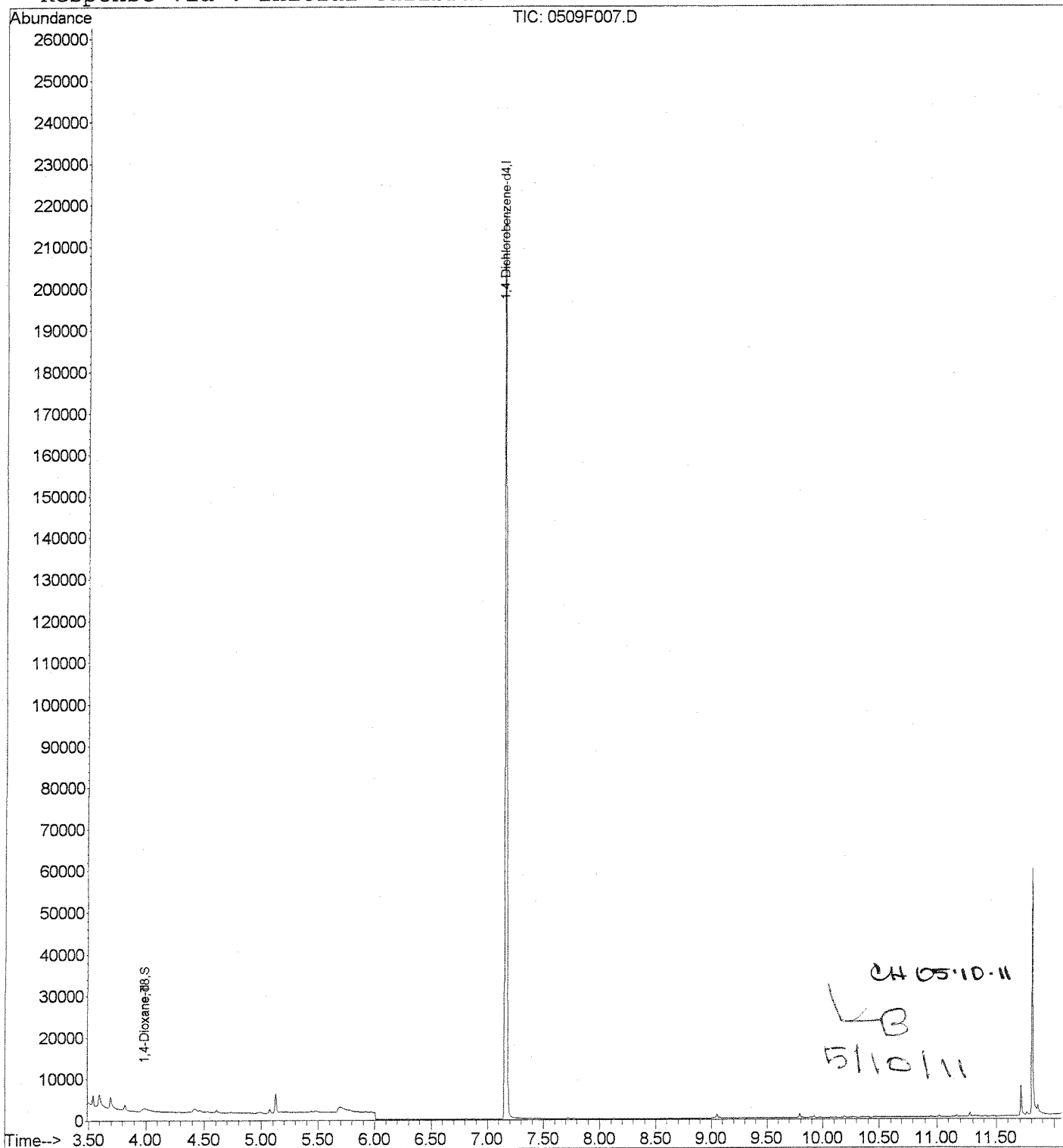
KB
5/10/11

Data File : J:\MS26\DATA\050911\0509F007.D
Acq On : 9 May 2011 12:03 pm
Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:22 2011

Vial: 3
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Data File : J:\MS26\DATA\050911\0509F007.D

Vial: 3

Acq On : 9 May 2011 12:03 pm

Operator: K Bailey

Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:21 2011

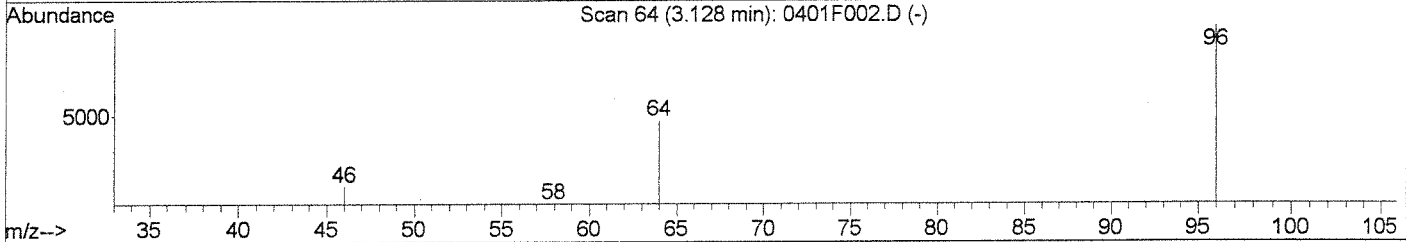
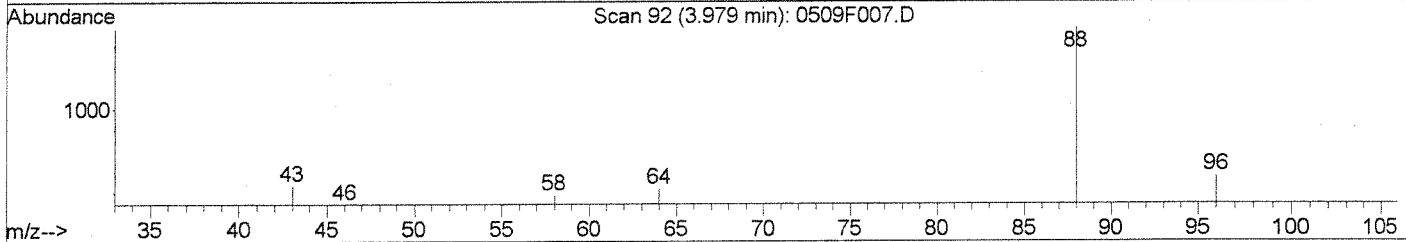
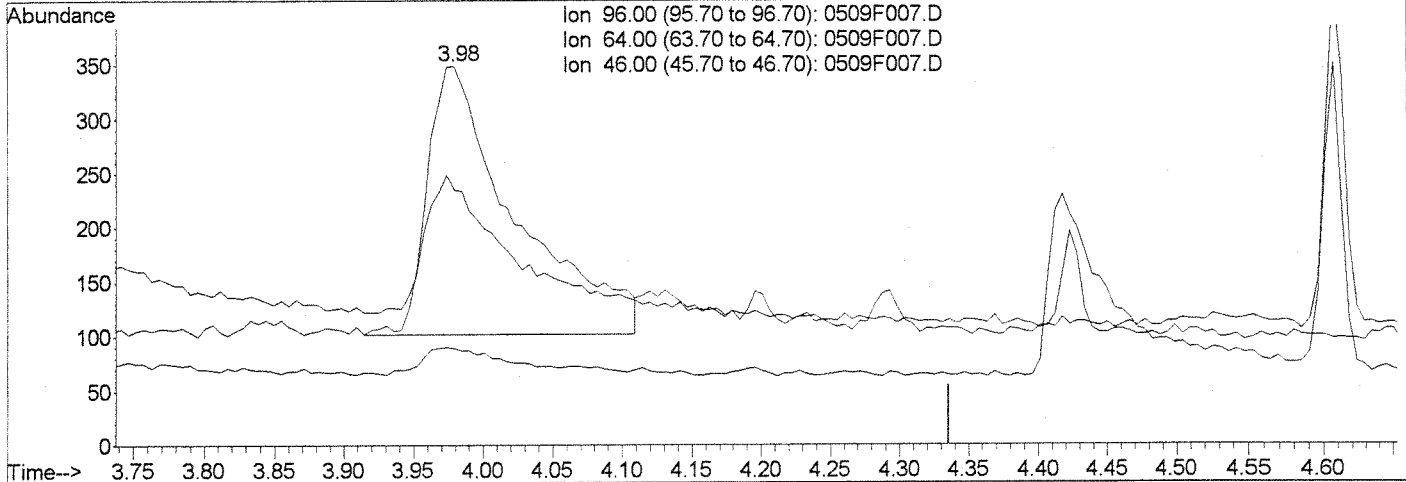
Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:21:18 2011

Response via : Multiple Level Calibration



TIC: 0509F007.D

(2) 1,4-Dioxane-d8 (S)

3.98min 1.80ng/ml

response 1087

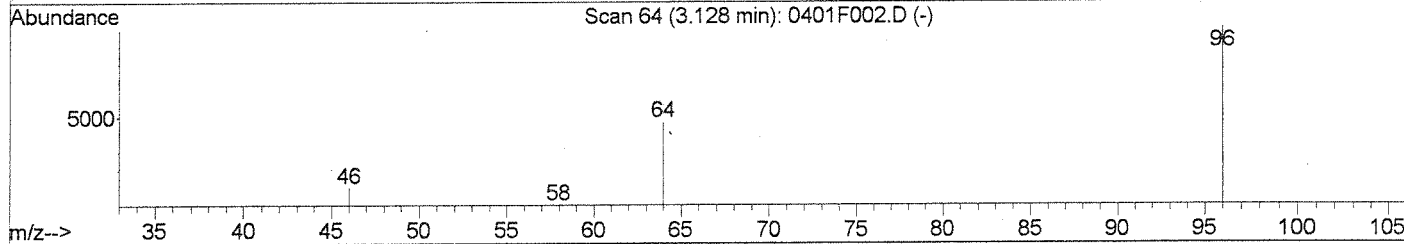
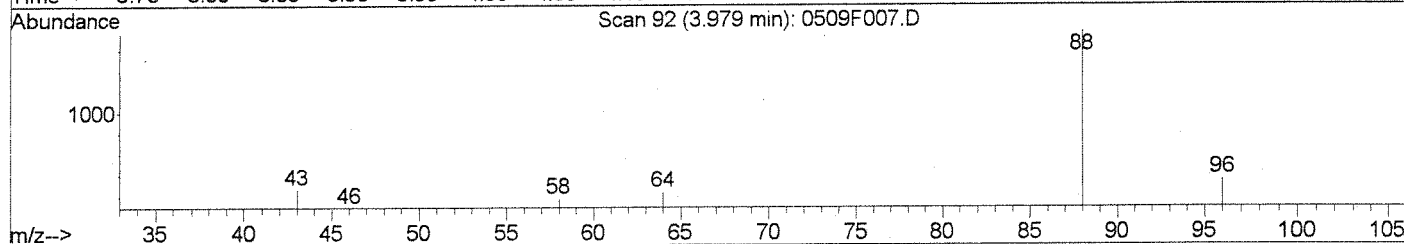
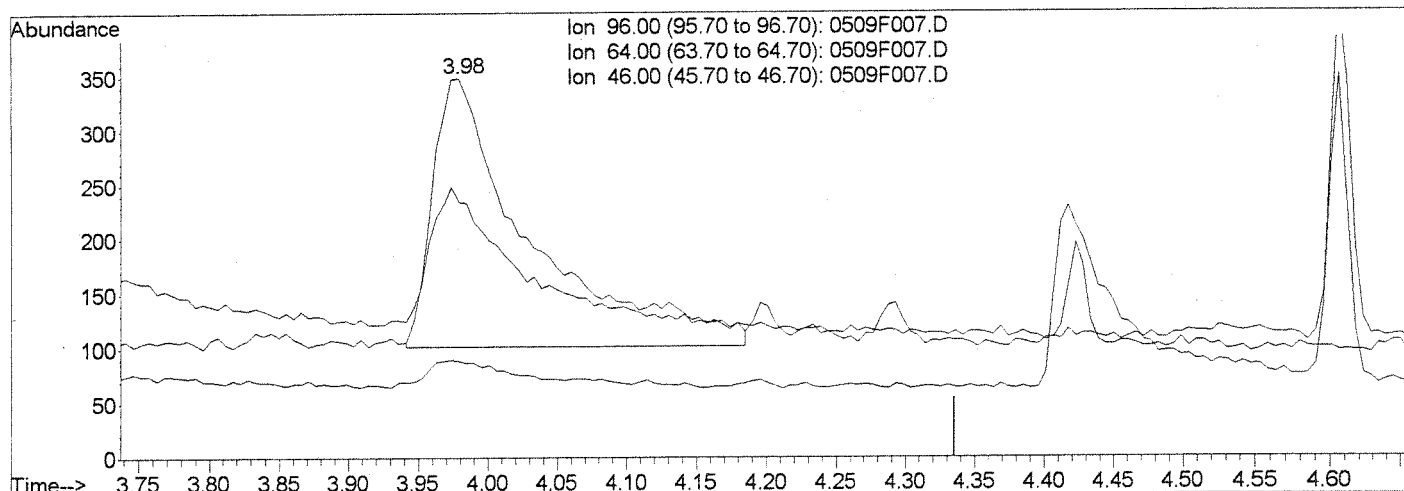
Ion	Exp%	Act%
96.00	100	100
64.00	55.60	45.75
46.00	11.70	8.91
0.00	0.00	0.00

Data File : J:\MS26\DATA\050911\0509F007.D
 Acq On : 9 May 2011 12:03 pm
 Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:21 2011

Vial: 3
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F007.D

(2) 1,4-Dioxane-d8 (S)			
3.98min	1.98ng/ml	m	
response	1201		
Ion	Exp%	Act%	
96.00	100	100	
64.00	55.60	67.34	
46.00	11.70	25.50	
0.00	0.00	0.00	

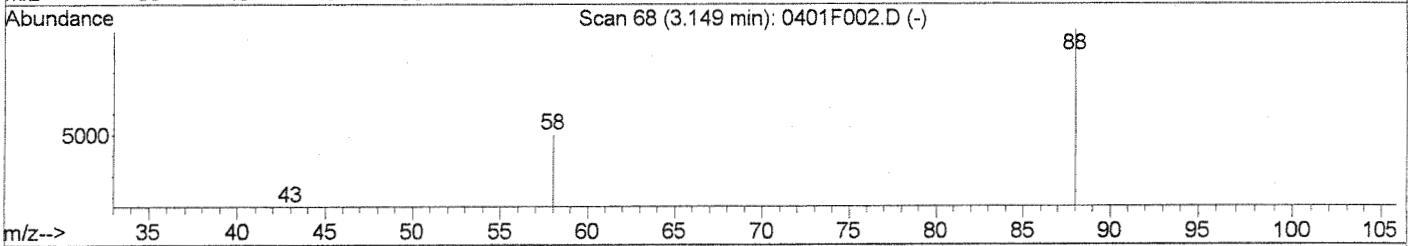
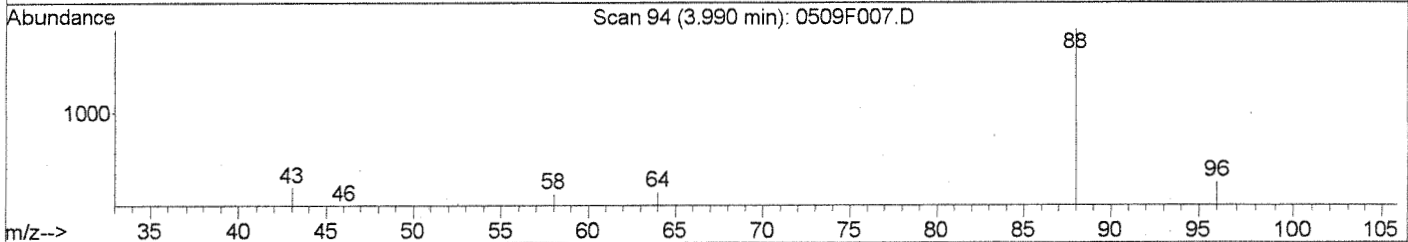
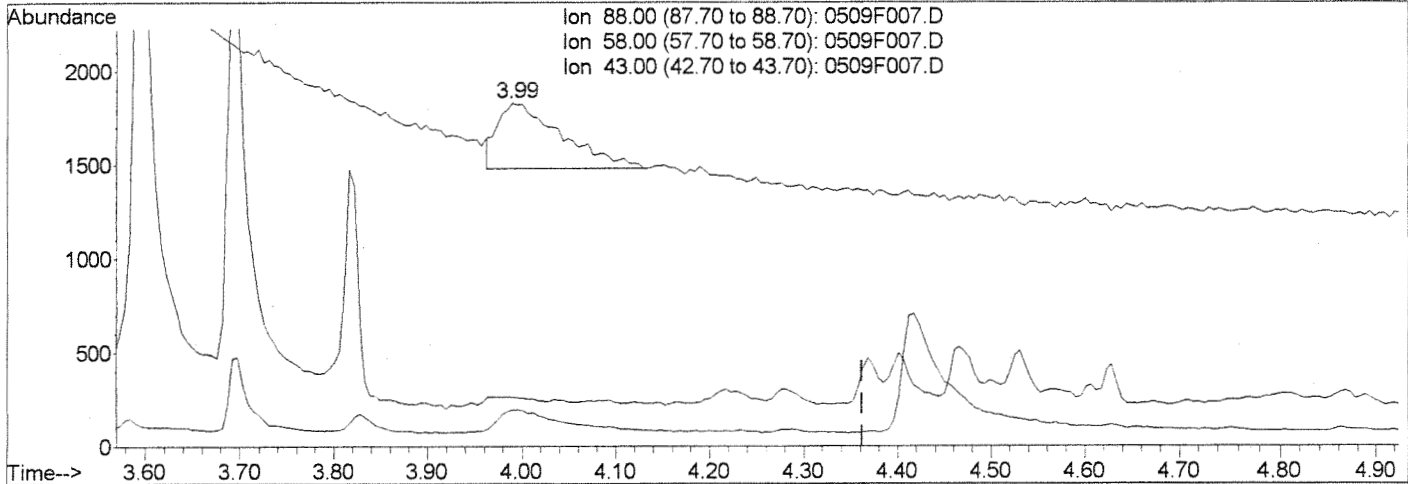
IC
 KB 5/10/11
 04051011

Data File : J:\MS26\DATA\050911\0509F007.D
 Acq On : 9 May 2011 12:03 pm
 Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:21 2011

Vial: 3
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F007.D

(3) 1,4-Dioxane (T)

3.99min 2.67ng/ml

response 1657

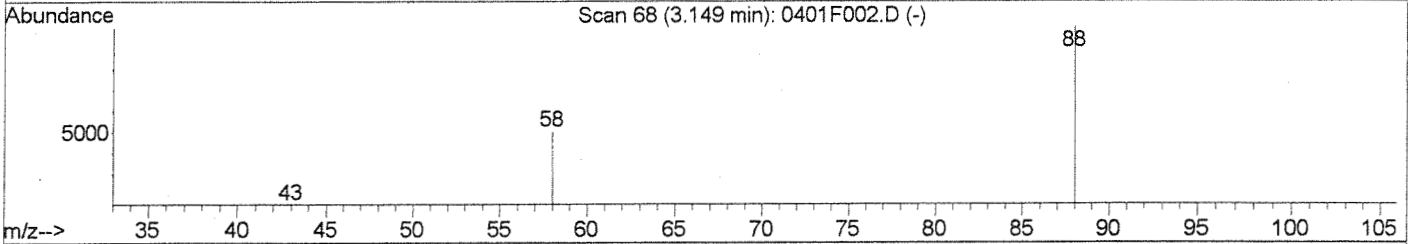
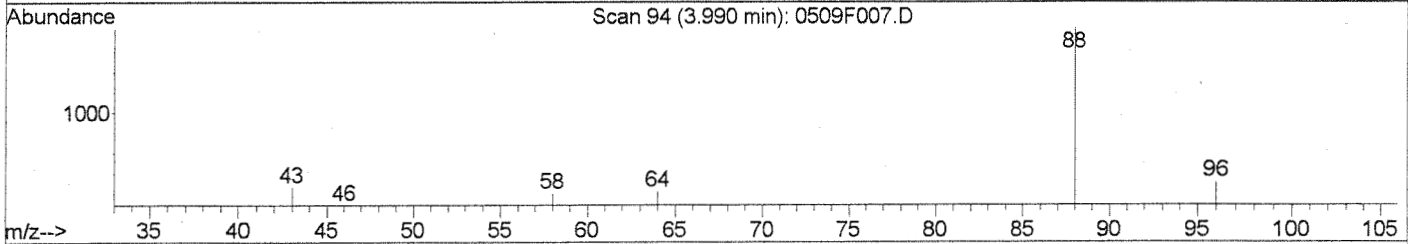
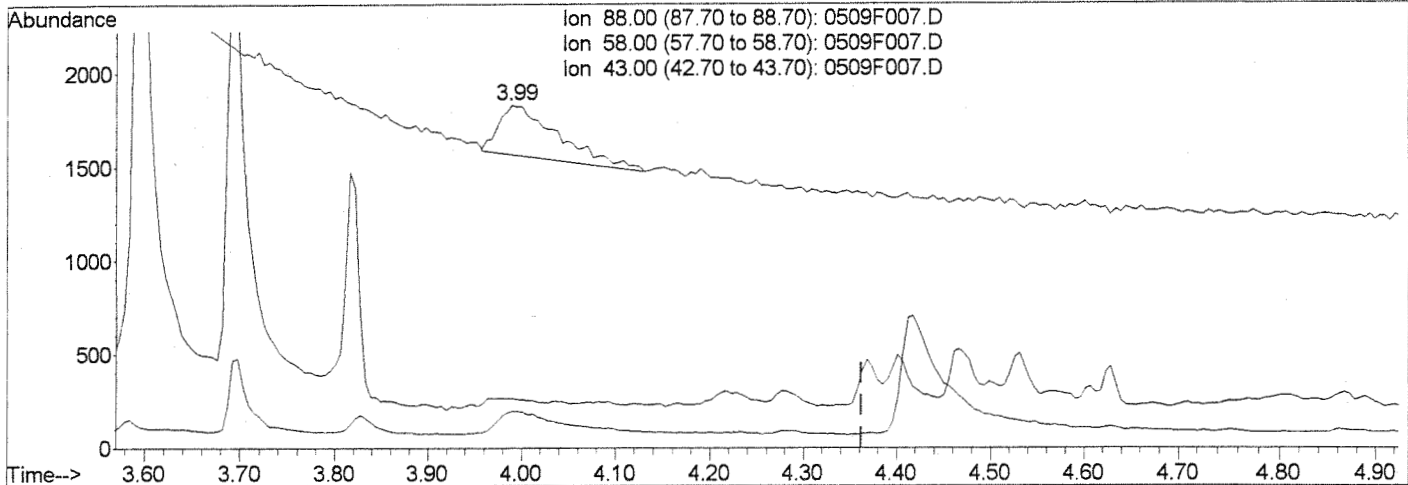
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	31.43
43.00	15.30	9.43
0.00	0.00	0.00

Data File : J:\MS26\DATA\050911\0509F007.D
 Acq On : 9 May 2011 12:03 pm
 Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:22 2011

Vial: 3
 Operator: K Bailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F007.D

(3) 1,4-Dioxane (T)
 3.99min 1.88ng/ml m
 response 1170

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	10.71#
43.00	15.30	14.43
0.00	0.00	0.00

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 LB 5/10/11
 CH 05.10.11

Data File : J:\MS26\DATA\050911\0509F008.D
Acq On : 9 May 2011 12:23 pm
Sample : 4.0ng/mL ICAL 1,4-Dioxane | SVM34-56C
Misc :

Vial: 4
Operator: KBailey
Inst : MS26
Multiplr: 1.00

MS Integration Params: RTEINT.P
Quant Time: May 09 14:21:30 2011

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:21:18 2011
Response via : Initial Calibration
DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	80983	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.96	96	2312	3.84	ng/ml	0.02
Spiked Amount	50.000		Recovery	=	7.68%	
Target Compounds						
3) 1,4-Dioxane	3.97	88	2314m	3.75	ng/ml	Qvalue

LB
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CA 05-10-11

Data File : J:\MS26\DATA\050911\0509F008.D

Vial: 4

Acq On : 9 May 2011 12:23 pm

Operator: KBailey

Sample : 4.0ng/mL ICAL 1,4-Dioxane | SVM34-56C

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:22 2011

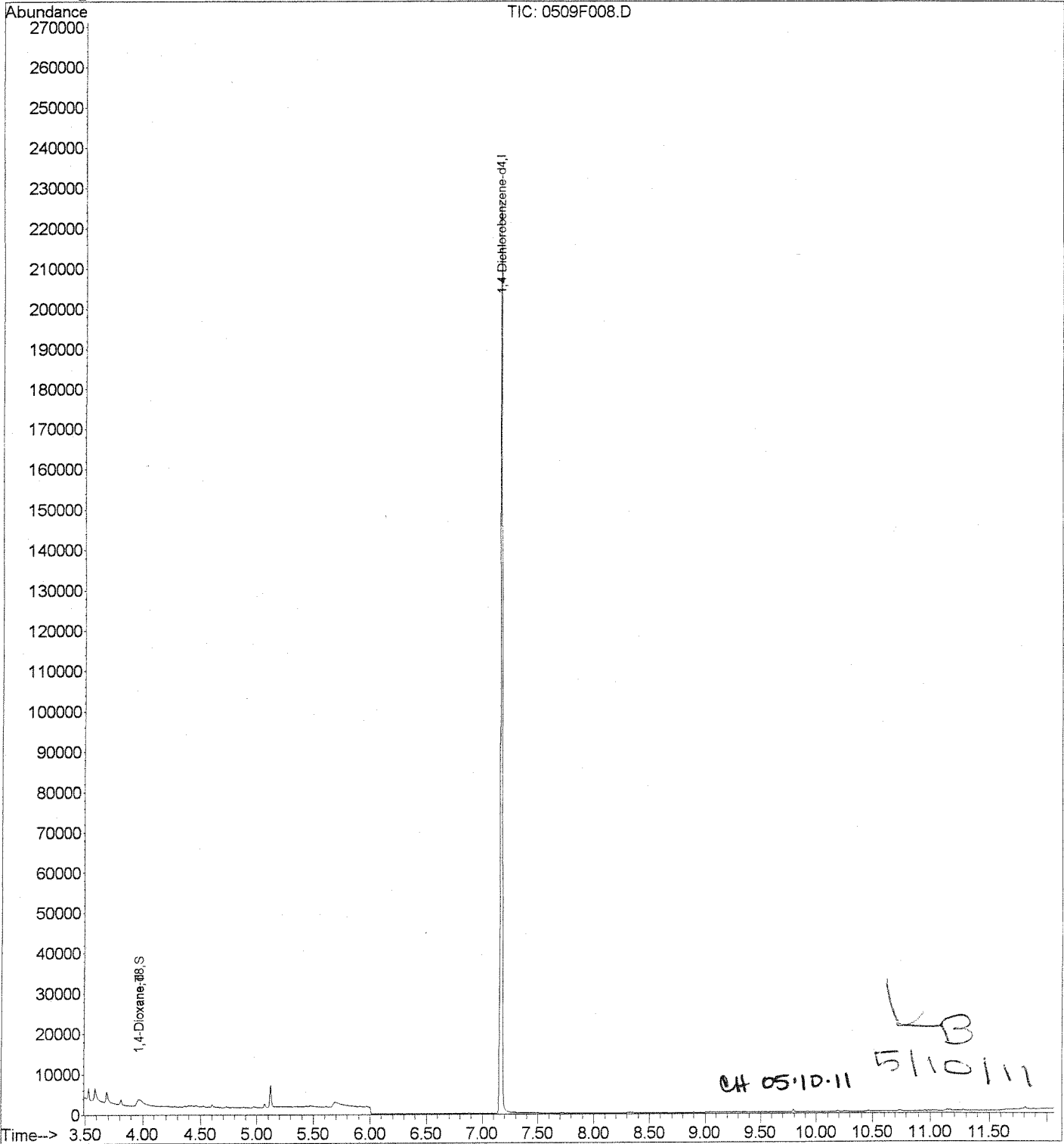
Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:26:14 2011

Response via : Initial Calibration

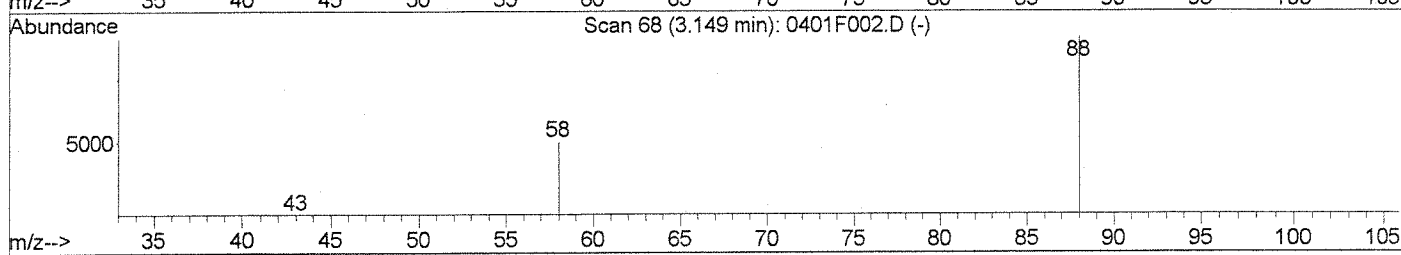
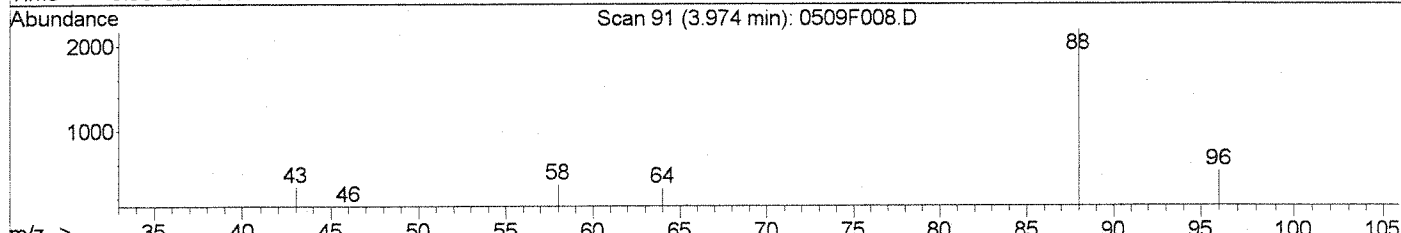
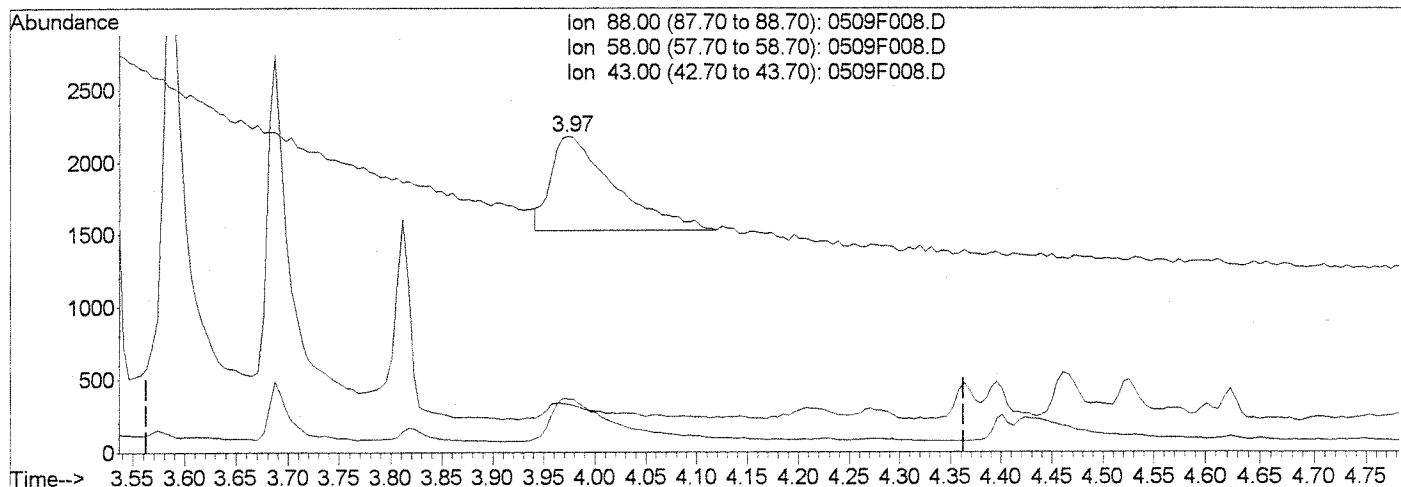


Data File : J:\MS26\DATA\050911\0509F008.D
 Acq On : 9 May 2011 12:23 pm
 Sample : 4.0ng/mL ICAL 1,4-Dioxane | SVM34-56C
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:21 2011

Vial: 4
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F008.D

(3) 1,4-Dioxane (T)

