Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *25-May-11*

QC Summary Report

Work Order: 11051802

Method Blank Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **11052306.D** Batch ID: **MS15W0523M** Analysis Date: **05/23/2011 09:58**

Sample ID: **MBLK MS15W0523M** Units : **µg/L** Run ID: **MSD_15_110523C** Prep Date: **05/23/2011 09:58**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	ND	0.5								
Chloromethane	ND	1								
Vinyl chloride	ND	0.5								
Chloroethane	ND	0.5								
Bromomethane	ND	1								
Trichlorofluoromethane	ND	0.5								
1,1-Dichloroethene	ND	0.5								
Dichloromethane	ND	1								
Freon-113	ND	0.5								
trans-1,2-Dichloroethene	ND	0.5								
Methyl tert-butyl ether (MTBE)	ND	0.5								
1,1-Dichloroethane	ND	0.5								
2-Butanone (MEK)	ND	10								
cis-1,2-Dichloroethene	ND	0.5								
Bromochloromethane	ND	0.5								
Chloroform	ND	0.5								
2,2-Dichloropropane	ND	0.5								
1,2-Dichloroethane	ND	0.5								
1,1,1-Trichloroethane	ND	0.5								
1,1-Dichloropropene	ND	0.5								
Carbon tetrachloride	ND	0.5								
Benzene	ND	0.5								
Dibromomethane	ND	0.5								
1,2-Dichloropropane	ND	0.5								
Trichloroethene	ND	0.5								
Bromodichloromethane	ND	0.5								
4-Methyl-2-pentanone (MIBK)	ND	2.5								
cis-1,3-Dichloropropene	ND	0.5								
trans-1,3-Dichloropropene	ND	0.5								
1,1,2-Trichloroethane	ND	0.5								
Toluene	ND	0.5								
1,3-Dichloropropane	ND	0.5								
Dibromochloromethane	ND	0.5								
1,2-Dibromoethane (EDB)	ND	1								
Tetrachloroethene	ND	0.5								
1,1,1,2-Tetrachloroethane	ND	0.5								
Chlorobenzene	ND	0.5								
Ethylbenzene	ND	0.5								
m,p-Xylene	ND	0.5								
Bromoform	ND	0.5								
Styrene	ND	0.5								
o-Xylene	ND	0.5								
1,1,2,2-Tetrachloroethane	ND	0.5								
1,2,3-Trichloropropane	ND	1								
Isopropylbenzene	ND	0.5								
Bromobenzene	ND	0.5								
n-Propylbenzene	ND	0.5								
4-Chlorotoluene	ND	0.5								
2-Chlorotoluene	ND	0.5								
1,3,5-Trimethylbenzene	ND	0.5								
tert-Butylbenzene	ND	0.5								
1,2,4-Trimethylbenzene	ND	0.5								
sec-Butylbenzene	ND	0.5								
1,3-Dichlorobenzene	ND	0.5								
1,4-Dichlorobenzene	ND	0.5								
4-Isopropyltoluene	ND	0.5								
1,2-Dichlorobenzene	ND	0.5								
n-Butylbenzene	ND	0.5								
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5								
1,2,4-Trichlorobenzene	ND	1								
Naphthalene	ND	1								
Hexachlorobutadiene	ND	1								
1,2,3-Trichlorobenzene	ND	1								
Surr: 1,2-Dichloroethane-d4	9.65		10		97	70	130			
Surr: Toluene-d8	10.3		10		103	70	130			

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Surr: 4-Bromofluorobenzene	9.63	10	96	70	130	

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Date: 25-May-11

QC Summary Report

Work Order: 11051802

Laboratory Control Spike Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **11052303.D** Batch ID: **MS15W0523M** Analysis Date: **05/23/2011 08:43**

Sample ID: **LCS MS15W0523M** Units : **µg/L** Run ID: **MSD_15_110523C** Prep Date: **05/23/2011 08:43**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	9.88	1	10		99	70	130			
Chloromethane	9.49	2	10		95	70	130			
Vinyl chloride	10.2	1	10		102	70	130			
Chloroethane	10	1	10		100	70	130			
Bromomethane	11	2	10		110	70	130			
Trichlorofluoromethane	12.9	1	10		129	70	130			
1,1-Dichloroethene	11.1	1	10		111	70	130			
Dichloromethane	9.89	2	10		99	70	130			
Freon-113	11.5	1	10		115	70	137			
trans-1,2-Dichloroethene	11.1	1	10		111	70	130			
Methyl tert-butyl ether (MTBE)	8.33	0.5	10		83	70	130			
1,1-Dichloroethane	10.1	1	10		101	70	130			
2-Butanone (MEK)	181	10	200		90	70	130			
cis-1,2-Dichloroethene	10.7	1	10		107	70	130			
Bromochloromethane	10.1	1	10		101	70	130			
Chloroform	10.6	1	10		106	70	130			
2,2-Dichloropropane	10.1	1	10		101	70	130			
1,2-Dichloroethane	9.59	1	10		96	70	130			
1,1,1-Trichloroethane	11	1	10		110	70	130			
1,1-Dichloropropene	11	1	10		110	70	130			
Carbon tetrachloride	11.2	1	10		112	70	130			
Benzene	10	0.5	10		100	70	130			
Dibromomethane	9.53	1	10		95	70	130			
1,2-Dichloropropane	9.63	1	10		96	70	130			
Trichloroethene	10.8	1	10		108	70	130			
Bromodichloromethane	10.3	1	10		103	70	130			
4-Methyl-2-pentanone (MIBK)	19.8	2.5	25		79	20	182			
cis-1,3-Dichloropropene	9.32	1	10		93	70	130			
trans-1,3-Dichloropropene	8.71	1	10		87	70	130			
1,1,2-Trichloroethane	8.77	1	10		88	70	130			
Toluene	10.7	0.5	10		107	70	130			
1,3-Dichloropropane	9.14	1	10		91	70	130			
Dibromochloromethane	9.57	1	10		96	70	130			
1,2-Dibromoethane (EDB)	19.7	2	20		99	70	130			
Tetrachloroethene	11.6	1	10		116	70	130			
1,1,1,2-Tetrachloroethane	10.6	1	10		106	70	130			
Chlorobenzene	10.7	1	10		107	70	130			
Ethylbenzene	10.8	0.5	10		108	70	130			
m,p-Xylene	11.1	0.5	10		111	70	130			
Bromoform	8.65	1	10		87	70	130			
Styrene	10.5	1	10		105	70	130			
o-Xylene	10.9	0.5	10		109	70	130			
1,1,2,2-Tetrachloroethane	8.25	1	10		83	70	130			
1,2,3-Trichloropropane	18.4	2	20		92	70	130			
Isopropylbenzene	10.5	1	10		105	70	130			
Bromobenzene	10.2	1	10		102	70	130			
n-Propylbenzene	10.8	1	10		108	70	130			
4-Chlorotoluene	10.7	1	10		107	70	130			
2-Chlorotoluene	10.6	1	10		106	70	130			
1,3,5-Trimethylbenzene	10.7	1	10		107	70	130			
tert-Butylbenzene	10.6	1	10		106	70	130			
1,2,4-Trimethylbenzene	10.4	1	10		104	70	130			
sec-Butylbenzene	11	1	10		110	70	130			
1,3-Dichlorobenzene	10.6	1	10		106	70	130			
1,4-Dichlorobenzene	10.1	1	10		101	70	130			
4-Isopropyltoluene	10.7	1	10		107	70	130			
1,2-Dichlorobenzene	9.68	1	10		97	70	130			
n-Butylbenzene	10.9	1	10		109	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	36.9	3	50		74	67	130			
1,2,4-Trichlorobenzene	9.48	2	10		95	70	130			
Naphthalene	5.15	2	10		52	70(70)	130			L50
Hexachlorobutadiene	19.1	2	20		96	70	130			
1,2,3-Trichlorobenzene	7.7	2	10		77	70	130			
Surr: 1,2-Dichloroethane-d4	9.25		10		93	70	130			
Surr: Toluene-d8	10.2		10		102	70	130			

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QC Summary Report

Work Order: 11051802

Surr: 4-Bromofluorobenzene	9.57	10	96	70	130	

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QC Summary Report

Work Order: 11051802

Sample Matrix Spike Type **MS** Test Code: **EPA Method SW8260B**

File ID: **11052307.D** Batch ID: **MS15W0523M** Analysis Date: **05/23/2011 10:20**

Sample ID: **11051802-01AMS** Units : **µg/L** Run ID: **MSD_15_110523C** Prep Date: **05/23/2011 10:20**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	49.8	2.5	50	0	99.6	21	138			
Chloromethane	41.3	10	50	0	83	23	144			
Vinyl chloride	58.8	2.5	50	0	118	49	136			
Chloroethane	51.4	2.5	50	0	102	21	159			
Bromomethane	64.9	10	50	0	130	10	174			
Trichlorofluoromethane	68.1	2.5	50	0	136	32	154			
1,1-Dichloroethene	56.8	2.5	50	0	114	64	130			
Dichloromethane	51.1	10	50	0	102	69	130			
Freon-113	62.8	2.5	50	0	126	55	141			
trans-1,2-Dichloroethene	56.1	2.5	50	0	112	63	130			
Methyl tert-butyl ether (MTBE)	48.9	1.3	50	0	98	47	150			
1,1-Dichloroethane	51.5	2.5	50	0	103	66	130			
2-Butanone (MEK)	712	50	1000	0	71	23	182			
cis-1,2-Dichloroethene	54.6	2.5	50	0	109	70	130			
Bromochloromethane	54.7	2.5	50	0	109	70	132			
Chloroform	53.9	2.5	50	0	108	70	130			
2,2-Dichloropropane	50.2	2.5	50	0	100	38	154			
1,2-Dichloroethane	52.4	2.5	50	0	105	65	134			
1,1,1-Trichloroethane	56.7	2.5	50	0	113	65	136			
1,1-Dichloropropene	56.5	2.5	50	0	113	68	132			
Carbon tetrachloride	58.6	2.5	50	0	117	58	148			
Benzene	51.8	1.3	50	0	104	59	138			
Dibromomethane	52.1	2.5	50	0	104	70	130			
1,2-Dichloropropane	49.6	2.5	50	0	99	70	131			
Trichloroethene	54.3	2.5	50	0	109	65	144			
Bromodichloromethane	53.9	2.5	50	0	108	50	157			
4-Methyl-2-pentanone (MIBK)	107	13	125	0	85	20	182			
cis-1,3-Dichloropropene	48.1	2.5	50	0	96	63	131			
trans-1,3-Dichloropropene	46	2.5	50	0	92	65	136			
1,1,2-Trichloroethane	48.3	2.5	50	0	97	70	131			
Toluene	54	1.3	50	0	108	68	130			
1,3-Dichloropropane	49.5	2.5	50	0	99	70	130			
Dibromochloromethane	51.6	2.5	50	0	103	42	155			
1,2-Dibromoethane (EDB)	107	5	100	0	107	70	130			
Tetrachloroethene	58.9	2.5	50	0	118	65	130			
1,1,1,2-Tetrachloroethane	53.9	2.5	50	0	108	70	130			
Chlorobenzene	54.3	2.5	50	0	109	70	130			
Ethylbenzene	54.3	1.3	50	0	109	68	130			
m,p-Xylene	55.7	1.3	50	0	111	68	131			
Bromoform	48.9	2.5	50	0	98	65	143			
Styrene	54.5	2.5	50	0	109	59	153			
o-Xylene	54.4	1.3	50	0	109	70	130			
1,1,2,2-Tetrachloroethane	47.3	2.5	50	0	95	67	130			
1,2,3-Trichloropropane	103	10	100	0	103	70	130			
Isopropylbenzene	50.7	2.5	50	0	101	55	138			
Bromobenzene	50.5	2.5	50	0	101	70	130			
n-Propylbenzene	52.2	2.5	50	0	104	67	133			
4-Chlorotoluene	53.3	2.5	50	0	107	70	130			
2-Chlorotoluene	51.5	2.5	50	0	103	70	130			
1,3,5-Trimethylbenzene	51.4	2.5	50	0	103	67	134			
tert-Butylbenzene	51.7	2.5	50	0	103	55	147			
1,2,4-Trimethylbenzene	51	2.5	50	0	102	65	135			
sec-Butylbenzene	52.5	2.5	50	0	105	68	135			
1,3-Dichlorobenzene	52.6	2.5	50	0	105	70	130			
1,4-Dichlorobenzene	50.7	2.5	50	0	101	70	130			
4-Isopropyltoluene	52.2	2.5	50	0	104	68	132			
1,2-Dichlorobenzene	49.6	2.5	50	0	99	70	130			
n-Butylbenzene	53.1	2.5	50	0	106	62	134			
1,2-Dibromo-3-chloropropane (DBCP)	201	15	250	0	80	64	130			
1,2,4-Trichlorobenzene	48.9	10	50	0	98	62	133			
Naphthalene	28.2	10	50	0	56	32	166			
Hexachlorobutadiene	95.5	10	100	0	95	63	130			
1,2,3-Trichlorobenzene	40.5	10	50	0	81	55	138			
Surr: 1,2-Dichloroethane-d4	50.6		50		101	70	130			
Surr: Toluene-d8	51.1		50		102	70	130			

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Surr: 4-Bromofluorobenzene	47.4	50	95	70	130	

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QC Summary Report

Work Order: 11051802

Sample Matrix Spike Duplicate Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **11052308.D** Batch ID: **MS15W0523M** Analysis Date: **05/23/2011 10:41**