3.97min 4.55ng/ml

response 2811

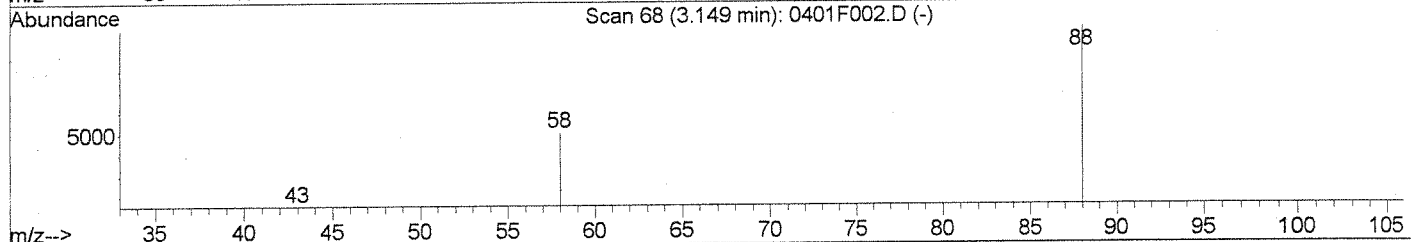
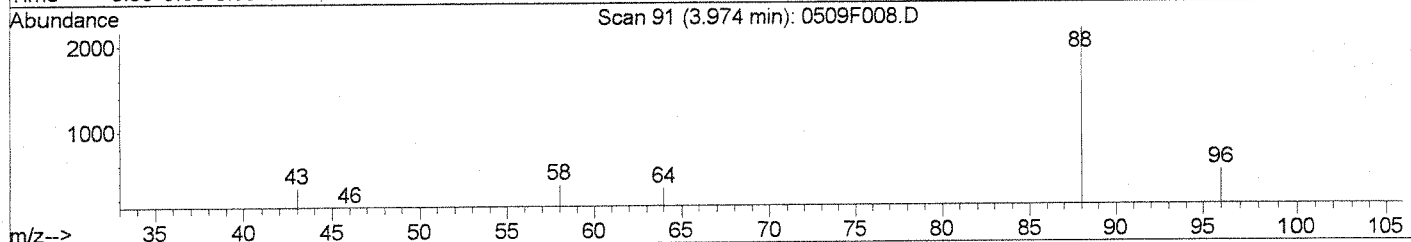
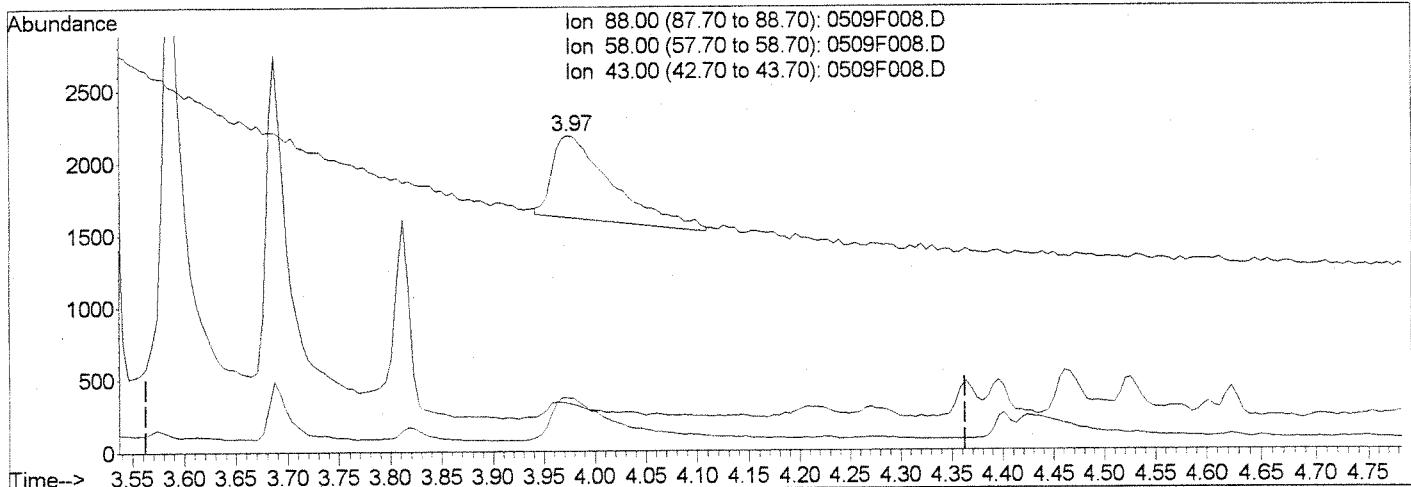
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	42.09
43.00	15.30	14.90
0.00	0.00	0.00

Data File : J:\MS26\DATA\050911\0509F008.D
Acq On : 9 May 2011 12:23 pm
Sample : 4.0ng/mL ICAL 1,4-Dioxane | SVM34-56C
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:22 2011

Vial: 4
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:21:18 2011
Response via : Multiple Level Calibration



TIC: 0509F008.D

(3) 1,4-Dioxane (T)
3.97min 3.75ng/ml m
response 2314

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	16.78#
43.00	15.30	15.13
0.00	0.00	0.00

01
KB 5/10/11
04 05'10'11

Data File : J:\MS26\DATA\050911\0509F009.D Vial: 5
 Acq On : 9 May 2011 12:43 pm Operator: KBailey
 Sample : 10ng/mL ICAL 1,4-Dioxane | SVM34-56D Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:30 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	82998	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.95	96	6105	9.90	ng/ml	0.01
Spiked Amount	50.000		Recovery	=	19.80%	
Target Compounds						
3) 1,4-Dioxane	3.97	88	6107m	9.64	ng/ml	Qvalue

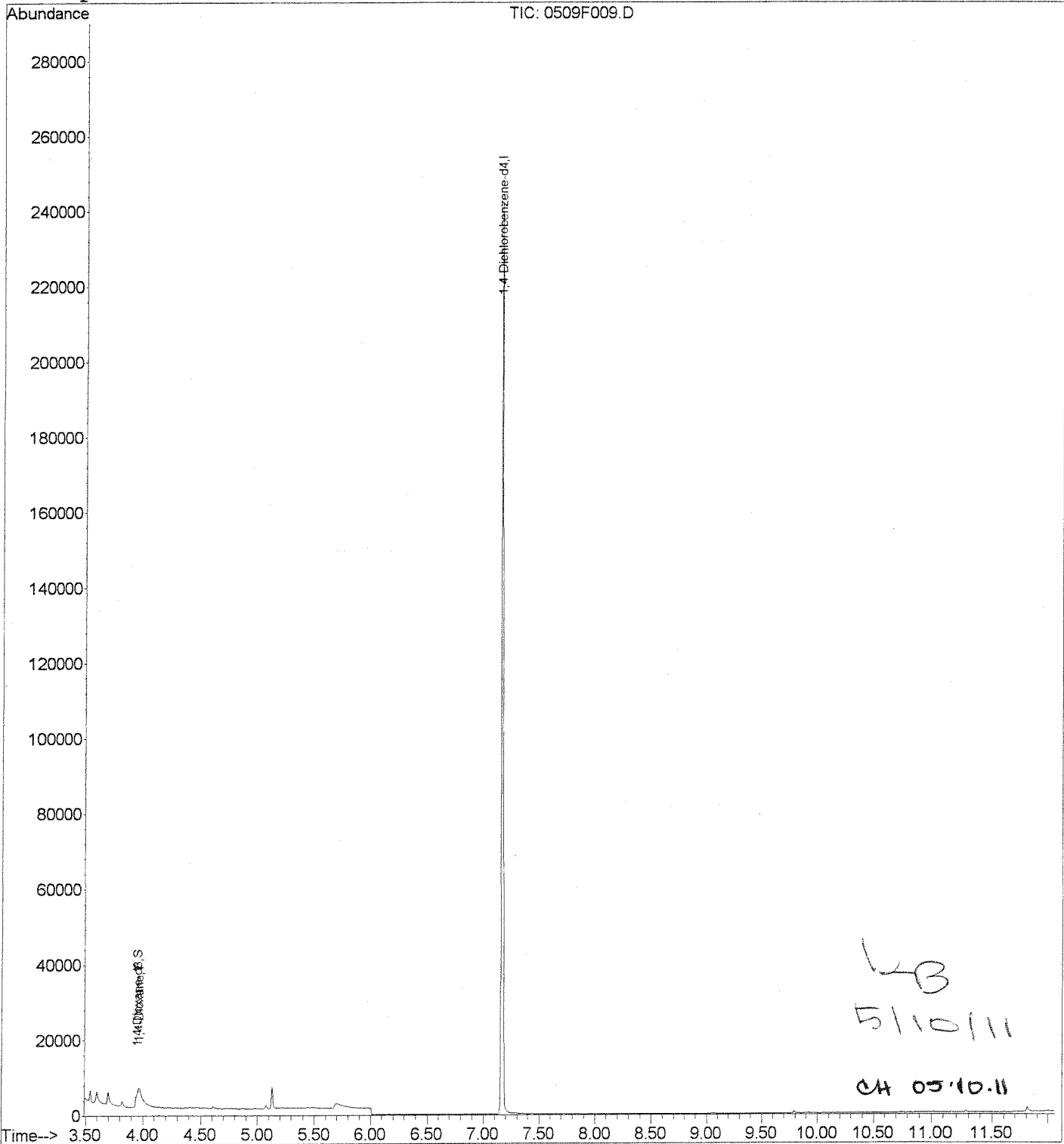
KB
 5/10/11
 04 05.10.11

Data File : J:\MS26\DATA\050911\0509F009.D
Acq On : 9 May 2011 12:43 pm
Sample : 10ng/mL ICAL 1,4-Dioxane | SVM34-56D
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:22 2011

Vial: 5
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration

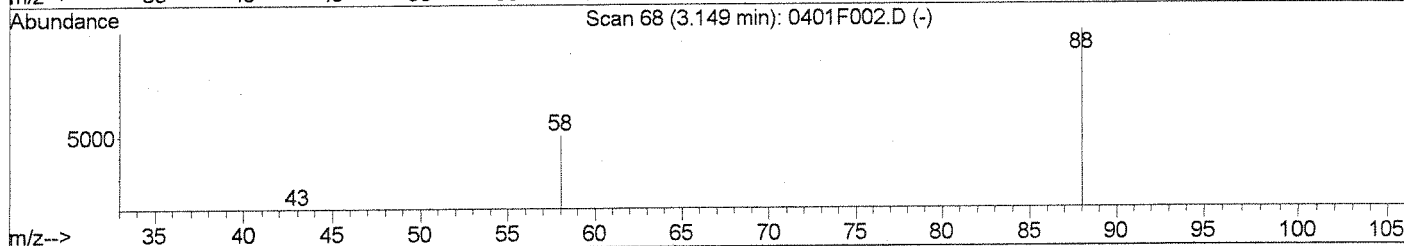
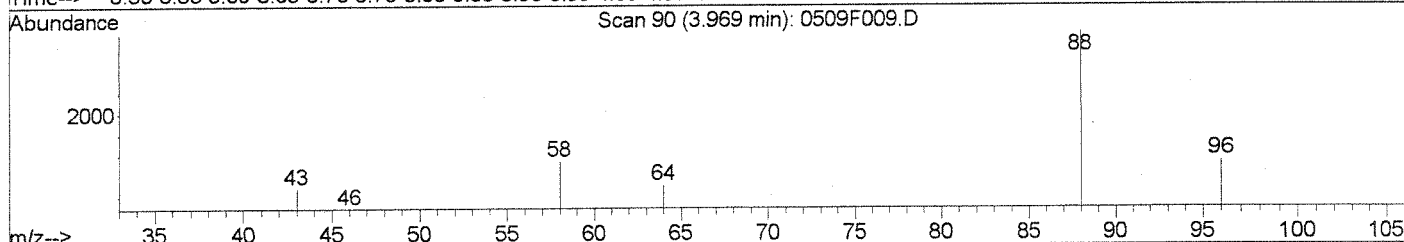
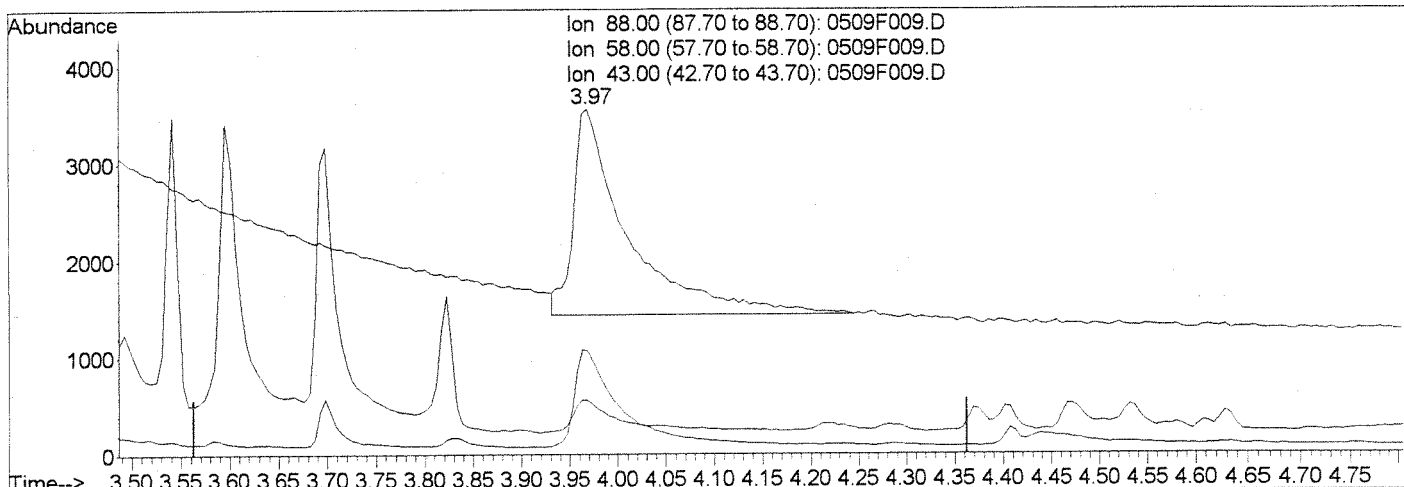


Data File : J:\MS26\DATA\050911\0509F009.D
 Acq On : 9 May 2011 12:43 pm
 Sample : 10ng/mL ICAL 1,4-Dioxane | SVM34-56D
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:21 2011

Vial: 5
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F009.D

(3) 1,4-Dioxane (T)

3.97min 13.34ng/ml

response 8447

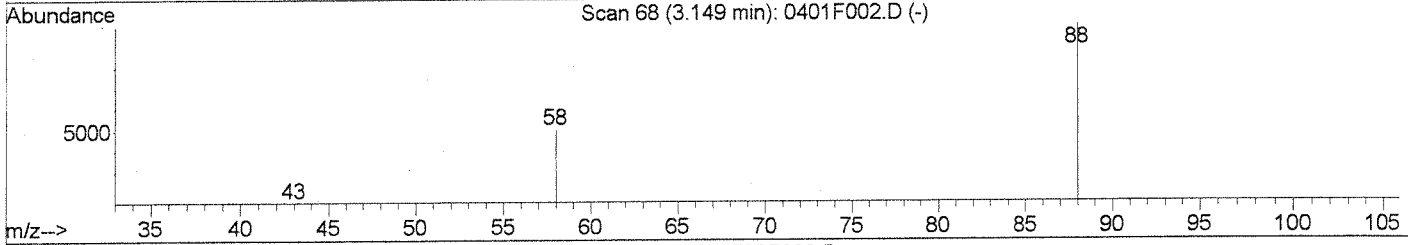
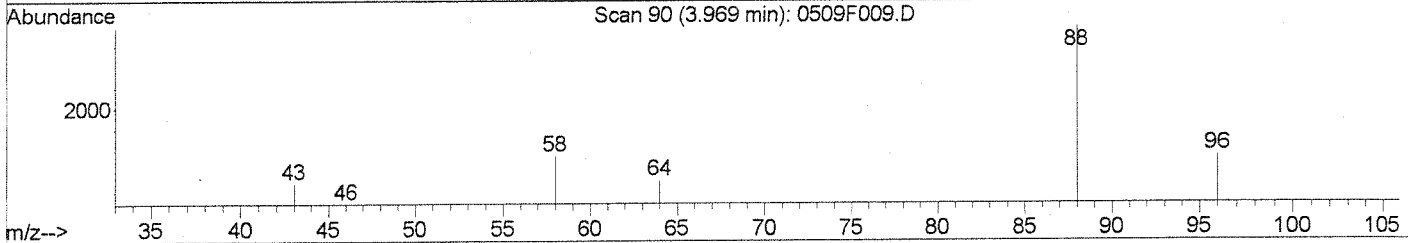
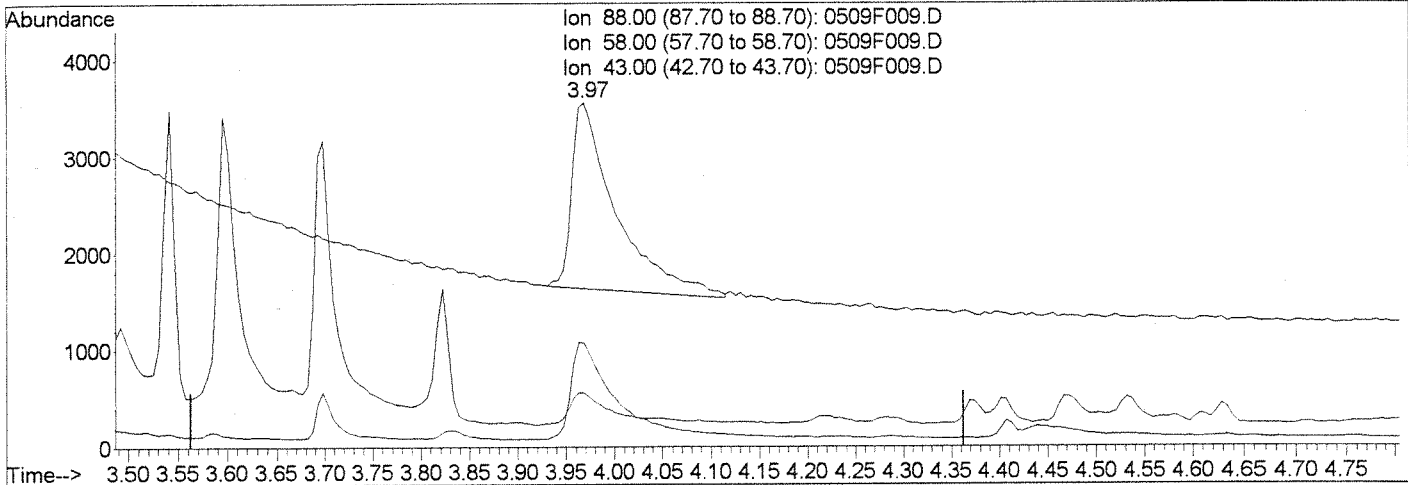
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	46.26
43.00	15.30	14.95
0.00	0.00	0.00

Data File : J:\MS26\DATA\050911\0509F009.D
Acq On : 9 May 2011 12:43 pm
Sample : 10ng/mL ICAL 1,4-Dioxane | SVM34-56D
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:22 2011

Vial: 5
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:21:18 2011
Response via : Multiple Level Calibration



(3) 1,4-Dioxane (T)

3.97min 9.64ng/ml m

response 6107

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	29.95
43.00	15.30	15.62
0.00	0.00	0.00

01
KB 5/10/11
04 05:10:11

Data File : J:\MS26\DATA\050911\0509F010.D Vial: 6
 Acq On : 9 May 2011 1:02 pm Operator: KBailey
 Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:30 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	84266	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.94	96	13588	21.69	ng/ml	0.00
Spiked Amount	50.000		Recovery	=	43.38%	
Target Compounds						
3) 1,4-Dioxane	3.96	88	13117m	20.40	ng/ml	Qvalue

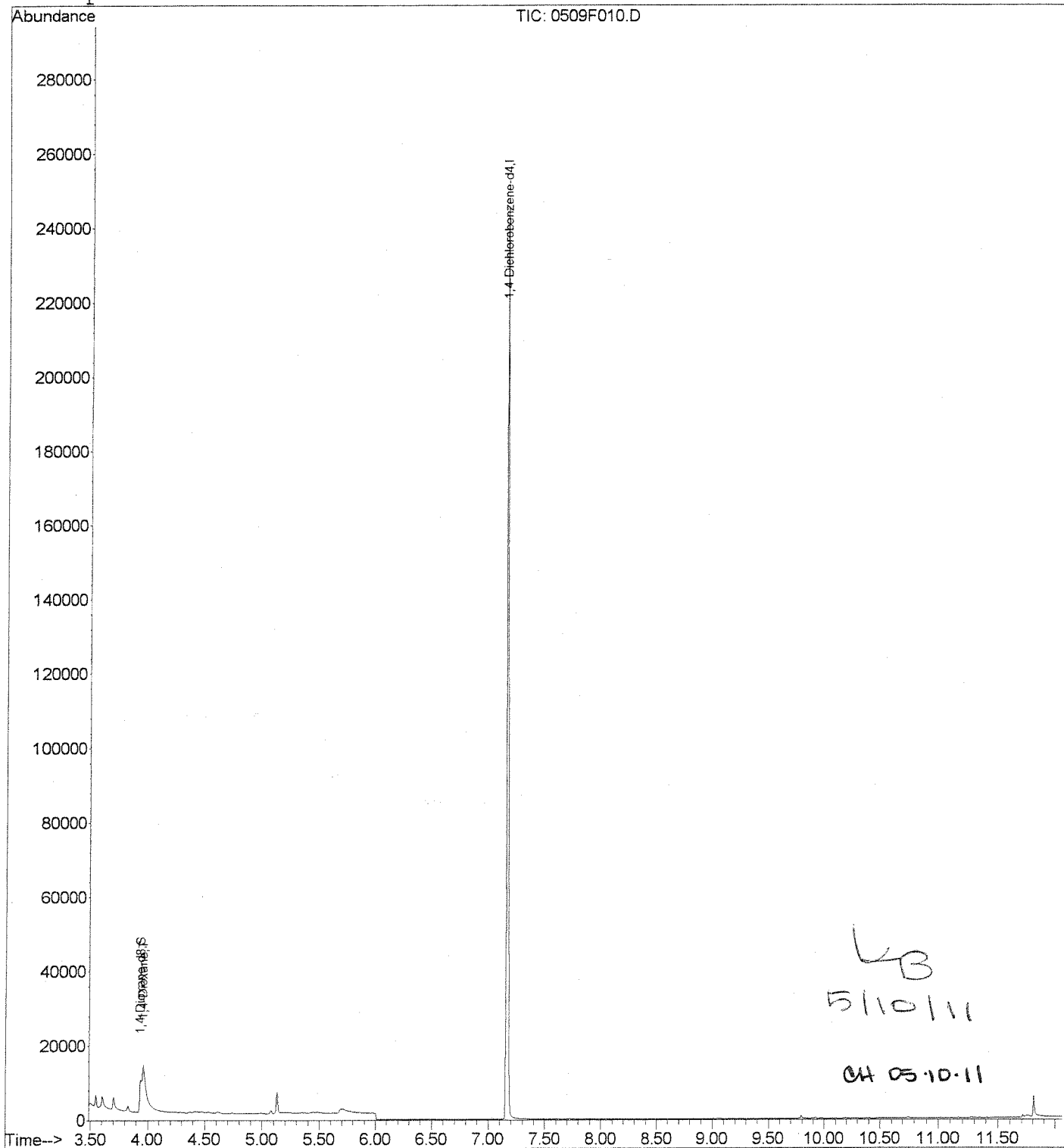
KB
 5/10/11
 CH 05-10-11

Data File : J:\MS26\DATA\050911\0509F010.D
Acq On : 9 May 2011 1:02 pm
Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:23 2011

Vial: 6
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



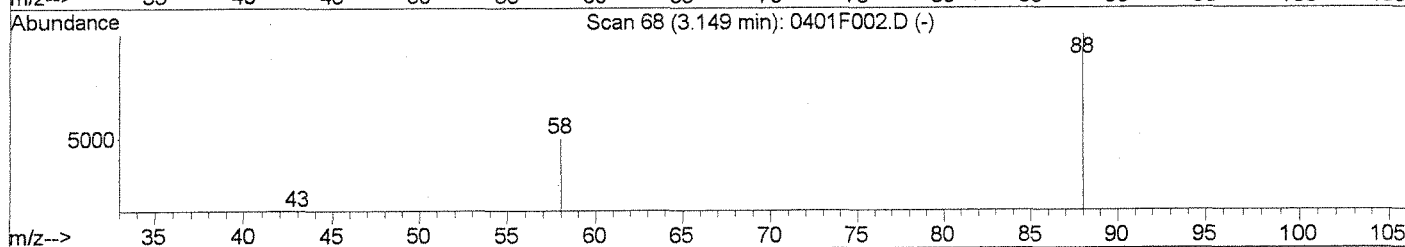
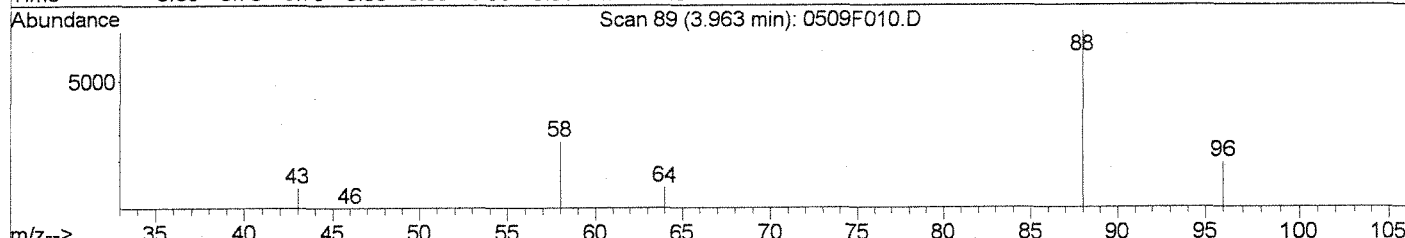
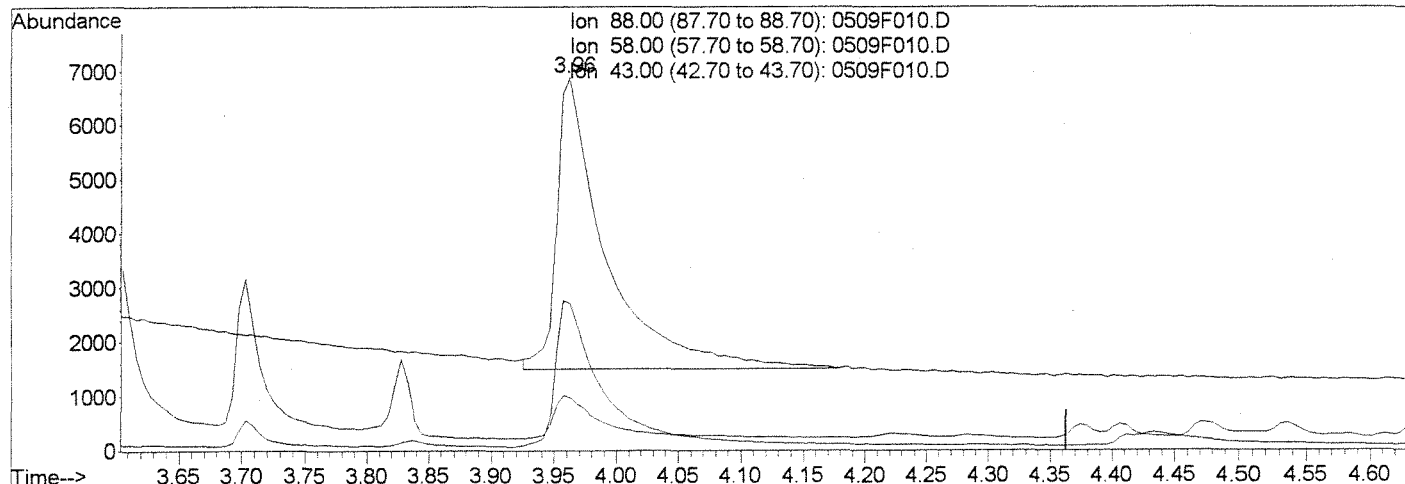
Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F010.D
Acq On : 9 May 2011 1:02 pm
Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:21 2011

Vial: 6
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:21:18 2011
Response via : Multiple Level Calibration



TIC: 0509F010.D

(3) 1,4-Dioxane (T)

3.96min 22.91ng/ml

response 14729

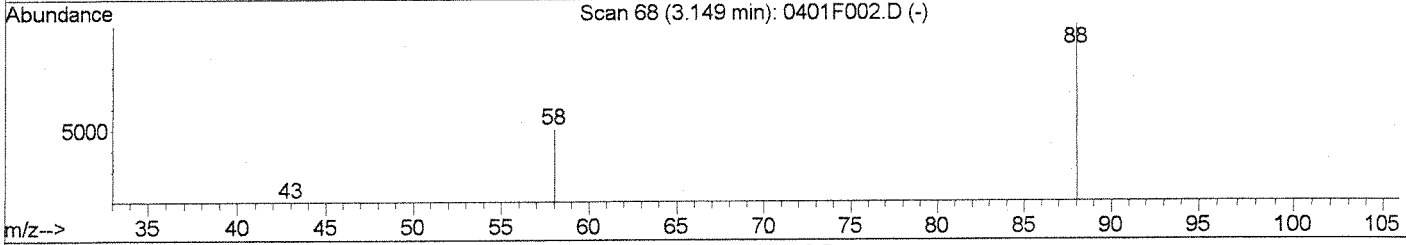
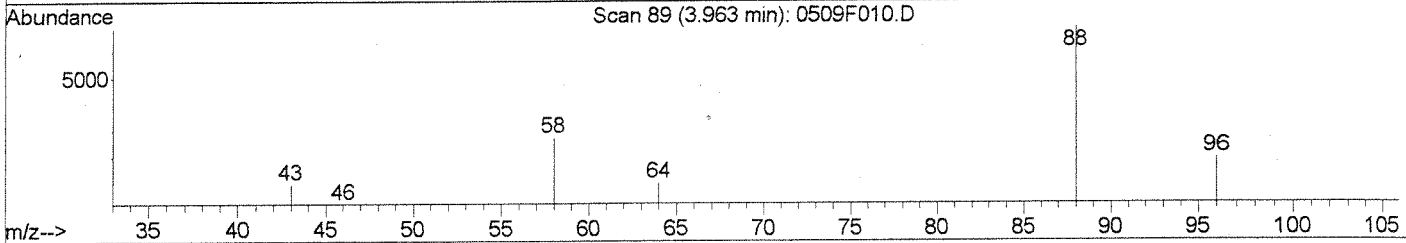
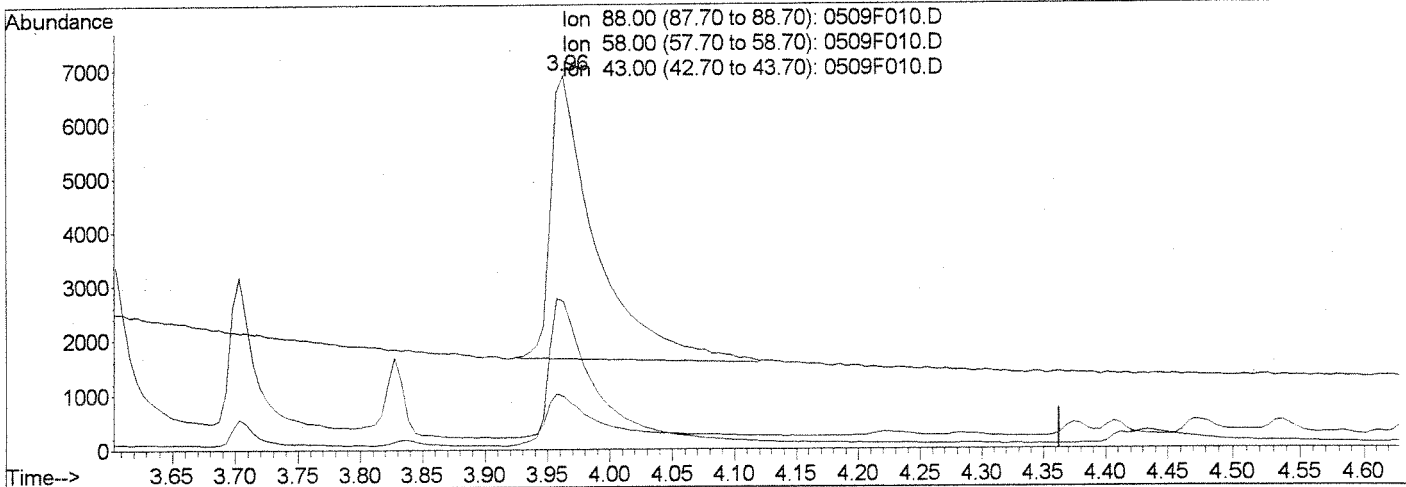
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	48.60
43.00	15.30	13.88
0.00	0.00	0.00

Data File : J:\MS26\DATA\050911\0509F010.D
Acq On : 9 May 2011 1:02 pm
Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:23 2011

Vial: 6
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:21:18 2011
Response via : Multiple Level Calibration



(3) 1,4-Dioxane (T)

3.96min 20.40ng/ml m

response 13117

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	39.32
43.00	15.30	14.10
0.00	0.00	0.00

01
LB 5/10/11
04 05.10.11

Data File : J:\MS26\DATA\050911\0509F011.D Vial: 7
 Acq On : 9 May 2011 1:22 pm Operator: KBailey
 Sample : 50ng/mL ICAL 1,4-Dioxane | SVM34-56F Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:30 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	82310	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.90	96	33167	54.21	ng/ml	-0.04
Spiked Amount	50.000		Recovery	=	108.42%	
Target Compounds						
3) 1,4-Dioxane	3.93	88	35042	55.80	ng/ml	Qvalue 93

LB
5/10/11

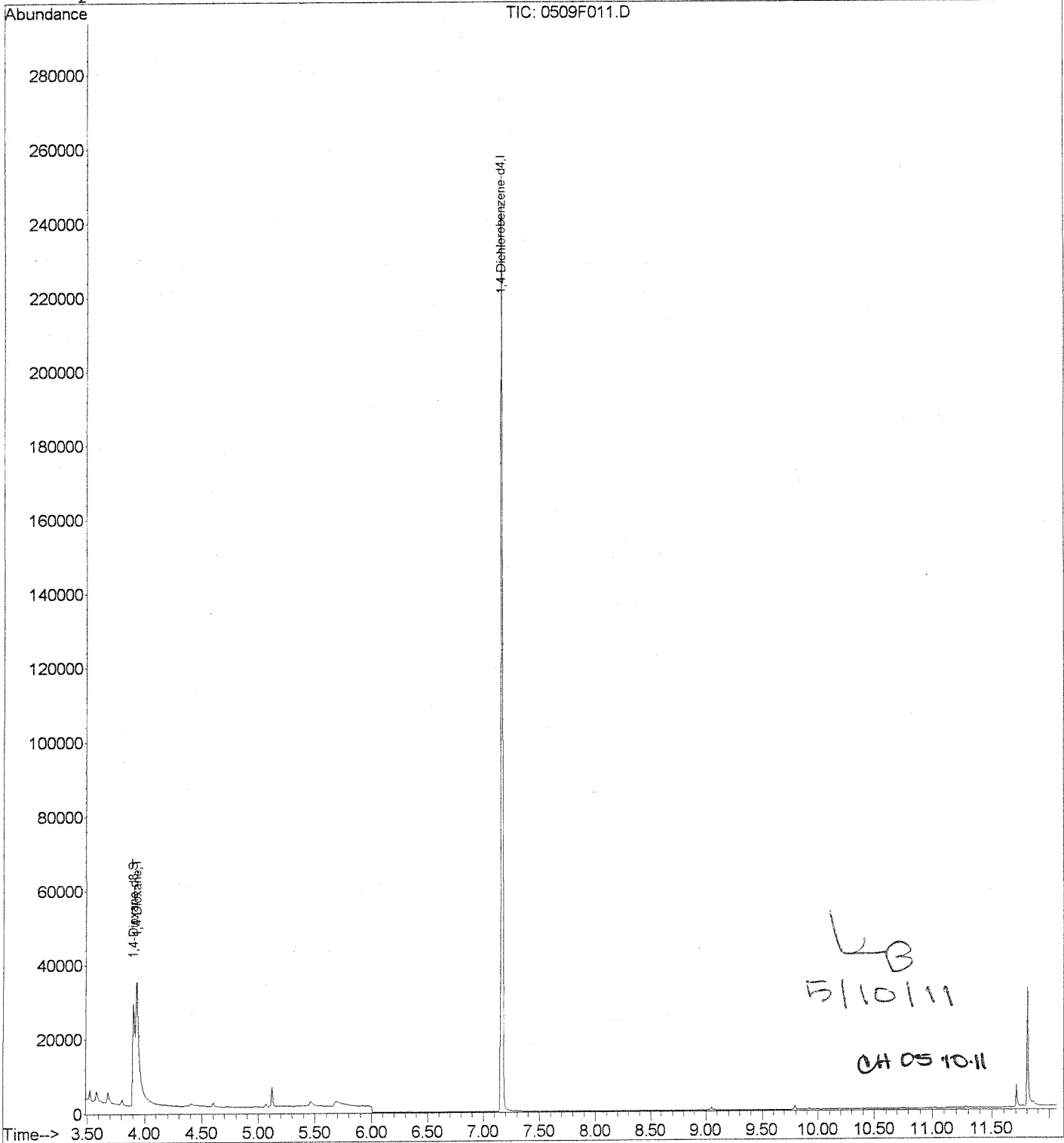
CH 05'10-11

Data File : J:\MS26\DATA\050911\0509F011.D
Acq On : 9 May 2011 1:22 pm
Sample : 50ng/mL ICAL 1,4-Dioxane | SVM34-56F
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:21 2011

Vial: 7
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Data File : J:\MS26\DATA\050911\0509F012.D Vial: 8
 Acq On : 9 May 2011 1:42 pm Operator: KBailey
 Sample : 100ng/mL ICAL 1,4-Dioxane | SVM34-56G Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:31 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	83941	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.90	96	70005	112.19	ng/ml	-0.03
Spiked Amount	50.000		Recovery	=	224.38%	
Target Compounds						
3) 1,4-Dioxane	3.94	88	72508m	113.21	ng/ml	Qvalue

LB
5/10/11

04 05 10 11

Data File : J:\MS26\DATA\050911\0509F012.D

Vial: 8

Acq On : 9 May 2011 1:42 pm

Operator: K Bailey

Sample : 100ng/mL ICAL 1,4-Dioxane | SVM34-56G

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:23 2011

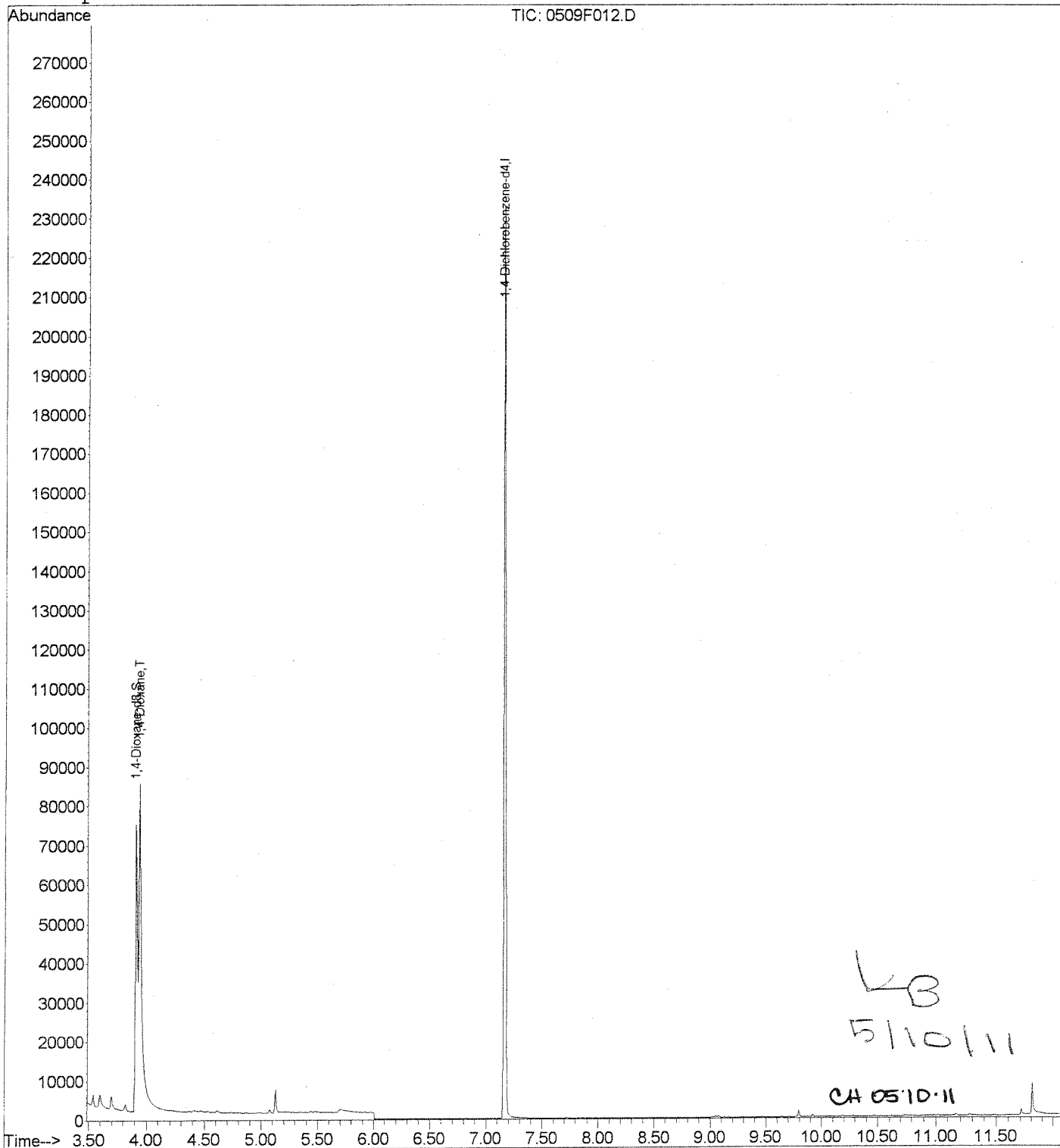
Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:26:14 2011

Response via : Initial Calibration

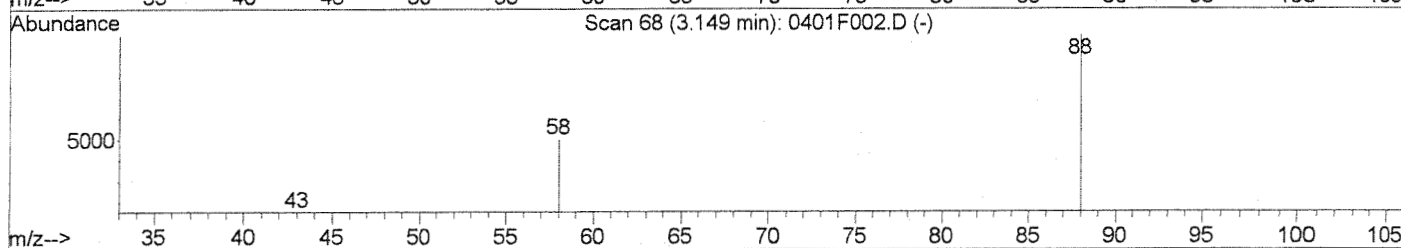
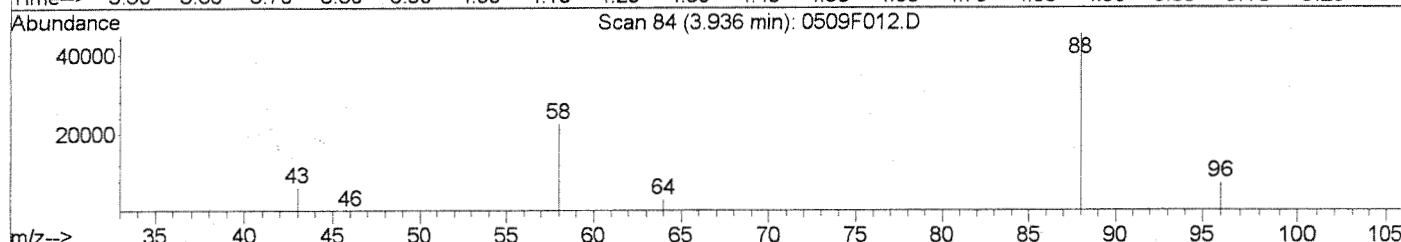
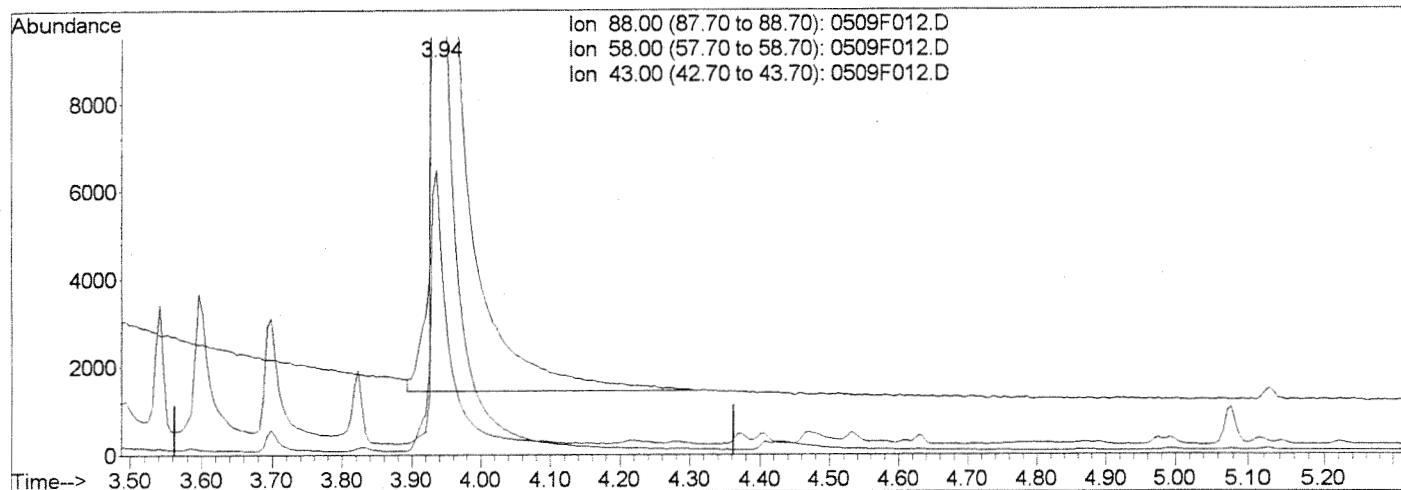


Data File : J:\MS26\DATA\050911\0509F012.D
 Acq On : 9 May 2011 1:42 pm
 Sample : 100ng/mL ICAL 1,4-Dioxane | SVM34-56G
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 9 14:21 2011

Vial: 8
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Multiple Level Calibration



TIC: 0509F012.D

(3) 1,4-Dioxane (T)

3.94min 118.97ng/ml

response 76193

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	51.28
43.00	15.30	14.29
0.00	0.00	0.00

Data File : J:\MS26\DATA\050911\0509F012.D

Vial: 8

Acq On : 9 May 2011 1:42 pm

Operator: KBailey

Sample : 100ng/mL ICAL 1,4-Dioxane | SVM34-56G

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:23 2011

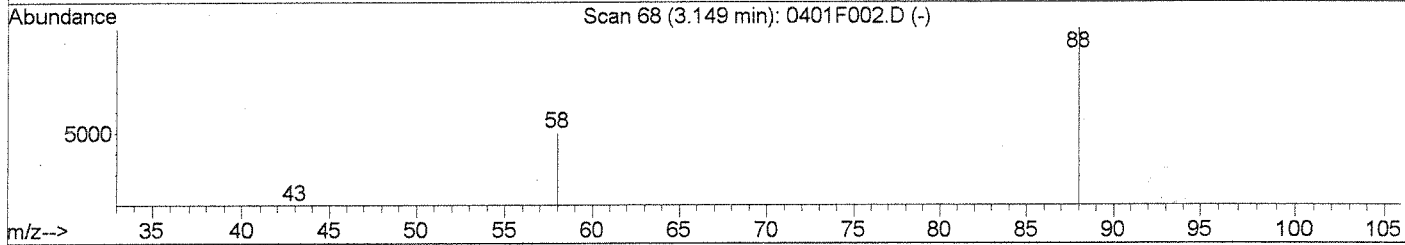
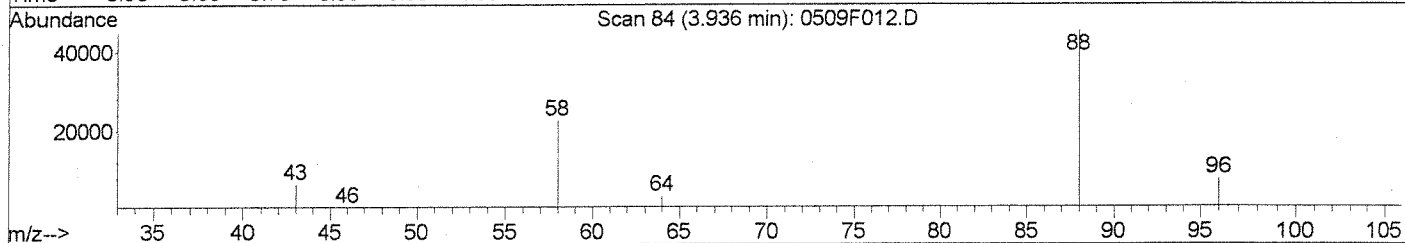
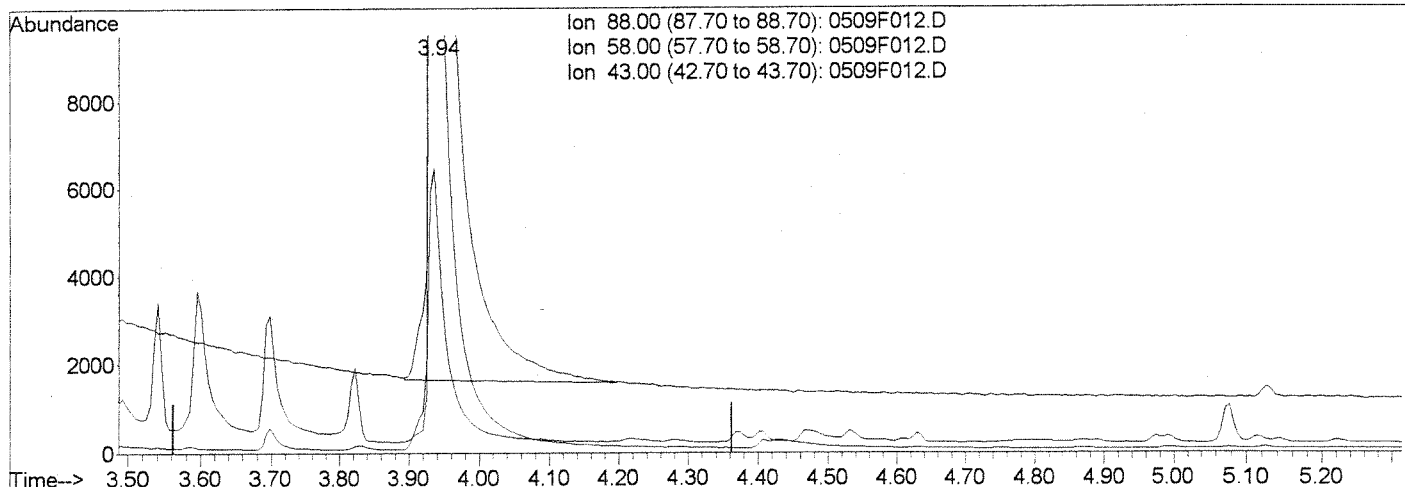
Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:21:18 2011

Response via : Multiple Level Calibration



TIC: 0509F012.D

(3) 1,4-Dioxane (T)

3.94min 113.21ng/ml m

response 72508

Ion	Exp%	Act%
88.00	100	100
58.00	44.20	49.81
43.00	15.30	14.36
0.00	0.00	0.00

01
 LB 5/10/11
 CA 05-10-11

Data File : J:\MS26\DATA\050911\0509F013.D Vial: 9
 Acq On : 9 May 2011 2:02 pm Operator: KBailey
 Sample : 200ng/mL ICAL 1,4-Dioxane | SVM34-56H Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:21:31 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:21:18 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	84919	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.90	96	142313	225.45	ng/ml	-0.04
Spiked Amount	50.000		Recovery	=	450.90%	
Target Compounds						
3) 1,4-Dioxane	3.93	88	152893	235.98	ng/ml	Qvalue 89

LB
 5/10/11
 CH 05.10.11

Data File : J:\MS26\DATA\050911\0509F013.D

Vial: 9

Acq On : 9 May 2011 2:02 pm

Operator: K Bailey

Sample : 200ng/mL ICAL 1,4-Dioxane | SVM34-56H

Inst : MS26

Misc :

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: May 9 14:21 2011

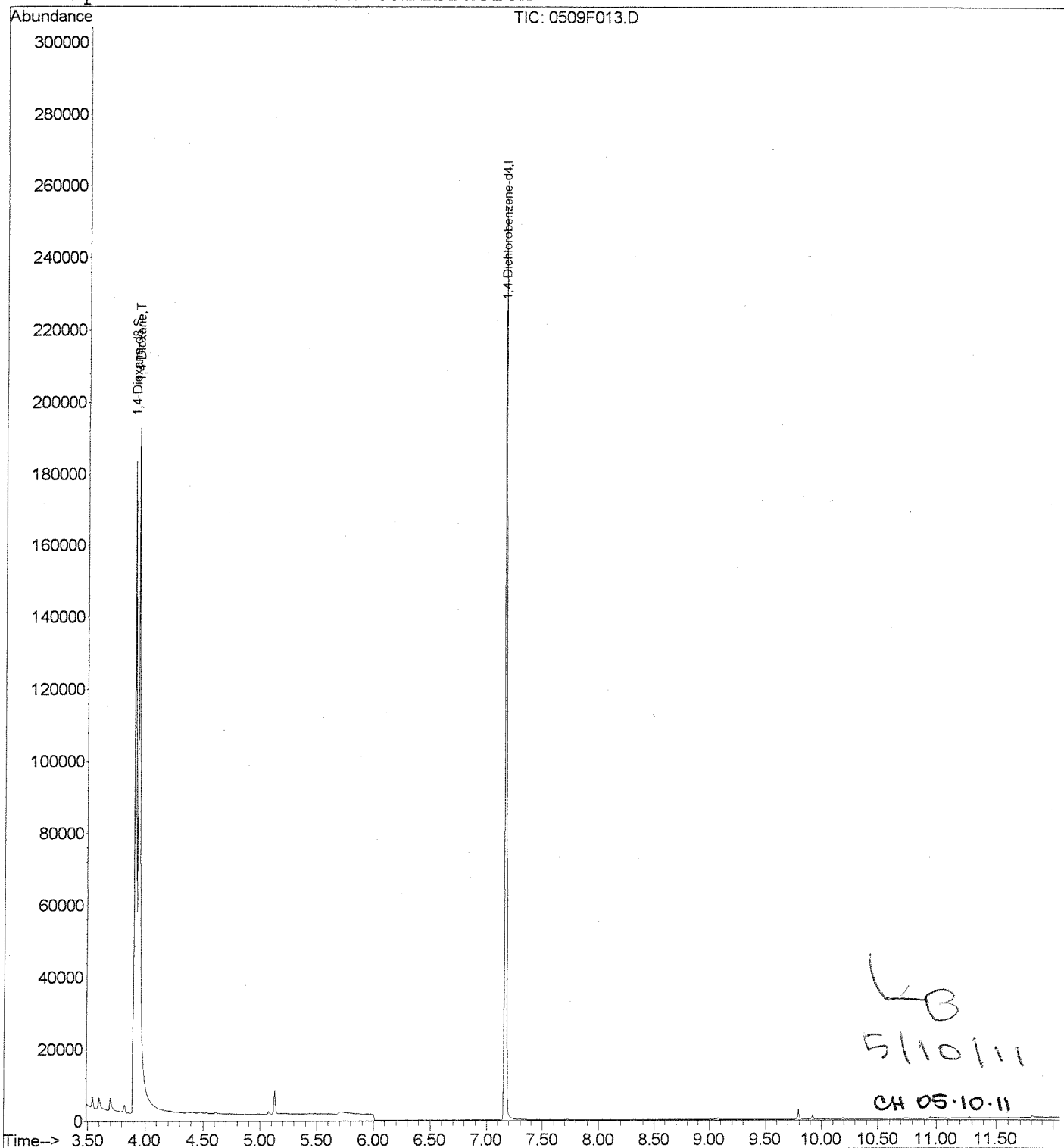
Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)

Title : 8270LL Calibration

Last Update : Mon May 09 14:26:14 2011

Response via : Initial Calibration



Data File : J:\MS26\DATA\050911\0509F014.D
 Acq On : 9 May 2011 2:21 pm
 Sample : 20ng/mL ICV 1,4-Dioxane | SVM34-57L
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 09 14:38:54 2011

Vial: 10
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	79096	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.92	96	14586	23.60	ng/ml	-0.02
Spiked Amount	50.000		Recovery	=	47.20%	
Target Compounds						
3) 1,4-Dioxane	3.94	88	14084	22.41	ng/ml	Qvalue 86

LB
 5/10/11

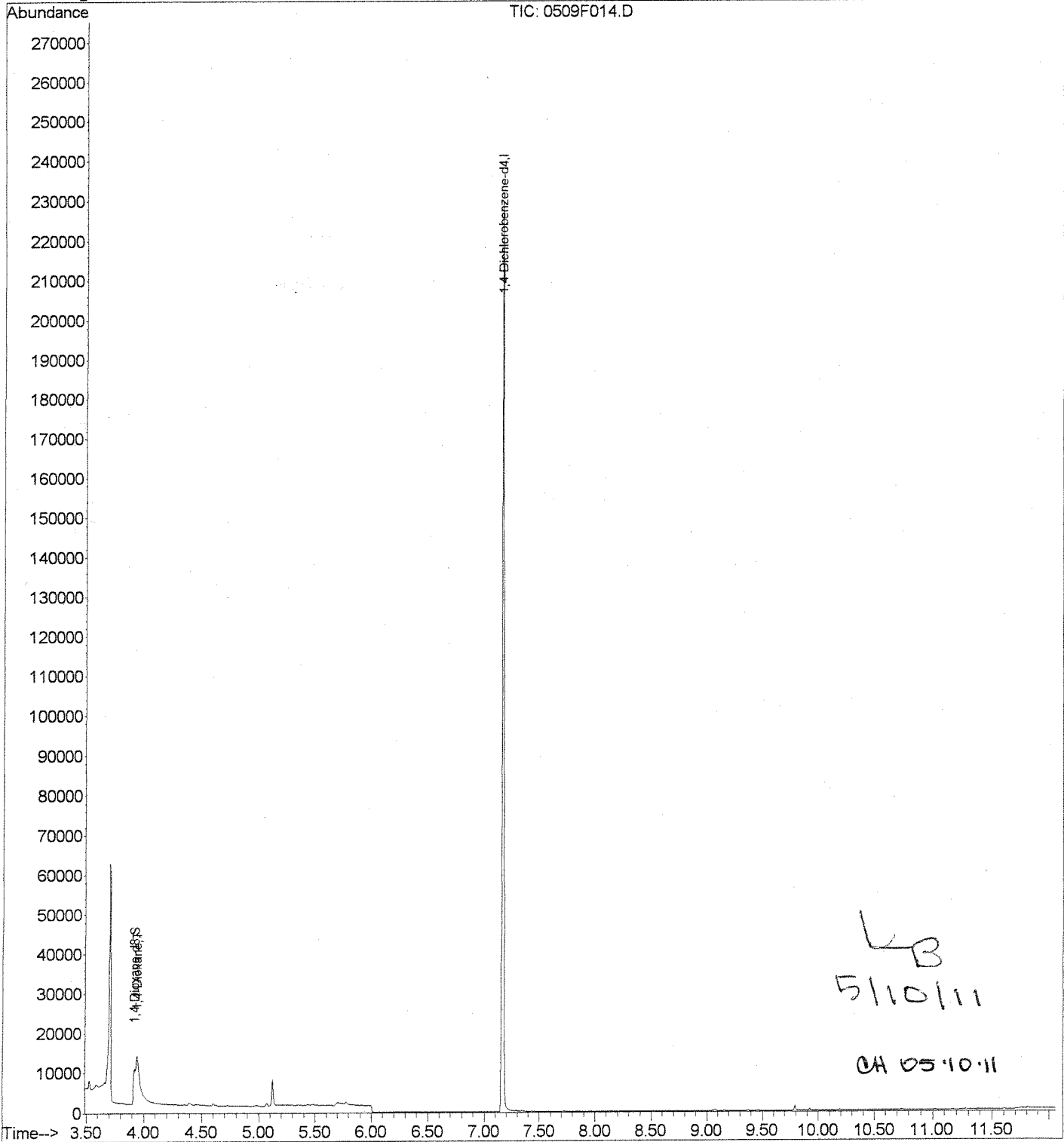
CA 05:10:11

Data File : J:\MS26\DATA\050911\0509F014.D
Acq On : 9 May 2011 2:21 pm
Sample : 20ng/mL ICV 1,4-Dioxane | SVM34-57L
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:38 2011

Vial: 10
Operator: KBailey
Inst : MS26
Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL-GW-2Q11/G005862 / JPL GWM

Service Request: P1101681
Date Analyzed: 05/17/2011

**Continuing Calibration Verification Summary
 1,4-Dioxane by GC/MS**

Calibration Type: Internal Standard
Analysis Method: 8270C SIM

Calibration Date: 05/09/2011
Calibration ID: CAL10487
Analysis Lot: KWG1104446
Units: ng/ml

File ID: J:\MS26\DATA\051711\0517F010.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
1,4-Dioxane	20	21	0.01	0.397	0.418	5	NA	± 20 %	AverageRF
1,4-Dioxane-d8	20	19	0.01	0.391	0.373	-5	NA	± 20 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Exception Report

Data File: J:\MS26\DATA\051711\0517F010.D
Lab ID: KWG1104446-2
RunType: CCV
Matrix: WATER

Date Acquired: 05/17/2011 14:22
Date Quantitated: 05/18/2011 10:58
Batch ID: KWG1104446
Analysis Method: 8270C SIM
MethodJoinID: MJ402

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	

Primary Review: KE 5/18/11

Secondary Review: CH 05-18-11

Quantitation Report

Bottle ID:	Tier:	Matrix:	WATER
Prod Code: 8270C SIM 14_DI	Collect Date:	Receive Date:	05/18/2011

Analysis Lot: KWG1104446	Prep Lot:	Report Group:
Analysis Method: 8270C SIM	Prep Method:	
Prep Ref:	Prep Date:	

Quant Method: J:\MS26\METHODS\SIM\050911_DX.M	Calibration ID: CAL10487
Title:	
Tune Ref: J:\MS26\DATA\051711\0517F009.D	Method ID: MJ402
MB Ref:	Quant based on Method

Data File: J:\MS26\DATA\051711\0517F010.D	Instrument: MS26	Vial: 3
Acqu Date: 05/17/2011 14:22	Quant Date: 05/18/2011 10:58	Dilution: 1.0
Run Type: CCV	Soln Conc. Units: ng/ml	
Lab ID: KWG1104446-2		

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	1,4-Dichlorobenzene-d4	7.18	0.01?	152	47308	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	1,4-Dioxane-d8	3.99			96	7051m	19.07		42-112	NA

Target Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	1,4-Dioxane	4.02			88	7910m	21.04			

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS26\DATA\051711\0517F010.D Vial: 3
 Acq On : 17 May 2011 2:22 pm Operator: KBailey
 Sample : 20ng/mL CCV 1,4-Dioxane | SVM34-96F Inst : MS26
 Misc : Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: May 18 10:58:35 2011 Quant Results File: 050911_DX.RES

Quant Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration
 DataAcq Meth : SIM14DX

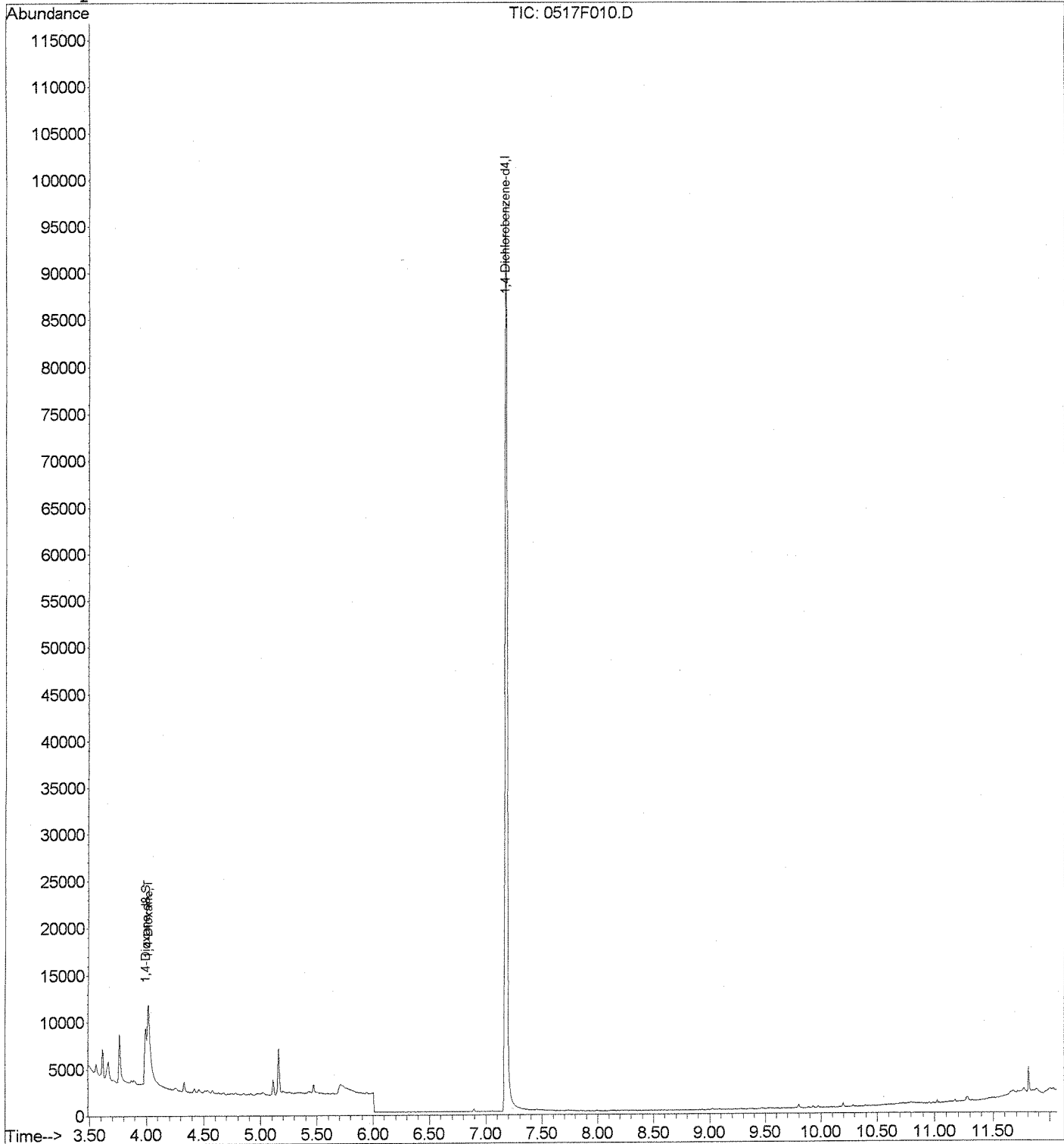
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.18	152	47308	50.00	ng/ml	0.01
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.99	96	7051m	19.07	ng/ml	0.06
Spiked Amount	50.000		Recovery	=	38.14%	
Target Compounds						
3) 1,4-Dioxane	4.02	88	7910m	21.04	ng/ml	Qvalue