Sample ID: **11051802-01AMSD** Units : **µg/L** Run ID: **MSD_15_110523C** Prep Date: **05/23/2011 10:41**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	40.9	2.5	50	0	82	21	138	49.79	19.6(33)	
Chloromethane	33.7	10	50	0	67	23	144	41.33	20.3(27)	
Vinyl chloride	49.6	2.5	50	0	99	49	136	58.84	17.0(21)	
Chloroethane	42.4	2.5	50	0	84	21	159	51.39	19.2(40)	
Bromomethane	57.8	10	50	0	116	10	174	64.91	11.6(40)	
Trichlorofluoromethane	56	2.5	50	0	112	32	154	68.12	19.5(37)	
1,1-Dichloroethene	47.2	2.5	50	0	94	64	130	56.83	18.5(21)	
Dichloromethane	43.4	10	50	0	87	69	130	51.05	16.2(20)	
Freon-113	51.7	2.5	50	0	103	55	141	62.77	19.4(40)	
trans-1,2-Dichloroethene	46.6	2.5	50	0	93	63	130	56.08	18.5(20)	
Methyl tert-butyl ether (MTBE)	43.7	1.3	50	0	87	47	150	48.89	11.2(40)	
1,1-Dichloroethane	42.8	2.5	50	0	86	66	130	51.49	18.4(20)	
2-Butanone (MEK)	640	50	1000	0	64	23	182	712.3	10.8(22)	
cis-1,2-Dichloroethene	46.1	2.5	50	0	92	70	130	54.61	17.0(20)	
Bromochloromethane	47.9	2.5	50	0	96	70	132	54.74	13.3(20)	
Chloroform	44.9	2.5	50	0	90	70	130	53.9	18.2(20)	
2,2-Dichloropropane	41.8	2.5	50	0	84	38	154	50.24	18.4(22)	
1,2-Dichloroethane	45.1	2.5	50	0	90	65	134	52.42	15.0(20)	
1,1,1-Trichloroethane	46.5	2.5	50	0	93	65	136	56.66	19.7(20)	
1,1-Dichloropropene	46.7	2.5	50	0	93	68	132	56.46	19.0(20)	
Carbon tetrachloride	48.5	2.5	50	0	97	58	148	58.61	18.9(20)	
Benzene	42.8	1.3	50	0	86	59	138	51.8	19.1(21)	
Dibromomethane	44.3	2.5	50	0	89	70	130	52.13	16.3(20)	
1,2-Dichloropropane	41.6	2.5	50	0	83	70	131	49.62	17.5(20)	
Trichloroethene	45.5	2.5	50	0	91	65	144	54.29	17.7(20)	
Bromodichloromethane	45.7	2.5	50	0	91	50	157	53.85	16.4(20)	
4-Methyl-2-pentanone (MIBK)	94.5	13	125	0	76	20	182	106.5	12.0(20)	
cis-1,3-Dichloropropene	41.3	2.5	50	0	83	63	131	48.14	15.2(20)	
trans-1,3-Dichloropropene	39.9	2.5	50	0	80	65	136	46.04	14.3(20)	
1,1,2-Trichloroethane	41.7	2.5	50	0	83	70	131	48.31	14.6(20)	
Toluene	44.7	1.3	50	0	89	68	130	53.99	18.8(20)	
1,3-Dichloropropane	43.5	2.5	50	0	87	70	130	49.49	13.0(20)	
Dibromochloromethane	44.9	2.5	50	0	90	42	155	51.56	13.7(20)	
1,2-Dibromoethane (EDB)	93.7	5	100	0	94	70	130	107	13.3(20)	
Tetrachloroethene	48.1	2.5	50	0	96	65	130	58.85	20.0(20)	R5
1,1,1,2-Tetrachloroethane	46.6	2.5	50	0	93	70	130	53.94	14.7(20)	
Chlorobenzene	45.7	2.5	50	0	91	70	130	54.25	17.2(20)	
Ethylbenzene	45.6	1.3	50	0	91	68	130	54.32	17.6(20)	
m,p-Xylene	46.5	1.3	50	0	93	68	131	55.74	18.1(20)	
Bromoform	43.2	2.5	50	0	86	65	143	48.88	12.4(20)	
Styrene	46	2.5	50	0	92	59	153	54.5	16.9(37)	
o-Xylene	46.1	1.3	50	0	92	70	130	54.44	16.7(20)	
1,1,2,2-Tetrachloroethane	42.6	2.5	50	0	85	67	130	47.31	10.5(20)	
1,2,3-Trichloropropane	90.1	10	100	0	90	70	130	103.2	13.6(20)	
Isopropylbenzene	42.2	2.5	50	0	84	55	138	50.71	18.3(20)	
Bromobenzene	43.2	2.5	50	0	86	70	130	50.52	15.6(20)	
n-Propylbenzene	43.1	2.5	50	0	86	67	133	52.23	19.1(30)	
4-Chlorotoluene	44.5	2.5	50	0	89	70	130	53.25	17.9(20)	
2-Chlorotoluene	43.7	2.5	50	0	87	70	130	51.49	16.4(20)	
1,3,5-Trimethylbenzene	42.9	2.5	50	0	86	67	134	51.4	18.1(21)	
tert-Butylbenzene	42.7	2.5	50	0	85	55	147	51.68	19.1(20)	
1,2,4-Trimethylbenzene	42.7	2.5	50	0	85	65	135	50.98	17.8(25)	
sec-Butylbenzene	43.9	2.5	50	0	88	68	135	52.54	18.0(20)	
1,3-Dichlorobenzene	44.3	2.5	50	0	89	70	130	52.64	17.1(20)	
1,4-Dichlorobenzene	42.8	2.5	50	0	86	70	130	50.74	17.0(20)	
4-Isopropyltoluene	43.1	2.5	50	0	86	68	132	52.18	19.2(20)	
1,2-Dichlorobenzene	42.2	2.5	50	0	84	70	130	49.64	16.3(20)	
n-Butylbenzene	43.9	2.5	50	0	88	62	134	53.05	18.9(21)	
1,2-Dibromo-3-chloropropane (DBCP)	176	15	250	0	71	64	130	200.9	12.9(20)	
1,2,4-Trichlorobenzene	41.5	10	50	0	83	62	133	48.86	16.4(29)	
Naphthalene	24.6	10	50	0	49	32	166	28.23	13.6(40)	
Hexachlorobutadiene	82.5	10	100	0	82	63	130	95.45	14.6(21)	
1,2,3-Trichlorobenzene	35.5	10	50	0	71	55	138	40.48	13.0(36)	
Surr: 1,2-Dichloroethane-d4	49		50		98	70	130			
Surr: Toluene-d8	50.7		50		101	70	130			

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *25-May-11*

QC Summary Report

Work Order: 11051802

Surr: 4-Bromofluorobenzene	46.9	50	94	70	130

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

R5 = MS/MSD RPD exceeded the laboratory control limit. Recovery met acceptance criteria.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

L50 = Analyte recovery was below acceptance limits for the LCS, but was acceptable in the MS/MSD.

Billing Information :

CHAIN-OF-CUSTODY RECORD

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

CA

WorkOrder : BMIS11051802

Report Due By : 5:00 PM On : 01-Jun-2011

Client:
Battelle Memorial Institute
655 West Broadway
Suite 1420
San Diego, CA 92101

Report Attention	Phone Number	EMail Address
David Conner	(619) 726-7311 x	connerd@battelle.org
Betsy Cutie	(614) 424-4899 x	cutiee@batelle.org
Shane Walton	(614) 424-4117 x	waltons@battelle.org

EDD Required : **Yes**

Sampled by : Chase Brogdon/ Mark Mendoza

PO : 218013

Client's COC # : 29130 Job : G005862/JPL Groundwater Monitoring

Cooler Temp	Samples Received	Date Printed
0 °C	18-May-2011	**18-May-2011**

QC Level : DS4 = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests 300_0_W	314_W	ALKALINITY_W	METALS_DW	PH_W	TDS_W	VOC_TIC_W	VOC_W	Sample Remarks
BMI11051802-01A	MW-25-5	AQ	05/17/11 08:15	5	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	Level IV QC
BMI11051802-02A	MW-25-4	AQ	05/17/11 08:56	5	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11051802-03A	MW-25-3	AQ	05/17/11 09:28	5	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11051802-04A	MW-25-2	AQ	05/17/11 10:03	5	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11051802-05A	MW-25-1	AQ	05/17/11 11:00	5	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11051802-06A	DUPE-4-2Q11	AQ	05/17/11 00:00	5	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11051802-07A	EB-13-5/17/11	AQ	05/17/11 10:47	5	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11051802-08A	TB-13-5/17/11	AQ	05/17/11 00:00	1	0	9							VOC by 524 Criteria	VOC by 524 Criteria	Reno Trip Blank 4/4/11

Comments: Security seals intact. Frozen ice. Temp Blank #7776 received @ 0°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD). :

	Signature	Print Name	Company	Date/Time
Logged in by:	Elizabeth Adcox	Elizabeth Adcox	**Alpha Analytical, Inc.**	5-18-11 9:50

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information:

Name BATTELLE / GERALD TOMPKINS
Address 505 KING AVE.
City, State, Zip COLUMBUS OH 43201
Phone Number _____ Fax _____

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044
Fax (775) 355-0406

Samples Collected From Which State? AZ ___ CA X NV ___ WA ___ ID ___ OR ___ OTHER ___

29130

Page # 1 of 1

Client Name	P.O. #	Job #
BATTELLE / DAVID CONNER	218013	G005862
Address	**EMail Address**	
3990 OLD TOWN AVE. C-205	CONNERD@BATTELLE.ORG	
City, State, Zip	**Phone #**	**Fax #**
SAN DIEGO CA 92110	(619) 726-7311	(614) 458-6641

Required QC Level? I II III IV

EDD EDF? YES X NO ___

Global ID # ___

Time Sampled	Date Sampled	Matrix* See Key Below	Sampled by / Lab ID Number (Office Use Only)	Report Attention / Sample Description	TAT	Field Filtered	Total and type of containers ** See below	VOC's (524.2)	Lead, Arsenic, Total Cr (200.8)	Cl2 (314.0)	Na, K, Ca, Mg, Fe (200.8)	CO3, HCO3, TDS, pH, Alkalinity (SM2320B, SM2540C, ISO 2)	Cl-, NO3-, NO2-, SO4, PO4-3 (300.0)		REMARKS
815	5/17/11	AQ	BMI1105182-01	MW-25-5	NORM		5	X	X	X	X	X	X		IV QC
856			-02	MW-25-4			5	X	X	X	X	X	X		
928			-03	MW-25-3			5	X	X	X	X	X	X		
1003			-04	MW-25-2			5	X	X	X	X	X	X		
1100			-05	MW-25-1			5	X	X	X	X	X	X		
—			-06	DUPE-4-2Q11			5	X	X	X	X	X	X		DUPLICATE
1047			-07	EB-13-5/17/11			5	X	X	X	X	X	X		EQUIP BLANK
—			-08	TB-13-5/17/11			1	X							TRIP BLANK

ADDITIONAL INSTRUCTIONS:

Signature	Print Name	Company	Date	Time
Relinquished by	MARK MENDOZA	IN SITU CHEM	5/17/11	1205
Received by	Anthony Stark	Alpha Analytical	5/17/11	1205
Relinquished by	"	"	"	1205
Received by Elizabeth Adcox	Elizabeth Adcox	Alpha	5-18-11	9:50
Relinquished by				
Received by				

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air **: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this coc. The liability of the laboratory is limited to the amount paid for the report.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *01-Jun-2011*

David Conner
Battelle Memorial Institute
655 West Broadway Suite 1420
San Diego, CA 92101
(619) 726-7311

CASE NARRATIVE

Job: G005862/JPL Groundwater Monitoring
Work Order: BMI11051902 **Cooler Temp:** 3 °C

Alpha's Sample ID	Client's Sample ID	Matrix
11051902-01A	MW-26-2	Aqueous
11051902-02A	MW-26-1	Aqueous
11051902-03A	EB-14-5/18/11	Aqueous
11051902-04A	TB-14-5/18/11	Aqueous

Manually Integrated Analytes

Alpha's Sample ID	Test Reference	Analyte
NONE		

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641
Date Received : 05/19/11

Job: G005862/JPL Groundwater Monitoring

Anions by IC
EPA Method 300.0

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-26-2**					
Lab ID : BMI11051902-01A	Chloride	21	0.50 mg/L	05/19/11 12:07	05/19/11 12:50
Date Sampled 05/18/11 08:10	Nitrite (NO2) - N	ND	0.25 mg/L	05/19/11 12:07	05/19/11 12:50
	Nitrate (NO3) - N	0.78	0.25 mg/L	05/19/11 12:07	05/19/11 12:50
	Phosphate, ortho - P	ND	0.50 mg/L	05/19/11 12:07	05/19/11 12:50
	Sulfate (SO4)	17	0.50 mg/L	05/19/11 12:07	05/19/11 12:50
Client ID: **MW-26-1**					
Lab ID : BMI11051902-02A	Chloride	90	50 mg/L	05/19/11 12:07	05/19/11 14:41
Date Sampled 05/18/11 08:53	Nitrite (NO2) - N	ND	0.25 mg/L	05/19/11 12:07	05/19/11 14:41
	Nitrate (NO3) - N	10	0.25 mg/L	05/19/11 12:07	05/19/11 14:41
	Phosphate, ortho - P	ND	0.50 mg/L	05/19/11 12:07	05/19/11 14:41
	Sulfate (SO4)	120	0.50 mg/L	05/19/11 12:07	05/19/11 14:41
Client ID: **EB-14-5/18/11**					
Lab ID : BMI11051902-03A	Chloride	ND	0.50 mg/L	05/19/11 12:07	05/19/11 15:00
Date Sampled 05/18/11 08:41	Nitrite (NO2) - N	ND	0.25 mg/L	05/19/11 12:07	05/19/11 15:00
	Nitrate (NO3) - N	ND	0.25 mg/L	05/19/11 12:07	05/19/11 15:00
	Phosphate, ortho - P	ND	0.50 mg/L	05/19/11 12:07	05/19/11 15:00
	Sulfate (SO4)	ND	0.50 mg/L	05/19/11 12:07	05/19/11 15:00

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

Alpha certifies that the test results meet all requirements of NELAC unless footnoted otherwise.

Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

6/2/11
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641
Date Received : 05/19/11

Job: G005862/JPL Groundwater Monitoring

Perchlorate by Ion Chromatography
EPA Method 314.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-26-2**				
Lab ID : BMI11051902-01A Perchlorate	ND	1.00 µg/L	05/19/11 12:10	05/19/11 20:28
Date Sampled 05/18/11 08:10				
Client ID: **MW-26-1**				
Lab ID : BMI11051902-02A Perchlorate	2.98	1.00 µg/L	05/19/11 12:10	05/19/11 20:46
Date Sampled 05/18/11 08:53				
Client ID: **EB-14-5/18/11**				
Lab ID : BMI11051902-03A Perchlorate	ND	1.00 µg/L	05/19/11 12:10	05/19/11 21:05
Date Sampled 05/18/11 08:41				

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641
Date Received : 05/19/11

Job: G005862/JPL Groundwater Monitoring

Alkalinity
SM2320B

Parameter		Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-26-2**					
Lab ID : BMI11051902-01A	Alkalinity, Bicarbonate (As CaCO3)	210	10 mg/L	05/20/11 14:43	05/20/11 14:43
Date Sampled 05/18/11 08:10	Alkalinity, Carbonate (As CaCO3)	ND	10 mg/L	05/20/11 14:43	05/20/11 14:43
	Alkalinity, Total (As CaCO3 at pH 4.5)	210	10 mg/L	05/20/11 14:43	05/20/11 14:43
Client ID: **MW-26-1**					
Lab ID : BMI11051902-02A	Alkalinity, Bicarbonate (As CaCO3)	250	10 mg/L	05/20/11 14:50	05/20/11 14:50
Date Sampled 05/18/11 08:53	Alkalinity, Carbonate (As CaCO3)	ND	10 mg/L	05/20/11 14:50	05/20/11 14:50
	Alkalinity, Total (As CaCO3 at pH 4.5)	250	10 mg/L	05/20/11 14:50	05/20/11 14:50
Client ID: **EB-14-5/18/11**					
Lab ID : BMI11051902-03A	Alkalinity, Bicarbonate (As CaCO3)	ND	10 mg/L	05/20/11 14:57	05/20/11 14:57
Date Sampled 05/18/11 08:41	Alkalinity, Carbonate (As CaCO3)	ND	10 mg/L	05/20/11 14:57	05/20/11 14:57
	Alkalinity, Total (As CaCO3 at pH 4.5)	ND	10 mg/L	05/20/11 14:57	05/20/11 14:57

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641
Date Received : 05/19/11

Job: G005862/JPL Groundwater Monitoring

Metals by ICPMS
EPA Method 200.8

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-26-2**				
Lab ID : BMI11051902-01A Sodium (Na)	33	0.50 mg/L	05/19/11 15:01	05/19/11 21:06
Date Sampled 05/18/11 08:10 Magnesium (Mg)	12	0.50 mg/L	05/19/11 15:01	05/19/11 21:06
Potassium (K)	2.0	0.50 mg/L	05/19/11 15:01	05/19/11 21:06
Calcium (Ca)	44	0.50 mg/L	05/19/11 15:01	05/19/11 21:06
Chromium (Cr)	ND	0.0050 mg/L	05/19/11 15:01	05/19/11 21:06
Iron (Fe)	0.32	0.30 mg/L	05/19/11 15:01	05/19/11 21:06
Arsenic (As)	ND	0.0020 mg/L	05/19/11 15:01	05/19/11 21:06
Lead (Pb)	ND	0.0050 mg/L	05/19/11 15:01	05/19/11 21:06
Client ID: **MW-26-1**				
Lab ID : BMI11051902-02A Sodium (Na)	23	0.50 mg/L	05/19/11 15:01	05/19/11 21:11
Date Sampled 05/18/11 08:53 Magnesium (Mg)	32	0.50 mg/L	05/19/11 15:01	05/19/11 21:11
Potassium (K)	2.7	0.50 mg/L	05/19/11 15:01	05/19/11 21:11
Calcium (Ca)	110	0.50 mg/L	05/19/11 15:01	05/19/11 21:11
Chromium (Cr)	ND	0.0050 mg/L	05/19/11 15:01	05/19/11 21:11
Iron (Fe)	0.36	0.30 mg/L	05/19/11 15:01	05/19/11 21:11
Arsenic (As)	ND	0.0020 mg/L	05/19/11 15:01	05/19/11 21:11
Lead (Pb)	ND	0.0050 mg/L	05/19/11 15:01	05/19/11 21:11
Client ID: **EB-14-5/18/11**				
Lab ID : BMI11051902-03A Sodium (Na)	ND	0.50 mg/L	05/19/11 15:01	05/19/11 21:17
Date Sampled 05/18/11 08:41 Magnesium (Mg)	ND	0.50 mg/L	05/19/11 15:01	05/19/11 21:17
Potassium (K)	ND	0.50 mg/L	05/19/11 15:01	05/19/11 21:17
Calcium (Ca)	ND	0.50 mg/L	05/19/11 15:01	05/19/11 21:17
Chromium (Cr)	ND	0.0050 mg/L	05/19/11 15:01	05/19/11 21:17
Iron (Fe)	ND	0.30 mg/L	05/19/11 15:01	05/19/11 21:17
Arsenic (As)	ND	0.0020 mg/L	05/19/11 15:01	05/19/11 21:17
Lead (Pb)	ND	0.0050 mg/L	05/19/11 15:01	05/19/11 21:17

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

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6/2/11
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641
Date Received : 05/19/11

Job: G005862/JPL Groundwater Monitoring

pH (Range 1.7 to 12.4)
EPA Method 150.1 / SM4500HB / SW9040C

Parameter		Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-26-2**					
Lab ID : BMI11051902-01A	pH	8.0	1.7 pH Units	05/19/11 15:11	05/19/11 15:11
Date Sampled 05/18/11 08:10	pH - Temperature	20	1.0 °C	05/19/11 15:11	05/19/11 15:11
Client ID: **MW-26-1**					
Lab ID : BMI11051902-02A	pH	7.4	1.7 pH Units	05/19/11 15:19	05/19/11 15:19
Date Sampled 05/18/11 08:53	pH - Temperature	19	1.0 °C	05/19/11 15:19	05/19/11 15:19
Client ID: **EB-14-5/18/11**					
Lab ID : BMI11051902-03A	pH	6.3	1.7 pH Units	05/19/11 15:21	05/19/11 15:21
Date Sampled 05/18/11 08:41	pH - Temperature	19	1.0 °C	05/19/11 15:21	05/19/11 15:21

The EPA has established an analytical holding time of 15 minutes for this method as documented in the Methods Update Rule, Federal Register, Vol 72, No 47, March 2007. This holding time will always be exceeded, unless samples are analyzed in the field.
The laboratory performed this analysis in the shortest practical holding time after sample receipt.

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

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6/2/11
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641
Date Received : 05/19/11

Job: G005862/JPL Groundwater Monitoring

Total Dissolved Solids (TDS)
SM2540C

Parameter		Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-26-2**					
Lab ID : BMI11051902-01A	Solids, Total Dissolved (TDS)	270	10 mg/L	05/25/11	05/25/11
Date Sampled 05/18/11 08:10					
Client ID: **MW-26-1**					
Lab ID : BMI11051902-02A	Solids, Total Dissolved (TDS)	590	10 mg/L	05/25/11	05/25/11
Date Sampled 05/18/11 08:53					
Client ID: **EB-14-5/18/11**					
Lab ID : BMI11051902-03A	Solids, Total Dissolved (TDS)	ND	10 mg/L	05/26/11	05/26/11
Date Sampled 05/18/11 08:41					

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

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6/2/11
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101
Job: G005862/JPL Groundwater Monitoring

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Tentatively Identified Compounds - Volatile Organics by GC/MS

		Parameter	Estimated Concentration	Estimated Reporting Limit	Date Extracted	Date Analyzed
Client ID :	**MW-26-2**					
Lab ID :	BMI11051902-01A	*** None Found ***	ND	2.0 µg/L	05/25/11 14:30	05/25/11 14:30
Date Received :	05/19/11					
Date Sampled :	05/18/11 08:10					
Client ID :	**MW-26-1**					
Lab ID :	BMI11051902-02A	*** None Found ***	ND	2.0 µg/L	05/25/11 14:52	05/25/11 14:52
Date Received :	05/19/11					
Date Sampled :	05/18/11 08:53					
Client ID :	**EB-14-5/18/11**					
Lab ID :	BMI11051902-03A	*** None Found ***	ND	2.0 µg/L	05/25/11 11:37	05/25/11 11:37
Date Received :	05/19/11					
Date Sampled :	05/18/11 08:41					
Client ID :	**TB-14-5/18/11**					
Lab ID :	BMI11051902-04A	*** None Found ***	ND	2.0 µg/L	05/25/11 11:15	05/25/11 11:15
Date Received :	05/19/11					
Date Sampled :	05/18/11 00:00					

Note: Analysis conducted using EPA Method 524.2 criteria.
ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com
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Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101
Job: G005862/JPL Groundwater Monitoring

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Alpha Analytical Number: BMI11051902-01A
Client I.D. Number: MW-26-2

Sampled: 05/18/11 08:10
Received: 05/19/11
Extracted: 05/25/11 14:30
Analyzed: 05/25/11 14:30

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		0.50	µg/L	36	1,1,1,2-Tetrachloroethane	ND		0.50	µg/L
2	Chloromethane	ND		1.0	µg/L	37	Chlorobenzene	ND		0.50	µg/L
3	Vinyl chloride	ND		0.50	µg/L	38	Ethylbenzene	ND		0.50	µg/L
4	Chloroethane	ND		0.50	µg/L	39	m,p-Xylene	ND		0.50	µg/L
5	Bromomethane	ND		1.0	µg/L	40	Bromoform	ND		0.50	µg/L
6	Trichlorofluoromethane	ND		0.50	µg/L	41	Styrene	ND		0.50	µg/L
7	1,1-Dichloroethene	ND		0.50	µg/L	42	o-Xylene	ND		0.50	µg/L
8	Dichloromethane	ND		1.0	µg/L	43	1,1,2,2-Tetrachloroethane	ND		0.50	µg/L
9	Freon-113	ND		0.50	µg/L	44	1,2,3-Trichloropropane	ND		1.0	µg/L
10	trans-1,2-Dichloroethene	ND		0.50	µg/L	45	Isopropylbenzene	ND		0.50	µg/L
11	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	46	Bromobenzene	ND		0.50	µg/L
12	1,1-Dichloroethane	ND		0.50	µg/L	47	n-Propylbenzene	ND		0.50	µg/L
13	2-Butanone (MEK)	ND		10	µg/L	48	4-Chlorotoluene	ND		0.50	µg/L
14	cis-1,2-Dichloroethene	ND		0.50	µg/L	49	2-Chlorotoluene	ND		0.50	µg/L
15	Bromochloromethane	ND		0.50	µg/L	50	1,3,5-Trimethylbenzene	ND		0.50	µg/L
16	Chloroform	ND		0.50	µg/L	51	tert-Butylbenzene	ND		0.50	µg/L
17	2,2-Dichloropropane	ND		0.50	µg/L	52	1,2,4-Trimethylbenzene	ND		0.50	µg/L
18	1,2-Dichloroethane	ND		0.50	µg/L	53	sec-Butylbenzene	ND		0.50	µg/L
19	1,1,1-Trichloroethane	ND		0.50	µg/L	54	1,3-Dichlorobenzene	ND		0.50	µg/L
20	1,1-Dichloropropene	ND		0.50	µg/L	55	1,4-Dichlorobenzene	ND		0.50	µg/L
21	Carbon tetrachloride	ND		0.50	µg/L	56	4-Isopropyltoluene	ND		0.50	µg/L
22	Benzene	ND		0.50	µg/L	57	1,2-Dichlorobenzene	ND		0.50	µg/L
23	Dibromomethane	ND		0.50	µg/L	58	n-Butylbenzene	ND		0.50	µg/L
24	1,2-Dichloropropane	ND		0.50	µg/L	59	1,2-Dibromo-3-chloropropane (DBCP)	ND		2.5	µg/L
25	Trichloroethene	ND		0.50	µg/L	60	1,2,4-Trichlorobenzene	ND		1.0	µg/L
26	Bromodichloromethane	ND		0.50	µg/L	61	Naphthalene	ND	Q	1.0	µg/L
27	4-Methyl-2-pentanone (MIBK)	ND		2.5	µg/L	62	Hexachlorobutadiene	ND		1.0	µg/L
28	cis-1,3-Dichloropropene	ND		0.50	µg/L	63	1,2,3-Trichlorobenzene	ND		1.0	µg/L
29	trans-1,3-Dichloropropene	ND		0.50	µg/L	64	Surr: 1,2-Dichloroethane-d4	104		(70-130)	%REC
30	1,1,2-Trichloroethane	ND		0.50	µg/L	65	Surr: Toluene-d8	104		(70-130)	%REC
31	Toluene	ND		0.50	µg/L	66	Surr: 4-Bromofluorobenzene	91		(70-130)	%REC
32	1,3-Dichloropropane	ND		0.50	µg/L						
33	Dibromochloromethane	ND		0.50	µg/L						
34	1,2-Dibromoethane (EDB)	ND		1.0	µg/L						
35	Tetrachloroethene	ND		0.50	µg/L						

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101
Job: G005862/JPL Groundwater Monitoring

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Alpha Analytical Number: BMI11051902-02A
Client I.D. Number: MW-26-1

Sampled: 05/18/11 08:53
Received: 05/19/11
Extracted: 05/25/11 14:52
Analyzed: 05/25/11 14:52