Data File : J:\MS26\DATA\051711\0517F010.D
 Acq On : 17 May 2011 2:22 pm
 Sample : 20ng/mL CCV 1,4-Dioxane | SVM34-96F
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 18 10:58 2011

Vial: 3
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: 050911_DX.RE

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Initial Calibration

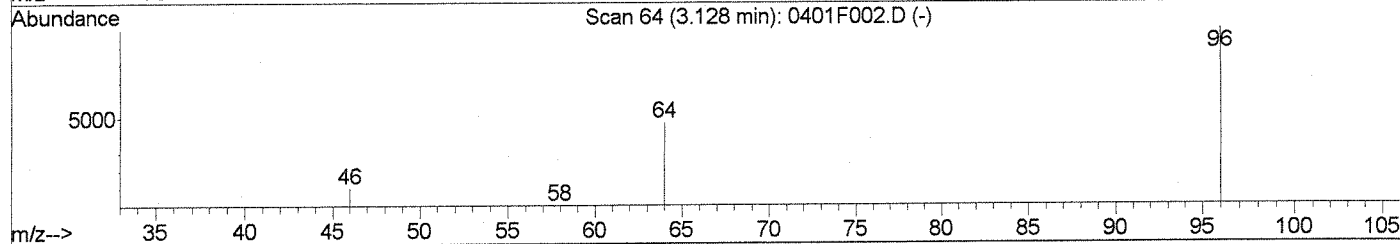
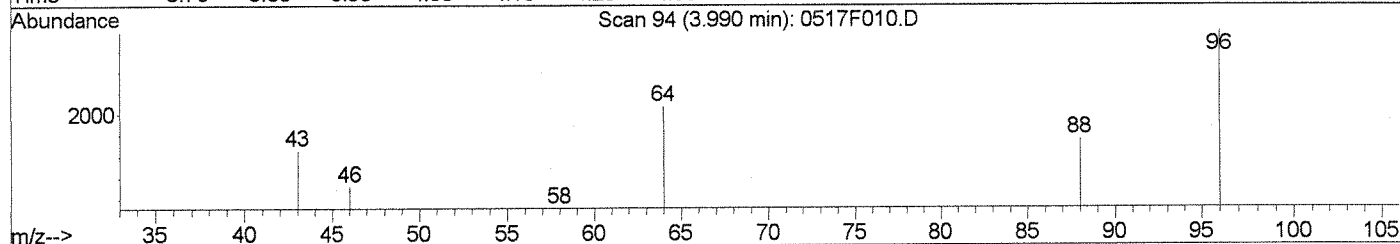
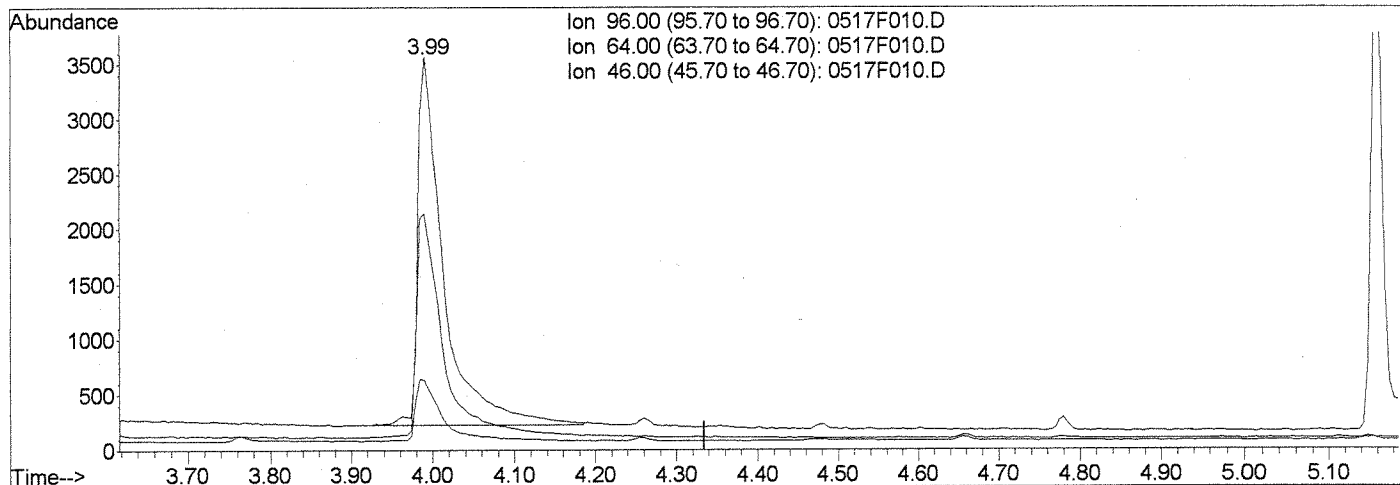


Data File : J:\MS26\DATA\051711\0517F010.D
 Acq On : 17 May 2011 2:22 pm
 Sample : 20ng/mL CCV 1,4-Dioxane | SVM34-96F
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 18 10:58 2011

Vial: 3
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0517F010.D

(2) 1,4-Dioxane-d8 (S)

3.99min 19.94ng/ml

response 7372

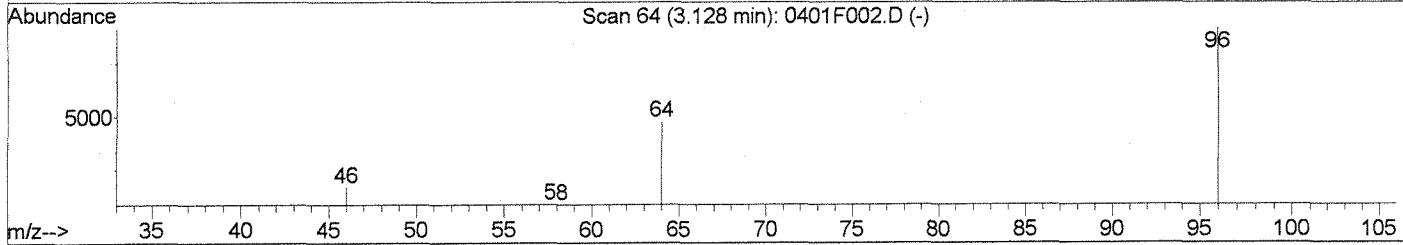
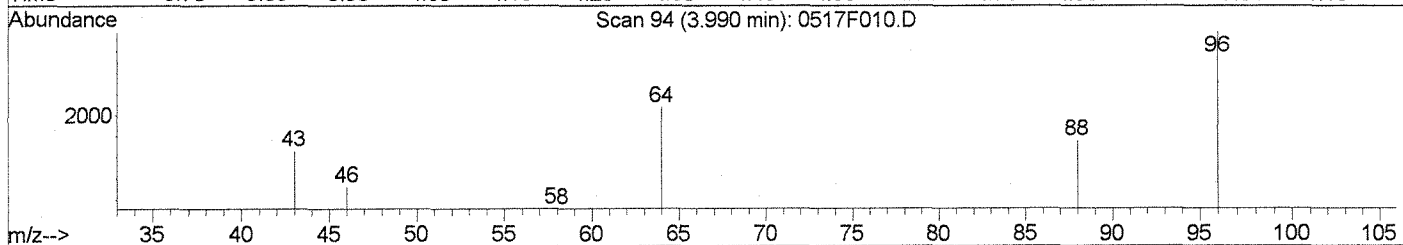
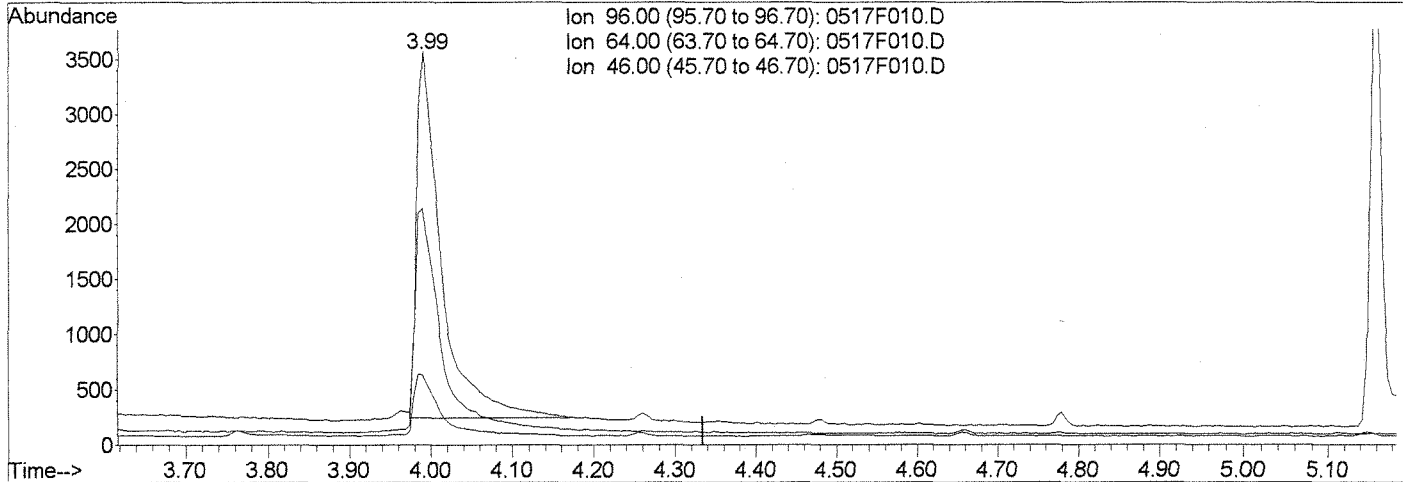
Ion	Exp%	Act%
96.00	100	100
64.00	52.90	60.56
46.00	10.90	16.39
0.00	0.00	0.00

Data File : J:\MS26\DATA\051711\0517F010.D
 Acq On : 17 May 2011 2:22 pm
 Sample : 20ng/mL CCV 1,4-Dioxane | SVM34-96F
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 18 10:58 2011

Vial: 3
 Operator: KBailey
 Inst : MS26
 Multiplr: 1.00

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
 Title : 8270LL Calibration
 Last Update : Mon May 09 14:26:14 2011
 Response via : Multiple Level Calibration



TIC: 0517F010.D

(2) 1,4-Dioxane-d8 (S)
 3.99min 19.07ng/ml m
 response 7051

Ion	Exp%	Act%
96.00	100	100
64.00	52.90	59.97
46.00	10.90	17.73
0.00	0.00	0.00

01
 LB 5/18/11
 CH 05.18.11

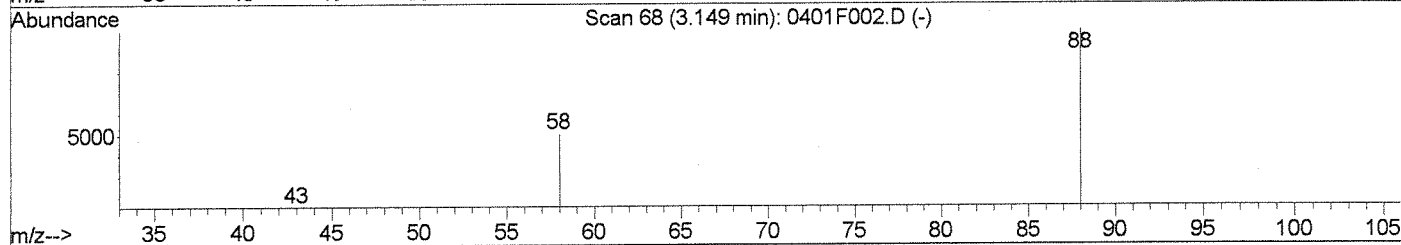
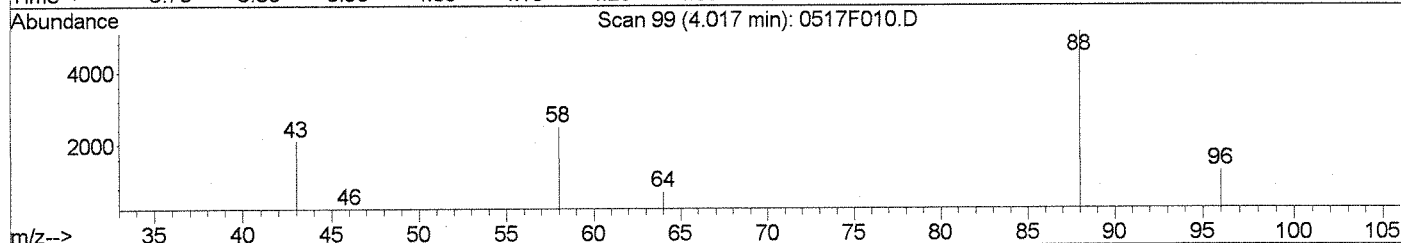
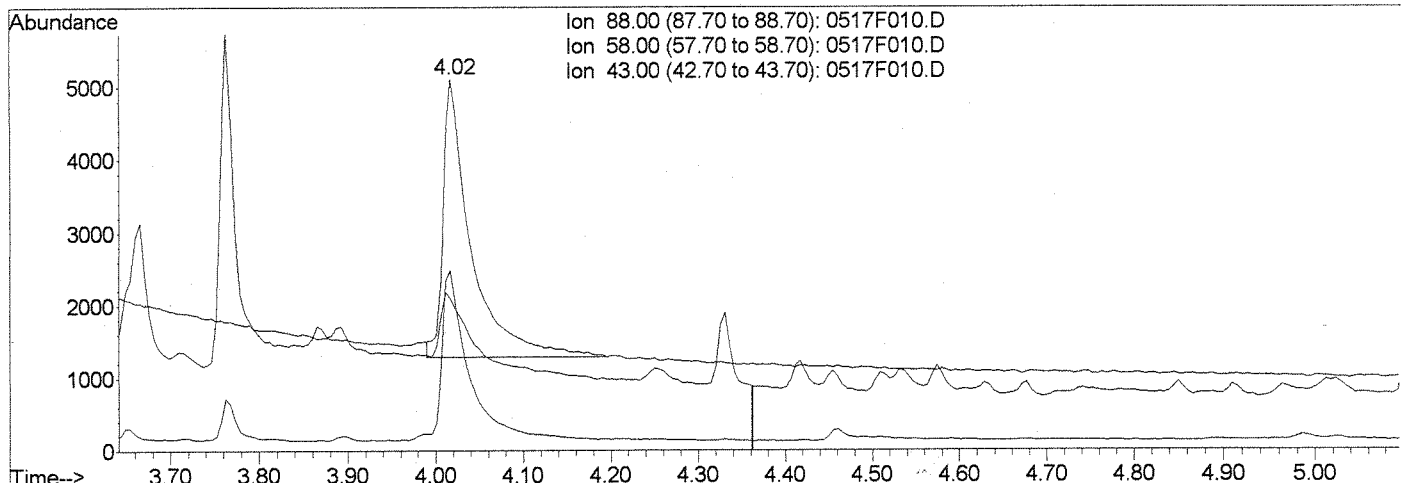
Data File : J:\MS26\DATA\051711\0517F010.D
Acq On : 17 May 2011 2:22 pm
Sample : 20ng/mL CCV 1,4-Dioxane | SVM34-96F
Misc :

Vial: 3
Operator: K Bailey
Inst : MS26
Multiplr: 1.00

MS Integration Params: RTEINT.P
Quant Time: May 18 10:58 2011

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Multiple Level Calibration



TIC: 0517F010.D

(3) 1,4-Dioxane (T)

4.02min 22.56ng/ml

response 8482

Ion	Exp%	Act%
88.00	100	100
58.00	39.30	60.81#
43.00	14.10	29.12
0.00	0.00	0.00

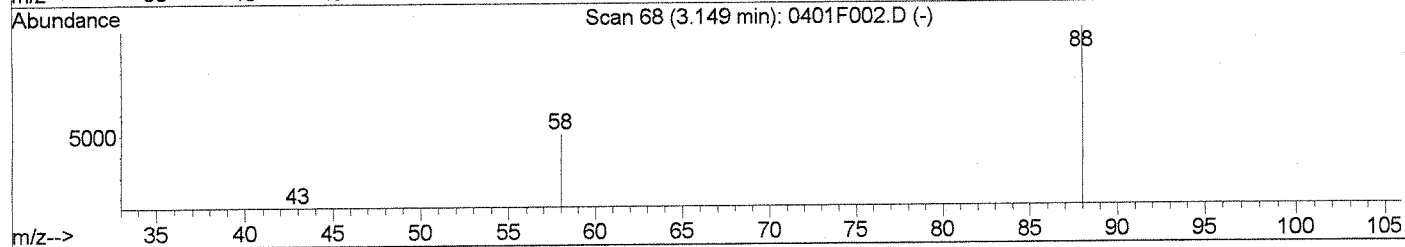
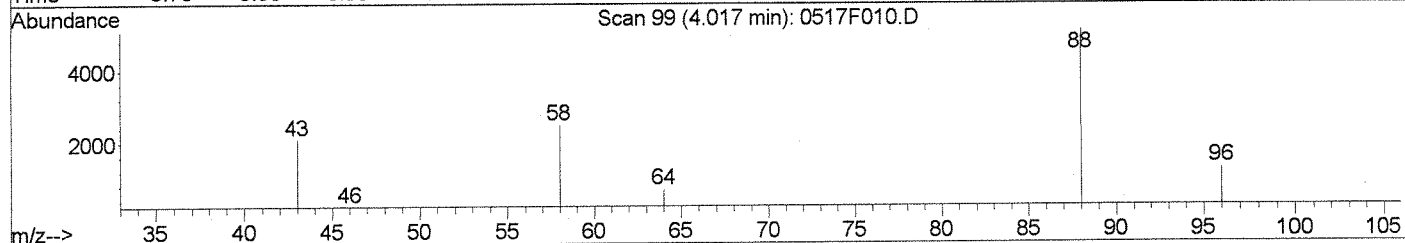
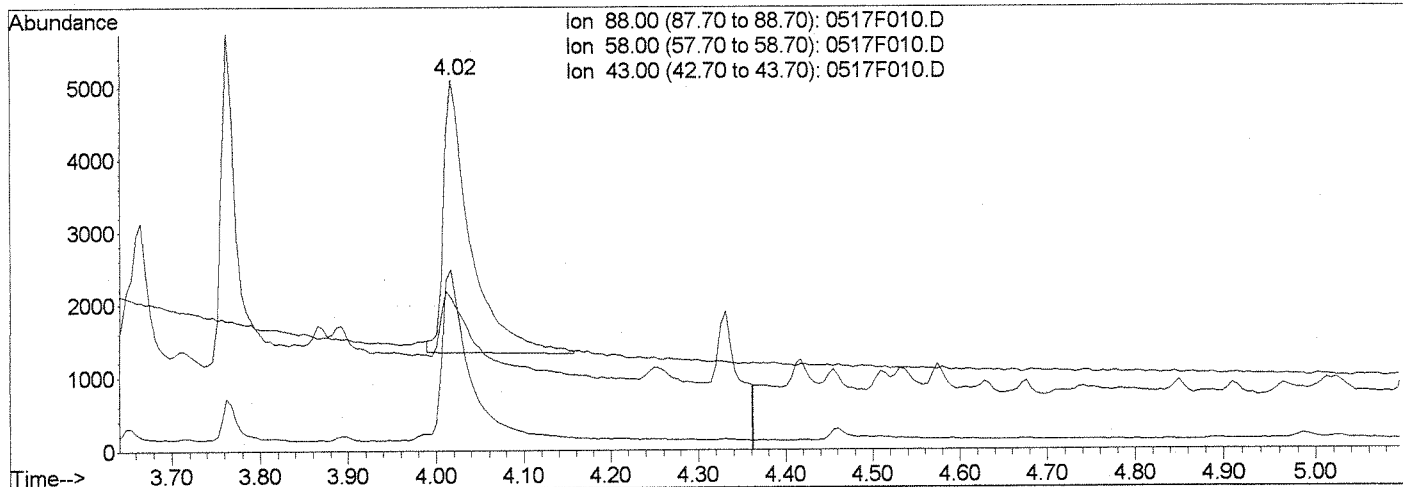
Data File : J:\MS26\DATA\051711\0517F010.D
Acq On : 17 May 2011 2:22 pm
Sample : 20ng/mL CCV 1,4-Dioxane | SVM34-96F
Misc :

Vial: 3
Operator: KBailey
Inst : MS26
Multiplr: 1.00

MS Integration Params: RTEINT.P
Quant Time: May 18 10:58 2011

Quant Results File: temp.res

Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Multiple Level Calibration



TIC: 0517F010.D

(3) 1,4-Dioxane (T)
4.02min 21.04ng/ml m
response 7910
Ion Exp% Act%
88.00 100 100
58.00 39.30 48.50
43.00 14.10 40.96#
0.00 0.00 0.00

01
LB 5/18/11
CH 05-18-11

Organic Analysis:
1,4-Dioxane by GC/MS

Validation Package

Sample Prep and Screen Data

Preparation Information

Group ID: KWG1104188	Prep Method: EPA 3510C	Prep Date: 05/11/11 00:00
Department: Semivoa GCMS		

Lab Code	Client ID	Product	Matrix	Amt. Ext.	Final Vol.
KWG1104188-1	Matrix Spike	8270C SIM 14_DIOXANE	WATER	100ml	50ml
KWG1104188-2	Duplicate Matrix Spike	8270C SIM 14_DIOXANE	WATER	100ml	50ml
KWG1104188-3	Lab Control Sample	8270C SIM 14_DIOXANE	WATER	100ml	50ml
KWG1104188-4	Method Blank	8270C SIM 14_DIOXANE	WATER	100ml	50ml
P1101681-001	MW-16	8270C SIM 14_DIOXANE	WATER	100ml	50ml

Lab Code	Prep Event ID	Surrogate Solution ID	Amount Added	Spike Solution ID	Amount Added	Witness
KWG1104188-1	1017528	SVM34-59G	50uL	SVM33-87C	50uL	KMiller
KWG1104188-2	1017529	SVM34-59G	50uL	SVM33-87C	50uL	KMiller
KWG1104188-3	1017530	SVM34-59G	50uL	SVM33-87C	50uL	KMiller
KWG1104188-4	1017531	SVM34-59G	50uL			KMiller
P1101681-001	1017527	SVM34-59G	50uL			KMiller

Comments

IS: SVM34-5LA

Started By: RHolden Assisted By: _____ Training Yes No

Completed By: KKerriga Assisted By: _____ Training Yes No

Reviewed By: [Signature] Date: 5/16/11 Storage: SVM LABS

Chain of Custody

Relinquished By: <u>[Signature]</u>	Date: <u>5/13/11</u>	Extracts Examined
Received By: <u>[Signature]</u>	Date: <u>5/17/11</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Preparation Information Due Date: 5-13-11

Group ID: KWG1104188	Prep Method: EPA 3510C	Prep Date: 05/11/11 00:00
Department: Semivoa GCMS		

#	Lab Code	Client ID	B#	√	Product	Matrix	Amt. Ext.	pH	Int. Vol.	Final Vol.	Surr. Added	Spike Added
1	KWG1104188-1	Matrix Spike <i>P1681-1MS</i>			8270C SIM 14_DIOXANE	WATER	<i>100ml</i>	<i>NA</i>	<i>N/A</i>	<i>50ml</i>	<i>50ml</i>	<i>50ml</i>
2	KWG1104188-2	Duplicate Matrix Spike <i>P1681-1DMS</i>			8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	↓
3	KWG1104188-3	Lab Control Sample			8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	↓
4	KWG1104188-4	Method Blank			8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	—
5	P1101681-001	MW-16			8270C SIM 14_DIOXANE	WATER	↓	↓	↓	↓	↓	—

Comments: _____

#132097

Surrogate ID: *SVM34-59-G, 50 ul, 50 ug/ml, XP: 10-1-11*

Spike ID: *SVM33-87-C, 50 ul, 50 ug/ml, XP: 6-21-11*

Witness: *km 5-11-11*

Started By: RHolden

Assisted By: _____

Completed By: *[Signature]*

Assisted By: _____

Additional Prep Information For 1,4 Dioxane by EPA 3510

Service Request P1101681 Workgroup KWF1104188

Pre-Prep Information:

DCM Lot DD020

Batch Start (Time/Date/Initial): 11:30 / 5-11-11 / RRA

Batch Stop (Time/Date/Initial): 13:00 / 5-11-11 / RRA

Sulfate Lot # BK1022 Salt Lot # G38343

Extract Storage: Catalina Winemixer

Date Completed: 3:07PM 5/13/11 RR

Comments/Observations:

Bench Sheet Review Check List	
<input checked="" type="checkbox"/>	Hold Times Met (if no, Reason: _____)
<input checked="" type="checkbox"/>	Prep date, dept, method, product code correct in stealth
<input checked="" type="checkbox"/>	Spike Information correct
<input checked="" type="checkbox"/>	Weights/Volumes and units correct on raw and final bench sheets
<input checked="" type="checkbox"/>	Sample IDs have been checked—Bottle numbers appended if required
<input checked="" type="checkbox"/>	Names present for: Started by, Completed by, relinquished by, and witnessed by.
<input checked="" type="checkbox"/>	Training has been circled
<input checked="" type="checkbox"/>	Extract Storage recorded
<input checked="" type="checkbox"/>	Additional Prep Sheet completely filled out (NA or line out Blanks)
<input checked="" type="checkbox"/>	All clean-ups have been noted on additional prep sheet
<input checked="" type="checkbox"/>	Signed service request with Form V, if applicable, has been attached

Injection Log

Directory: J:\MS26\DATA\051711

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	0517F001.d	1.	PR		17 May 2011 10:3
2	1	0517F002.d	1.	PR		17 May 2011 10:5
3	2	0517F003.d	1.	10ug/mL DFTPP SVM34-95A	Fail	17 May 2011 11:1
4	3	0517F004.d	1.	20ng/mL CCV 1,4-Dioxane SVM34-96F	OK (NP)	17 May 2011 11:3
5	2	0517F005.d	1.	10ug/mL DFTPP SVM34-95A	Fail	17 May 2011 11:5
6	2	0517F006.d	1.	10ug/mL DFTPP SVM34-95A		17 May 2011 12:4
7	2	0517F007.d	1.	10ug/mL DFTPP SVM34-95A		17 May 2011 13:1
8	2	0517F008.d	1.	10ug/mL DFTPP SVM34-95A		17 May 2011 13:3
9	2	0517F009.d	1.	10ug/mL DFTPP SVM34-95A	OK - New Tune	17 May 2011 14:0
10	3	0517F010.d	1.	20ng/mL CCV 1,4-Dioxane SVM34-96F		17 May 2011 14:2
11	4	0517F011.d	1.	KWG1104188-4 MB		17 May 2011 14:4
12	5	0517F012.d	1.	KWG1104188-3 LCS		17 May 2011 15:0
13	6	0517F013.d	1.	P1101681-001		17 May 2011 15:2
14	7	0517F014.d	1.	KWG1104188-1 MS P1101681-001MS		17 May 2011 15:4
15	8	0517F015.d	1.	KWG1104188-2 DMS P1101681-001DMS		17 May 2011 16:0
16	9	0517F016.d	1.	KWG1104333-4 MB		17 May 2011 16:2
17	10	0517F017.d	1.	KWG1104333-3 LCS		17 May 2011 16:4
18	11	0517F018.d	1.	K1104106-005		17 May 2011 17:0
19	12	0517F019.d	1.	KWG1104333-1 MS K1104106-005MS		17 May 2011 17:2
20	13	0517F020.d	1.	KWG1104333-2 DMS K1104106-005DMS		17 May 2011 17:4
21	14	0517F021.d	1.	P1101793-002		17 May 2011 18:0
22	15	0517F022.d	1.	K1104106-004		17 May 2011 18:2
23	16	0517F023.d	1.	K1104106-006		17 May 2011 18:4
24	17	0517F024.d	1.	K1104106-008		17 May 2011 19:0
25	18	0517F025.d	1.	K1104106-009		17 May 2011 19:2
26	19	0517F026.d	1.	K1104106-010		17 May 2011 19:4
27	20	0517F027.d	1.	K1104106-011		17 May 2011 20:0
28	21	0517F028.d	1.	K1104106-013		17 May 2011 20:2
29	22	0517F029.d	1.	K1104106-014		17 May 2011 20:4
30	23	0517F030.d	1.	K1104106-015		17 May 2011 21:0
31	24	0517F031.d	1.	K1104106-023		17 May 2011 21:2

Run # 246527

CAL 10487

LB 5/18/11

CH 05-18-11

LABORATORY REPORT

May 11, 2011

David Conner
Battelle
4800 Oak Grove Dr. M/S 180-801
Pasadena, CA 91109

RE: JPL GW Mon 2Q11 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 5, 2011. For your reference, these analyses have been assigned our service request number P1101682.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-10-1; Minnesota Department of Health, NELAP Certificate No. 219474; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.



Digitally signed by Sue Anderson
Date: 2011.05.11 11:07:28 -07'00'

Sue Anderson
Project Manager

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

CAS Project No: P1101682

CASE NARRATIVE

The samples were received intact under chain of custody on May 5, 2011 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

DETAIL SUMMARY REPORT

Client: Battelle
 Project ID: JPL GW Mon 2Q11 / G486090

Service Request: P1101682

Date Received: 5/5/2011
 Time Received: 12:48

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-20-5	P1101682-001	Water	5/5/2011	08:04	X
MW-20-4	P1101682-002	Water	5/5/2011	08:44	X
MW-20-3	P1101682-003	Water	5/5/2011	09:50	X
MW-20-2	P1101682-004	Water	5/5/2011	10:25	X
MW-20-1	P1101682-005	Water	5/5/2011	11:01	X
DUPE-2-2Q11	P1101682-006	Water	5/5/2011	00:00	X
EB-8-5/5/11	P1101682-007	Water	5/5/2011	10:45	X

Columbia Analytical Services, Inc.

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl <i>tert</i> -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.