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		0.50	µg/L	36	1,1,1,2-Tetrachloroethane	ND		0.50	µg/L
2	Chloromethane	ND		1.0	µg/L	37	Chlorobenzene	ND		0.50	µg/L
3	Vinyl chloride	ND		0.50	µg/L	38	Ethylbenzene	ND		0.50	µg/L
4	Chloroethane	ND		0.50	µg/L	39	m,p-Xylene	ND		0.50	µg/L
5	Bromomethane	ND		1.0	µg/L	40	Bromoform	ND		0.50	µg/L
6	Trichlorofluoromethane	ND		0.50	µg/L	41	Styrene	ND		0.50	µg/L
7	1,1-Dichloroethene	ND		0.50	µg/L	42	o-Xylene	ND		0.50	µg/L
8	Dichloromethane	ND		1.0	µg/L	43	1,1,2,2-Tetrachloroethane	ND		0.50	µg/L
9	Freon-113	ND		0.50	µg/L	44	1,2,3-Trichloropropane	ND		1.0	µg/L
10	trans-1,2-Dichloroethene	ND		0.50	µg/L	45	Isopropylbenzene	ND		0.50	µg/L
11	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	46	Bromobenzene	ND		0.50	µg/L
12	1,1-Dichloroethane	ND		0.50	µg/L	47	n-Propylbenzene	ND		0.50	µg/L
13	2-Butanone (MEK)	ND		10	µg/L	48	4-Chlorotoluene	ND		0.50	µg/L
14	cis-1,2-Dichloroethene	ND		0.50	µg/L	49	2-Chlorotoluene	ND		0.50	µg/L
15	Bromochloromethane	ND		0.50	µg/L	50	1,3,5-Trimethylbenzene	ND		0.50	µg/L
16	Chloroform	ND		0.50	µg/L	51	tert-Butylbenzene	ND		0.50	µg/L
17	2,2-Dichloropropane	ND		0.50	µg/L	52	1,2,4-Trimethylbenzene	ND		0.50	µg/L
18	1,2-Dichloroethane	ND		0.50	µg/L	53	sec-Butylbenzene	ND		0.50	µg/L
19	1,1,1-Trichloroethane	ND		0.50	µg/L	54	1,3-Dichlorobenzene	ND		0.50	µg/L
20	1,1-Dichloropropene	ND		0.50	µg/L	55	1,4-Dichlorobenzene	ND		0.50	µg/L
21	Carbon tetrachloride	ND		0.50	µg/L	56	4-Isopropyltoluene	ND		0.50	µg/L
22	Benzene	ND		0.50	µg/L	57	1,2-Dichlorobenzene	ND		0.50	µg/L
23	Dibromomethane	ND		0.50	µg/L	58	n-Butylbenzene	ND		0.50	µg/L
24	1,2-Dichloropropane	ND		0.50	µg/L	59	1,2-Dibromo-3-chloropropane (DBCP)	ND		2.5	µg/L
25	Trichloroethene	ND		0.50	µg/L	60	1,2,4-Trichlorobenzene	ND		1.0	µg/L
26	Bromodichloromethane	ND		0.50	µg/L	61	Naphthalene	ND	Q	1.0	µg/L
27	4-Methyl-2-pentanone (MIBK)	ND		2.5	µg/L	62	Hexachlorobutadiene	ND		1.0	µg/L
28	cis-1,3-Dichloropropene	ND		0.50	µg/L	63	1,2,3-Trichlorobenzene	ND		1.0	µg/L
29	trans-1,3-Dichloropropene	ND		0.50	µg/L	64	Surr: 1,2-Dichloroethane-d4	101		(70-130)	%REC
30	1,1,2-Trichloroethane	ND		0.50	µg/L	65	Surr: Toluene-d8	103		(70-130)	%REC
31	Toluene	ND		0.50	µg/L	66	Surr: 4-Bromofluorobenzene	93		(70-130)	%REC
32	1,3-Dichloropropane	ND		0.50	µg/L						
33	Dibromochloromethane	ND		0.50	µg/L						
34	1,2-Dibromoethane (EDB)	ND		1.0	µg/L						
35	Tetrachloroethene	0.88		0.50	µg/L						

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

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Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Alpha Analytical Number: BMI11051902-03A
Client I.D. Number: EB-14-5/18/11

Sampled: 05/18/11 08:41
Received: 05/19/11
Extracted: 05/25/11 11:37
Analyzed: 05/25/11 11:37

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		0.50	µg/L	36	1,1,1,2-Tetrachloroethane	ND		0.50	µg/L
2	Chloromethane	ND		1.0	µg/L	37	Chlorobenzene	ND		0.50	µg/L
3	Vinyl chloride	ND		0.50	µg/L	38	Ethylbenzene	ND		0.50	µg/L
4	Chloroethane	ND		0.50	µg/L	39	m,p-Xylene	ND		0.50	µg/L
5	Bromomethane	ND		1.0	µg/L	40	Bromoform	ND		0.50	µg/L
6	Trichlorofluoromethane	ND		0.50	µg/L	41	Styrene	ND		0.50	µg/L
7	1,1-Dichloroethene	ND		0.50	µg/L	42	o-Xylene	ND		0.50	µg/L
8	Dichloromethane	ND		1.0	µg/L	43	1,1,2,2-Tetrachloroethane	ND		0.50	µg/L
9	Freon-113	ND		0.50	µg/L	44	1,2,3-Trichloropropane	ND		1.0	µg/L
10	trans-1,2-Dichloroethene	ND		0.50	µg/L	45	Isopropylbenzene	ND		0.50	µg/L
11	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	46	Bromobenzene	ND		0.50	µg/L
12	1,1-Dichloroethane	ND		0.50	µg/L	47	n-Propylbenzene	ND		0.50	µg/L
13	2-Butanone (MEK)	ND		10	µg/L	48	4-Chlorotoluene	ND		0.50	µg/L
14	cis-1,2-Dichloroethene	ND		0.50	µg/L	49	2-Chlorotoluene	ND		0.50	µg/L
15	Bromochloromethane	ND		0.50	µg/L	50	1,3,5-Trimethylbenzene	ND		0.50	µg/L
16	Chloroform	ND		0.50	µg/L	51	tert-Butylbenzene	ND		0.50	µg/L
17	2,2-Dichloropropane	ND		0.50	µg/L	52	1,2,4-Trimethylbenzene	ND		0.50	µg/L
18	1,2-Dichloroethane	ND		0.50	µg/L	53	sec-Butylbenzene	ND		0.50	µg/L
19	1,1,1-Trichloroethane	ND		0.50	µg/L	54	1,3-Dichlorobenzene	ND		0.50	µg/L
20	1,1-Dichloropropene	ND		0.50	µg/L	55	1,4-Dichlorobenzene	ND		0.50	µg/L
21	Carbon tetrachloride	ND		0.50	µg/L	56	4-Isopropyltoluene	ND		0.50	µg/L
22	Benzene	ND		0.50	µg/L	57	1,2-Dichlorobenzene	ND		0.50	µg/L
23	Dibromomethane	ND		0.50	µg/L	58	n-Butylbenzene	ND		0.50	µg/L
24	1,2-Dichloropropane	ND		0.50	µg/L	59	1,2-Dibromo-3-chloropropane (DBCP)	ND		2.5	µg/L
25	Trichloroethene	ND		0.50	µg/L	60	1,2,4-Trichlorobenzene	ND		1.0	µg/L
26	Bromodichloromethane	ND		0.50	µg/L	61	Naphthalene	ND	Q	1.0	µg/L
27	4-Methyl-2-pentanone (MIBK)	ND		2.5	µg/L	62	Hexachlorobutadiene	ND		1.0	µg/L
28	cis-1,3-Dichloropropene	ND		0.50	µg/L	63	1,2,3-Trichlorobenzene	ND		1.0	µg/L
29	trans-1,3-Dichloropropene	ND		0.50	µg/L	64	Surr: 1,2-Dichloroethane-d4	102		(70-130)	%REC
30	1,1,2-Trichloroethane	ND		0.50	µg/L	65	Surr: Toluene-d8	102		(70-130)	%REC
31	Toluene	ND		0.50	µg/L	66	Surr: 4-Bromofluorobenzene	90		(70-130)	%REC
32	1,3-Dichloropropane	ND		0.50	µg/L						
33	Dibromochloromethane	ND		0.50	µg/L						
34	1,2-Dibromoethane (EDB)	ND		1.0	µg/L						
35	Tetrachloroethene	ND		0.50	µg/L						

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

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Job: G005862/JPL Groundwater Monitoring

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Alpha Analytical Number: BMI11051902-04A
Client I.D. Number: TB-14-5/18/11

Sampled: 05/18/11 00:00
Received: 05/19/11
Extracted: 05/25/11 11:15
Analyzed: 05/25/11 11:15

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		0.50	µg/L	36	1,1,1,2-Tetrachloroethane	ND		0.50	µg/L
2	Chloromethane	ND		1.0	µg/L	37	Chlorobenzene	ND		0.50	µg/L
3	Vinyl chloride	ND		0.50	µg/L	38	Ethylbenzene	ND		0.50	µg/L
4	Chloroethane	ND		0.50	µg/L	39	m,p-Xylene	ND		0.50	µg/L
5	Bromomethane	ND		1.0	µg/L	40	Bromoform	ND		0.50	µg/L
6	Trichlorofluoromethane	ND		0.50	µg/L	41	Styrene	ND		0.50	µg/L
7	1,1-Dichloroethene	ND		0.50	µg/L	42	o-Xylene	ND		0.50	µg/L
8	Dichloromethane	ND		1.0	µg/L	43	1,1,2,2-Tetrachloroethane	ND		0.50	µg/L
9	Freon-113	ND		0.50	µg/L	44	1,2,3-Trichloropropane	ND		1.0	µg/L
10	trans-1,2-Dichloroethene	ND		0.50	µg/L	45	Isopropylbenzene	ND		0.50	µg/L
11	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	46	Bromobenzene	ND		0.50	µg/L
12	1,1-Dichloroethane	ND		0.50	µg/L	47	n-Propylbenzene	ND		0.50	µg/L
13	2-Butanone (MEK)	ND		10	µg/L	48	4-Chlorotoluene	ND		0.50	µg/L
14	cis-1,2-Dichloroethene	ND		0.50	µg/L	49	2-Chlorotoluene	ND		0.50	µg/L
15	Bromochloromethane	ND		0.50	µg/L	50	1,3,5-Trimethylbenzene	ND		0.50	µg/L
16	Chloroform	ND		0.50	µg/L	51	tert-Butylbenzene	ND		0.50	µg/L
17	2,2-Dichloropropane	ND		0.50	µg/L	52	1,2,4-Trimethylbenzene	ND		0.50	µg/L
18	1,2-Dichloroethane	ND		0.50	µg/L	53	sec-Butylbenzene	ND		0.50	µg/L
19	1,1,1-Trichloroethane	ND		0.50	µg/L	54	1,3-Dichlorobenzene	ND		0.50	µg/L
20	1,1-Dichloropropene	ND		0.50	µg/L	55	1,4-Dichlorobenzene	ND		0.50	µg/L
21	Carbon tetrachloride	ND		0.50	µg/L	56	4-Isopropyltoluene	ND		0.50	µg/L
22	Benzene	ND		0.50	µg/L	57	1,2-Dichlorobenzene	ND		0.50	µg/L
23	Dibromomethane	ND		0.50	µg/L	58	n-Butylbenzene	ND		0.50	µg/L
24	1,2-Dichloropropane	ND		0.50	µg/L	59	1,2-Dibromo-3-chloropropane (DBCP)	ND		2.5	µg/L
25	Trichloroethene	ND		0.50	µg/L	60	1,2,4-Trichlorobenzene	ND		1.0	µg/L
26	Bromodichloromethane	ND		0.50	µg/L	61	Naphthalene	ND	Q	1.0	µg/L
27	4-Methyl-2-pentanone (MIBK)	ND		2.5	µg/L	62	Hexachlorobutadiene	ND		1.0	µg/L
28	cis-1,3-Dichloropropene	ND		0.50	µg/L	63	1,2,3-Trichlorobenzene	ND		1.0	µg/L
29	trans-1,3-Dichloropropene	ND		0.50	µg/L	64	Surr: 1,2-Dichloroethane-d4	99		(70-130)	%REC
30	1,1,2-Trichloroethane	ND		0.50	µg/L	65	Surr: Toluene-d8	101		(70-130)	%REC
31	Toluene	ND		0.50	µg/L	66	Surr: 4-Bromofluorobenzene	93		(70-130)	%REC
32	1,3-Dichloropropane	ND		0.50	µg/L						
33	Dibromochloromethane	ND		0.50	µg/L						
34	1,2-Dibromoethane (EDB)	ND		1.0	µg/L						
35	Tetrachloroethene	ND		0.50	µg/L						

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Alpha certifies that the test results meet all requirements of NELAC unless footnoted otherwise.

Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

6/2/11
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

VOC Sample Preservation Report

Work Order: BMI11051902 **Job:** G005862/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	pH
11051902-01A	MW-26-2	Aqueous	2
11051902-02A	MW-26-1	Aqueous	2
11051902-03A	EB-14-5/18/11	Aqueous	2
11051902-04A	TB-14-5/18/11	Aqueous	2

6/2/11
Report Date

Alpha Analytical, Inc.

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Date: *02-Jun-11*

QC Summary Report

Work Order: 11051902

Method Blank

Type: **MBLK** Test Code: **EPA Method 300.0**

File ID: **21** Batch ID: **26573** Analysis Date: **05/19/2011 11:55**

Sample ID: **MB-26573** Units : **mg/L** Run ID: **IC_1_110519B** Prep Date: **05/19/2011 12:07**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	ND	0.5								
Nitrite (NO2) - N	ND	0.25								
Nitrate (NO3) - N	ND	0.25								
Phosphate, ortho - P	ND	0.5								
Sulfate (SO4)	ND	0.5								

Laboratory Fortified Blank

Type: **LFB** Test Code: **EPA Method 300.0**

File ID: **22** Batch ID: **26573** Analysis Date: **05/19/2011 12:13**

Sample ID: **LFB-26573** Units : **mg/L** Run ID: **IC_1_110519B** Prep Date: **05/19/2011 12:07**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	50	0.5	50		100	90	110			
Nitrite (NO2) - N	5.32	0.25	5		106	90	110			
Nitrate (NO3) - N	4.99	0.25	5		99.7	90	110			
Phosphate, ortho - P	5.43	0.5	5		109	90	110			
Sulfate (SO4)	99.8	0.5	100		99.8	90	110			

Sample Matrix Spike

Type: **LFM** Test Code: **EPA Method 300.0**

File ID: **28** Batch ID: **26573** Analysis Date: **05/19/2011 14:04**

Sample ID: **11051902-01ALFM** Units : **mg/L** Run ID: **IC_1_110519B** Prep Date: **05/19/2011 12:07**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	122	0.5	100	21.22	101	80	120			
Nitrite (NO2) - N	10.9	0.25	10	0	109	80	120			
Nitrate (NO3) - N	11	0.25	10	0.7795	103	80	120			
Phosphate, ortho - P	11.6	0.5	10	0	116	80	120			
Sulfate (SO4)	204	0.5	200	16.77	94	80	120			

Sample Matrix Spike Duplicate

Type: **LFMD** Test Code: **EPA Method 300.0**

File ID: **29** Batch ID: **26573** Analysis Date: **05/19/2011 14:23**

Sample ID: **11051902-01ALFMD** Units : **mg/L** Run ID: **IC_1_110519B** Prep Date: **05/19/2011 12:07**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	123	0.5	100	21.22	102	80	120	122.5	0.3(15)	
Nitrite (NO2) - N	11	0.25	10	0	110	80	120	10.94	0.7(15)	
Nitrate (NO3) - N	11.2	0.25	10	0.7795	104	80	120	11.03	1.4(15)	
Phosphate, ortho - P	11.9	0.5	10	0	119	80	120	11.57	2.7(15)	
Sulfate (SO4)	205	0.5	200	16.77	94	80	120	204.4	0.5(15)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

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Date: *01-Jun-11*

QC Summary Report

Work Order: 11051902

Method Blank

Type: **MBLK** Test Code: **EPA Method 314.0**

File ID: **14** Batch ID: **26574** Analysis Date: **05/19/2011 13:06**

Sample ID: **MB-26574** Units : **µg/L** Run ID: **IC_3_110519A** Prep Date: **05/19/2011 12:10**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	ND	1								

Laboratory Fortified Blank

Type: **LFB** Test Code: **EPA Method 314.0**

File ID: **15** Batch ID: **26574** Analysis Date: **05/19/2011 13:25**

Sample ID: **LFB-26574** Units : **µg/L** Run ID: **IC_3_110519A** Prep Date: **05/19/2011 12:10**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	23.4	2	25		94	85	115			

Sample Matrix Spike

Type: **LFM** Test Code: **EPA Method 314.0**

File ID: **20** Batch ID: **26574** Analysis Date: **05/19/2011 14:57**

Sample ID: **11051702-01ALFM** Units : **µg/L** Run ID: **IC_3_110519A** Prep Date: **05/19/2011 12:10**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	24.1	2	25	0	96	80	120			

Sample Matrix Spike Duplicate

Type: **LFMD** Test Code: **EPA Method 314.0**

File ID: **21** Batch ID: **26574** Analysis Date: **05/19/2011 15:15**

Sample ID: **11051702-01ALFMD** Units : **µg/L** Run ID: **IC_3_110519A** Prep Date: **05/19/2011 12:10**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	25.1	2	25	0	100	80	120	24.12	4.0(15)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *23-May-11*

QC Summary Report

Work Order: 11051902

Laboratory Control Spike Type **LCS** Test Code: **SM2320B**

File ID: Batch ID: **W0520AL** Analysis Date: **05/20/2011 14:40**

Sample ID: **LCS-W0520AL** Units : **mg/L** Run ID: **WETLAB_110520D** Prep Date: **05/20/2011 14:40**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Alkalinity, Bicarbonate (As CaCO3)	250.4	10	250		100	80	120			
Alkalinity, Carbonate (As CaCO3)	250.4	10	250		100	80	120			
Alkalinity, Total (As CaCO3 at pH 4.5)	250	10	250		100	80	120			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *24-May-11*

QC Summary Report

Work Order: 11051902

Method Blank

Type **MBLK** Test Code: **EPA Method 200.8**

File ID: **051911.B\115_M.D** Batch ID: **26580** Analysis Date: **05/19/2011 19:42**

Sample ID: **MB-26580** Units : **mg/L** Run ID: **ICP/MS_110519E** Prep Date: **05/19/2011 15:01**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Sodium (Na)	ND	0.5								
Magnesium (Mg)	ND	0.5								
Potassium (K)	ND	0.5								
Calcium (Ca)	ND	0.5								
Chromium (Cr)	ND	0.005								
Iron (Fe)	ND	0.3								
Arsenic (As)	ND	0.002								
Lead (Pb)	ND	0.005								

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method 200.8**

File ID: **051911.B\116_M.D** Batch ID: **26580** Analysis Date: **05/19/2011 19:47**

Sample ID: **LCS-26580** Units : **mg/L** Run ID: **ICP/MS_110519E** Prep Date: **05/19/2011 15:01**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Sodium (Na)	4.55	0.5	5		91	85	115			
Magnesium (Mg)	4.67	0.5	5		93	85	115			
Potassium (K)	5.03	0.5	5		101	85	115			
Calcium (Ca)	4.99	0.5	5		99.8	85	115			
Chromium (Cr)	0.0508	0.005	0.05		102	85	115			
Iron (Fe)	5.23	0.3	5		105	85	115			
Arsenic (As)	0.0497	0.002	0.05		99	85	115			
Lead (Pb)	0.0469	0.005	0.05		94	85	115			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method 200.8**

File ID: **051911.B\121_M.D** Batch ID: **26580** Analysis Date: **05/19/2011 20:15**

Sample ID: **11051802-01AMS** Units : **mg/L** Run ID: **ICP/MS_110519E** Prep Date: **05/19/2011 15:01**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Sodium (Na)	60.8	0.5	5	58.11	54	70	130			M3
Magnesium (Mg)	11.7	0.5	5	7.156	91	70	130			
Potassium (K)	7.05	0.5	5	2.057	99.9	70	130			
Calcium (Ca)	17.7	0.5	5	12.81	98	70	130			
Chromium (Cr)	0.0509	0.005	0.05	0	102	70	130			
Iron (Fe)	5.16	0.3	5	0	103	70	130			
Arsenic (As)	0.0526	0.002	0.05	0	105	70	130			
Lead (Pb)	0.0545	0.005	0.05	0	109	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method 200.8**

File ID: **051911.B\122_M.D** Batch ID: **26580** Analysis Date: **05/19/2011 20:21**

Sample ID: **11051802-01AMSD** Units : **mg/L** Run ID: **ICP/MS_110519E** Prep Date: **05/19/2011 15:01**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Sodium (Na)	60.6	0.5	5	58.11	50	70	130	60.83	0.4(20)	M3
Magnesium (Mg)	11.5	0.5	5	7.156	86	70	130	11.72	2.2(20)	
Potassium (K)	6.72	0.5	5	2.057	93	70	130	7.053	4.9(20)	
Calcium (Ca)	17.7	0.5	5	12.81	97	70	130	17.72	0.2(20)	
Chromium (Cr)	0.0493	0.005	0.05	0	99	70	130	0.05093	3.2(20)	
Iron (Fe)	4.9	0.3	5	0	98	70	130	5.155	5.1(20)	
Arsenic (As)	0.0504	0.002	0.05	0	101	70	130	0.0526	4.3(20)	
Lead (Pb)	0.0456	0.005	0.05	0	91	70	130	0.05448	17.8(20)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

M3 = The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to the spike level. The method control sample recovery was acceptable.

Alpha Analytical, Inc.

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Date: *23-May-11*

QC Summary Report

Work Order: 11051902

Laboratory Control Spike Type **LCS** Test Code: **EPA Method 150.1 / SM4500HB / SW9040C**

File ID: Batch ID: **W0519PH** Analysis Date: **05/19/2011 15:08**

Sample ID: **LCS-W0519PH** Units : **pH Units** Run ID: **WETLAB_110519A** Prep Date: **05/19/2011 15:08**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
pH	5.1	1.7	5		102	90	110			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *27-May-11*

QC Summary Report

Work Order: 11051902

Method Blank

Type **MBLK** Test Code: **SM2540C**

File ID: Batch ID: **W0520DS** Analysis Date: **05/25/2011 00:00**

Sample ID: **MBLK-W0520DS** Units : **mg/L** Run ID: **WETLAB_110520G** Prep Date: **05/25/2011 00:00**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Solids, Total Dissolved (TDS)	ND	10								

Laboratory Control Spike

Type **LCS** Test Code: **SM2540C**

File ID: Batch ID: **W0520DS** Analysis Date: **05/25/2011 00:00**

Sample ID: **LCS-W0520DS** Units : **mg/L** Run ID: **WETLAB_110520G** Prep Date: **05/25/2011 00:00**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Solids, Total Dissolved (TDS)	100	10	100		100	70	130			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *01-Jun-2011*

QC Summary Report

Work Order: 11051902

Method Blank Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **11052506.D** Batch ID: **MS15W0525M** Analysis Date: **05/25/2011 09:49**

Sample ID: **MBLK MS15W0525M** Units : **µg/L** Run ID: **MSD_15_110525D** Prep Date: **05/25/2011 09:49**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	ND	0.5								
Chloromethane	ND	1								
Vinyl chloride	ND	0.5								
Chloroethane	ND	0.5								
Bromomethane	ND	1								
Trichlorofluoromethane	ND	0.5								
1,1-Dichloroethene	ND	0.5								
Dichloromethane	ND	1								
Freon-113	ND	0.5								
trans-1,2-Dichloroethene	ND	0.5								
Methyl tert-butyl ether (MTBE)	ND	0.5								
1,1-Dichloroethane	ND	0.5								
2-Butanone (MEK)	ND	10								
cis-1,2-Dichloroethene	ND	0.5								
Bromochloromethane	ND	0.5								
Chloroform	ND	0.5								
2,2-Dichloropropane	ND	0.5								
1,2-Dichloroethane	ND	0.5								
1,1,1-Trichloroethane	ND	0.5								
1,1-Dichloropropene	ND	0.5								
Carbon tetrachloride	ND	0.5								
Benzene	ND	0.5								
Dibromomethane	ND	0.5								
1,2-Dichloropropane	ND	0.5								
Trichloroethene	ND	0.5								
Bromodichloromethane	ND	0.5								
4-Methyl-2-pentanone (MIBK)	ND	2.5								
cis-1,3-Dichloropropene	ND	0.5								
trans-1,3-Dichloropropene	ND	0.5								
1,1,2-Trichloroethane	ND	0.5								
Toluene	ND	0.5								
1,3-Dichloropropane	ND	0.5								
Dibromochloromethane	ND	0.5								
1,2-Dibromoethane (EDB)	ND	1								
Tetrachloroethene	ND	0.5								
1,1,1,2-Tetrachloroethane	ND	0.5								
Chlorobenzene	ND	0.5								
Ethylbenzene	ND	0.5								
m,p-Xylene	ND	0.5								
Bromoform	ND	0.5								
Styrene	ND	0.5								
o-Xylene	ND	0.5								
1,1,2,2-Tetrachloroethane	ND	0.5								
1,2,3-Trichloropropane	ND	1								
Isopropylbenzene	ND	0.5								
Bromobenzene	ND	0.5								
n-Propylbenzene	ND	0.5								
4-Chlorotoluene	ND	0.5								
2-Chlorotoluene	ND	0.5								
1,3,5-Trimethylbenzene	ND	0.5								
tert-Butylbenzene	ND	0.5								
1,2,4-Trimethylbenzene	ND	0.5								
sec-Butylbenzene	ND	0.5								
1,3-Dichlorobenzene	ND	0.5								
1,4-Dichlorobenzene	ND	0.5								
4-Isopropyltoluene	ND	0.5								
1,2-Dichlorobenzene	ND	0.5								
n-Butylbenzene	ND	0.5								
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5								
1,2,4-Trichlorobenzene	ND	1								
Naphthalene	ND	1								
Hexachlorobutadiene	ND	1								
1,2,3-Trichlorobenzene	ND	1								
Surr: 1,2-Dichloroethane-d4	9.74		10		97	70	130			
Surr: Toluene-d8	10.3		10		103	70	130			

Alpha Analytical, Inc.

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Date: *01-Jun-2011*

QC Summary Report

Work Order: 11051902

Surr: 4-Bromofluorobenzene	9.08	10	91	70	130	

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Date: 01-Jun-2011

QC Summary Report

Work Order: 11051902

Laboratory Control Spike Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **11052503.D** Batch ID: **MS15W0525M** Analysis Date: **05/25/2011 08:35**

Sample ID: **LCS MS15W0525M** Units : **µg/L** Run ID: **MSD_15_110525D** Prep Date: **05/25/2011 08:35**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	9.22	1	10		92	70	130			
Chloromethane	9.15	2	10		92	70	130			
Vinyl chloride	9.83	1	10		98	70	130			
Chloroethane	9.69	1	10		97	70	130			
Bromomethane	12.4	2	10		124	70	130			
Trichlorofluoromethane	11	1	10		110	70	130			
1,1-Dichloroethene	10.6	1	10		106	70	130			
Dichloromethane	9.86	2	10		99	70	130			
Freon-113	11.7	1	10		117	70	137			
trans-1,2-Dichloroethene	10.6	1	10		106	70	130			
Methyl tert-butyl ether (MTBE)	8.97	0.5	10		90	70	130			
1,1-Dichloroethane	9.71	1	10		97	70	130			
2-Butanone (MEK)	197	10	200		98	70	130			
cis-1,2-Dichloroethene	10.1	1	10		101	70	130			
Bromochloromethane	10.4	1	10		104	70	130			
Chloroform	10.2	1	10		102	70	130			
2,2-Dichloropropane	9.95	1	10		100	70	130			
1,2-Dichloroethane	9.56	1	10		96	70	130			
1,1,1-Trichloroethane	10.6	1	10		106	70	130			
1,1-Dichloropropene	10.4	1	10		104	70	130			
Carbon tetrachloride	10.7	1	10		107	70	130			
Benzene	9.75	0.5	10		98	70	130			
Dibromomethane	9.24	1	10		92	70	130			
1,2-Dichloropropane	9.4	1	10		94	70	130			
Trichloroethene	10.4	1	10		104	70	130			
Bromodichloromethane	9.6	1	10		96	70	130			
4-Methyl-2-pentanone (MIBK)	20.9	2.5	25		84	20	182			
cis-1,3-Dichloropropene	9.13	1	10		91	70	130			
trans-1,3-Dichloropropene	8.52	1	10		85	70	130			
1,1,2-Trichloroethane	8.69	1	10		87	70	130			
Toluene	10.3	0.5	10		103	70	130			
1,3-Dichloropropane	9.31	1	10		93	70	130			
Dibromochloromethane	9.11	1	10		91	70	130			
1,2-Dibromoethane (EDB)	20	2	20		99.8	70	130			
Tetrachloroethene	11.3	1	10		113	70	130			
1,1,1,2-Tetrachloroethane	10.1	1	10		101	70	130			
Chlorobenzene	10.2	1	10		102	70	130			
Ethylbenzene	10.3	0.5	10		103	70	130			
m,p-Xylene	10.5	0.5	10		105	70	130			
Bromoform	8.61	1	10		86	70	130			
Styrene	10.1	1	10		101	70	130			
o-Xylene	10.2	0.5	10		102	70	130			
1,1,2,2-Tetrachloroethane	8.45	1	10		85	70	130			
1,2,3-Trichloropropane	18.5	2	20		93	70	130			
Isopropylbenzene	9.67	1	10		97	70	130			
Bromobenzene	9.69	1	10		97	70	130			
n-Propylbenzene	9.85	1	10		99	70	130			
4-Chlorotoluene	10.1	1	10		101	70	130			
2-Chlorotoluene	9.76	1	10		98	70	130			
1,3,5-Trimethylbenzene	9.75	1	10		98	70	130			
tert-Butylbenzene	9.75	1	10		98	70	130			
1,2,4-Trimethylbenzene	9.61	1	10		96	70	130			
sec-Butylbenzene	10	1	10		100	70	130			
1,3-Dichlorobenzene	9.96	1	10		99.6	70	130			
1,4-Dichlorobenzene	9.43	1	10		94	70	130			
4-Isopropyltoluene	9.84	1	10		98	70	130			
1,2-Dichlorobenzene	9.2	1	10		92	70	130			
n-Butylbenzene	9.97	1	10		99.7	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	37.1	3	50		74	67	130			
1,2,4-Trichlorobenzene	9.89	2	10		99	70	130			
Naphthalene	6.72	2	10		67	70(70)	130			L50
Hexachlorobutadiene	19.7	2	20		98	70	130			
1,2,3-Trichlorobenzene	9.37	2	10		94	70	130			
Surr: 1,2-Dichloroethane-d4	9.71		10		97	70	130			
Surr: Toluene-d8	10.3		10		103	70	130			