Columbia Analytical Services
 An Employee - Owned Company
 2655 Park Center Drive, Suite A
 Simi Valley, California 93065
 Phone (805) 526-7161
 Fax (805) 526-7270

Water & Soil - Chain of Custody Record & Analytical Service Request

Requested Turnaround Time in Business Days (Surcharges) please circle
 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. 1110687
 CAS Contact:

Company Name & Address (Reporting Information)		Project Name		Analysis Method and/or Analytes		Preservative Code		Preservative Key			
BATTLE 3990 BID TOWN AVE. C-205 SAN DIEGO, CA 92110		JPL GULMAN 2011 6486090		P.O. # / Billing Information 214315 / BATTLE ATTN: GERRARD TOMAKINS 505 KING AVE. COLUMBUS, OH 43201		Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/> TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted) Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)		(7916) CR VI (7916)		0 1 None 2 HCL 3 HNO3 4 H2SO4 5 NaOH 6 Zn Acetate 7 Asc Acid Other	
Project Manager	DAVID CONNOR	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers					
Phone	(619) 726-7311										
Fax	(619) 458-6641										
Email Address for Result Reporting		Sampler (Print & Sign)									
Client Sample ID											
MW - 20 - 5	1	9/5/11	804	W	1	X			IV RC		
MW - 20 - 4	2		844		1	X					
MW - 20 - 3	3		950		1	X					
MW - 20 - 2	4		1025		1	X					
MW - 20 - 1	5		1101		1	X					
Dupe - 2 - 2A11	6				1	X			Duplicate		
EB - 8 - 5/5/11	7		1045		1	X			Equip Blank		

Report Tier Levels - please select

Tier I - (Results/Default if not specified) _____ Tier III - (Data Validation Package) 10% Surcharge _____ MRL required Yes / No _____ EDD required Yes / No _____
 Tier II - (Results + QC) _____ Tier V - (client specified) _____ MDL / PQL / J required Yes / No _____ Type: _____

Relinquished by: (Signature) Date 9/5/11 Time 12:07
 Relinquished by: (Signature) Date 9/5/11 Time 12:08
 Received by: (Signature) Date 9/5/11 Time 12:07
 Received by: (Signature) Date 9/5/11 Time 12:08

Cooler / Blank / Ice / No Ice
 Temperature °C

Client: Battelle

Service Request: P1101682

Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101682-001.01	7196A	5/5/11	1317	SMO / SSTAPLES	
		5/5/11	1345	In Lab / SANDERSON	
		5/5/11	1552	P-37 / SANDERSON	
P1101682-002.01	7196A	5/5/11	1317	SMO / SSTAPLES	
		5/5/11	1345	In Lab / SANDERSON	
		5/5/11	1552	P-37 / SANDERSON	
P1101682-003.01	7196A	5/5/11	1317	SMO / SSTAPLES	
		5/5/11	1345	In Lab / SANDERSON	
		5/5/11	1552	P-37 / SANDERSON	
P1101682-004.01	7196A	5/5/11	1317	SMO / SSTAPLES	
		5/5/11	1345	In Lab / SANDERSON	
		5/5/11	1552	P-37 / SANDERSON	
P1101682-005.01	7196A	5/5/11	1317	SMO / SSTAPLES	
		5/5/11	1345	In Lab / SANDERSON	
		5/5/11	1552	P-37 / SANDERSON	
P1101682-006.01	7196A	5/5/11	1317	SMO / SSTAPLES	
		5/5/11	1345	In Lab / SANDERSON	
		5/5/11	1552	P-37 / SANDERSON	
P1101682-007.01	7196A	5/5/11	1317	SMO / SSTAPLES	
		5/5/11	1345	In Lab / SANDERSON	
		5/5/11	1552	P-37 / SANDERSON	

Sample Acceptance Check Form

Client: Battelle Work order: P1101682

Project: JPL GW Mon 2Q11 / G486090

Sample(s) received on: 5/5/11 Date opened: 5/5/11 by: SSTAPLES

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- | | Yes | No | N/A |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were sample containers properly marked with client sample ID? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 Container(s) supplied by CAS ? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 Did sample containers arrive in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 Were chain-of-custody papers used and filled out? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 Did sample container labels and/or tags agree with custody papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 Was sample volume received adequate for analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 Are samples within specified holding times? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 Was proper temperature (thermal preservation) of cooler at receipt adhered to? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cooler Temperature _____ °C Blank Temperature <u>5</u> °C | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9 Was a trip blank received? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10 Were custody seals on outside of cooler/Box? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate preservation , according to method/SOP or Client specified information? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Is there a client indication that the submitted samples are pH preserved? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were VOA vials checked for presence/absence of air bubbles? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12 Tubes: Are the tubes capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Do they contain moisture? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13 Badges: Are the badges properly capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101682-001.01	125mL Plastic NP					
P1101682-002.01	125mL Plastic NP					
P1101682-003.01	125mL Plastic NP					
P1101682-004.01	125mL Plastic NP					
P1101682-005.01	125mL Plastic NP					
P1101682-006.01	125mL Plastic NP					
P1101682-007.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
 Project Name : JPL GW Mon 2Q11
 Project Number : G486090
 Sample Matrix : WATER

Service Request : P1101682
 Date Collected : 05/05/11
 Date Received : 05/05/11

Chromium, Hexavalent

Prep Method : None
 Analysis Method : 7196A
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-20-5	P1101682-001	0.010	0.003	1	NA	05/05/11 14:50	ND	
MW-20-4	P1101682-002	0.010	0.003	1	NA	05/05/11 14:50	ND	
MW-20-3	P1101682-003	0.010	0.003	1	NA	05/05/11 14:50	ND	
MW-20-2	P1101682-004	0.010	0.003	1	NA	05/05/11 14:50	ND	
MW-20-1	P1101682-005	0.010	0.003	1	NA	05/05/11 14:50	ND	
DUPE-2-2Q11	P1101682-006	0.010	0.003	1	NA	05/05/11 14:50	ND	
EB-8-5/5/11	P1101682-007	0.010	0.003	1	NA	05/05/11 14:50	ND	
Method Blank	P1101682-MB	0.010	0.003	1	NA	05/05/11 14:50	ND	

Approved By *Kam Rya* Date : 5/6/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101682
Date Analyzed: 05/05/11

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Kanu Rya Date: 5/6/11
ICCBMDL120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101682
Date Analyzed: 05/05/11

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0500	0.0515	103	90-110
CCV1	0.0500	0.0524	105	90-110
CCV2	0.0500	0.0524	105	90-110

Approved By: _____
CCV1A/120594

Kanu Rya

Date: _____

5/6/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101682
Date Collected : NA
Date Received : NA
Date Extracted : NA
Date Analyzed : 05/05/11

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name : Laboratory Control Sample
Lab Code : P1101682-LCS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0387	97	90-110	

Approved By

Karu Rya

Date :

5/6/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101682
Date Collected : 05/05/11
Date Received : 05/05/11
Date Extracted : NA
Date Analyzed : 05/05/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-20-5 Units : mg/L (ppm)
 Lab Code : P1101682-001MS P1101682-001DMS Basis : NA
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0430	0.0430	86	86	73-119	<1	

Approved By *Kam Rya* Date : 5/6/11

pH Run Log

Service Request #(s): P1101488, 1681, 1682

Time: 0830

Sample	VWR lot #	Exp.	Slope	Prep.Run #
pH 2 Buffer	524-11041002	1/20/12	97.8%	
pH 4 Buffer	524-11041003	8/31/12		
pH 7 Buffer	524-04271102A	3/20/13		
pH 10 Buffer	524-04261102	9/30/12		

pH in liquid: (1) 9040B, (2) 9040C pH in solid: (3) 9045C, (4) 9045D (Note method number in column labeled # below)

pH adjustment:(5) 7196A,(6) 7199 (Note method # in column labeled #)

Sample	#	pH	Temp. °C	Sample	#	pH	Temp. °C
pH 2.000	5	2.012	22.7°	1682-2.01	5	2.022	15.8°
pH 4.000		3.997	22.7°	T-4.01		2.022	16.2°
pH 7.000		6.995	22.6°	T-5.01		2.086	16.4°
pH 10.000		9.995	22.8°	-6.01		1.925	16.8°
Ref#: 519-11230903D		6.359	22.7°	↓ -7.01		2.011	16.9°
DI		2.066	21.6°	pH 2.000		2.023	22.1°
NA 5/4/11 soil prep		2.160	23.8°				
WCS		2.065	24.4°				
BLS		1.965	24.0°				
1488-1.01		2.060	24.3°				
T-1.01 DWP		1.996	24.3°				
pH 2.000		1.972	22.5°				
TIME: 1410							
pH 2.000	5	2.012	22.5°				
1681-1.01	T	2.095	13.9°				
1682-1.01	T	1.957	15.9°				
T-2.01	↓	1.888	15.5°				

pH Adjustments: 7196A: Diluted/Conc H₂SO₄ cmd 49284 EXP: 11/20/14

7199A: Diluted NaOH _____ EXP: _____

Comments: _____

* Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 5/2/11

Note: ATC probe used: therefore, temperature correction calculation is not necessary.

Analyst: Jon

Date: 5/5/11

Reviewer: KR

Date: 5/5/11

Hexavalent Chromium (Liquids)



Method EPA 7196A

page 1 of 2 79

Service Request#(s): P1101681 1682
 Stock#: 524-02281103 T.V.=100PPM EXP: 2/28/12
 CVICCV#: 524-10151001 T.V.=100PPM EXP: 3/20/12

Run#: 244968
 Prep Run#: _____
 Conc. H₂SO₄ Lot#: EMD 44284 EXP: 11/20/14
 Coloring Reagent Ref#: 524-05051101 EXP: 6/5/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.999980134
Absorbance @ 540 nm	0.000	0.011	0.058	0.117	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1	10ml	—	✓	0.000	0.000	0.000	0.000344	LO.003
2	FEV 0.05PPM	—	✓	0.000	0.060	0.060	0.0515	103%
3	MB	—	✓	0.000	0.000	0.000	0.000344	LO.003
4	LCS 0.04PPM	—	✓	0.000	0.045	0.045	0.0387	97%
5	1681-1.01	—	✓	0.000	0.006	0.006	0.00546	'J'
6	T -1.01 VS 0.03PPM	—	✓	0.000	0.037	0.037	0.0319	88%
7	J -1.01 MS 0.05PPM	—	✓	0.000	0.059	0.059	0.0507	90%
8	↓ -1.01 MSD ↓	—	✓	0.000	0.059	0.059	0.0507	90%
9	1682-001.01	—	✓	0.000	0.000	0.000	0.000344	LO.003
10	T 001.01MS 0.05PPM	—	✓	0.000	0.050	0.050	0.0430	86%
11	↓ 001.01MSD ↓	—	✓	0.000	0.050	0.050	0.0436	86%
12	↓ -2.01	—	✓	0.000	0.000	0.000	0.000344	LO.003
13	CVV1 0.05PPM	—	✓	0.000	0.061	0.061	0.0524	105%
14	CVB1	—	✓	0.000	0.000	0.000	0.000344	LO.003
15	1682-3.01	—	✓	0.000	0.001	0.001	0.00120	LO.003
16	T -3.01 VS 0.03PPM	—	✓	0.000	0.032	0.032	0.0276	92%
17	↓ -4.01	—	✓	0.000	0.000	0.000	0.000344	LO.003

pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10151001 @ 10 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of 524-02281103 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of 524-02281103 @ 10 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]

Analyzed By: [Signature]

Reviewed By: [Signature]

Date/Time: 5/5/11 @ 1435

Date/Time: 5/5/11 @ 1450

Date: 5/5/11

Hexavalent Chromium (Liquids)



Method EPA 7196A

page 2 of 80

Service Request#(s): P1101681 1682
 Stock#: 524-02281103 T.V.=10PPM EXP: 2/28/12
 CVICCV#: 524-10151001 T.V.=100PPM EXP: 3/20/13

Run#: 244968
 Prep Run#: _____
 Conc. H₂SO₄ Lot#: EMD 49284 EXP: 11/20/14
 Coloring Reagent Ref#: 524-05051101 EXP: 6/5/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.999980134
Absorbance @ 540 nm	0.000	0.011	0.058	0.117	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1682-5.01	10mL	—	✓	0.002	0.002	0.000	0.000344	10.003
T-6.01	↓	—	✓	0.002	0.002	0.000	↓	↓
↓-7.01	↓	—	✓	0.000	0.000	0.000	↓	↓
CCV2 0.05PPM	↓	—	✓	0.000	0.061	0.061	0.0524	105%
CV2	✓	—	✓	0.000	0.000	0.000	0.000344	10.003
<p style="font-size: 2em; font-family: cursive;">Spine not used</p>								

pH Requirement: Method 7196A (2 ± 0.5) Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10151001 @ 10 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 ↑ 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of ↓ ↑ 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of ↓ @ 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]

Analyzed By: [Signature]

Reviewed By: [Signature]

Date/Time: 5/5/11 1435

Date/Time: 5/5/11 1450

Date: 5/5/11

150

11/23/09 519-11230902 1000 PPM SO₂ (ICV/CCV)
JW 0.1607g Na₂SO₃ (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/ DI
EXP: 5/23/10

11/23/09 519-11230903 A, B, C, D PH REFERENCE
JW PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/20/12

11/24/09 519-11240901 1000 PPM SO₄ Standard
JW PURCHASED CAT # ICC-006
LOT # K60794
EXP: 9/30/13

11/25/09 519-~~H/25~~^{82 11/25/09} 11250901 0.1N H₂SO₄
JW 5.6ml conc H₂SO₄ (EMD 47050 EXP: 9/13/10)
EXP: ~~H/25~~^{82 11/25/09} 9/13/10

11/30/09 519-11300901 Cr⁶⁺ Coloring Reagent
JW 0.2500g diphenylcarbohydrazide (EMD 47103EE; EXP:
1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 519-11300902 25133 ppb Stock for O₃ in Air
JW 0.05ml Pyridine-4-carboxaldehyde (Alfa Aesar LOT 10140598; EXP 5/11/12)
↑ 500ml deionized H₂O
EXP: 12/14/09

11/30/09 519-11300903 25133 ppb ICV/CCV for O₃ in Air
JW 0.05ml Pyridine-4-carboxaldehyde (TCI LOT # I61INC; EXP: 5/10/12)
↑ 500ml w/ DI H₂O
EXP: 12/14/09

Reviewed And Approved By:
Initial: LL Date: 12/22/09

10/6/10
 SW
524-10061001 25133 ppb Stock for 03
 0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar
 10140598 :Exp: 8/11/12 up to 500 ml w DI
 Water.
 EXP: 10/20/10

10/6/10
 SW
524-10061002 25133 ppb ION/COV for 03
 0.05 ml Pyridine-4-carboxaldehyde TCI
 ICI INC :Exp: 8/10/12 up to 500 ml w DI
 Water.
 EXP: 10/20/10

10/6/10
 SW
524-10061003 MBTH 50/17
 0.5000 g MBTH (Aldrich 54696EK :Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ EMD 44254; EXP 11/20
 EXP: 10/7/10

10/15/10
 SW
524-10151001 Cr6+ ION/COV Stock
 Purchased 100ppm Cr6+
 RICCA Chemical Co Cut No 2095-16
 500ml Plastic
 LOT # 1010177
 EXP: 3/20/12

10/15/10
 SW
524-10151002 500ppm NO₂ Stock
 Purchased
 RICCA Chemical Co Cut No: 5444.5-4
 LOT # 1010371 120ml amber glass
 EXP: 4/20/11

10/28/10 524-10781002 1000 PPM SO3 ICV/CCV
JW

0.1607 Na2SO3 (Mallinckrodt Lot #1125469; Exp: 8/1/14) up
to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 524-11011001 ICV/CCV Cr⁶⁺ T.V = 0.579 PPM
JW 0.5 ml 519-04090904 (T.V = 115.8 mg/L; EXP: 12/2010)
↑ 100 ml w/ DI
EXP: 11/15/10

11/1/10 524-11011002 Cr⁶⁺ Coloring Reagent
JW 0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP:
1/30/13) ↑ 50 ml w/ Acetone (EMD 471540; EXP:
9/24/12).
EXP: 11/15/10

11/4/10 524-11041001 A-SE PH Filling Sol'n
JW PURCHASED (3M KCl) P/N 702613-AD2
Thermo Scientific
LOT Code: OR1
EXP: 11/4/11

11/4/10 524-11041002 PH 2.000 Buffer
JW purchased
BDH CAT NO: 5010-500 ml
LOT # 1002199
EXP: 1/2012

11/4/10 S24-11041003 pH 4.00 Buffer
 purchased
 J.T. Baker Cat No: 5657-01 500 ml
 Lot # J30507
 Exp: 8/31/12

11/4/10 S24-11041004 pH 7.00 Buffer
 purchased
 J.T. Baker Cat No: 5656-01 500 ml
 Lot # J35515
 Exp: 9/30/12

11/5/10 S24-11051001 MBTH Solⁿ
 0.5000 g MBTH (Aldrich 521696EK; Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ EMD 49884
 Exp: 11/22/14
 Exp: 11/6/10

11/8/10 S24-11081001 1000 PPM NH₃
 0.3141g NH₄Cl (EMD 49198931; Exp: 10/19/14) 100 ml
 w/ S24-10221006 Exp: 10/22/11
 Exp: 10/22/11

11/12/10 S24-11121001 1000 PPM SO₂ STOCK
 0.1591 Na₂SO₃ (JT Baker Lot #1110627; Exp: 8/31/14) up to
 100 ml w/ DI Water.
 Exp: 11/26/10

54

2/21/11
JW
524-0221101 1:1 H₂SO₄
250ml H₂SO₄ (EMD 49284; EXP: 11/20/14)
ADDED SLOWLY TO 250ml DI. COOL
COMPLETELY
EXP: 2/21/12

2/21/11
JW
524-0221102 Cr6+ Coloring Reagent
0.2500g 4,5-nitrophenylcarbonylhydrazide (EMD lot 4710372)
EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD
lot # 471540; EXP: 9/24/12).
EXP: 3/31/11

2/28/11
JW
524-0228101 0.1 H₂SO₄
5.6 ml conc H₂SO₄ (EMD 49284 EXP: 11/20/14) ↑ 2L
w/ DI H₂O
EXP: 2/28/12

2/28/11
JW
524-0228102 1001 mg/l Cr6+
Purchased
Inorganic Ventures CGCR (6)1-1
125ml Clear Glass
LOT# D2-CR03040
EXP: 3/1/2012

2/28/11
JL

524-02281103 10ppm Cr6+ Sol'n
1.0 ml 524-02281102 (100ppm Cr6+; EXP: 3/1/12) ↑
100ml w/ DI H2O
EXP: 2/28/12

3/7/11
JL

524-03071101 Cr6+ Colony Reagent
0.2500g 1,5-Diphenylcarbazide
(EMD Lot 47103721, EXP: 1/30/13) ↑ 50ml w/
Acetone (EMD 47154, EXP: 9/24/12).
EXP: 4/7/11

3/7/11
JL

524-03071102 500ppm NO2
Purchased
RILCA Chem Co Cat No 5444.5-4
LOT # 1102544
EXP: 8/20/11

3/17/11
JL

524-03271101 Alkaline Digestion Sol'n
20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g
Na2CO3 (EMD 46321715B; EXP: 10/11/12) ↑ 1L
w/ DI H2O.
EXP: 4/17/11

Reviewed And Approved By:
Initial: JK Date: 3/18/11

4/14/11
JL

524-04141101 ICO2 Eluent
75ml 524-04291003 (100 Conc Eluent, exp 4/29/11)
↑ 750ml w/ DI H2O. DEGAS
EXP: 4/28/11

PH 10.000 Buffer

SAI-0461103

Purchased

OT Baker

Lot No: 5055-01

Lot # 13354

EXP: 9/30/12

SAI-0461103 NBS Fixing Soln

Purchased

Thermo Orion

Lot # 0X1

EXP: 4/30/12

9/20/11

SAI-0461103

1:1 H2SO4

250ml conc H2SO4 (Lot # 4984, Exp: 11/30/14)

ADDED SLOWLY TO 250ml DI H2O

LET CUL

EXP: 4/30/12

SAI-0461101

Ammonia Soln

6.25ml conc H2SO4 (Lot # 4984, Exp: 11/30/14) Added to

2.5ml DI H2O. Let CUL

Dissolve 1.6875g N-N-Dimethyl-p-Toluidine

oxide (Lot # 136386, Exp: 8/7/14)

in water sulfate Soln and dilute to 250ml w/

1:1 H2SO4 (Lot # 4984, Exp: 11/30/14)

EXP: 5/25/11

SAI
4/27/11

SAI
4/27/11

SAI
4/27/11

SAI
4/27/11

4/27/11 524-04271102 A&B pH 7.00 Buffer
 Purchased
 BDH Cat No. BDH5046 - 500 mL
 LOT # 1103379
 EXP: 3/30/13

4/28/11 524-04281101 0.1N H₂SO₄
 5.6 ml conc. H₂SO₄ (EMD 49284; EXP: 11/20/14)
 ↑ 2L w/ DI H₂O
 EXP: 4/28/12

5/4/11 524-05041101 Alkaline Digestion Sol'n
 20.0g NaOH (EMD 47022713; EXP: 10/11/12) +
 30.0g Na₂CO₃ (EMD 46321715B; EXP: 10/11/12)
 ↑ 1L w/ DI H₂O
 EXP: 06/04/11

5/6/11 524-05051101 Violet Coloring reagent
 0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05041;
 EXP: 06/15/15) ↑ 50ml w/ Acetone (EMD 47154 D;
 EXP: 9/24/12)
 EXP: 06/05/11

5/5/11 524-05051102 ICO₂ Eluent
 100 ml 524-04191101 (14x conc eluent; EXP: 9/32/11)
 ↑ 1L w/ DI H₂O - Degassed
 EXP: 5/19/11

LABORATORY REPORT

May 24, 2011

David Conner
Battelle
4800 Oak Grove Dr. M/S 180-801
Pasadena, CA 91109

RE: JPL GW Mon 2Q11 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 10, 2011. For your reference, these analyses have been assigned our service request number P1101750.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-10-1; Minnesota Department of Health, NELAP Certificate No. 219474; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.



Digitally Signed By Sue Anderson at 4:41 pm, May 24, 2011

Sue Anderson
Project Manager

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

CAS Project No: P1101750

CASE NARRATIVE

The samples were received intact under chain of custody on May 10, 2011 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

DETAIL SUMMARY REPORT

Client: Battelle
 Project ID: JPL GW Mon 2Q11 / G486090

Service Request: P1101750

Date Received: 5/10/2011
 Time Received: 16:00

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-3-5	P1101750-001	Water	5/10/2011	07:44	X
MW-3-4	P1101750-002	Water	5/10/2011	08:25	X
MW-3-3	P1101750-003	Water	5/10/2011	09:29	X
MW-3-2	P1101750-004	Water	5/10/2011	10:09	X
MW-3-1	P1101750-005	Water	5/10/2011	13:15	X
EB-9-5/10/11	P1101750-006	Water	5/10/2011	13:02	X

Columbia Analytical Services, Inc.

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl <i>tert</i> -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.



Columbia Analytical Services, Inc.
 An Employee - Owned Company
 2655 Park Center Drive, Suite A
 Simi Valley, California 93065
 Phone (805) 526-7161
 Fax (805) 526-7270

Water & Soil - Chain of Custody Record & Analytical Service Request

Requested Turnaround Time in Business Days (Surcharges) please circle
 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No: 1111750
 CAS Contact: _____

Company Name & Address (Reporting Information)
BATTELLE
 3990 OLD TOWN AVE - C-205
 SAN DIEGO CA 92110

Project Name: JPL GW.MON.2011
 Project Number: G486040

Project Manager: DAVID CORNER
 PO # / Billing Information: 214319 / BATTELLE
 ATTN: GERALD TEMPLINS
 505 KING AVE
 COLUMBUS, OH 43201

Phone: (619) 726-7311 Fax: (614) 458-6641
 Email Address for Result Reporting: _____

Sampler (Print & Sign)

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers
MMW - 3 - 5	1	5/10/11	744	W	1
MMW - 3 - 4	1	5/10/11	825		2
MMW - 3 - 3	3	5/10/11	929		1
MMW - 3 - 2	4	5/10/11	1009		1
MMW - 3 - 1	5	5/10/11	1315		1
ER - 9 - 5/10/11	6	5/10/11	1302		1

Analysis Method and/or Analytes	Preservative Code
Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/> TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted)	
Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)	
CR VI (7196)	

Remarks
MS/MSD
EQUIP BLANK

Report Tier Levels - Please select
 Tier I - (Results/Default if not specified) _____
 Tier II - (Results + QC) _____
 Tier III - (Data Validation Package) 10% Surcharge _____
 Tier V - (client specified) _____

MRL required Yes / No _____
 MDL / PQL / J required Yes / No _____
 EDD required Yes / No _____
 Type: _____

Project Requirements (MRLs, QAPP)
 Cooler / Blank / Ice / No Ice _____
 Temperature _____ °C

Relinquished by: (Signature) _____
 Date: 5/10/11 Time: 1501

Relinquished by: (Signature) _____
 Date: 5/10/11 Time: 600

Relinquished by: (Signature) _____
 Date: _____ Time: _____

Received by: (Signature) _____
 Date: 5/10/11 Time: 1320

Received by: (Signature) _____
 Date: 5/10/11 Time: 600

Received by: (Signature) _____
 Date: _____ Time: _____

Client: Battelle

Service Request: P1101750

Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101750-001.01	7196A	5/10/11	1604	SMO / SSTAPLES	
		5/10/11	1604	P-37 / SSTAPLES	
		5/10/11	1609	In Lab / SANDERSON	
		5/10/11	1653	P-37 / SANDERSON	
P1101750-002.01	7196A	5/10/11	1604	SMO / SSTAPLES	
		5/10/11	1604	P-37 / SSTAPLES	
		5/10/11	1609	In Lab / SANDERSON	
		5/10/11	1653	P-37 / SANDERSON	
P1101750-002.02		5/10/11	1604	SMO / SSTAPLES	
		5/10/11	1604	P-37 / SSTAPLES	
		5/10/11	1609	In Lab / SANDERSON	
		5/10/11	1653	P-37 / SANDERSON	
P1101750-003.01	7196A	5/10/11	1604	SMO / SSTAPLES	
		5/10/11	1604	P-37 / SSTAPLES	
		5/10/11	1609	In Lab / SANDERSON	
		5/10/11	1653	P-37 / SANDERSON	
P1101750-004.01	7196A	5/10/11	1604	SMO / SSTAPLES	
		5/10/11	1604	P-37 / SSTAPLES	
		5/10/11	1609	In Lab / SANDERSON	
		5/10/11	1653	P-37 / SANDERSON	
P1101750-005.01	7196A	5/10/11	1604	SMO / SSTAPLES	
		5/10/11	1604	P-37 / SSTAPLES	
		5/10/11	1609	In Lab / SANDERSON	
		5/10/11	1653	P-37 / SANDERSON	
P1101750-006.01	7196A	5/10/11	1604	SMO / SSTAPLES	
		5/10/11	1604	P-37 / SSTAPLES	
		5/10/11	1609	In Lab / SANDERSON	
		5/10/11	1653	P-37 / SANDERSON	

Sample Acceptance Check Form

Client: Battelle Work order: P1101750
 Project: JPL GW Mon 2Q11 / G486090
 Sample(s) received on: 5/10/11 Date opened: 5/10/11 by: SSTAPLES

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- | | | Yes | No | N/A |
|----|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 | Were sample containers properly marked with client sample ID? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 | Container(s) supplied by CAS ? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 | Did sample containers arrive in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 | Were chain-of-custody papers used and filled out? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 | Did sample container labels and/or tags agree with custody papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 | Was sample volume received adequate for analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 | Are samples within specified holding times? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 | Was proper temperature (thermal preservation) of cooler at receipt adhered to?
Cooler Temperature _____ °C Blank Temperature <u>5</u> °C | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9 | Was a trip blank received? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10 | Were custody seals on outside of cooler/Box?
Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| | Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Were custody seals on outside of sample container?
Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| | Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 | Do containers have appropriate preservation , according to method/SOP or Client specified information? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Is there a client indication that the submitted samples are pH preserved? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Were VOA vials checked for presence/absence of air bubbles? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12 | Tubes: Are the tubes capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Do they contain moisture? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13 | Badges: Are the badges properly capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Are dual bed badges separated and individually capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101750-001.01	125mL Plastic NP					
P1101750-002.01	125mL Plastic NP					
P1101750-002.02	125mL Plastic NP					
P1101750-003.01	125mL Plastic NP					
P1101750-004.01	125mL Plastic NP					
P1101750-005.01	125mL Plastic NP					
P1101750-006.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
 Project Name : JPL GW Mon 2Q11
 Project Number : G486090
 Sample Matrix : WATER

Service Request : P1101750
 Date Collected : 05/10/11
 Date Received : 05/10/11

Chromium, Hexavalent

Prep Method : None
 Analysis Method : 7196A
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-3-5	P1101750-001	0.010	0.003	1	NA	05/10/11 16:45	ND	
MW-3-4	P1101750-002	0.010	0.003	1	NA	05/10/11 16:45	ND	
MW-3-3	P1101750-003	0.010	0.003	1	NA	05/10/11 16:45	ND	
MW-3-2	P1101750-004	0.010	0.003	1	NA	05/10/11 16:45	ND	
MW-3-1	P1101750-005	0.010	0.003	1	NA	05/10/11 16:45	ND	
EB-9-5/10/11	P1101750-006	0.010	0.003	1	NA	05/10/11 16:45	ND	
Method Blank	P1101750-MB	0.010	0.003	1	NA	05/10/11 16:45	ND	

Approved By *Karan Rya* Date : 5/17/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101750
Date Analyzed: 05/10/11

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: Kam Rya Date: 5/17/11
iccBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101750
Date Analyzed: 05/10/11

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0500	0.0493	99	90-110
CCV1	0.0500	0.0502	100	90-110
CCV2	0.0500	0.0502	100	90-110

Approved By: _____

Kanu Rya

Date: _____

5/17/11

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
 Project Name : JPL GW Mon 2Q11
 Project Number : G486090
 Sample Matrix : WATER

Service Request : P1101750
 Date Collected : NA
 Date Received : NA
 Date Extracted : NA
 Date Analyzed : 05/10/11

Laboratory Control Sample Summary
 Inorganic Parameters

Sample Name : Laboratory Control Sample
 Lab Code : P1101750-LCS
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0411	103	90-110	

Approved By Kanu Rya Date : 5/17/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
 Project Name : JPL GW Mon 2Q11
 Project Number : G486090
 Sample Matrix : WATER

Service Request : P1101750
 Date Collected : 05/10/11
 Date Received : 05/10/11
 Date Extracted : NA
 Date Analyzed : 05/10/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-3-4 Units : mg/L (ppm)
 Lab Code : P1101750-002MS P1101750-002DMS Basis : NA
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0484	0.0493	97	99	73-119	2	

Approved By Kanu Rya Date : 5/17/11

pH Run Log

Service Request #(s): P1101750

Time: 0723

Sample	VWR lot #	Exp.	Slope	Prep.Run #
pH 2 Buffer	52411041002	1/2012	} 97.9%	—
pH 4 Buffer	52411041003	8/31/12		Run#
pH 7 Buffer	524-04271024	3/2013		—
pH 10 Buffer	524-04261102	9/2012		—

pH in liquid: (1) 9040B, (2) 9040C pH in solid: (3) 9045C, (4) 9045D (Note method number in column labeled # below)

pH adjustment:(5) 7196A,(6) 7199 (Note method # in column labeled #)

Sample	#	pH	Temp. °C	Sample	#	pH	Temp. °C
pH 2.000	5	1.990	22.5°	<div style="font-size: 4em; font-weight: bold;">/</div> <p>Final not used</p>			
pH 4.000		4.002	22.4°				
pH 7.000		7.002	22.5°				
pH 10.000		10.005	22.5°				
Ref#		6.373	22.6°				
DI		1.920	20.3°				
pH 2.000		1.988	22.3°				
TIME: 1414							
pH 2.000	5	1.990	22.3°				
1750-1.01		1.853	6.7°				
-2.01		1.972	6.3°				
-3.01		2.020	7.1°				
-4.01		1.818	7.2°				
-5.01		1.853	8.8°				
-6.01		1.802	8.2°				
pH 2.000		2.001	22.0°				

pH Adjustments: 7196A: Diluted/Conc H₂SO₄ END 49284 EXP: 11/20/14

7199A: Diluted NaOH _____ EXP: _____

Comments: _____

* Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 5/9/11

Note: ATC probe used; therefore, temperature correction calculation is not necessary.

Analyst: [Signature]
 Reviewer: KR

Date: 5/10/11
 Date: 5/16/11

Service Request#(s): P11017530

Run#: 245520

Stock#: 524-02281103 T.V.=100PPM EXP: 3/26/12

Prep Run#: _____

ICV/CCV#: 524-10151001 T.V.=100PPM EXP: 3/20/12

Conc. H₂SO₄ Lot#: EMD 49284 EXP: 11/20/14

Coloring Reagent Ref#: 524-05051101 EXP: 6/5/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.9999
Absorbance @ 540 nm	0.000	0.010	0.055	0.110	0.9999

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
11	ICS	10 ml	-	0.000	0.000	0.000	0.000401	10.003
12	ICW 0.05PPM	-	-	0.000	0.0574	0.0574	0.0493	99%
13	MB	-	-	0.000	0.000	0.000	0.000401	10.003
14	LCS 0.04PPM	-	-	0.000	0.045	0.045	0.0411	103%
15	1750-1.01	-	-	0.003	0.005	0.002	0.00231	10.003
16	-1.01 VS 0.03PPM	-	-	0.003	0.032	0.029	0.0266	89%
17	-2.01	-	-	0.002	0.002	0.000	0.000401	10.003
18	-2.01 MS 0.05PPM	-	-	0.002	0.055	0.053	0.0484	97%
19	-2.01 MSD J	-	-	0.002	0.056	0.054	0.0493	99%
20	-3.01	-	-	0.002	0.003	0.001	0.00131	10.003
21	-4.01	-	-	0.001	0.003	0.002	0.00231	10.003
22	-5.01	-	-	0.000	0.000	0.000	0.000401	10.003
23	ICW 0.05 PPM	-	-	0.000	0.055	0.055	0.0502	100%
24	ICW	-	-	0.000	0.000	0.000	0.000401	10.003
25	1750-6.01	-	-	0.000	0.000	0.000	0.000401	10.003
26	ICW 0.05PPM	-	-	0.000	0.055	0.055	0.0502	100%
27	ICW	-	-	0.000	0.000	0.000	0.000401	10.003

pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10151001 @ 10 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 ↑ 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of _____ ↑ 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.20 ml of _____ @ 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]
 Analyzed By: [Signature]
 Reviewed By: [Signature]

Date/Time: 5/10/11 @ 1630
 Date/Time: 5/10/11 @ 1645
 Date: 5/10/11

F0V

11/23/09 519-11230902 1000 ppm SO₂ (ICV/COV)
JW 0.1607g Na₂SO₃ (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/DI
EXP: 5/23/10

11/23/09 519-11230903 A, B, C, D PH REFERENCE
JW PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 519-11240901 1000 ppm SO₄ Standard
JW PURCHASED CAT # ICC-006
LOT # K60794
EXP: 9/30/13

11/25/09 519-~~H/25~~ ^{82w 11/25/09} 11250901 0.1N H₂SO₄
JW 5.6ml conc H₂SO₄ (EMD 47050 EXP: 9/13/10)
EXP: ~~H/25~~ ^{82w 11/25/09} 9/13/10

11/30/09 519-11300901 Cr⁶⁺ Coloring Reagent
JW 0.2500g diphenylcarbohydrazide (EMD 4710322; EXP:
1/30/13) ↑ 5ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 519-11300902 25133 ppb Stock for O₃ in Air
JW 0.05ml Pyridine-4-carboxaldehyde (Alfa Aesar Lot 10140558; EXP 8/11/12)
↑ 500ml deionized H₂O
EXP: 12/14/09

11/30/09 519-11300903 25133 ppb ICV/COV for O₃ in Air
JW 0.05ml Pyridine-4-carboxaldehyde (TCI Lot # IGTINC; EXP: 8/10/12)
↑ 500ml w/DI H₂O
EXP: 12/14/09

Reviewed And Approved By:
Initial: JW Date: 12/22/09

10/16/10 524-10061001 25133 ppb Stock for O3
 0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar
 10146598 :Exp: 8/11/12 up to 500 ml w/ DI
 Water.
 EXP: 10/20/10

10/16/10 524-10061002 25133, 26 ION/CON for O3
 0.05 ml Pyridine-4-carboxaldehyde TCI
 (IGJNE) :Exp: 8/10/12 up to 500 ml w/ DI
 Water.
 EXP: 10/20/10

10/16/10 524-10061003 MBTH 50/17
 0.5000 g MBTH (Aldrich 54646EK :Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ EMD 44284; EXP 11/20
 EXP: 10/7/10

10/15/10 524-10151001 Cr6+ ION/CON Stock
 Purchased 100ppm Cr6+
 RICCA Chemical Co Cut No 2095-16
 500ml Plastic
 LOT # 1010177
 EXP: 3/20/12

10/15/10 524-10151002 500ppm NO₂ Stock
 Purchased
 RICCA Chemical Co Cut No: 5444.5-4
 LOT # 1010271 120ml amber glass
 EXP: 4/20/11

10/28/10
JW

S24-10781002

1000 PPM SO₃ ION/CCV

0.1607 Na₂SO₃ (Mallinckrodt Lot #H25469; Exp: 8/1/14) up to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10
JW

S24-11011001

ION/CCV U⁶⁺ T.V = 0.579 PPM

0.5 ml 519-04090904 (T.V = 115.8 mg/L; EXP: 12/2010)

↑ 100 ml w/ DI

EXP: 11/15/10

11/1/10
JW

S24-11011002

Cr⁶⁺ Coloring Reagent

0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD 471548; EXP: 9/24/12).

EXP: 11/15/10

11/4/10
JW

S24-11041001 A-SE

pH Filling Sol'n

PURCHASED (3M KCl)

Thermo Scientific

LOT Code: OR1

EXP: 11/4/11

P/N 702613-A02

11/4/10
JW

S24-11041002

pH 2.000 Buffer

purchased

BDH CAT NO: 5010-500 ml

LOT # 1002199

EXP: 11/2012

11/4/10 S24-11041003 pH 4.000 Buffer
 purchased
 J.T. Baker Cat No: 5657-01 500 ml
 LOT # J30507
 EXP: 8/31/12

11/4/10 S24-11041004 pH 7.000 Buffer
 purchased
 J.T. Baker Cat No: 5656-01 500 ml
 LOT # J35515
 EXP: 9/30/12

11/5/10 S24-11051001 MBTH Solⁿ
 0.5000 g MBTH (Aldrich 541696EK, Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ EMD 44884
 EXP: 11/20/14
 EXP: 11/6/10

11/8/10 S24-11081001 1000 PPM NH₃
 0.3141g NH₄Cl (EMD 49198931; EXP: 10/19/14) 100 ml
 w/ S24-10271006 EXP: 10/22/11
 EXP: 10/22/11

11/12/10 S24-11121001 1000 PPM SO₃ STOCK
 0.1591 Na₂SO₃ (JT Baker Lot #H110627; Exp: 8/31/14) up to
 100 ml w/ DI Water.
 EXP: 11/26/10

54

2/21/11
JW
524-0221101 1:1 H₂SO₄
250ml H₂SO₄ (EMD 49284; EXP: 11/20/14)
ADDED SLOWLY TO 250ml DI. COOL
COMPLETELY
EXP: 2/21/12

2/21/11
JW
524-0221102 Carb Coloring Reagent
0.2500g 1,5-naphthylcarbonylhydrazide (EMD lot 4710372,
EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD
lot #471540; EXP: 9/24/12).
EXP: 3/21/11

2/28/11
JW
524-0228101 0.1 H₂SO₄
5.6ml conc H₂SO₄ (EMD 49284 EXP: 11/20/14) ↑ 2L
w/ DI H₂O
EXP: 2/28/12

2/28/11
JW
524-0228102 1001 mg/l Carb
Purchased
Inorganic Ventures CGCR (6)1-1
125ml Clear Glass
LOT# D2-CR03040
EXP: 3/11/2012

2/28/11
JL

524-02281103

10ppm Cr6+ Soln

1.0 ml 524-02281102 (100ppm Cr6+; EXP: 3/1/12) ↑

100ml w/ DI H2O

EXP: 2/28/12

3/7/11
JL

524-03071101 Cr6+ Colormetric Reagent

0.2500g 1,5-Diphenylcarbazide

(EMD Lot 47103721, EXP: 1/30/13) ↑ 50 ml w/

Acetone (EMD 47154, EXP: 9/24/12).

EXP: 4/7/11

3/7/11
JL

524-03071102

500ppm NO2

Purchased

PICCA Chem Co

Cart No 5444.5-4

LOT # 1162544

EXP: 8/20/11

3/17/11
JL

524-032171101

Alkaline Digestion Soln

20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g

Na2CO3 (EMD 46321715B; EXP: 10/11/12) ↑ 1L

w/ DI H2O.

EXP: 4/17/11

Reviewed And Approved By:

Initial: JL Date: 3/18/11

4/14/11
JL

524-04141101 ICO2 Eluent

75ml 524-04291002 (100 Conc Eluent, EXP 4/29/11)

↑ 750ml w/ DI H2O. DEGAS

EXP: 4/28/11

4/26/11
 SN
 524-04261102 pH 10.000 Buffer
 Purchased
 JT Baker Cat No: 5655-01 (500ml)
 LOT # J33524
 EXP: 9/30/12

4/26/11
 SN
 524-04261103 NH3 FILLING SOLN
 Purchased
 Thermo Orion Orion 951202 (60ml)
 LOT # OX1 P/N: 70243-A04
 EXP: 4/26/12

4/26/11
 SN
 524-04261104 ^{9/4/20/11} 1:1 H2SO4
 250ml conc H2SO4 (LMD 49284, EXP: 11/20/14)
 ADDED SLOWLY TO 250ml DI H2O
 LET COOL
 EXP: 4/26/12

4/27/11
 SN
 524-04271101 Amido Sulfuric Soln
 6.25ml conc H2SO4 (LMD 49284; EXP: 11/20/14) Added to
 2.5ml DI H2O. Let Cool.
 DISSOLVE 1.6875g N,N-Dimethyl-p-phenylenediamine
 Oxidant (Fluka 136338613408204; EXP: 8/7/14)
 in cooled sulfuric soln and dilute to 250ml w/
 1:1 H2SO4 (524-04261104; EXP: 4/26/12)
 EXP: 5/25/11

4/27/11 524-04271102 A/B pH 7.00 Buffer
 Purchased
 BDH Cat No: BDH5046-500 mL
 LOT # 1103379
 EXP: 3/30/13

4/28/11 524-04281101 0.1N H₂SO₄
 5.6 ml conc H₂SO₄ (EMD 49284; EXP: 11/20/14)
 ↑ 2L w/DI H₂O
 EXP: 4/28/12

5/4/11 524-05041101 Alkaline Digestion Sol'n
 20.0g NaOH (EMD 47022713; EXP: 10/11/12) +
 30.0g Na₂CO₃ (EMD 46321715B; EXP: 10/11/12)
 ↑ 1L w/DI H₂O
 EXP: 06/04/11

6/6/11 524-05051101 Cryst Coloring reagent
 0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;
 EXP: 06/15/15) ↑ 50ml w/Acetone (EMD 47154D;
 EXP: 9/24/12)
 EXP: 06/05/11

6/5/11 524-05051102 ICO₂ Eluent
 100 ml 524-04191101 (10x wmf eluent; EXP: 9/22/11)
 ↑ 1L w/DI H₂O - Deaerated
 EXP: 5/19/11

LABORATORY REPORT

May 25, 2011

David Conner
Battelle
4800 Oak Grove Dr. M/S 180-801
Pasadena, CA 91109

RE: JPL GW Mon 2Q11 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 11, 2011. For your reference, these analyses have been assigned our service request number P1101772.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-10-1; Minnesota Department of Health, NELAP Certificate No. 219474; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.



Digitally Signed By Sue Anderson at 2:39 pm, May 25, 2011

Sue Anderson
Project Manager

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

CAS Project No: P1101772

CASE NARRATIVE

The samples were received intact under chain of custody on May 11, 2011 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

DETAIL SUMMARY REPORT

 Client: Battelle
 Project ID: JPL GW Mon 2Q11 / G486090

Service Request: P1101772

 Date Received: 5/11/2011
 Time Received: 15:41

7196A - Cr6

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
MW-19-5	P1101772-001	Water	5/11/2011	07:50	X
MW-19-4	P1101772-002	Water	5/11/2011	08:21	X
MW-19-3	P1101772-003	Water	5/11/2011	08:58	X
MW-19-2	P1101772-004	Water	5/11/2011	10:04	X
MW-19-1	P1101772-005	Water	5/11/2011	13:15	X
DUPE-3-2Q11	P1101772-006	Water	5/11/2011	00:00	X
EB-10-5/11/11	P1101772-007	Water	5/11/2011	13:04	X

Columbia Analytical Services, Inc.

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl <i>tert</i> -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.



Columbia Analytical Services
 2655 Park Center Drive, Suite A
 Simi Valley, California 93065
 Phone (805) 526-7161
 Fax (805) 526-7270

Water & Soil - Chain of Custody Record & Analytical Service Request

Requested Turnaround Time in Business Days (Surcharges) please circle
 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. 2101772
 CAS Contact: _____

Company Name & Address (Reporting Information)
BAYTELLE
 3990 OLD TOWN AVE. C-205
 SAN DIEGO, CA 92110

Project Name: **SPL GW. MON. 2011**
 Project Number: **6486090**

Project Manager: **DAVID CONNER**

Phone: _____ Fax: _____
 (619) 726-7311 (619) 458-6641

Email Address for Result Reporting: _____
 Sampler (Print & Sign) _____

Client Sample ID: _____ Laboratory ID Number: _____ Date Collected: _____ Time Collected: _____ Matrix: _____ Number of Containers: _____

P.O. # / Billing Information: **214319 / BAYTELLE**
 ATTN: DAVID CONNER
 505 KING AVE.
 COLUMBUS, OH 43201

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Analysis Method and/or Analytes		Preservative Code
						Volatiles	Semi-Volatiles	
MW-19-5	1	5/11/11	750	W	1	X		
MW-19-4	2		821		1	X		
MW-19-3	3		858		1	X		
MW-19-2	4		1004		1	X		
MW-19-1	5		1315		1	X		
DUPE-3-2011	6				1	X		
EB-10-5/11/11	7		1304		1	X		

Volatiles GC/MS
 624 8260B Oxygenates TPH Gas
 TPH Gas 8015B
 BTEX 8021B MTBE 8021B
 TPH Diesel 8015B (Subcontracted)
 TPH Diesel Low Level 8015B (Subcontracted)
 TPH FC 8015M (Subcontracted)

Semi-Volatile Organics GC/MS
 625 8270C (Subcontracted)

917 (7196)

Project Requirements (MRLs, GAPP)
 Tier I - (Results/Default if not specified) _____
 Tier II - (Results + QC) _____
 Tier III - (Data Validation Packages) 10% Surcharge _____
 Tier V - (client specified) _____

MRL required Yes / No _____
 MDL / PQL / J required Yes / No _____
 EDD required Yes / No _____
 Type: _____

Project Requirements (MRLs, GAPP)
 Cooler / Blank / Ice / No Ice _____
 Temperature _____ °C

Remarks: **Duplicate**
Equip Blank

Relinquished by (Signature) _____ Date: 5/11/11 Time: 7:50
 Relinquished by (Signature) _____ Date: 5/11/11 Time: 7:50
 Relinquished by (Signature) _____ Date: 5/11/11 Time: 7:50

Client: Battelle

Service Request: P1101772

Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101772-001.01	7196A	5/11/11	1549	SMO / SSTAPLES	
		5/11/11	1552	In Lab / SANDERSON	
		5/11/11	1649	P-37 / SANDERSON	
P1101772-002.01	7196A	5/11/11	1549	SMO / SSTAPLES	
		5/11/11	1552	In Lab / SANDERSON	
		5/11/11	1649	P-37 / SANDERSON	
P1101772-003.01	7196A	5/11/11	1549	SMO / SSTAPLES	
		5/11/11	1552	In Lab / SANDERSON	
		5/11/11	1649	P-37 / SANDERSON	
P1101772-004.01	7196A	5/11/11	1549	SMO / SSTAPLES	
		5/11/11	1552	In Lab / SANDERSON	
		5/11/11	1649	P-37 / SANDERSON	
P1101772-005.01	7196A	5/11/11	1549	SMO / SSTAPLES	
		5/11/11	1552	In Lab / SANDERSON	
		5/11/11	1649	P-37 / SANDERSON	
P1101772-006.01	7196A	5/11/11	1549	SMO / SSTAPLES	
		5/11/11	1552	In Lab / SANDERSON	
		5/11/11	1649	P-37 / SANDERSON	
P1101772-007.01	7196A	5/11/11	1549	SMO / SSTAPLES	
		5/11/11	1552	In Lab / SANDERSON	
		5/11/11	1649	P-37 / SANDERSON	

Sample Acceptance Check Form

Client: Battelle Work order: P1101772

Project: JPL GW Mon 2Q11 / G486090

Sample(s) received on: 5/11/11 Date opened: 5/11/11 by: SSTAPLES

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- | | Yes | No | N/A |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were sample containers properly marked with client sample ID? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 Container(s) supplied by CAS ? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 Did sample containers arrive in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 Were chain-of-custody papers used and filled out? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 Did sample container labels and/or tags agree with custody papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 Was sample volume received adequate for analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 Are samples within specified holding times? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 Was proper temperature (thermal preservation) of cooler at receipt adhered to? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cooler Temperature _____ °C Blank Temperature <u>4</u> °C | | | |
| 9 Was a trip blank received? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10 Were custody seals on outside of cooler/Box? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate preservation , according to method/SOP or Client specified information? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Is there a client indication that the submitted samples are pH preserved? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were VOA vials checked for presence/absence of air bubbles? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12 Tubes: Are the tubes capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Do they contain moisture? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13 Badges: Are the badges properly capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101772-001.01	125mL Plastic NP					
P1101772-002.01	125mL Plastic NP					
P1101772-003.01	125mL Plastic NP					
P1101772-004.01	125mL Plastic NP					
P1101772-005.01	125mL Plastic NP					
P1101772-006.01	125mL Plastic NP					
P1101772-007.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

Analytical Report

Client : Battelle
 Project Name : JPL GW Mon 2Q11
 Project Number : G486090
 Sample Matrix : WATER

Service Request : P1101772
 Date Collected : 05/11/11
 Date Received : 05/11/11

Chromium, Hexavalent

Prep Method : None
 Analysis Method : 7196A
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-19-5	P1101772-001	0.010	0.003	1	NA	05/11/11 16:25	ND	
MW-19-4	P1101772-002	0.010	0.003	1	NA	05/11/11 16:25	ND	
MW-19-3	P1101772-003	0.010	0.003	1	NA	05/11/11 16:25	ND	
MW-19-2	P1101772-004	0.010	0.003	1	NA	05/11/11 16:25	ND	
MW-19-1	P1101772-005	0.010	0.003	1	NA	05/11/11 16:25	ND	
DUPE-3-2Q11	P1101772-006	0.010	0.003	1	NA	05/11/11 16:25	ND	
EB-10-5/11/11	P1101772-007	0.010	0.003	1	NA	05/11/11 16:25	ND	
Method Blank	P1101772-MB	0.010	0.003	1	NA	05/11/11 16:25	ND	

Approved By Kam Rya Date : 5/17/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

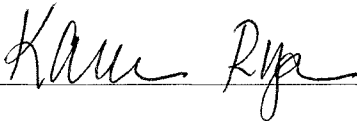
Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101772
Date Analyzed: 05/11/11

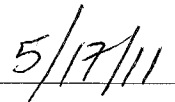
Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: _____



Date: _____



ICCBMDL120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101772
Date Analyzed: 05/11/11

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0500	0.0503	101	90-110
CCV1	0.0500	0.0503	101	90-110
CCV2	0.0500	0.0503	101	90-110

Approved By: _____

Kam Rya

Date: _____

5/17/11

CCV1A/120594

QA/QC Report

Client : Battelle
 Project Name : JPL GW Mon 2Q11
 Project Number : G486090
 Sample Matrix : WATER

Service Request : P1101772
 Date Collected : NA
 Date Received : NA
 Date Extracted : NA
 Date Analyzed : 05/11/11

Laboratory Control Sample Summary
 Inorganic Parameters

Sample Name : Laboratory Control Sample
 Lab Code : P1101772-LCS
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0398	100	90-110	

Approved By Kanu Rya Date : 5/17/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101772
Date Collected : 05/11/11
Date Received : 05/11/11
Date Extracted : NA
Date Analyzed : 05/11/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-19-5 Units : mg/L (ppm)
 Lab Code : P1101772-001MS P1101772-001DMS Basis : NA
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0398	0.0398	80	80	73-119	<1	

Approved By *Kam Rya* Date : *5/17/11*

pH Run Log

Service Request #(s): P1101772

Time: 0740

Sample	VWR lot #	Exp.
pH 2 Buffer	524-11041002	1/2012
pH 4 Buffer	524-11041003	8/31/12
pH 7 Buffer	524-04271102A	3/2013
pH 10 Buffer	524-04261102	9/30/12

Slope	Prep.Run #
} 97.9%	—
	Run#
	—

pH in liquid: (1) 9040B, (2) 9040C pH in solid: (3) 9045C, (4) 9045D (Note method number in column labeled # below)

pH adjustment:(5) 7196A,(6) 7199 (Note method # In column labeled #)

Sample	#	pH	Temp. °C
pH 2.000	5	1.990	22.4°
pH 4.000		4.003	22.3°
pH 7.000		7.000	22.4°
pH 10.000		9.995	22.5°
Rev 26.0.00 Exp: 11/20/12 Ref#: 514-11230903D		6.353	22.6°
DI		1.960	18.6°
pH 2.000	↓	1.988	22.2°
TIME: 1535			
pH 2.000	5	1.984	22.3°
1772-1.01	—	1.936	7.3°
-2.01	—	2.030	7.2°
-3.01	—	2.058	7.5°
-4.01	—	2.033	7.6°
-5.01	—	1.871	8.3°
-6.01	—	2.042	8.4°
↓ -7.01	—	2.098	8.9°
pH 2.000	↓	1.988	22.0°

Sample	#	pH	Temp. °C
<i>Space not used</i>			

pH Adjustments: 7196A: Diluted/Conc H₂SO₄ EMD 49284 EXP: 11/20/14

7199A: Diluted NaOH _____ EXP: _____

Comments: _____

* Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 5/9/11

Note: ATC probe used; therefore, temperature correction calculation is not necessary.

Analyst: SR

Date: 5/10/11

Reviewer: KR

Date: 5/10/11

Hexavalent Chromium (Liquids)

Service Request#(s): P1101772
 Stock#: 524-02281103 T.V.=10PPM EXP: 2/28/12
 CVICCV#: 524-10151001 T.V.=100PPM EXP: 3/20/12

Run#: 245705
 Prep Run#: _____
 Conc. H₂SO₄ Lot#: EMD 49284 EXP: 11/20/14
 Coloring Reagent Ref#: 524-05051101 EXP: 6/5/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.99995849
Absorbance @ 540 nm	0.000	0.011	0.056	0.114	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1 ICB	10 ml	-	✓	0.000	0.000	0.000	0.000318	10.003
2 ICV 0.05PPM	-	-	✓	0.000	0.057	0.057	0.0503	101%
3 MB	-	-	✓	0.000	0.000	0.000	0.000318	10.003
4 LCS 0.04PPM	-	-	✓	0.000	0.045	0.045	0.0398	100%
5 1772-1.01	-	-	✓	0.000	0.000	0.000	0.000318	10.003
6 -1.01 MS 0.05PPM	-	-	✓	0.000	0.045	0.045	0.0398	80% 241%
7 -1.01 MSD ↓	-	-	✓	0.000	0.045	0.045	0.0398	80% 5%
8 -2.01	-	-	✓	0.000	0.000	0.000	0.000318	10.003
9 -2.01 VS	-	-	✓	0.000	0.039	0.039	0.0257	86%
10 -3.01	-	-	✓	0.001	0.003	0.002	0.00207	10.003
11 -4.01	-	-	✓	0.005	0.007	0.002	0.00207	↓
12 -5.01	-	-	✓	0.005	0.005	0.000	0.000318	↓
13 CCV1 0.05PPM	-	-	✓	0.000	0.057	0.057	0.0503	101%
14 CCV1	-	-	✓	0.000	0.000	0.000	0.000318	10.003
15 1772-6.01	-	-	✓	0.004	0.004	0.000	0.000318	↓
16 -7.01	-	-	✓	0.000	0.000	0.000	0.000318	↓
17 CCV2 0.05PPM	-	-	✓	0.000	0.057	0.057	0.0503	101%
18 CCV2	-	-	✓	0.000	0.000	0.000	0.000318	10.003

pH Requirement: Method 7196A (2 ± 0.5) * Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10151001 @ to 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 ↑ 10 ml of pH adjusted sample (T.V.= 0.05 ppm)

LCS spiked with 0.2 ml of ↓ 50 ml of pH adjusted DI Water (T.V.= 0.04 ppm)

Verification Standard Spiked 0.3 ml of ↓ @ to ↑ 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: [Signature]

Analyzed By: [Signature]

Reviewed By: [Signature]

Date/Time: 5/11/11 @ 1610

Date/Time: 5/11/11 @ 21625

Date: 5/16/11

100

11/23/09 519-11230902 1000ppm SO₂ (ICV/COV)
Ja 0.1607g Na₂SO₃ (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/DI
EXP: 5/23/10

11/23/09 519-11230903 A, B, C, D PH REFERENCE
Ja PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 519-11240901 1000ppm SO₄ Standard
Ja PURCHASED CAT # ICC-006
LOT # K60794
EXP: 9/30/13

11/25/09 519-~~H/25~~^{82 11/25/09} 11250901 0.1N H₂SO₄
Ja 50ml conc H₂SO₄ (EMD 47050 EXP: 9/13/10)
EXP: ~~H/25~~^{82 11/25/09} 9/13/10

11/30/09 519-11300901 Cr⁶⁺ Coloring Reagent
Ja 0.2500g diphenylcarbohydrazide (EMD 47103ED; EXP:
1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 519-11300902 25133ppb Stock for O₃ in Air
Ja 0.05ml Pyridine-4-carboxaldehyde (Alfa Aesar Lot 10140558; EXP 8/11/12)
↑ 500ml deionized H₂O
EXP: 12/14/09

11/30/09 519-11300903 25133ppb ICV/COV FOR O₃ in Air
Ja 0.05ml Pyridine-4-carboxaldehyde (TCI Lot # IGTINC; EXP: 8/10/12)
↑ 500ml w/DI H₂O
EXP: 12/14/09

Reviewed And Approved By:
Initial: LL Date: 12/22/09

10/6/10 524-10061001 25133 ppb Stock for O3
 0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar
 10140598 :Exp: 8/11/12 up to 500 ml w/ DI
 Water.
 EXP: 10/20/10

10/6/10 524-10061002 25133 ppb ION/CON for O3
 0.05 ml Pyridine-4-carboxaldehyde TCI
 (IC?INC) :Exp: 8/10/12 up to 500 ml w/ DI
 Water.
 EXP: 10/20/10

10/6/10 524-10061003 MBTH 50/17
 0.5000 g MBTH (Aldrich 54696EK :Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ EMD 44284; EXP 11/20/
 EXP: 10/7/10

10/15/10 524-10151001 Cr6+ ION/CON Stock
 Purchased 100ppm Cr6+
 RICCA Chemical Co Cut No 2095-16
 500ml Plastic
 LOT # 1010177
 EXP: 3/20/12

10/15/10 524-10151002 500ppm NO2 Stock
 Purchased
 RICCA Chemical Co Cut No: 5444.5-4
 LOT # 1010271 120ml amber glass
 EXP: 4/20/11

10/28/10 S24-10781002 1000 PPM SO3 JCV/CCV
JCV

0.1607 Na2SO3 (Mallinckrodt Lot #1125469; Exp: 8/1/14) up
to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 S24-11011001 JCV/CCV Cr^{6+} T.V = 0.579 PPM
JCV 0.5 ml 519-04090904 (T.V = 115.8 mg/L; EXP: 12/2010)
↑ 100 ml w/ DI
EXP: 11/15/10

11/1/10 S24-11011002 Cr^{6+} Coloring Reagent
JCV 0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP:
11/30/13) ↑ 50 ml w/ Acetone (EMD 471540; EXP:
9/24/12)
EXP: 11/15/10

11/4/10 S24-11041001 A-SE PH Filling Sol'n
JCV PURCHASED (3M KCl)
Thermo Scientific P/N 702613-AD2
LOT Code: OR1
EXP: 11/4/11

11/4/10 S24-11041002 PH 2.000 Buffer
JCV purchased
BDH CAT NO: 5010-500 ml
LOT # 1002199
EXP: 1/2012

11/4/10 524-11041003 pH 4.000 Buffer
 purchased
 JT Baker Cat No: 5657-01 500 ml
 LOT # J30507
 EXP: 8/31/12

11/4/10 524-11041004 pH 7.000 Buffer
 purchased
 J.T. Baker Cat No: 5656-01 500 ml
 LOT # J35515
 EXP: 9/30/12

11/5/10 524-11051001 MBTH Soln
 0.5000 g MBTH (Aldrich 521616EX; Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ EMD 44884
 EXP: 11/22/14
 EXP: 11/6/10

11/8/10 524-11081001 1000 PPM NH₃
 0.3141g NH₄Cl (EMD 49198931; EXP: 10/19/14) 100 ml
 w/ 524-10271006 EXP: 10/22/11
 EXP: 10/22/11

11/12/10 524-11121001 1000 PPM SO₃ STOCK
 0.1591 Na₂SO₃ (JT Baker Lot #1110627; Exp: 8/31/14) up to
 100 ml w/ DI Water.
 EXP: 11/26/10

54

2/21/10
JSC
524-02211101 1:1 H₂SO₄
250ml H₂SO₄ (EMD 49284; EXP: 11/20/14)
ADDED SLOWLY TO 250ml DI. COOL
COMPLETELY
EXP: 2/21/12

2/21/11
JSC
524-02211102 Cr6+ Coloring Reagent
0.2500g 1,5-naphthylcarbonylhydrazide (EMD lot 4710372)
EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD
lot # 471540, EXP: 9/24/12)
EXP: 3/21/11

2/28/11
JSC
524-02281101 0.1 H₂SO₄
5.6 ml conc H₂SO₄ (EMD 49284 EXP: 11/20/14) ↑ 2L
w/ DI H₂O
EXP: 2/28/12

2/28/11
JSC
524-02281102 1001 mg/l Cr6+
Purchased
Inorganic Ventures CGCR(6)1-1
125ml Clear Glass
LOT# D2-CR03040
EXP: 3/11/2012

2/28/11
 JZ
524-02281103 10ppm Cr⁶⁺ Sol'n
 1.0 ml 524-02281102 (100ppm Cr⁶⁺; EXP: 3/1/12) ↑
 100ml w/ DI H₂O
 EXP: 2/28/12

3/7/11
 JZ
524-03071101 Cr⁶⁺ Colony Reagent
 0.2500g 1,5-Diphenylcarbazide
 (EMD Lot 47103721, EXP: 1/30/12) ↑ 50ml w/
 Acetone (EMD 47154, EXP: 9/24/12).
 EXP: 4/7/11

3/7/11
 JZ
524-03071102 500ppm NO₂
 Purchased
 RICCA Chem Co Cat No 5444.5-4
 Lot # 1162544
 EXP: 8/20/11

3/17/11
 JZ
524-03271101 Alkaline Digestion Sol'n
 20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g
 Na₂CO₃ (EMD 44321715B; EXP: 10/11/12) ↑ 1L
 w/ DI H₂O.
 EXP: 4/17/11

Reviewed And Approved By:
 Initial: JZ Date: 3/18/11

4/14/11
 JZ
524-04141101 ICO₂ Eluent
 75ml 524-04291002 (10x Conc Eluent, exp 4/29/11)
 ↑ 750ml w/ DI H₂O. DEGAS
 EXP: 4/30/11

PH 10.000 Buffer

504-0461102

Purchased

OT Baker

Cat No: 5255-01

(BOM)

LOT # J33524

EXP: 9/30/12

504-0461103

MHS FINING SOLN

Purchased

Thermo Orion

(cont)

LOT # DX1

P/N: 70243-A04

EXP: 4/30/12

9/21/2011

504-0461104

1:1 H2SO4

250ml conc H2SO4

(LMD 4984, EXP: 11/20/14)

LET OUT

ADDED SLOWLY TO 250ml DI H2O

EXP: 4/30/12

504-0461101

Ammonia Buffer Soln

6.25ml conc H2SO4 (LMD 4984, EXP: 11/20/14) Added to

2.5ml DI H2O. LET OUT

Dissolve 1.6875g N-N-Dimethyl-p-Phenylenediamine

oxide (Fluka 1363386 840820) (EXP: 8/7/14)

in cooled sulfuric acid and dilute to 250ml w/

1:1 H2SO4 (524-0461104, EXP: 4/30/12)

EXP: 6/25/11

4/27/11

4/26/11

4/26/11

4/26/11

4/27/11 524-04271102 A&B pH 7.00 Buffer
Purchased
BDH Cat No: BDH5046-500 mL
LOT # 1103379
EXP: 3/20/13

4/28/11 524-04281101 0.1N H₂SO₄
5.6 ml conc H₂SO₄ (EMD 49284; EXP: 11/20/14)
↑ 2L w/DI H₂O
EXP: 4/28/12

5/4/11 524-05041101 Alkaline Digestion Sol'n
20.0g NaOH (EMD 47022713; EXP: 10/11/12) +
30.0g Na₂CO₃ (EMD 46321715B; EXP: 10/11/12)
↑ 1L w/DI H₂O
EXP: 06/04/11

5/6/11 524-05051101 Cryst Coloring reagent
0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;
EXP: 06/15/15) ↑ 50ml w/Acetone (EMD 47154D;
EXP: 9/24/12).
EXP: 06/05/11

6/5/11 524-05051103 ICO₂ Eluent
100 ml 524-04191101 (10x conc eluent; EXP: 9/22/11)
↑ 1L w/DI H₂O. Degassed
EXP: 5/19/11

LABORATORY REPORT

June 7, 2011

David Conner
Battelle
4800 Oak Grove Dr. M/S 180-801
Pasadena, CA 91109

RE: JPL GW Mon 2Q11 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on May 12, 2011. One of the samples was sent out for partial analysis to our Kelso facility. Please find their report attached. For your reference, these analyses have been assigned our service request number P1101793.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-10-1; Minnesota Department of Health, NELAP Certificate No. 219474; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.



Digitally Signed By Sue Anderson at 1:19 pm, Jun 07, 2011

Sue Anderson
Project Manager

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

CAS Project No: P1101793

CASE NARRATIVE

The samples were received intact under chain of custody on May 12, 2011 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

DETAIL SUMMARY REPORT

Client: Battelle
 Project ID: JPL GW Mon 2Q11 / G486090

Service Request: P1101793

Date Received: 5/12/2011
 Time Received: 15:50

7196A - Cr6	521 - Nitrosamines	8270C SIM - 14_DIOXANE
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Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	7196A - Cr6	521 - Nitrosamines	8270C SIM - 14_DIOXANE
MW-17-5	P1101793-001	Water	5/12/2011	08:35	X		
MW-17-4	P1101793-002	Water	5/12/2011	09:12	X	X	X
MW-17-3	P1101793-003	Water	5/12/2011	10:21	X		
MW-17-2	P1101793-004	Water	5/12/2011	13:29	X		
MW-17-1	P1101793-005	Water	5/12/2011	14:15	X		
EB-11-5/12/11	P1101793-006	Water	5/12/2011	14:05	X		

Columbia Analytical Services, Inc.

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl <i>tert</i> -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19th Ed., 1995.
SW	<i>Test Methods for Evaluating Solid Waste, Physical/Chemical Methods</i> , SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.