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *01-Jun-2011*

QC Summary Report

Work Order: 11051902

Surr: 4-Bromofluorobenzene	9.51	10	95	70	130	

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Date: *01-Jun-2011*

QC Summary Report

Work Order: 11051902

Sample Matrix Spike Type **MS** Test Code: **EPA Method SW8260B**

File ID: **11052507.D** Batch ID: **MS15W0525M** Analysis Date: **05/25/2011 10:11**

Sample ID: **11051902-01AMS** Units : **µg/L** Run ID: **MSD_15_110525D** Prep Date: **05/25/2011 10:11**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	51.8	2.5	50	0	104	21	138			
Chloromethane	47.8	10	50	0	96	23	144			
Vinyl chloride	57.6	2.5	50	0	115	49	136			
Chloroethane	51.2	2.5	50	0	102	21	159			
Bromomethane	74.6	10	50	0	149	10	174			
Trichlorofluoromethane	61.2	2.5	50	0	122	32	154			
1,1-Dichloroethene	54.7	2.5	50	0	109	64	130			
Dichloromethane	49.9	10	50	0	99.8	69	130			
Freon-113	59.1	2.5	50	0	118	55	141			
trans-1,2-Dichloroethene	53.3	2.5	50	0	107	63	130			
Methyl tert-butyl ether (MTBE)	49.1	1.3	50	0	98	47	150			
1,1-Dichloroethane	49.5	2.5	50	0	99	66	130			
2-Butanone (MEK)	723	50	1000	0	72	23	182			
cis-1,2-Dichloroethene	51.2	2.5	50	0	102	70	130			
Bromochloromethane	54.2	2.5	50	0	108	70	132			
Chloroform	51.7	2.5	50	0	103	70	130			
2,2-Dichloropropane	49.4	2.5	50	0	99	38	154			
1,2-Dichloroethane	51.8	2.5	50	0	104	65	134			
1,1,1-Trichloroethane	52.4	2.5	50	0	105	65	136			
1,1-Dichloropropene	53.3	2.5	50	0	107	68	132			
Carbon tetrachloride	54.7	2.5	50	0	109	58	148			
Benzene	49.2	1.3	50	0	98	59	138			
Dibromomethane	50.2	2.5	50	0	100	70	130			
1,2-Dichloropropane	48.2	2.5	50	0	96	70	131			
Trichloroethene	51.7	2.5	50	0	103	65	144			
Bromodichloromethane	50.4	2.5	50	0	101	50	157			
4-Methyl-2-pentanone (MIBK)	109	13	125	0	87	20	182			
cis-1,3-Dichloropropene	47.4	2.5	50	0	95	63	131			
trans-1,3-Dichloropropene	45.4	2.5	50	0	91	65	136			
1,1,2-Trichloroethane	47.1	2.5	50	0	94	70	131			
Toluene	50.4	1.3	50	0	101	68	130			
1,3-Dichloropropane	48.7	2.5	50	0	97	70	130			
Dibromochloromethane	48.1	2.5	50	0	96	42	155			
1,2-Dibromoethane (EDB)	103	5	100	0	103	70	130			
Tetrachloroethene	54.1	2.5	50	0	108	65	130			
1,1,1,2-Tetrachloroethane	51.2	2.5	50	0	102	70	130			
Chlorobenzene	51	2.5	50	0	102	70	130			
Ethylbenzene	50.5	1.3	50	0	101	68	130			
m,p-Xylene	51.9	1.3	50	0	104	68	131			
Bromoform	46.2	2.5	50	0	92	65	143			
Styrene	50.7	2.5	50	0	101	59	153			
o-Xylene	51	1.3	50	0	102	70	130			
1,1,2,2-Tetrachloroethane	45.1	2.5	50	0	90	67	130			
1,2,3-Trichloropropane	98.1	10	100	0	98	70	130			
Isopropylbenzene	47.1	2.5	50	0	94	55	138			
Bromobenzene	47.8	2.5	50	0	96	70	130			
n-Propylbenzene	48.6	2.5	50	0	97	67	133			
4-Chlorotoluene	49.6	2.5	50	0	99	70	130			
2-Chlorotoluene	47.4	2.5	50	0	95	70	130			
1,3,5-Trimethylbenzene	47.8	2.5	50	0	96	67	134			
tert-Butylbenzene	47.9	2.5	50	0	96	55	147			
1,2,4-Trimethylbenzene	47.2	2.5	50	0	94	65	135			
sec-Butylbenzene	50.1	2.5	50	0	100	68	135			
1,3-Dichlorobenzene	49.5	2.5	50	0	99	70	130			
1,4-Dichlorobenzene	47	2.5	50	0	94	70	130			
4-Isopropyltoluene	48.3	2.5	50	0	97	68	132			
1,2-Dichlorobenzene	46.1	2.5	50	0	92	70	130			
n-Butylbenzene	49.1	2.5	50	0	98	62	134			
1,2-Dibromo-3-chloropropane (DBCP)	196	15	250	0	78	64	130			
1,2,4-Trichlorobenzene	47.3	10	50	0	95	62	133			
Naphthalene	30.8	10	50	0	62	32	166			
Hexachlorobutadiene	94.8	10	100	0	95	63	130			
1,2,3-Trichlorobenzene	43.4	10	50	0	87	55	138			
Surr: 1,2-Dichloroethane-d4	49.2		50		98	70	130			
Surr: Toluene-d8	49.5		50		99	70	130			

Alpha Analytical, Inc.

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Date: *01-Jun-2011*

QC Summary Report

Work Order: 11051902

Surr: 4-Bromofluorobenzene	46.7	50	93	70	130	

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Date: 01-Jun-2011

QC Summary Report

Work Order: 11051902

Sample Matrix Spike Duplicate Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **11052508.D** Batch ID: **MS15W0525M** Analysis Date: **05/25/2011 10:32**

Sample ID: **11051902-01AMSD** Units : **µg/L** Run ID: **MSD_15_110525D** Prep Date: **05/25/2011 10:32**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	48.2	2.5	50	0	96	21	138	51.81	7.3(33)	
Chloromethane	44.6	10	50	0	89	23	144	47.78	6.9(27)	
Vinyl chloride	54.3	2.5	50	0	109	49	136	57.55	5.9(21)	
Chloroethane	48	2.5	50	0	96	21	159	51.19	6.4(40)	
Bromomethane	79.2	10	50	0	158	10	174	74.62	6.0(40)	
Trichlorofluoromethane	58.3	2.5	50	0	117	32	154	61.16	4.8(37)	
1,1-Dichloroethene	51.3	2.5	50	0	103	64	130	54.73	6.4(21)	
Dichloromethane	46.2	10	50	0	92	69	130	49.88	7.7(20)	
Freon-113	55.8	2.5	50	0	112	55	141	59.13	5.8(40)	
trans-1,2-Dichloroethene	50	2.5	50	0	100	63	130	53.3	6.4(20)	
Methyl tert-butyl ether (MTBE)	47.4	1.3	50	0	95	47	150	49.14	3.7(40)	
1,1-Dichloroethane	45.9	2.5	50	0	92	66	130	49.49	7.5(20)	
2-Butanone (MEK)	689	50	1000	0	69	23	182	722.7	4.8(22)	
cis-1,2-Dichloroethene	48.6	2.5	50	0	97	70	130	51.17	5.2(20)	
Bromochloromethane	49.8	2.5	50	0	99.6	70	132	54.2	8.4(20)	
Chloroform	48	2.5	50	0	96	70	130	51.67	7.3(20)	
2,2-Dichloropropane	46.2	2.5	50	0	92	38	154	49.42	6.8(22)	
1,2-Dichloroethane	47.5	2.5	50	0	95	65	134	51.75	8.7(20)	
1,1,1-Trichloroethane	49.9	2.5	50	0	99.8	65	136	52.42	4.9(20)	
1,1-Dichloropropene	49.7	2.5	50	0	99	68	132	53.33	7.0(20)	
Carbon tetrachloride	52.6	2.5	50	0	105	58	148	54.65	3.8(20)	
Benzene	45.8	1.3	50	0	92	59	138	49.15	7.0(21)	
Dibromomethane	46.9	2.5	50	0	94	70	130	50.18	6.7(20)	
1,2-Dichloropropane	45.4	2.5	50	0	91	70	131	48.19	5.9(20)	
Trichloroethene	48.8	2.5	50	0	98	65	144	51.72	5.7(20)	
Bromodichloromethane	47.6	2.5	50	0	95	50	157	50.41	5.7(20)	
4-Methyl-2-pentanone (MIBK)	103	13	125	0	82	20	182	109.3	5.9(20)	
cis-1,3-Dichloropropene	44.1	2.5	50	0	88	63	131	47.43	7.3(20)	
trans-1,3-Dichloropropene	43.1	2.5	50	0	86	65	136	45.39	5.1(20)	
1,1,2-Trichloroethane	44.7	2.5	50	0	89	70	131	47.06	5.3(20)	
Toluene	48.9	1.3	50	0	98	68	130	50.41	3.1(20)	
1,3-Dichloropropane	47.1	2.5	50	0	94	70	130	48.68	3.4(20)	
Dibromochloromethane	48.1	2.5	50	0	96	42	155	48.12	0.1(20)	
1,2-Dibromoethane (EDB)	102	5	100	0	102	70	130	102.8	1.1(20)	
Tetrachloroethene	53.1	2.5	50	0	106	65	130	54.14	1.9(20)	
1,1,1,2-Tetrachloroethane	50	2.5	50	0	99.9	70	130	51.22	2.5(20)	
Chlorobenzene	49.3	2.5	50	0	99	70	130	51.01	3.4(20)	
Ethylbenzene	49.2	1.3	50	0	98	68	130	50.49	2.6(20)	
m,p-Xylene	51	1.3	50	0	102	68	131	51.94	1.9(20)	
Bromoform	46.1	2.5	50	0	92	65	143	46.16	0.1(20)	
Styrene	49.8	2.5	50	0	99.6	59	153	50.69	1.8(37)	
o-Xylene	49.4	1.3	50	0	99	70	130	51.01	3.1(20)	
1,1,2,2-Tetrachloroethane	45	2.5	50	0	90	67	130	45.12	0.3(20)	
1,2,3-Trichloropropane	96.3	10	100	0	96	70	130	98.11	1.9(20)	
Isopropylbenzene	45.5	2.5	50	0	91	55	138	47.05	3.3(20)	
Bromobenzene	46.7	2.5	50	0	93	70	130	47.83	2.3(20)	
n-Propylbenzene	46.8	2.5	50	0	94	67	133	48.59	3.7(30)	
4-Chlorotoluene	47.8	2.5	50	0	96	70	130	49.57	3.7(20)	
2-Chlorotoluene	46.7	2.5	50	0	93	70	130	47.42	1.6(20)	
1,3,5-Trimethylbenzene	46.2	2.5	50	0	92	67	134	47.8	3.5(21)	
tert-Butylbenzene	46.3	2.5	50	0	93	55	147	47.9	3.4(20)	
1,2,4-Trimethylbenzene	45.6	2.5	50	0	91	65	135	47.17	3.4(25)	
sec-Butylbenzene	47.8	2.5	50	0	96	68	135	50.09	4.7(20)	
1,3-Dichlorobenzene	47.9	2.5	50	0	96	70	130	49.5	3.3(20)	
1,4-Dichlorobenzene	45.6	2.5	50	0	91	70	130	47.02	3.1(20)	
4-Isopropyltoluene	46.8	2.5	50	0	94	68	132	48.28	3.0(20)	
1,2-Dichlorobenzene	45.3	2.5	50	0	91	70	130	46.08	1.7(20)	
n-Butylbenzene	47.3	2.5	50	0	95	62	134	49.1	3.8(21)	
1,2-Dibromo-3-chloropropane (DBCP)	190	15	250	0	76	64	130	195.8	3.3(20)	
1,2,4-Trichlorobenzene	46.3	10	50	0	93	62	133	47.26	2.0(29)	
Naphthalene	28.4	10	50	0	57	32	166	30.76	8.2(40)	
Hexachlorobutadiene	90.5	10	100	0	91	63	130	94.81	4.6(21)	
1,2,3-Trichlorobenzene	40	10	50	0	80	55	138	43.37	8.1(36)	
Surr: 1,2-Dichloroethane-d4	49.6		50		99	70	130			
Surr: Toluene-d8	51.4		50		103	70	130			

Alpha Analytical, Inc.