Columbia Analytical Services
 2655 Park Center Drive, Suite A
 Simi Valley, California 93065
 Phone (805) 526-7161
 Fax (805) 526-7270

Water & Soil - Chain of Custody Record & Analytical Service Request

Requested Turnaround Time in Business Days (Surcharges) please circle
 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

CAS Project No. 9101793
 CAS Contact:

Company Name & Address (Reporting Information)				Project Name		Analysis Method and/or Analytes		Preservative Code		Preservative Key					
BATTELLE 2990 OLD TOWN AVE. C-205 SAN DIEGO, CA 92110				TPL GW. MON. 2011 6486090		P.O. # / Billing Information 214319 / BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBIUS, OH 43201		Volatile Organics GC/MS 624 <input type="checkbox"/> 8260B <input type="checkbox"/> Oxygenates <input type="checkbox"/> TPH Gas <input type="checkbox"/> TPH Gas 8015B <input type="checkbox"/> BTEX 8021B <input type="checkbox"/> MTBE 8021B <input type="checkbox"/> TPH Diesel 8015B <input type="checkbox"/> (Subcontracted) TPH Diesel Low Level 8015B <input type="checkbox"/> (Subcontracted) TPH FC <input type="checkbox"/> 8015M (Subcontracted) Semi-Volatile Organics GC/MS 625 <input type="checkbox"/> 8270C <input type="checkbox"/> (Subcontracted)		CR VI NDMA (521) DIOXANE (8270 SIM)		0 7 0		0 None HCL HNO3 H2SO4 NaOH Zn Acetate Asc Acid Other	
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Remarks									
MW - 17 - 5	1	5/12/11	835	W	1										
MW - 17 - 4	2	5/12/11	912	W	4										
MW - 17 - 3	3	5/12/11	1021	W	1										
MW - 17 - 2	4	5/12/11	1329	W	2										
MW - 17 - 1	5	5/12/11	1415	W	1										
ER - 11 - 5/12/11	6	5/12/11	1405	W	1	Equip Blank									

Report Tier Levels - please select

Tier I - (Results/Default if not specified) _____ Tier III - (Data Validation Package) 10% Surcharge _____ EDD required Yes / No _____
 Tier II - (Results + QC) _____ Tier V - (client specified) _____ MDL / POL / J required Yes / No _____ Type: _____

Requisitioned by: (Signature) _____ Date: _____ Time: _____
 Relinquished by: (Signature) _____ Date: _____ Time: _____
 Requisitioned by: (Signature) _____ Date: _____ Time: _____
 Relinquished by: (Signature) _____ Date: _____ Time: _____

Project Requirements (MRLs, QAPP)
 Cooler / Blank / Ice / No Ice
 Temperature 20C °C

Client: Battelle **Service Request:** P1101793
Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101793-001.01	7196A	5/12/11	1554	SMO / MZAMORA	
		5/12/11	1556	P-37 / MZAMORA	
		5/12/11	1604	In Lab / SANDERSON	
		5/12/11	1652	P-37 / SANDERSON	
P1101793-002.01	521	5/12/11	1554	SMO / MZAMORA	
		5/12/11	1556	SUBBED / MZAMORA	
		5/14/11	1001	K-Delilah-05 / FADAIR	
		5/19/11	0801	Custodian / DMOORE	
		5/19/11	0801	In Lab / RHAYES	
		5/19/11	1542	K-Delilah-05 / DMOORE	
P1101793-002.02		5/12/11	1554	SMO / MZAMORA	
		5/12/11	1556	SUBBED / MZAMORA	
		5/14/11	1001	K-Delilah-05 / FADAIR	
		5/19/11	0801	Custodian / DMOORE	
		5/19/11	0801	In Lab / RHAYES	
P1101793-002.03	7196A	5/12/11	1554	SMO / MZAMORA	
		5/12/11	1556	P-37 / MZAMORA	
		5/12/11	1604	In Lab / SANDERSON	
		5/12/11	1652	P-37 / SANDERSON	
P1101793-002.04	8270C SIM	5/12/11	1554	SMO / MZAMORA	
		5/12/11	1556	SUBBED / MZAMORA	
		5/14/11	1001	K-Delilah-05 / FADAIR	
		5/16/11	0926	In Lab / RHOLDEN	
		5/16/11	0950	K-Delilah-05 / KSMITH	
P1101793-003.01	7196A	5/12/11	1554	SMO / MZAMORA	
		5/12/11	1556	P-37 / MZAMORA	
		5/12/11	1604	In Lab / SANDERSON	
		5/12/11	1652	P-37 / SANDERSON	
P1101793-004.01	7196A	5/12/11	1554	SMO / MZAMORA	

Client: Battelle

Service Request: P1101793

Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
		5/12/11	1556	P-37 / MZAMORA	
		5/12/11	1604	In Lab / SANDERSON	
		5/12/11	1652	P-37 / SANDERSON	
<hr/>					
P1101793-004.02		5/12/11	1554	SMO / MZAMORA	
		5/12/11	1556	P-37 / MZAMORA	
		5/12/11	1604	In Lab / SANDERSON	
		5/12/11	1652	P-37 / SANDERSON	
<hr/>					
P1101793-005.01	7196A	5/12/11	1554	SMO / MZAMORA	
		5/12/11	1556	P-37 / MZAMORA	
		5/12/11	1604	In Lab / SANDERSON	
		5/12/11	1652	P-37 / SANDERSON	
<hr/>					
P1101793-006.01	7196A	5/12/11	1554	SMO / MZAMORA	
		5/12/11	1556	P-37 / MZAMORA	
		5/12/11	1604	In Lab / SANDERSON	
		5/12/11	1652	P-37 / SANDERSON	

Sample Acceptance Check Form

Client: Battelle Work order: P1101793

Project: JPL GW Mon 2Q11 / G486090

Sample(s) received on: 5/12/11 Date opened: 5/12/11 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- | | Yes | No | N/A |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were sample containers properly marked with client sample ID? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 Container(s) supplied by CAS ? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 Did sample containers arrive in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 Were chain-of-custody papers used and filled out? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 Did sample container labels and/or tags agree with custody papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 Was sample volume received adequate for analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 Are samples within specified holding times? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 Was proper temperature (thermal preservation) of cooler at receipt adhered to? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cooler Temperature _____ °C Blank Temperature <u>2</u> °C | | | |
| 9 Was a trip blank received? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10 Were custody seals on outside of cooler/Box? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate preservation , according to method/SOP or Client specified information? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Is there a client indication that the submitted samples are pH preserved? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were VOA vials checked for presence/absence of air bubbles? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12 Tubes: Are the tubes capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Do they contain moisture? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13 Badges: Are the badges properly capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101793-001.01	125mL Plastic NP					
P1101793-002.01	1000ml AG NP					
P1101793-002.02	1000ml AG NP					
P1101793-002.03	125mL Plastic NP					
P1101793-002.04	500mL AG NP					
P1101793-003.01	125mL Plastic NP					
P1101793-004.01	125mL Plastic NP					
P1101793-004.02	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers): _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101793
Date Collected : 05/12/11
Date Received : 05/12/11

Chromium, Hexavalent

Prep Method : None
Analysis Method : 7196A
Test Notes :

Units : mg/L (ppm)
Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-17-5	P1101793-001	0.010	0.003	1	NA	05/12/11 16:35	ND	
MW-17-4	P1101793-002	0.010	0.003	1	NA	05/12/11 16:35	ND	
MW-17-3	P1101793-003	0.010	0.003	1	NA	05/12/11 16:35	ND	
MW-17-2	P1101793-004	0.010	0.003	1	NA	05/12/11 16:35	ND	
MW-17-1	P1101793-005	0.010	0.003	1	NA	05/12/11 16:35	ND	
EB-11-5/12/11	P1101793-006	0.010	0.003	1	NA	05/12/11 16:35	ND	
Method Blank	P1101793-MB	0.010	0.003	1	NA	05/12/11 16:35	ND	

Approved By Kam Rya Date : 5/17/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101793
Date Analyzed: 05/12/11

Title: Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: _____

Kam Rya

Date: _____

5/17/11

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11 / G486090

Service Request: P1101793
Date Analyzed: 05/12/11

Title: Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte: Chromium, Hexavalent
Method: 7196A
Units: mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0500	0.0499	100	90-110
CCV1	0.0500	0.0491	98	90-110
CCV2	0.0500	0.0491	98	90-110

Approved By: _____

Karen Rya

Date: _____

5/17/11

CCV1A/120594

QA/QC Report

Client : Battelle
 Project Name : JPL GW Mon 2Q11
 Project Number : G486090
 Sample Matrix : WATER

Service Request : P1101793
 Date Collected : NA
 Date Received : NA
 Date Extracted : NA
 Date Analyzed : 05/12/11

Laboratory Control Sample Summary
 Inorganic Parameters

Sample Name : Laboratory Control Sample
 Lab Code : P1101793-LCS
 Test Notes :

Units : mg/L (ppm)
 Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0387	97	90-110	

Approved By Karu Rya Date : 5/17/11

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
 Project Name : JPL GW Mon 2Q11
 Project Number : G486090
 Sample Matrix : WATER

Service Request : P1101793
 Date Collected : 05/12/11
 Date Received : 05/12/11
 Date Extracted : NA
 Date Analyzed : 05/12/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-17-2 Units : mg/L (ppm)
 Lab Code : P1101793-004MS P1101793-004DMS Basis : NA
 Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0396	0.0396	79	79	73-119	<1	

Approved By *Kam Rya* Date : *5/17/11*

pH Run Log

Service Request #(s): P1101793

Time: 0725

Sample	VWR lot #	Exp.
pH 2 Buffer	524-11041002	1/2012
pH 4 Buffer	524-11041003	8/31/12
pH 7 Buffer	524-04271102A	3/2013
pH 10 Buffer	524-04261107	9/30/12

Slope	Prep.Run #
} 97.9%	—
	Run#
	—

pH in liquid: (1) 9040B, (2) 9040C pH in solid: (3) 9045C, (4) 9045D (Note method number in column labeled # below)

pH adjustment:(5) 7196A,(6) 7199 (Note method # in column labeled #)

Sample	#	pH	Temp. °C
pH 2.000	5	1.998	22.7°
pH 4.000		3.990	22.7°
pH 7.000		6.998	22.5
pH 10.000		9.998	22.9°
Ref#		6.361	22.9°
DI		2.062	20.8°
pH 2.000		1.999	22.4°
TIME: 1605			
pH 2.000	5	1.997	22.1°
1793-1.01		1.894	8.3°
-2.01		2.051	7.9°
-3.01		2.037	8.2°
-4.01		2.042	8.3°
-5.01		1.936	8.6°
-6.01		1.885	9.2°
pH 2.000		2.002	22.0°

Sample	#	pH	Temp. °C
<p><i>Space not used</i></p>			

pH Adjustments: 7196A: Diluted/Conc H₂SO₄ EMD 492824 EXP: 11/20/14
 7199A: Diluted NaOH _____ EXP: _____

Comments: _____

* Soil or Solid prep: 1:1(wt:vol) with DI water: ** Samples received past recommended hold time.

Date buffers and filling solution changed: 5/9/11

Note: ATC probe used; therefore, temperature correction calculation is not necessary.

Analyst: CS

Date: 5/12/11

Reviewer: KR

Date: 3/14/11

Service Request#(s): P1101713

Run#: 245928

Stock#: 524-02281103 T.V.=10PPM EXP: 2/28/12

Prep Run#: _____

CVICCV#: 524-10151001 T.V.=100PPM EXP: 3/20/12

Conc. H₂SO₄ Lot#: EMD 49284 EXP: 11/20/10

Coloring Reagent Ref#: 524-05051101 EXP: 6/5/11

Working Curve:

Prep Dilution	NA	0.05/50	0.25/50	0.5/50	Corr. Coeff.
Concentration mg/L	0.00	0.01	0.05	0.1	0.99999418
Absorbance @ 540 nm	0.000	0.012	0.058	0.116	

Sample #	Sample Vol.(mL)	Dilution	pH	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1	ICB	10ml	✓	0.000	0.000	0.000	-0.000153	10.003
2	ICV 0.05PPM		✓	0.000	0.058	0.058	0.0499	100%
3	MB		✓	0.000	0.001	0.001	0.000710	10.003
4	LCS 0.04PPM		✓	0.000	0.045	0.045	0.0387	97%
5	1793-1.01		✓	0.000	0.000	0.000	-0.000153	10.003
6	1.01US 0.03PPM		✓	0.000	0.030	0.030	0.0258	86%
7	2.01		✓	0.000	0.000	0.000	-0.000153	10.003
8	3.01		✓	0.004	0.004	0.000	-0.000153	
9	4.01		✓	0.000	0.001	0.001	0.000710	
10	4.01MS 0.05PPM		✓	0.000	0.046	0.046	0.0396	79% 7 L1%
11	4.01MSD		✓	0.000	0.046	0.046	0.0396	79% 5 RPD
12	5.01		✓	0.000	0.000	0.000	-0.000153	10.003
13	CV1 0.05PPM		✓	0.000	0.057	0.057	0.0491	98%
14	CV1		✓	0.000	0.000	0.000	-0.000153	10.003
15	1793-6.01		✓	0.000	0.000	0.000	-0.000153	10.003
16	CV2 0.05PPM		✓	0.000	0.057	0.057	0.0491	98%
17	CV2		✓	0.000	0.000	0.000	-0.000153	10.003

pH Requirement: Method 7196A (2 ± 0.5) = Samples filtered prior to pH adjustment

ICV/CCV spiked with 0.25 ml of 524-10151001 @ 10 ppm + 50 ml of pH adjusted DI WATER (T.V. = 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-02281103 + 10 ml of pH adjusted sample (T.V. = 0.05 ppm)

LCS spiked with 0.2 ml of _____ + 50 ml of pH adjusted DI Water (T.V. = 0.04 ppm)

Verification Standard Spiked 0.3 ml of _____ + 10 ml of sample (T.V. = 0.03 ppm)

Comments: _____

Prepared By: [Signature]

Date/Time: 5/12/11 @ 1630

Analyzed By: [Signature]

Date/Time: 5/12/11 @ 1635

Reviewed By: [Signature]

Date: 5/16/11

11/23/09 519-11230902 1000 PPM SO2 (ICV/COV)
Ja 0.1607g Na2SO3 (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/DI
EXP: 5/23/10

11/23/09 519-11230903 A, B, C, D PH REFERENCE
Ja PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 519-11240901 1000 PPM SO4 Standard
Ja PURCHASED CAT # ICC-006
LOT # K60794
EXP: 9/30/13

11/25/09 519-~~H/25~~ 11250901 0.1N H2SO4
Ja 50ml CONC H2SO4 (END 47050 EXP: 9/13/10)
EXP: ~~H/25~~ 9/13/10
see 11/25/09

11/30/09 519-11300901 Cr⁶⁺ Coloring Reagent
Ja 0.2500g Diphenylcarbohydrazide (END 47103EE; EXP:
1/30/13) ↑ 50ml w/ Acetone (END 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 519-11300902 25133 ppb Stock for O3 in Air
Ja 0.05ml Pyridine-4-Carboxaldehyde (Alfa Aesar Lot 10140598; EXP 8/11/12)
↑ 500ml deionized H2O
EXP: 12/14/09

11/30/09 519-11300903 25733 ppb ICV/COV FOR O3 in Air
Ja 0.05ml Pyridine-4-carboxaldehyde (TCI LOT# I01ENC; EXP: 8/10/12)
↑ 500ml w/DI H2O
EXP: 12/14/09

Reviewed And Approved By:
Initial: JA Date: 12/22/09

10/16/10 524-10061001 25133 ppb Stock for O3
 0.05 ml Pyridine-4-carboxaldehyde Alfa Aesar
 10146598 :Exp: 8/11/12 up to 500 ml w DI
 Water.

EXP: 10/20/10

10/16/10 524-10061002 25133, 26 ION/CON for O3
 0.05 ml Pyridine-4-carboxaldehyde TCI
 (IGTNE) :Exp: 8/10/12 up to 500 ml w DI
 Water.

EXP: 10/20/10

10/16/10 524-10061003 MBTH 50/17
 0.5000 g MBTH (Aldrich 54696EK :Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ EMD 44284; Exp 11/20/10

EXP: 10/7/10

10/15/10 524-10151001 Cr6+ ION/CON Stock
 Purchased Ricca Chemical Co 100PPM Cr6+
 500ml Plastic Cut No 2095-16
 LOT # 1010177
 EXP: 3/20/12

10/15/10 524-10151002 500PPM NO2 Stock
 Purchased Ricca Chemical Co
 LOT # 1010271
 EXP: 4/20/11
 Cut No: 5444.5-4
 120ml amber glass

10/28/10 S24-10781002 1000 PPM SO3 ION/CCV
GR

0.1607 Na2SO3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up
to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 S24-11011001 ION/CCV Cr⁶⁺ T.V = 0.579 PPM
GR 0.5 ml 519-04090904 (T.V = 115.8 mg/L; EXP: 12/20/10)
↑ 100 ml w/ DI
EXP: 11/15/10

11/1/10 S24-11011002 Cr⁶⁺ Coloring Reagent
GR 0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP:
11/30/13) ↑ 50 ml w/ Acetone (EMD 471542; EXP:
9/24/12)
EXP: 11/15/10

11/4/10 S24-11041001 A-SE PH Filling Soln
GR PURCHASED (3M KCl)
Thermo Scientific P/N 702613-AD2
LOT Code: OR1
EXP: 11/4/11

11/4/10 S24-11041002 PH 2.000 Buffer
GR purchased
BDH CAT NO: 5010-500 ml
LOT # 1002199
EXP: 11/20/12

11/4/10 524-11041003 pH 4.00 Buffer
 Purchased
 JT Baker Cat No: 5657-01 500 ml
 Lot # J30507
 Exp: 8/31/12

11/4/10 524-11041004 pH 7.00 Buffer
 Purchased
 J.T. Baker Cat No: 5656-01 500 ml
 Lot # J35515
 Exp: 9/30/12

11/5/10 524-11051001 MBTH Soln
 0.5000 g MBTH (Aldrich 5216106K; Exp: 8/7/14) up
 to 100 ml w/ DI Water. Plus 0.5 ml Conc. H₂SO₄ (EMD 49884; Exp: 11/22/14)
 Exp: 11/6/10

4/8/10 524-11081001 1000 PPM NH₃
 0.3141g NH₄Cl (EMD 49198931; Exp: 10/19/14) 100 ml
 w/ 524-10271006 Exp: 10/22/11
 Exp: 10/22/11

11/12/10 524-11121001 1000 PPM SO₃ Stock
 0.1591 Na₂SO₃ (JT Baker Lot #H110627; Exp: 8/31/14) up to
 100 ml w/ DI Water.
 Exp: 11/26/10

54

2/21/10
JW
524-0221101 1:1 H₂SO₄
250ml H₂SO₄ (EMD 49284; EXP: 11/20/14)
ADDED SLOWLY TO 250ml DI. COOL
COMPLETELY
EXP: 2/21/12

2/21/11
JW
524-0221102 Cr6+ Coloring Reagent
0.2500g 4,5-dimethylcarbohydrazide (EMD LOT 4710372)
EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD
LOT # 471540; EXP: 9/24/12)
EXP: 3/21/11

2/28/11
JW
524-0228101 0.1 H₂SO₄
5.6 ml conc H₂SO₄ (EMD 49284 EXP: 11/20/14) ↑ 2L
w/ DI H₂O
EXP: 2/28/12

2/28/11
JW
524-0228103 1001 mg/L Cr6+
Purchased
Inorganic Ventures CGCR(6)1-1
125 mL Clear Glass
LOT# D2-CR03040
EXP: 3/1/2012

2/28/11
JL

524-02281103 10ppm Cr6+ Sol'n
1.0ml 524-02281102 (100ppm Cr6+; EXP: 3/1/12) ↑
100ml w/ DI H2O
EXP: 2/28/12

3/7/11
JL

524-03071101 Cr6+ Colony Reagent
0.2500g 1,5-Diphenylcarbazide
(EMD Lot 47103721, EXP: 1/30/12) ↑ 50ml w/
Acetone (EMD 47154, EXP: 9/24/12).
EXP: 4/7/11

3/7/11
JL

524-03071102 500ppm NO2
Purchased
Ricca Chem Co Cat No 5444.5-4
Lot # 1162544
EXP: 8/20/11

3/17/11
JL

524-03271101 Alkaline Digestion Sol'n
20.0g NaOH (EMD 47022713B; EXP: 10/11/12) + 30.0g
Na2CO3 (EMD 46321715B; EXP: 10/11/12) ↑ 1L
w/ DI H2O.
EXP: 4/17/11

Reviewed And Approved By:
Initial: JL Date: 3/18/11

4/14/11
JL

524-04141101 ICC2 Eluent
75ml 524-04291002 (100 Conc Eluent, exp 4/29/11)
↑ 750ml w/ DI H2O. DEGAS
EXP: 4/28/11

524-04261102 pH 10.000 Buffer
4/26/11
SN Purchased
JT Baker Cat No: 5655-01 (500ml)
LOT # J33524
EXP: 9/30/12

524-04261103 NH3 FILLING SOLN
4/26/11
SN Purchased
Thermo Orion Orion 951202 (60ml)
LOT # OX1 P/N: 70243-A04
EXP: 4/26/12

524-042611034 1:1 H2SO4
4/26/11
SN 250ml conc H2SO4 (LMD 49284, EXP: 11/20/14)
ADDED SLOWLY TO 250ml DI H2O
LET COOL
EXP: 4/26/12

524-04271101 Ammono Sulfuric Soln
4/27/11
SN 6.25ml conc H2SO4 (LMD 49284; EXP: 11/20/14) added to
2.5ml DI H2O. Let Cool.
DISSOLVE 1.6875g N,N-dimethyl-p-phenylenediamine
oxalate (Fluka 136338613408204; EXP: 8/7/14)
in cooled sulfuric soln and dilute to 250ml w/
1:1 H2SO4 (524-04261104; EXP: 4/26/12)
EXP: 5/25/11

4/27/11
 Sr 524-04271102 A/B pH 7.000 Buffer
 Purchased
 BDH Cat No: BDH5046-500 mL
 Lot # 1103379
 Exp: 3/30/13

4/28/11
 Sr 524-04281101 0.1N H2SO4
 5.6 ml conc H2SO4 (EMD 49284; exp: 11/20/14)
 ↑ 2L w/ DI H2O
 Exp: 4/28/12

5/4/11
 Sr 524-05041101 Alkaline Digestion Soln
 20.0g NaOH (EMD 47022713; exp: 10/11/12) +
 30.0g Na2CO3 (EMD 46321715B; exp: 10/11/12)
 ↑ 1L w/ DI H2O
 Exp: 06/04/11

5/6/11
 Sr 524-05051101 Criot Coloring reagent
 0.2500g 1,5-Diphenylcarbohydrazide (JT Baker J05641;
 exp: 06/15/15) ↑ 50ml w/ Acetone (EMD 47154D;
 exp: 9/24/12).
 Exp: 06/05/11

6/5/11
 Sr 524-05051103 ICO2 Eluent
 100 ml 524-04191101 (10x conc eluent; exp: 9/22/11)
 ↑ 1L w/ DI H2O - De-gassed
 Exp: 5/19/11

June 6, 2011

Analytical Report for Service Request No: P1101793

Sue Anderson
Columbia Analytical Services
2655 Park Center Drive
Suite A
Simi Valley, CA 93065-6209

RE: JPL GW Mon 2Q11/G486090


Dear Sue:

Enclosed are the results of the samples submitted to our laboratory on May 12, 2011. For your reference, these analyses have been assigned our service request number P1101793.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3364. You may also contact me via Email at HHolmes@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.
Howard Holmes
Project Chemist

HH/jw

Page 1 of 269

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Agency	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DEQ	WA100010
South Carolina DHEC	61002
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-



Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Water

Service Request No.: P1101793
Date Received: 5/12/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

One water sample was received for analysis at Columbia Analytical Services on 5/12/11. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

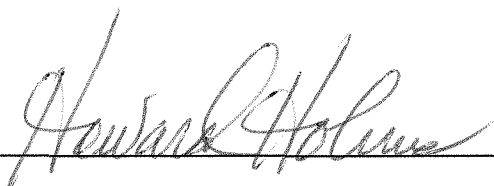
Nitosamines by 521

No anomalies associated with the analysis of these samples were observed.

1,4-Dioxane by EPA Method 8270C SIM

No anomalies associated with the analysis of these samples were observed.

Approved by



Date

6-7-11

Chain of Custody

Project Name: JPL GW Mon 2Q11
 Project Number: G486090
 Project Manager: David Conner
 Company: Battelle

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample			Send To
				Date	Time	Date Received	
P1101793-002	MW-17-4	3	Water	5/12/11	0912	5/12/11	KEISO
							14_DIOXANE 8270C SIM
							Nitrosamines 521

Test Comments
 Nitrosamines - 521 P1101793-002 NDMA

Special Instructions/Comments	Turnaround Requirements <input type="checkbox"/> RUSH (Surcharges Apply) PLEASE CIRCLE WORK DAYS 1 2 3 4 5 <input checked="" type="checkbox"/> STANDARD	Report Requirements <input type="checkbox"/> I. Results Only <input type="checkbox"/> II. Results + QC Summaries <input type="checkbox"/> III. Results + QC and Calibration Summaries <input checked="" type="checkbox"/> IV. Data Validation Report with Raw Data	Invoice Information PO# P1101793
	Requested FAX Date: _____ Requested Report Date: 05/30/11	PQL/MDL/1 EDD Y Y	Bill to

Relinquished By:  05/12/11 Received By:  Arbitr Number: 0900

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC HH

Client / Project: CAS - Simi Valley Service Request KH P1101793
 Received: 5/14/11 Opened: 5/14/11 By: JA Unloaded: 5/14/11 By: JA

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered
 2. Samples were received in: (circle) Cooler Box Envelope Other NA
 3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	NA	Tracking Number	NA	Filed
<u>5.6</u>		<u>257</u>			<u>1Z 789 05X 444011 0700</u>		

7. Packing material used. Inserts Baggies Bubble Wrap Gel Packs Wet Ice Sleeves Other _____
 8. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
 9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N
 10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
 11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
 12. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
 13. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
 14. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
 15. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Out of	Head-	Broke	pH	Reagent	Volume	Reagent Lot	Initials	Time
	Bottle Type	Temp	space				added	Number		

Notes, Discrepancies, & Resolutions: _____

Nitrosamines

Organic Analysis:
Nitrosamines by EPA 521

Summary Package

Sample and QC Results

Client: Battelle
 Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793

Cover Page - Organic Analysis Data Package
 Nitrosamines by EPA 521

Sample Name	Lab Code	Date Collected	Date Received
MW-17-4MS	KWG1104527-1	05/12/2011	05/12/2011
MW-17-4DMS	KWG1104527-2	05/12/2011	05/12/2011
MW-17-4	P1101793-002	05/12/2011	05/12/2011

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Loren E. Putman

Name: Loren Putman

Date: 6/6/11

Title: scientist

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101793
Date Collected: 05/12/2011
Date Received: 05/12/2011

Nitrosamines by EPA 521

Sample Name: MW-17-4
Lab Code: P1101793-002
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND U	2.0	0.32	1	05/19/11	05/19/11	KWG1104527	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	86	70-130	05/19/11	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Drinking water

Service Request: P1101793
Date Collected: NA
Date Received: NA

Nitrosamines by EPA 521

Sample Name: Method Blank
Lab Code: KWG1104527-4
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND U	2.0	0.32	1	05/19/11	05/19/11	KWG1104527	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	87	70-130	05/19/11	Acceptable

Comments: _____

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101793

**Surrogate Recovery Summary
 Nitrosamines by EPA 521**

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
MW-17-4	P1101793-002	86
Method Blank	KWG1104527-4	87
MW-17-4MS	KWG1104527-1	85
MW-17-4DMS	KWG1104527-2	101
Lab Control Sample	KWG1104527-3	81

Surrogate Recovery Control Limits (%)

Sur1 = N-Nitrosodimethylamine-d6 70-130

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
 Project: JPL GW Mon 2Q11/G486090
 Sample Matrix: Water

Service Request: P1101793
 Date Extracted: 05/19/2011
 Date Analyzed: 05/19/2011 - 05/26/2011

Matrix Spike/Duplicate Matrix Spike Summary
 Nitrosamines by EPA 521

Sample Name: MW-17-4
 Lab Code: P1101793-002
 Extraction Method: METHOD
 Analysis Method: 521

Units: ng/L
 Basis: NA
 Level: Low
 Extraction Lot: KWG1104527

Analyte Name	Sample Result	MW-17-4MS KWG1104527-1 Matrix Spike			MW-17-4DMS KWG1104527-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
N-Nitrosodimethylamine	ND	17.6	20.0	88	17.3	20.0	87	50-150	1	50

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Drinking water

Service Request: P1101793
Date Extracted: 05/19/2011
Date Analyzed: 05/26/2011

**Lab Control Spike Summary
 Nitrosamines by EPA 521**

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low
Extraction Lot: KWG1104527

Analyte Name	Lab Control Sample KWG1104527-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
N-Nitrosodimethylamine	2.20	2.00	110	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Drinking water

Service Request: P1101793
Date Extracted: 05/19/2011
Date Analyzed: 05/19/2011
Time Analyzed: 19:10

**Method Blank Summary
 Nitrosamines by EPA 521**

Sample Name: Method Blank
Lab Code: KWG1104527-4
Extraction Method: METHOD
Analysis Method: 521

File ID: J:\MS16\DATA\051911-521\0519007.D
Instrument ID: MS16
Level: Low
Extraction Lot: KWG1104527

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
MW-17-4	P1101793-002	J:\MS16\DATA\051911-521\0519009.D	05/19/11	20:28
MW-17-4MS	KWG1104527-1	J:\MS16\DATA\051911-521\0519010.D	05/19/11	21:07
Lab Control Sample	KWG1104527-3	J:\MS16\DATA\052611-521\0526006.D	05/26/11	15:40
MW-17-4DMS	KWG1104527-2	J:\MS16\DATA\052611-521\0526013.D	05/26/11	20:13

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Drinking water

Service Request: P1101793
Date Extracted: 05/19/2011
Date Analyzed: 05/26/2011
Time Analyzed: 15:40

**Lab Control Sample Summary
 Nitrosamines by EPA 521**

Sample Name: Lab Control Sample **File ID:** J:\MS16\DATA\052611-521\0526006.D
Lab Code: KWG1104527-3 **Instrument ID:** MS16
Extraction Method: METHOD **Level:** Low
Analysis Method: 521 **Extraction Lot:** KWG1104527

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1104527-4	J:\MS16\DATA\051911-521\0519007.D	05/19/11	19:10
MW-17-4	P1101793-002	J:\MS16\DATA\051911-521\0519009.D	05/19/11	20:28
MW-17-4MS	KWG1104527-1	J:\MS16\DATA\051911-521\0519010.D	05/19/11	21:07
MW-17-4DMS	KWG1104527-2	J:\MS16\DATA\052611-521\0526013.D	05/26/11	20:13

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793
Calibration Date: 05/12/2011

Initial Calibration Summary
Nitrosamines by EPA 521

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS16\DATA\051211-521\0512015.D	E	J:\MS16\DATA\051211-521\0512019.D
B	J:\MS16\DATA\051211-521\0512016.D	F	J:\MS16\DATA\051211-521\0512020.D
C	J:\MS16\DATA\051211-521\0512017.D		
D	J:\MS16\DATA\051211-521\0512018.D		

Analyte Name	Level			Level			Level			Level			Level		
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF
N-Nitrosodimethylamine-d6	A	1.0	3.06	B	2.0	3.45	C	5.0	4.25	D	10	4.54	E	20	5.21
	F	50	7.35												
N-Nitrosodimethylamine	A	1.0	1.11	B	2.0	1.01	C	5.0	1.35	D	10	1.24	E	20	1.38
	F	50	2.25												

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793
Calibration Date: 05/12/2011

**Initial Calibration Summary
 Nitrosamines by EPA 521**

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

Analyte Name	Compound Type	Calibration Evaluation					RRF Evaluation		
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
N-Nitrosodimethylamine-d6	SURR	Quadratic	COD	1.000		≥ 0.99	4.64		
N-Nitrosodimethylamine	MS	Quadratic	COD	0.999		≥ 0.99	1.39		

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793
Calibration Date: 05/12/2011
Date Analyzed: 05/12/2011

**Second Source Calibration Verification
 Nitrosamines by EPA 521**

Calibration Type: Internal Standard
Analysis Method: 521

Calibration ID: CAL10502
Units: ug/L

File ID: J:\MS16\DATA\051211-521\0512021.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine	10	7.6	1.39	0.877	NA	-24	± 30 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793
Calibration Date: 05/24/2011

**Initial Calibration Summary
 Nitrosamines by EPA 521**

Calibration ID: CAL10543
Instrument ID: MS16

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS16\DATA\052411-521\0524003.D	E	J:\MS16\DATA\052411-521\0524007.D
B	J:\MS16\DATA\052411-521\0524004.D	F	J:\MS16\DATA\052411-521\0524008.D
C	J:\MS16\DATA\052411-521\0524005.D		
D	J:\MS16\DATA\052411-521\0524006.D		

Analyte Name	Level			Level			Level			Level			Level		
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF
N-Nitrosodimethylamine-d6	A	1.0	3.37	B	2.0	3.58	C	5.0	4.05	D	10	4.75	E	20	4.93
	F	50	5.06												
N-Nitrosodimethylamine	A	1.0	2.11	B	2.0	1.47	C	5.0	1.73	D	10	2.06	E	20	2.09
	F	50	2.01												

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793
Calibration Date: 05/24/2011

Initial Calibration Summary
Nitrosamines by EPA 521

Calibration ID: CAL10543
Instrument ID: MS16

Column: MS

Analyte Name	Compound Type	Calibration Evaluation					RRF Evaluation		
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
N-Nitrosodimethylamine-d6	SURR	Quadratic	COD	1.000		≥ 0.99	4.29		
N-Nitrosodimethylamine	MS	Quadratic	COD	0.999		≥ 0.99	1.91		

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793
Calibration Date: 05/24/2011
Date Analyzed: 05/24/2011

Second Source Calibration Verification
Nitrosamines by EPA 521

Calibration Type: Internal Standard
Analysis Method: 521

Calibration ID: CAL10543
Units: ug/L

File ID: J:\MS16\DATA\052411-521\0524009.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine	10	7.4	1.91	1.48	NA	-26	± 30 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793
Date Analyzed: 05/19/2011

**Continuing Calibration Verification Summary
 Nitrosamines by EPA 521**

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/12/2011
Calibration ID: CAL10502
Analysis Lot: KWG1104805
Units: ug/L

File ID: J:\MS16\DATA\051911-521\0519006.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	10	8.5		4.64	3.75	NA	-15	± 50 %	Quadratic
N-Nitrosodimethylamine	10	12		1.39	1.48	NA	18	± 50 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793
Date Analyzed: 05/19/2011

**Continuing Calibration Verification Summary
 Nitrosamines by EPA 521**

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/12/2011
Calibration ID: CAL10502
Analysis Lot: KWG1104805
Units: ug/L

File ID: J:\MS16\DATA\051911-521\0519013.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	10	11		4.64	4.83	NA	6	± 50 %	Quadratic
N-Nitrosodimethylamine	10	9.3		1.39	1.12	NA	-7	± 50 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793
Date Analyzed: 05/26/2011

**Continuing Calibration Verification Summary
 Nitrosamines by EPA 521**

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/24/2011
Calibration ID: CAL10543
Analysis Lot: KWG1104806
Units: ug/L

File ID: J:\MS16\DATA\052611-521\0526005.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	10	9.7		4.29	4.58	NA	-3	± 50 %	Quadratic
N-Nitrosodimethylamine	10	8.4		1.91	1.67	NA	-16	± 50 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793
Date Analyzed: 05/26/2011

**Continuing Calibration Verification Summary
 Nitrosamines by EPA 521**

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/24/2011
Calibration ID: CAL10543
Analysis Lot: KWG1104806
Units: ug/L

File ID: J:\MS16\DATA\052611-521\0526007.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	10	9.5		4.29	4.48	NA	-5	± 50 %	Quadratic
N-Nitrosodimethylamine	10	9.3		1.91	1.86	NA	-7	± 50 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793
Date Analyzed: 05/27/2011

**Continuing Calibration Verification Summary
 Nitrosamines by EPA 521**

Calibration Type: Internal Standard
Analysis Method: 521

Calibration Date: 05/24/2011
Calibration ID: CAL10543
Analysis Lot: KWG1104806
Units: ug/L

File ID: J:\MS16\DATA\052611-521\0526020.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
N-Nitrosodimethylamine-d6	10	9.9		4.29	4.69	NA	-1	± 50 %	Quadratic
N-Nitrosodimethylamine	10	7.6		1.91	1.52	NA	-24	± 50 %	Quadratic

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793

Analysis Run Log
Nitrosamines by EPA 521

Analysis Method: 521

Analysis Lot: KWG1104805
Instrument ID: MS16

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
\0519004.D	GC/MS Tuning - Decafluorotriphenylp	KWG1104805-1	5/19/2011	17:14		5/19/2011	17:43
\0519006.D	Continuing Calibration Verification	KWG1104805-2	5/19/2011	18:32		5/19/2011	19:01
\0519007.D	Method Blank	KWG1104527-4	5/19/2011	19:10		5/19/2011	19:39
\0519009.D	MW-17-4	P1101793-002	5/19/2011	20:28		5/19/2011	20:57
\0519010.D	MW-17-4MS	KWG1104527-1	5/19/2011	21:07		5/19/2011	21:36
\0519011.D	ZZZZZ	ZZZZZ	5/19/2011	21:47		5/19/2011	22:16
\0519013.D	Continuing Calibration Verification	KWG1104805-3	5/19/2011	23:05		5/19/2011	23:34

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090

Service Request: P1101793

**Analysis Run Log
 Nitrosamines by EPA 521**

Analysis Method: 521

Analysis Lot: KWG1104806
Instrument ID: MS16

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
\0526003.D	GC/MS Tuning - Decafluorotriphenylp	KWG1104806-1	5/26/2011	13:42		5/26/2011	14:11
\0526005.D	Continuing Calibration Verification	KWG1104806-2	5/26/2011	15:01		5/26/2011	15:30
\0526006.D	Lab Control Sample	KWG1104527-3	5/26/2011	15:40		5/26/2011	16:09
\0526007.D	Continuing Calibration Verification	KWG1104806-3	5/26/2011	16:19		5/26/2011	16:48
\0526013.D	MW-17-4DMS	KWG1104527-2	5/26/2011	20:13		5/26/2011	20:42
\0526014.D	ZZZZZZ	ZZZZZZ	5/26/2011	20:52		5/26/2011	21:21
\0526018.D	ZZZZZZ	ZZZZZZ	5/26/2011	23:29		5/26/2011	23:58
\0526019.D	ZZZZZZ	ZZZZZZ	5/27/2011	00:08		5/27/2011	00:37
\0526020.D	Continuing Calibration Verification	KWG1104806-4	5/27/2011	00:47		5/27/2011	01:16

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101793
Date Extracted: 05/19/2011

**Extraction Prep Log
 Nitrosamines by EPA 521**

Extraction Method: METHOD
Analysis Method: 521

Extraction Lot: KWG1104527
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
MW-17-4	P1101793-002	05/12/11	05/12/11	500ml	1ml	NA	
Method Blank	KWG1104527-4	NA	NA	500ml	1ml	NA	
MW-17-4MS	KWG1104527-1	05/12/11	05/12/11	500ml	1ml	NA	
MW-17-4DMS	KWG1104527-2	05/12/11	05/12/11	500ml	1ml	NA	
Lab Control Sample	KWG1104527-3	NA	NA	500ml	1ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Organic Analysis:
Nitrosamines by EPA 521

Validation Package

Organic Analysis:
Nitrosamines by EPA 521

Validation Package

QC Reports

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101793

**Surrogate Recovery Summary
 Nitrosamines by EPA 521**

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
MW-17-4	P1101793-002	86
Method Blank	KWG1104527-4	87
MW-17-4MS	KWG1104527-1	85
MW-17-4DMS	KWG1104527-2	101
Lab Control Sample	KWG1104527-3	81

Surrogate Recovery Control Limits (%)

Sur1 = N-Nitrosodimethylamine-d6 70-130

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101793
Date Extracted: 05/19/2011
Date Analyzed: 05/19/2011 - 05/26/2011

Matrix Spike/Duplicate Matrix Spike Summary
Nitrosamines by EPA 521

Sample Name: MW-17-4
Lab Code: P1101793-002
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low
Extraction Lot: KWG1104527

Analyte Name	Sample Result	MW-17-4MS KWG1104527-1 Matrix Spike			MW-17-4DMS KWG1104527-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
N-Nitrosodimethylamine	ND	17.6	20.0	88	17.3	20.0	87	50-150	1	50

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Drinking water

Service Request: P1101793
Date Extracted: 05/19/2011
Date Analyzed: 05/26/2011

Lab Control Spike Summary
Nitrosamines by EPA 521

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low
Extraction Lot: KWG1104527

Lab Control Sample
 KWG1104527-3
 Lab Control Spike

Analyte Name	Result	Expected	%Rec	%Rec Limits
N-Nitrosodimethylamine	2.20	2.00	110	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Drinking water

Service Request: P1101793
Date Extracted: 05/19/2011
Date Analyzed: 05/19/2011
Time Analyzed: 19:10

**Method Blank Summary
 Nitrosamines by EPA 521**

Sample Name: Method Blank
Lab Code: KWG1104527-4
Extraction Method: METHOD
Analysis Method: 521

File ID: J:\MS16\DATA\051911-521\0519007.D
Instrument ID: MS16
Level: Low
Extraction Lot: KWG1104527

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
MW-17-4	P1101793-002	J:\MS16\DATA\051911-521\0519009.D	05/19/11	20:28
MW-17-4MS	KWG1104527-1	J:\MS16\DATA\051911-521\0519010.D	05/19/11	21:07
Lab Control Sample	KWG1104527-3	J:\MS16\DATA\052611-521\0526006.D	05/26/11	15:40
MW-17-4DMS	KWG1104527-2	J:\MS16\DATA\052611-521\0526013.D	05/26/11	20:13

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Drinking water

Service Request: P1101793
Date Extracted: 05/19/2011
Date Analyzed: 05/26/2011
Time Analyzed: 15:40

Lab Control Sample Summary
Nitrosamines by EPA 521

Sample Name: Lab Control Sample
Lab Code: KWG1104527-3
Extraction Method: METHOD
Analysis Method: 521

File ID: J:\MS16\DATA\052611-521\0526006.D
Instrument ID: MS16
Level: Low
Extraction Lot: KWG1104527

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1104527-4	J:\MS16\DATA\051911-521\0519007.D	05/19/11	19:10
MW-17-4	P1101793-002	J:\MS16\DATA\051911-521\0519009.D	05/19/11	20:28
MW-17-4MS	KWG1104527-1	J:\MS16\DATA\051911-521\0519010.D	05/19/11	21:07
MW-17-4DMS	KWG1104527-2	J:\MS16\DATA\052611-521\0526013.D	05/26/11	20:13

Organic Analysis:
Nitrosamines by EPA 521

Validation Package

Raw Data

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101793
Date Collected: 05/12/2011
Date Received: 05/12/2011

Nitrosamines by EPA 521

Sample Name: MW-17-4
Lab Code: P1101793-002
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND U	2.0	0.32	1	05/19/11	05/19/11	KWG1104527	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	86	70-130	05/19/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\051911-521\0519009.D
Lab ID: P1101793-002
RunType: SMPL
Matrix: WATER

Date Acquired: 05/19/2011 20:28
Date Quantitated: 05/26/2011 18:17
Batch ID: KWG1104805
Analysis Method: 521
ListJoinID: LJ11420

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
Preparation Holding Time	NA	NA	NA	x	
Pre-Preparation Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Method Blank	NA	NA	NA	x	
MB Surrogate Recovery	NA	NA	NA	x	
Lab Control Spike	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: W. S. Miller

Secondary Review: [Signature]

Quantitation Report

Bottle ID:		Tier:	IV	Matrix:	WATER
Prod Code:	521 Nitrosamine	Collect Date:	05/12/2011	Receive Date:	05/12/2011

Analysis Lot:	KWG1104805	Prep Lot:	KWG1104527	Report Group:	P1101793
Analysis Method:	521	Prep Method:	METHOD		
Prep Ref:	1020202	Prep Date:	05/19/2011		

Quant Method:	J:\MS16\METHODS\051211_D14.M	Calibration ID:	CAL10502
Title:	Nitrosamines by EPA 521	Report List ID:	LJ11420
Tune Ref:	J:\MS16\DATA\051911-521\0519004.D	Method ID:	MJ808
MB Ref:	J:\MS16\DATA\051911-521\0519007.D	Quant based on Report List	

Data File:	J:\MS16\DATA\051911-521\0519009.D	Instrument:	MS16
Acqu Date:	05/19/2011 20:28	Quant Date:	05/26/2011 18:17
Run Type:	SMPL	Vial:	5
Lab ID:	P1101793-002	Dilution:	1.0
		Soln Conc. Units:	ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.10	-0.01	97	29601	50.00	OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.42	0.00	0.00	50	22334	8.58	86	70-130	OK

Target Compounds

							Final Conc. Units: ng/L			
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine				47	0		0.32	U	

Prep Amount: 500 ml Dilution: 1.0
 Prep Final Vol: 1 ml Unit Factor: 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 F: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS16\DATA\051911-521\0519009.D
 Acq On : 19 May 11 20:28
 Sample : K1101793-002
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 26 18:16:16 2011

Vial: 5
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL 10500
 Last Update : Thu May 26 18:14:22 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

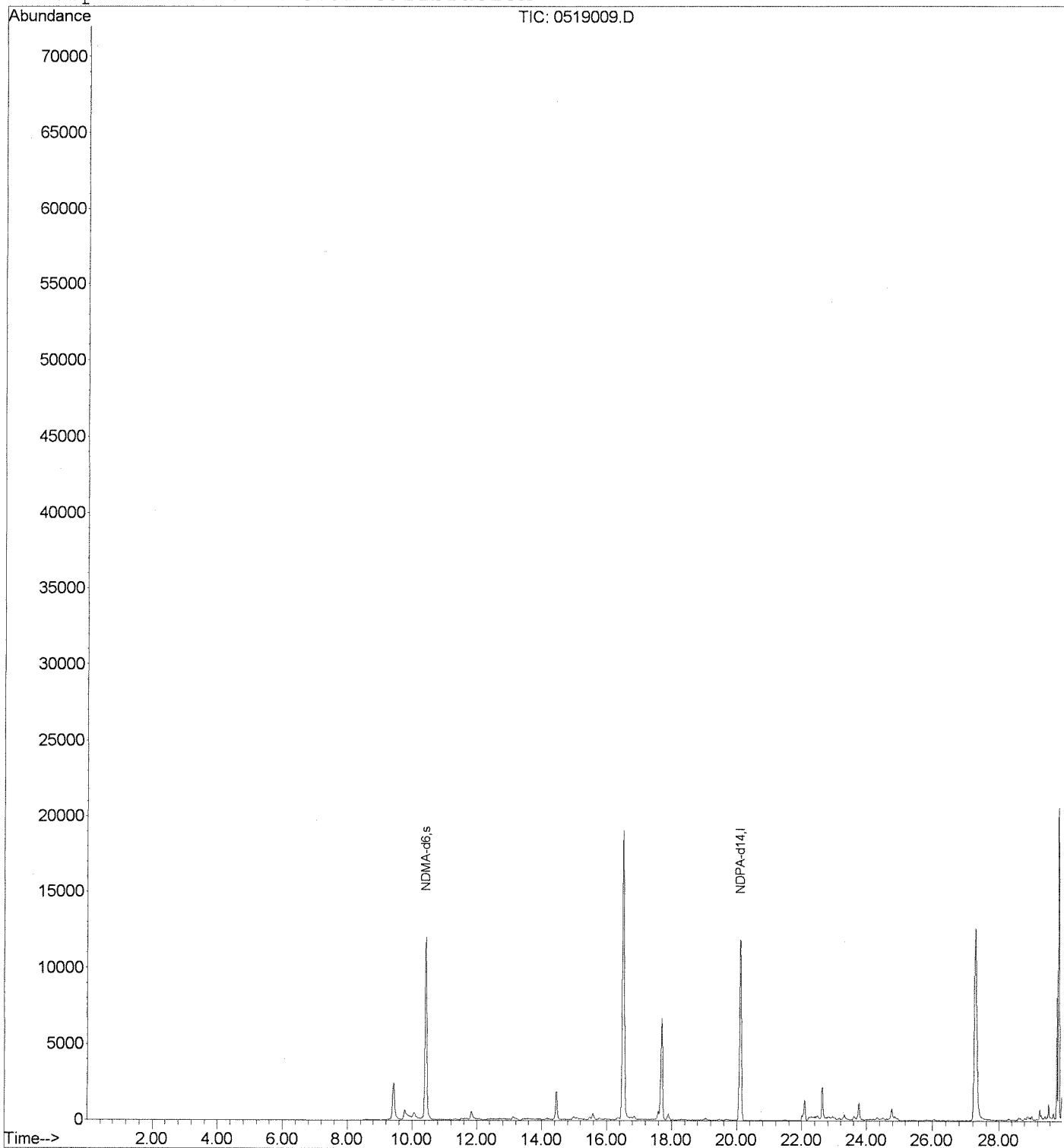
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.10	97	29601	50.00	ug/L	-0.01
System Monitoring Compounds						
3) NDMA-d6	10.42	50	22334	8.58	ug/L	-0.02
Target Compounds						Qvalue

Data File : J:\MS16\DATA\051911-521\0519009.D
Acq On : 19 May 11 20:28
Sample : K1101793-002
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 26 18:17 2011

Vial: 5
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL 10500
Last Update : Thu May 26 18:14:22 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Drinking water

Service Request: P1101793
Date Collected: NA
Date Received: NA

Nitrosamines by EPA 521

Sample Name: Method Blank
Lab Code: KWG1104527-4
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND U	2.0	0.32	1	05/19/11	05/19/11	KWG1104527	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	87	70-130	05/19/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\051911-521\0519007.D
Lab ID: KWG1104527-4
RunType: MB
Matrix: DRINKING WATER

Date Acquired: 05/19/2011 19:10
Date Quantitated: 05/26/2011 18:16
Batch ID: KWG1104805
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: 

Secondary Review: 

Quantitation Report

Bottle ID:	Tier:	Matrix:	DRINKING WATE
Prod Code: 521 Nitrosamine	Collect Date:	Receive Date:	05/19/2011

Analysis Lot: KWG1104805	Prep Lot: KWG1104527	Report Group:
Analysis Method: 521	Prep Method: METHOD	
Prep Ref: 1020206	Prep Date: 05/19/2011	

Quant Method: J:\MS16\METHODS\051211_D14.M	Calibration ID: CAL10502
Title:	
Tune Ref: J:\MS16\DATA\051911-521\0519004.D	Method ID: MJ808
MB Ref:	Quant based on Method

Data File: J:\MS16\DATA\051911-521\0519007.D	Instrument: MS16
Acqu Date: 05/19/2011 19:10	Quant Date: 05/26/2011 18:16
Run Type: MB	Vial: 3
Lab ID: KWG1104527-4	Dilution: 1.0
	Soln Conc. Units: ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.12	0.01	97	31333	50.00	OK ✓
1	N-Nitrosodiethylamine-d10			81	0d		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.43	0.01	0.00	50	23878	8.66	87	70-130	OK ✓

Target Compounds

								Final Conc. Units: ng/L		
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine				47	0		0.32	U	
1	N-Nitrosomethylethylamine				61	0		0.50	U	
1	N-Nitrosodiethylamine				75	0		0.76	U	
1	N-Nitrosodi-n-propylamine				89	0		0.76	U	
1	N-Nitrosopyrrolidine				55	0d		0.61	U	
1	N-Nitrosopiperidine				69	0d		0.55	U	
1	N-Nitrosodi-n-butylamine				57	0		0.77	U	

Prep Amount: 500 ml **Dilution:** 1.0
Prep Final Vol: 1 ml **Unit Factor:** 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Data File : J:\MS16\DATA\051911-521\0519007.D
 Acq On : 19 May 11 19:10
 Sample : 051911-MB
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 26 18:16:15 2011

Vial: 3
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL 10500
 Last Update : Thu May 26 18:14:22 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

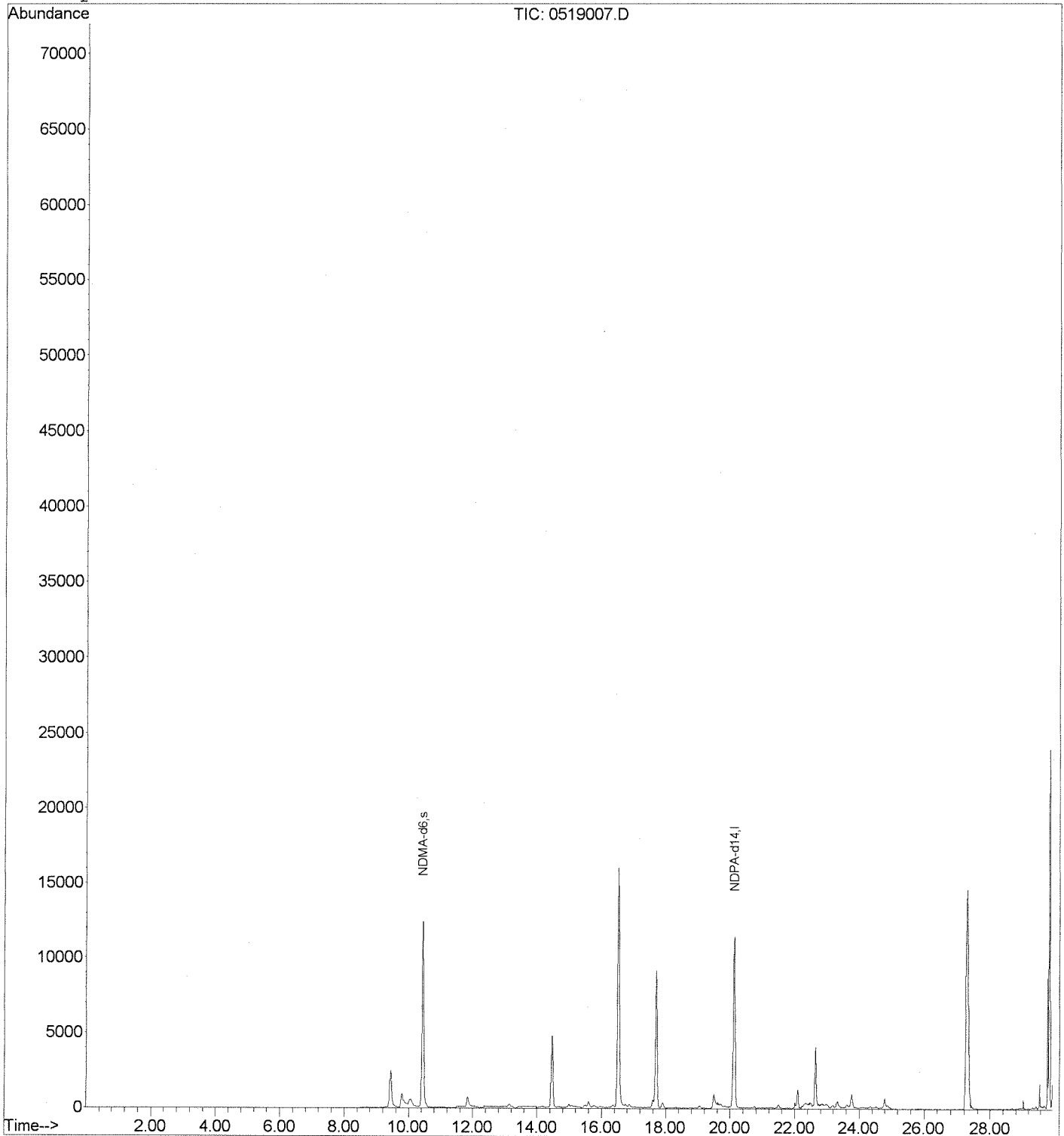
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.12	97	31333	50.00	ug/L	0.00
System Monitoring Compounds						
3) NDMA-d6	10.43	50	23878	8.66	ug/L	0.00
Target Compounds						Qvalue

Data File : J:\MS16\DATA\051911-521\0519007.D
Acq On : 19 May 11 19:10
Sample : 051911-MB
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 26 18:16 2011

Vial: 3
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL_10500
Last Update : Thu May 26 18:14:22 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101793
Date Collected: 05/12/2011
Date Received: 05/12/2011

Nitrosamines by EPA 521

Sample Name: MW-17-4MS
Lab Code: KWG1104527-1
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	17.6		2.0	0.32	1	05/19/11	05/19/11	KWG1104527	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	85	70-130	05/19/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\051911-521\0519010.D
Lab ID: KWG1104527-1 -- P1101793-002MS
RunType: MS
Matrix: WATER

Date Acquired: 05/19/2011 21:07
Date Quantitated: 05/26/2011 18:16
Batch ID: KWG1104805
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: W. Stealy
 Secondary Review: W

Quantitation Report

Bottle ID:		Tier:		Matrix:	WATER
Prod Code:	521 Nitrosamine	Collect Date:		Receive Date:	05/19/2011

Analysis Lot:	KWG1104805	Prep Lot:	KWG1104527	Report Group:	
Analysis Method:	521	Prep Method:	METHOD		
Prep Ref:	1020203	Prep Date:	05/19/2011		

Quant Method:	J:\MS16\METHODS\051211_D14.M	Calibration ID:	CAL10502
Title:		Method ID:	MJ808
Tune Ref:	J:\MS16\DATA\051911-521\0519004.D	Quant based on Method	
MB Ref:	J:\MS16\DATA\051911-521\0519007.D		

Data File:	J:\MS16\DATA\051911-521\0519010.D	Instrument:	MS16
Acqu Date:	05/19/2011 21:07	Quant Date:	05/26/2011 18:16
Run Type:	MS	Vial:	6
Lab ID:	KWG1104527-1 -- P1101793-002MS	Dilution:	1.0
		Soln Conc. Units:	ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.11	0.00	97	28863	50.00	OK
1	N-Nitrosodiethylamine-d10			81	0		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.43	0.01	0.00	50	21423	8.46	85	70-130	OK

Target Compounds

Final Conc. Units: ng/L										
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine	10.55	0.01	0.00	47	6013	8.78	17.6		
1	N-Nitrosomethylethylamine	13.12		0.00	61	44232	8.25	16.5		
1	N-Nitrosodiethylamine	15.23	-0.01	0.00	75	6284	9.01	18.0		
1	N-Nitrosodi-n-propylamine	20.40		0.00	89	5908	7.88	15.8		
1	N-Nitrosopyrrolidine	22.75	-0.01	0.00	55	39838	7.73	15.5		
1	N-Nitrosopiperidine	23.66	-0.01	0.00	69	73070	8.11	16.2		
1	N-Nitrosodi-n-butylamine	25.84		0.00	57	22397	7.13	14.3		

Prep Amount: 500 ml **Dilution:** 1.0
Prep Final Vol: 1 ml **Unit Factor:** 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS16\DATA\051911-521\0519010.D
 Acq On : 19 May 11 21:07
 Sample : K1101793-002 MS
 Misc :
 MS Integration Params: RTEINT.P
 Quant Time: May 26 18:16:16 2011

Vial: 6
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

Quant Results File: 051211_D14.RES

Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
 Title : 050911_D14.m MJ808 CAL_10500
 Last Update : Thu May 26 18:14:22 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

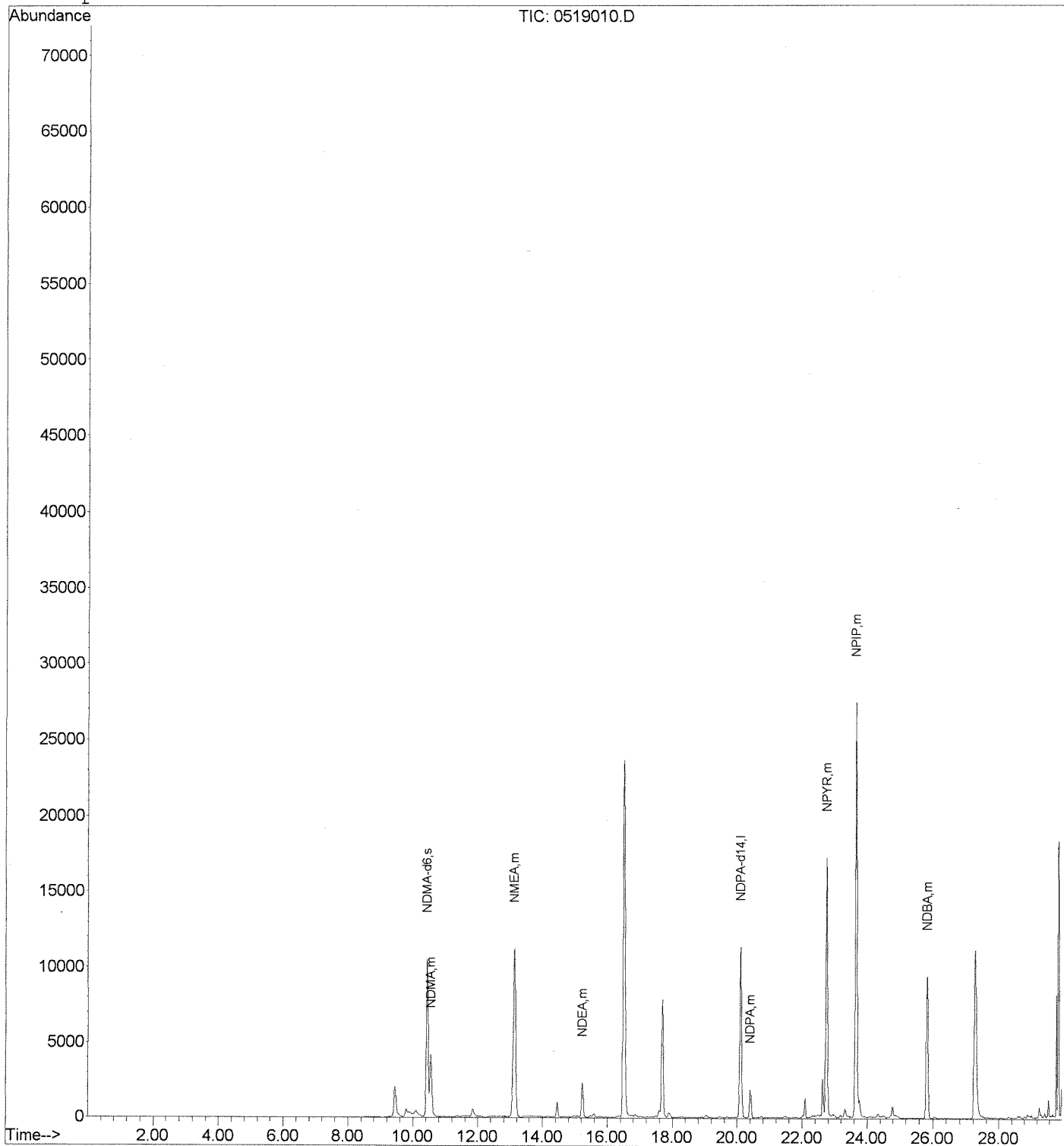
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.11	97	28863	50.00	ug/L	0.00
System Monitoring Compounds						
3) NDMA-d6	10.43	50	21423	8.46	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.55	47	6013	8.78	ug/L	# 46
5) NMEA	13.12	61	44232	8.25	ug/L	85
6) NDEA	15.23	75	6284	9.01	ug/L	69
7) NDPA	20.40	89	5908	7.88	ug/L	83
8) NPYR	22.75	55	39838	7.73	ug/L	99
9) NPIP	23.66	69	73070	8.11	ug/L	96
10) NDBA	25.84	57	22397	7.13	ug/L	72

Data File : J:\MS16\DATA\051911-521\0519010.D
Acq On : 19 May 11 21:07
Sample : K1101793-002 MS
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 26 18:16 2011

Vial: 6
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 051211_D14.R

Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 050911_D14.m MJ808 CAL 10500
Last Update : Thu May 26 18:14:22 2011
Response via : Initial Calibration



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Battelle
Project: JPL GW Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101793
Date Collected: 05/12/2011
Date Received: 05/12/2011

Nitrosamines by EPA 521

Sample Name: MW-17-4DMS
Lab Code: KWG1104527-2
Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	17.3		2.0	0.32	1	05/19/11	05/26/11	KWG1104527	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	101	70-130	05/26/11	Acceptable

Comments: _____

Exception Report

Data File: J:\MS16\DATA\052611-521\0526013.D
Lab ID: KWG1104527-2 -- P1101793-002DMS
RunType: DMS
Matrix: WATER

Date Acquired: 05/26/2011 20:13
Date Quantitated: 06/01/2011 09:25
Batch ID: KWG1104806
Analysis Method: 521
MethodJoinID: MJ808

Sample Exceptions

Exception Categories	Result	Low Limit	High Limit	Pass	Fail
Tune Window	NA	NA	NA	x	
Analytical Holding Time	NA	NA	NA	x	
ICAL Pass/Fail	NA	NA	NA	x	
ICAL Analyte Recovery	NA	NA	NA	x	
Initial Calibration Minimum RF	NA	NA	NA	x	
Initial Calibration SPCC/CCC	NA	NA	NA	x	
Second Source ICAL Verification	NA	NA	NA	x	
Calibration Verification Pass/Fail	NA	NA	NA	x	
Continuing Calibration Recovery	NA	NA	NA	x	
Continuing Calibration Minimum RF	NA	NA	NA	x	
Continuing Calibration SPCC/CCC	NA	NA	NA	x	
Continuing Calibration Recovery (Closing)	NA	NA	NA	x	
Internal Standards	NA	NA	NA	x	
Surrogates	NA	NA	NA	x	
Analyte Co-elution	NA	NA	NA	x	
Retention Time	NA	NA	NA	x	
Relative Retention Time	NA	NA	NA	x	
Below Lowest ICAL Level	NA	NA	NA	x	
Std MRL Unsupported by ICAL	NA	NA	NA	x	
Above Highest ICAL Level	NA	NA	NA	x	
Enviroquant/Stealth Calibration Check	NA	NA	NA	x	
Overdiluted Analysis	NA	NA	NA	x	

Primary Review: 

Secondary Review: _____

Quantitation Report

Bottle ID:	Tier:	Matrix:
Prod Code: 521 Nitrosamine	Collect Date:	WATER
		Receive Date: 05/19/2011

Analysis Lot: KWG1104806	Prep Lot: KWG1104527	Report Group:
Analysis Method: 521	Prep Method: METHOD	
Prep Ref: 1020204	Prep Date: 05/19/2011	

Quant Method: J:\MS16\METHODS\052411_D14.M	Calibration ID: CAL10543
Title:	
Tune Ref: J:\MS16\DATA\052611-521\0526003.D	Method ID: MJ808
MB Ref: J:\MS16\DATA\051911-521\0519007.D	Quant based on Method

Data File: J:\MS16\DATA\052611-521\0526013.D	Instrument: MS16
Acqu Date: 05/26/2011 20:13	Quant Date: 06/01/2011 09:25
Run Type: DMS	Vial: 7
Lab ID: KWG1104527-2 -- P1101793-002DMS	Dilution: 1.0
	Soln Conc. Units: ug/L

Internal Standard Compounds

IS Ref	Parameter Name	RT	RT Dev	Quant Mass	Response	Solution Conc	Area Criteria
1	N-Nitrosodi-n-propylamine-d14	20.12	0.00	97	38218	50.00	OK ✓
1	N-Nitrosodiethylamine-d10			81	0		OK

Surrogate Compounds

IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	%Rec	%Rec Limits	Rpt?
1	N-Nitrosodimethylamine-d6	10.45	0.03	0.00	50	36730	10.13	101	70-130	OK ✓

Target Compounds

										Final Conc. Units: ng/L
IS Ref	Parameter Name	RT	RT Dev	RRT Dev	Quant Mass	Response	Solution Conc	Final Conc	Q	Rpt?
1	N-Nitrosodimethylamine	10.55	0.01	0.00	47	13269	8.67	17.3		
1	N-Nitrosomethylethylamine	13.14	0.02	0.00	61	49504	7.29	14.6		
1	N-Nitrosodiethylamine	15.25	-0.01	0.00	75	7173	8.25	16.5		
1	N-Nitrosodi-n-propylamine	20.43	0.01	0.00	89	7385	7.00	14.0		
1	N-Nitrosopyrrolidine	22.77	0.01	0.00	55	58553	8.24	16.5		
1	N-Nitrosopiperidine	23.69	0.01	0.00	69	101671	7.83	15.7		
1	N-Nitrosodi-n-butylamine	25.86	0.02	0.00	57	34535	7.53	15.1		

Prep Amount: 500 ml Dilution: 1.0
 Prep Final Vol: 1 ml Unit Factor: 1000

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / Prep Amount) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Data File : J:\MS16\DATA\052611-521\0526013.D
 Acq On : 26 May 11 20:13
 Sample : P1101793-002 DMS
 Misc :

Vial: 7
 Operator: SVO-DW
 Inst : MS16
 Multiplr: 1.00

MS Integration Params: RTEINT.P
 Quant Time: Jun 01 09:25:19 2011

Quant Results File: 052411_D14.RES

Quant Method : J:\MS16\METHODS\052411_D14.M (RTE Integrator)
 Title : 052411_D14.m MJ808 CAL 10
 Last Update : Wed Jun 01 09:25:00 2011
 Response via : Initial Calibration
 DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.12	97	38218	50.00	ug/L	0.01
System Monitoring Compounds						
3) NDMA-d6	10.45	50	36730	10.13	ug/L	0.01
Target Compounds						Qvalue
4) NDMA	10.55	47	13269	8.67	ug/L	97
5) NMEA	13.14	61	49504	7.29	ug/L	51
6) NDEA	15.25	75	7173	8.25	ug/L	97
7) NDPA	20.43	89	7385	7.00	ug/L	92
8) NPYR	22.77	55	58553	8.24	ug/L	78
9) NPIP	23.69	69	101671	7.83	ug/L	89
10) NDBA	25.86	57	34535	7.53	ug/L	70

Data File : J:\MS16\DATA\052611-521\0526013.D
Acq On : 26 May 11 20:13
Sample : P1101793-002 DMS
Misc :
MS Integration Params: RTEINT.P
Quant Time: Jun 1 9:25 2011

Vial: 7
Operator: SVO-DW
Inst : MS16
Multiplr: 1.00

Quant Results File: 052411_D14.R

Method : J:\MS16\METHODS\052411_D14.M (RTE Integrator)
Title : 052411_D14.m MJ808 CAL_10
Last Update : Wed Jun 01 09:25:00 2011
Response via : Initial Calibration