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Date: *01-Jun-2011*

QC Summary Report

Work Order: 11051902

Surr: 4-Bromofluorobenzene	46.9	50	94	70	130	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

L50 = Analyte recovery was below acceptance limits for the LCS, but was acceptable in the MS/MSD.

Billing Information :

CHAIN-OF-CUSTODY RECORD

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

CA

WorkOrder : BMIS11051902

Report Due By : 5:00 PM On : 03-Jun-2011

Client:
Battelle Memorial Institute
655 West Broadway
Suite 1420
San Diego, CA 92101

Report Attention	Phone Number	EMail Address
David Conner	(619) 726-7311 x	connerd@battelle.org
Betsy Cutie	(614) 424-4899 x	cutiee@batelle.org
Shane Walton	(614) 424-4117 x	waltons@battelle.org

EDD Required : **Yes**

Sampled by : Client

PO : 218013

Client's COC # : 29131 Job : G005862/JPL Groundwater Monitoring

Cooler Temp	Samples Received	Date Printed
3 °C	19-May-2011	**19-May-2011**

QC Level : DS4 = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests 300_0_W	314_W	ALKALINITY_W	METALS_DW	PH_W	TDS_W	VOC_TIC_W	VOC_W	Sample Remarks
BMI11051902-01A	MW-26-2	AQ	05/18/11 08:10	5	0	10	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11051902-02A	MW-26-1	AQ	05/18/11 08:53	5	0	10	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11051902-03A	EB-14-5/18/11	AQ	05/18/11 08:41	5	0	10	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11051902-04A	TB-14-5/18/11	AQ	05/18/11 00:00	1	0	10							VOC by 524 Criteria	VOC by 524 Criteria	Reno Trip Blank 4/6/11

Comments: No security seals. Frozen ice. Temp Blank #7280 received @ 3°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD). :

	Signature	Print Name	Company	Date/Time
Logged in by:	Elizabeth Adcox	Elizabeth Adcox	**Alpha Analytical, Inc.**	5-19-11 10:09

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information:

Name BATTELLE / GERALD TOMPKINS
Address 505 KING AVE
City, State, Zip COLUMBUS, OH 43201
Phone Number _____ Fax _____

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044
Fax (775) 355-0406

Samples Collected From Which State? AZ ___ CA X NV ___ WA ___ ID ___ OR ___ OTHER ___

29131

Page # 1 of 1

Client Name	P.O. #	Job #
BATTELLE / DAVID CONNER	218013	G005862
Address	**EMail Address**	
3990 OLD TOWN AVE. C-205	CONNERD@BATTELLE.ORG	
City, State, Zip	**Phone #**	**Fax #**
SAN DIEGO CA 92110	(619) 726-7311	(614) 458-6641

Report Attention: DAVID CONNER

Analyses Required

Required QC Level? I II (III) IV

EDD/EDF? YES X NO ___

Global ID # _____

Time Sampled	Date Sampled	Matrix* See Key Below	Sampled by / Lab ID Number (Office Use Only)	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	VOC's (5242)	Lead, Arsenic, Total Cr (200.8)	Cl, Br, F (314.0)	Na, K, Ca, Mg, Fe (200.8)	CO_3, HCO_3, TDS, pH, Alkalinity (SM2320B SM2540C, 150.2)	Cl^-, NO_3, SO_4, PO_4^{-3} (300.0)		REMARKS
810	5/18/11	AQ	BMI1105190201	MW-26-2	NORM		5	X	X	X	X	X	X		
853			.02	MW-26-1			5	X	X	X	X	X	X		
841			.03	EB-14-5/18/11			5	X	X	X	X	X	X		EQUIP BLANK
—			.04	TB-14-5/18/11			1	X							TRIP BLANK

ADDITIONAL INSTRUCTIONS:

Signature	Print Name	Company	Date	Time
Relinquished by	MARCO MENDOZA	INSIGHT	5/18/11	1230
Received by Elizabeth Adcox	Elizabeth Adcox	Alpha	5.19.11	10:09
Relinquished by				
Received by				
Relinquished by				
Received by				

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air **: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this coc. The liability of the laboratory is limited to the amount paid for the report.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *01-Jun-2011*

David Conner
Battelle Memorial Institute
655 West Broadway Suite 1420
San Diego, CA 92101
(619) 726-7311

CASE NARRATIVE

Job: G005862/JPL Groundwater Monitoring
Work Order: BMI11052004 **Cooler Temp:** 0 °C

Alpha's Sample ID	Client's Sample ID	Matrix
11052004-01A	MW-21-5	Aqueous
11052004-02A	MW-21-4	Aqueous
11052004-03A	MW-21-3	Aqueous
11052004-04A	MW-21-2	Aqueous
11052004-05A	MW-21-1	Aqueous
11052004-06A	EB-15-5/19/11	Aqueous
11052004-07A	TB-15-5/19/11	Aqueous

Manually Integrated Analytes

Alpha's Sample ID	Test Reference	Analyte
NONE		

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641
Date Received : 05/20/11

Job: G005862/JPL Groundwater Monitoring

Anions by IC
EPA Method 300.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-21-5**				
Lab ID : BMI11052004-01A Chloride	74	50 mg/L	05/20/11 12:28	05/20/11 12:39
Date Sampled 05/19/11 07:48 Nitrite (NO2) - N	ND	0.25 mg/L	05/20/11 12:28	05/20/11 12:39
Nitrate (NO3) - N	7.8	0.25 mg/L	05/20/11 12:28	05/20/11 12:39
Phosphate, ortho - P	ND	0.50 mg/L	05/20/11 12:28	05/20/11 12:39
Sulfate (SO4)	130	0.50 mg/L	05/20/11 12:28	05/20/11 12:39
Client ID: **MW-21-4**				
Lab ID : BMI11052004-02A Chloride	75	50 mg/L	05/20/11 12:28	05/20/11 13:35
Date Sampled 05/19/11 08:29 Nitrite (NO2) - N	ND	0.25 mg/L	05/20/11 12:28	05/20/11 13:35
Nitrate (NO3) - N	5.5	0.25 mg/L	05/20/11 12:28	05/20/11 13:35
Phosphate, ortho - P	ND	0.50 mg/L	05/20/11 12:28	05/20/11 13:35
Sulfate (SO4)	140	0.50 mg/L	05/20/11 12:28	05/20/11 13:35
Client ID: **MW-21-3**				
Lab ID : BMI11052004-03A Chloride	100	50 mg/L	05/20/11 12:28	05/20/11 13:53
Date Sampled 05/19/11 08:57 Nitrite (NO2) - N	ND	0.25 mg/L	05/20/11 12:28	05/20/11 13:53
Nitrate (NO3) - N	9.4	0.25 mg/L	05/20/11 12:28	05/20/11 13:53
Phosphate, ortho - P	ND	0.50 mg/L	05/20/11 12:28	05/20/11 13:53
Sulfate (SO4)	160	50 mg/L	05/20/11 12:28	05/20/11 13:53
Client ID: **MW-21-2**				
Lab ID : BMI11052004-04A Chloride	120	50 mg/L	05/20/11 12:28	05/20/11 14:12
Date Sampled 05/19/11 09:29 Nitrite (NO2) - N	ND	0.25 mg/L	05/20/11 12:28	05/20/11 14:12
Nitrate (NO3) - N	9.4	0.25 mg/L	05/20/11 12:28	05/20/11 14:12
Phosphate, ortho - P	ND	0.50 mg/L	05/20/11 12:28	05/20/11 14:12
Sulfate (SO4)	180	50 mg/L	05/20/11 12:28	05/20/11 14:12
Client ID: **MW-21-1**				
Lab ID : BMI11052004-05A Chloride	140	50 mg/L	05/20/11 12:28	05/20/11 14:30
Date Sampled 05/19/11 10:05 Nitrite (NO2) - N	ND	0.25 mg/L	05/20/11 12:28	05/20/11 14:30
Nitrate (NO3) - N	19	0.25 mg/L	05/20/11 12:28	05/20/11 14:30
Phosphate, ortho - P	ND	0.50 mg/L	05/20/11 12:28	05/20/11 14:30
Sulfate (SO4)	210	50 mg/L	05/20/11 12:28	05/20/11 14:30
Client ID: **EB-15-5/19/11**				
Lab ID : BMI11052004-06A Chloride	ND	0.50 mg/L	05/20/11 12:28	05/20/11 14:49
Date Sampled 05/19/11 09:47 Nitrite (NO2) - N	ND	0.25 mg/L	05/20/11 12:28	05/20/11 14:49
Nitrate (NO3) - N	ND	0.25 mg/L	05/20/11 12:28	05/20/11 14:49
Phosphate, ortho - P	ND	0.50 mg/L	05/20/11 12:28	05/20/11 14:49
Sulfate (SO4)	ND	0.50 mg/L	05/20/11 12:28	05/20/11 14:49

Alpha Analytical, Inc.

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ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

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6/2/11

Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641
Date Received : 05/20/11

Job: G005862/JPL Groundwater Monitoring

Perchlorate by Ion Chromatography
EPA Method 314.0

Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-21-5**				
Lab ID : BMI11052004-01A Perchlorate	2.40	1.00 µg/L	05/20/11 11:49	05/20/11 14:54
Date Sampled 05/19/11 07:48				
Client ID: **MW-21-4**				
Lab ID : BMI11052004-02A Perchlorate	2.07	1.00 µg/L	05/20/11 11:49	05/20/11 15:50
Date Sampled 05/19/11 08:29				
Client ID: **MW-21-3**				
Lab ID : BMI11052004-03A Perchlorate	2.48	1.00 µg/L	05/20/11 11:49	05/20/11 16:08
Date Sampled 05/19/11 08:57				
Client ID: **MW-21-2**				
Lab ID : BMI11052004-04A Perchlorate	1.85	1.00 µg/L	05/20/11 11:49	05/20/11 16:26
Date Sampled 05/19/11 09:29				
Client ID: **MW-21-1**				
Lab ID : BMI11052004-05A Perchlorate	2.60	1.00 µg/L	05/20/11 11:49	05/20/11 16:45
Date Sampled 05/19/11 10:05				
Client ID: **EB-15-5/19/11**				
Lab ID : BMI11052004-06A Perchlorate	ND	1.00 µg/L	05/20/11 11:49	05/20/11 17:03
Date Sampled 05/19/11 09:47				

ND = Not Detected

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Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641
Date Received : 05/20/11

Job: G005862/JPL Groundwater Monitoring

Alkalinity
SM2320B

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-21-5**					
Lab ID : BMI11052004-01A	Alkalinity, Bicarbonate (As CaCO3)	210	10 mg/L	05/20/11 14:59	05/20/11 14:59
Date Sampled 05/19/11 07:48	Alkalinity, Carbonate (As CaCO3)	ND	10 mg/L	05/20/11 14:59	05/20/11 14:59
	Alkalinity, Total (As CaCO3 at pH 4.5)	210	10 mg/L	05/20/11 14:59	05/20/11 14:59
Client ID: **MW-21-4**					
Lab ID : BMI11052004-02A	Alkalinity, Bicarbonate (As CaCO3)	180	10 mg/L	05/20/11 15:03	05/20/11 15:03
Date Sampled 05/19/11 08:29	Alkalinity, Carbonate (As CaCO3)	ND	10 mg/L	05/20/11 15:03	05/20/11 15:03
	Alkalinity, Total (As CaCO3 at pH 4.5)	180	10 mg/L	05/20/11 15:03	05/20/11 15:03
Client ID: **MW-21-3**					
Lab ID : BMI11052004-03A	Alkalinity, Bicarbonate (As CaCO3)	250	10 mg/L	05/20/11 15:07	05/20/11 15:07
Date Sampled 05/19/11 08:57	Alkalinity, Carbonate (As CaCO3)	ND	10 mg/L	05/20/11 15:07	05/20/11 15:07
	Alkalinity, Total (As CaCO3 at pH 4.5)	250	10 mg/L	05/20/11 15:07	05/20/11 15:07
Client ID: **MW-21-2**					
Lab ID : BMI11052004-04A	Alkalinity, Bicarbonate (As CaCO3)	280	10 mg/L	05/20/11 15:11	05/20/11 15:11
Date Sampled 05/19/11 09:29	Alkalinity, Carbonate (As CaCO3)	ND	10 mg/L	05/20/11 15:11	05/20/11 15:11
	Alkalinity, Total (As CaCO3 at pH 4.5)	280	10 mg/L	05/20/11 15:11	05/20/11 15:11
Client ID: **MW-21-1**					
Lab ID : BMI11052004-05A	Alkalinity, Bicarbonate (As CaCO3)	190	10 mg/L	05/20/11 15:14	05/20/11 15:14
Date Sampled 05/19/11 10:05	Alkalinity, Carbonate (As CaCO3)	ND	10 mg/L	05/20/11 15:14	05/20/11 15:14
	Alkalinity, Total (As CaCO3 at pH 4.5)	190	10 mg/L	05/20/11 15:14	05/20/11 15:14
Client ID: **EB-15-5/19/11**					
Lab ID : BMI11052004-06A	Alkalinity, Bicarbonate (As CaCO3)	ND	10 mg/L	05/20/11 15:18	05/20/11 15:18
Date Sampled 05/19/11 09:47	Alkalinity, Carbonate (As CaCO3)	ND	10 mg/L	05/20/11 15:18	05/20/11 15:18
	Alkalinity, Total (As CaCO3 at pH 4.5)	ND	10 mg/L	05/20/11 15:18	05/20/11 15:18

ND = Not Detected

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Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641
Date Received : 05/20/11

Job: G005862/JPL Groundwater Monitoring

Metals by ICPMS
EPA Method 200.8

	Parameter	Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-21-5**					
Lab ID : BMI11052004-01A	Sodium (Na)	32	0.50 mg/L	05/24/11 14:51	05/25/11 13:17
Date Sampled 05/19/11 07:48	Magnesium (Mg)	27	0.50 mg/L	05/24/11 14:51	05/25/11 13:17
	Potassium (K)	2.5	0.50 mg/L	05/24/11 14:51	05/25/11 13:17
	Calcium (Ca)	120	0.50 mg/L	05/24/11 14:51	05/25/11 13:17
	Chromium (Cr)	ND	0.0050 mg/L	05/24/11 14:51	05/25/11 13:17
	Iron (Fe)	0.50	0.30 mg/L	05/24/11 14:51	05/25/11 13:17
	Arsenic (As)	ND	0.0020 mg/L	05/24/11 14:51	05/25/11 13:17
	Lead (Pb)	ND	0.0050 mg/L	05/24/11 14:51	05/25/11 13:17
Client ID: **MW-21-4**					
Lab ID : BMI11052004-02A	Sodium (Na)	31	0.50 mg/L	05/24/11 14:51	05/25/11 13:40
Date Sampled 05/19/11 08:29	Magnesium (Mg)	28	0.50 mg/L	05/24/11 14:51	05/25/11 13:40
	Potassium (K)	2.5	0.50 mg/L	05/24/11 14:51	05/25/11 13:40
	Calcium (Ca)	110	0.50 mg/L	05/24/11 14:51	05/25/11 13:40
	Chromium (Cr)	ND	0.0050 mg/L	05/24/11 14:51	05/25/11 13:40
	Iron (Fe)	0.53	0.30 mg/L	05/24/11 14:51	05/25/11 13:40
	Arsenic (As)	ND	0.0020 mg/L	05/24/11 14:51	05/25/11 13:40
	Lead (Pb)	ND	0.0050 mg/L	05/24/11 14:51	05/25/11 13:40
Client ID: **MW-21-3**					
Lab ID : BMI11052004-03A	Sodium (Na)	47	0.50 mg/L	05/24/11 14:51	05/25/11 13:45
Date Sampled 05/19/11 08:57	Magnesium (Mg)	39	0.50 mg/L	05/24/11 14:51	05/25/11 13:45
	Potassium (K)	3.3	0.50 mg/L	05/24/11 14:51	05/25/11 13:45
	Calcium (Ca)	150	0.50 mg/L	05/24/11 14:51	05/25/11 13:45
	Chromium (Cr)	ND	0.0050 mg/L	05/24/11 14:51	05/25/11 13:45
	Iron (Fe)	0.82	0.30 mg/L	05/24/11 14:51	05/25/11 13:45
	Arsenic (As)	ND	0.0020 mg/L	05/24/11 14:51	05/25/11 13:45
	Lead (Pb)	ND	0.0050 mg/L	05/24/11 14:51	05/25/11 13:45
Client ID: **MW-21-2**					
Lab ID : BMI11052004-04A	Sodium (Na)	57	0.50 mg/L	05/24/11 14:51	05/26/11 18:55
Date Sampled 05/19/11 09:29	Magnesium (Mg)	43	0.50 mg/L	05/24/11 14:51	05/26/11 18:55
	Potassium (K)	3.0	0.50 mg/L	05/24/11 14:51	05/26/11 18:55
	Calcium (Ca)	150	0.50 mg/L	05/24/11 14:51	05/26/11 18:55
	Chromium (Cr)	ND	0.0050 mg/L	05/24/11 14:51	05/26/11 18:55
	Iron (Fe)	0.74	0.30 mg/L	05/24/11 14:51	05/26/11 18:55
	Arsenic (As)	ND	0.0020 mg/L	05/24/11 14:51	05/26/11 18:55
	Lead (Pb)	ND	0.0050 mg/L	05/24/11 14:51	05/26/11 18:55

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Client ID: **MW-21-1**					
Lab ID : BMI11052004-05A	Sodium (Na)	34	0.50 mg/L	05/24/11 14:51	05/25/11 13:57
Date Sampled 05/19/11 10:05	Magnesium (Mg)	43	0.50 mg/L	05/24/11 14:51	05/25/11 13:57
	Potassium (K)	2.2	0.50 mg/L	05/24/11 14:51	05/25/11 13:57
	Calcium (Ca)	170	0.50 mg/L	05/24/11 14:51	05/25/11 13:57
	Chromium (Cr)	ND	0.0050 mg/L	05/24/11 14:51	05/25/11 13:57
	Iron (Fe)	1.3	0.30 mg/L	05/24/11 14:51	05/25/11 13:57
	Arsenic (As)	ND	0.0020 mg/L	05/24/11 14:51	05/25/11 13:57
	Lead (Pb)	ND	0.0050 mg/L	05/24/11 14:51	05/25/11 13:57
Client ID: **EB-15-5/19/11**					
Lab ID : BMI11052004-06A	Sodium (Na)	ND	0.50 mg/L	05/24/11 14:51	05/25/11 14:02
Date Sampled 05/19/11 09:47	Magnesium (Mg)	ND	0.50 mg/L	05/24/11 14:51	05/25/11 14:02
	Potassium (K)	ND	0.50 mg/L	05/24/11 14:51	05/25/11 14:02
	Calcium (Ca)	ND	0.50 mg/L	05/24/11 14:51	05/25/11 14:02
	Chromium (Cr)	ND	0.0050 mg/L	05/24/11 14:51	05/25/11 14:02
	Iron (Fe)	ND	0.30 mg/L	05/24/11 14:51	05/25/11 14:02
	Arsenic (As)	ND	0.0020 mg/L	05/24/11 14:51	05/25/11 14:02
	Lead (Pb)	ND	0.0050 mg/L	05/24/11 14:51	05/25/11 14:02

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641
Date Received : 05/20/11

Job: G005862/JPL Groundwater Monitoring

pH (Range 1.7 to 12.4)
EPA Method 150.1 / SM4500HB / SW9040C

Parameter		Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-21-5**					
Lab ID : BMI11052004-01A	pH	7.9	1.7 pH Units	05/20/11 15:02	05/20/11 15:02
Date Sampled 05/19/11 07:48	pH - Temperature	22	1.0 °C	05/20/11 15:02	05/20/11 15:02
Client ID: **MW-21-4**					
Lab ID : BMI11052004-02A	pH	7.6	1.7 pH Units	05/20/11 15:06	05/20/11 15:06
Date Sampled 05/19/11 08:29	pH - Temperature	23	1.0 °C	05/20/11 15:06	05/20/11 15:06
Client ID: **MW-21-3**					
Lab ID : BMI11052004-03A	pH	7.7	1.7 pH Units	05/20/11 15:08	05/20/11 15:08
Date Sampled 05/19/11 08:57	pH - Temperature	23	1.0 °C	05/20/11 15:08	05/20/11 15:08
Client ID: **MW-21-2**					
Lab ID : BMI11052004-04A	pH	7.6	1.7 pH Units	05/20/11 15:10	05/20/11 15:10
Date Sampled 05/19/11 09:29	pH - Temperature	23	1.0 °C	05/20/11 15:10	05/20/11 15:10
Client ID: **MW-21-1**					
Lab ID : BMI11052004-05A	pH	6.7	1.7 pH Units	05/20/11 15:12	05/20/11 15:12
Date Sampled 05/19/11 10:05	pH - Temperature	23	1.0 °C	05/20/11 15:12	05/20/11 15:12
Client ID: **EB-15-5/19/11**					
Lab ID : BMI11052004-06A	pH	6.3	1.7 pH Units	05/20/11 15:16	05/20/11 15:16
Date Sampled 05/19/11 09:47	pH - Temperature	23	1.0 °C	05/20/11 15:16	05/20/11 15:16

The EPA has established an analytical holding time of 15 minutes for this method as documented in the Methods Update Rule, Federal Register, Vol 72, No 47, March 2007. This holding time will always be exceeded, unless samples are analyzed in the field.
The laboratory performed this analysis in the shortest practical holding time after sample receipt.

Roger Scholl Randy Gardner Walter Hinchman

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641
Date Received : 05/20/11

Job: G005862/JPL Groundwater Monitoring

Total Dissolved Solids (TDS)
SM2540C

Parameter		Concentration	Reporting Limit	Date Extracted	Date Analyzed
Client ID: **MW-21-5**					
Lab ID : BMI11052004-01A	Solids, Total Dissolved (TDS)	550	10 mg/L	05/25/11	05/25/11
Date Sampled 05/19/11 07:48					
Client ID: **MW-21-4**					
Lab ID : BMI11052004-02A	Solids, Total Dissolved (TDS)	520	10 mg/L	05/25/11	05/25/11
Date Sampled 05/19/11 08:29					
Client ID: **MW-21-3**					
Lab ID : BMI11052004-03A	Solids, Total Dissolved (TDS)	720	10 mg/L	05/26/11	05/26/11
Date Sampled 05/19/11 08:57					
Client ID: **MW-21-2**					
Lab ID : BMI11052004-04A	Solids, Total Dissolved (TDS)	780	10 mg/L	05/25/11	05/25/11
Date Sampled 05/19/11 09:29					
Client ID: **MW-21-1**					
Lab ID : BMI11052004-05A	Solids, Total Dissolved (TDS)	880	10 mg/L	05/25/11	05/25/11
Date Sampled 05/19/11 10:05					
Client ID: **EB-15-5/19/11**					
Lab ID : BMI11052004-06A	Solids, Total Dissolved (TDS)	ND	10 mg/L	05/25/11	05/25/11
Date Sampled 05/19/11 09:47					

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101
Job: G005862/JPL Groundwater Monitoring

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Tentatively Identified Compounds - Volatile Organics by GC/MS

	Parameter	Estimated Concentration	Estimated Reporting Limit	Date Extracted	Date Analyzed
Client ID : **MW-21-5** Lab ID : BMI11052004-01A Date Received : 05/20/11 Date Sampled : 05/19/11 07:48	* * * None Found * * *	ND	2.0 µg/L	05/25/11 12:42	05/25/11 12:42
Client ID : **MW-21-4** Lab ID : BMI11052004-02A Date Received : 05/20/11 Date Sampled : 05/19/11 08:29	* * * None Found * * *	ND	2.0 µg/L	05/25/11 13:04	05/25/11 13:04
Client ID : **MW-21-3** Lab ID : BMI11052004-03A Date Received : 05/20/11 Date Sampled : 05/19/11 08:57	* * * None Found * * *	ND	2.0 µg/L	05/25/11 13:25	05/25/11 13:25
Client ID : **MW-21-2** Lab ID : BMI11052004-04A Date Received : 05/20/11 Date Sampled : 05/19/11 09:29	* * * None Found * * *	ND	2.0 µg/L	05/25/11 13:47	05/25/11 13:47
Client ID : **MW-21-1** Lab ID : BMI11052004-05A Date Received : 05/20/11 Date Sampled : 05/19/11 10:05	* * * None Found * * *	ND	2.0 µg/L	05/25/11 14:08	05/25/11 14:08
Client ID : **EB-15-5/19/11** Lab ID : BMI11052004-06A Date Received : 05/20/11 Date Sampled : 05/19/11 09:47	* * * None Found * * *	ND	2.0 µg/L	05/25/11 12:20	05/25/11 12:20
Client ID : **TB-15-5/19/11** Lab ID : BMI11052004-07A Date Received : 05/20/11 Date Sampled : 05/19/11 00:00	* * * None Found * * *	ND	2.0 µg/L	05/25/11 11:59	05/25/11 11:59

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Note: Analysis conducted using EPA Method 524.2 criteria.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

Alpha certifies that the test results meet all requirements of NELAC unless footnoted otherwise.

Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

6/2/11

Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101
Job: G005862/JPL Groundwater Monitoring

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Alpha Analytical Number: BMI11052004-01A
Client I.D. Number: MW-21-5

Sampled: 05/19/11 07:48
Received: 05/20/11
Extracted: 05/25/11 12:42
Analyzed: 05/25/11 12:42

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		0.50	µg/L	36	1,1,1,2-Tetrachloroethane	ND		0.50	µg/L
2	Chloromethane	ND		1.0	µg/L	37	Chlorobenzene	ND		0.50	µg/L
3	Vinyl chloride	ND		0.50	µg/L	38	Ethylbenzene	ND		0.50	µg/L
4	Chloroethane	ND		0.50	µg/L	39	m,p-Xylene	ND		0.50	µg/L
5	Bromomethane	ND		1.0	µg/L	40	Bromoform	ND		0.50	µg/L
6	Trichlorofluoromethane	ND		0.50	µg/L	41	Styrene	ND		0.50	µg/L
7	1,1-Dichloroethene	ND		0.50	µg/L	42	o-Xylene	ND		0.50	µg/L
8	Dichloromethane	ND		1.0	µg/L	43	1,1,2,2-Tetrachloroethane	ND		0.50	µg/L
9	Freon-113	ND		0.50	µg/L	44	1,2,3-Trichloropropane	ND		1.0	µg/L
10	trans-1,2-Dichloroethene	ND		0.50	µg/L	45	Isopropylbenzene	ND		0.50	µg/L
11	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	46	Bromobenzene	ND		0.50	µg/L
12	1,1-Dichloroethane	ND		0.50	µg/L	47	n-Propylbenzene	ND		0.50	µg/L
13	2-Butanone (MEK)	ND		10	µg/L	48	4-Chlorotoluene	ND		0.50	µg/L
14	cis-1,2-Dichloroethene	ND		0.50	µg/L	49	2-Chlorotoluene	ND		0.50	µg/L
15	Bromochloromethane	ND		0.50	µg/L	50	1,3,5-Trimethylbenzene	ND		0.50	µg/L
16	Chloroform	3.9		0.50	µg/L	51	tert-Butylbenzene	ND		0.50	µg/L
17	2,2-Dichloropropane	ND		0.50	µg/L	52	1,2,4-Trimethylbenzene	ND		0.50	µg/L
18	1,2-Dichloroethane	ND		0.50	µg/L	53	sec-Butylbenzene	ND		0.50	µg/L
19	1,1,1-Trichloroethane	ND		0.50	µg/L	54	1,3-Dichlorobenzene	ND		0.50	µg/L
20	1,1-Dichloropropene	ND		0.50	µg/L	55	1,4-Dichlorobenzene	ND		0.50	µg/L
21	Carbon tetrachloride	ND		0.50	µg/L	56	4-Isopropyltoluene	ND		0.50	µg/L
22	Benzene	ND		0.50	µg/L	57	1,2-Dichlorobenzene	ND		0.50	µg/L
23	Dibromomethane	ND		0.50	µg/L	58	n-Butylbenzene	ND		0.50	µg/L
24	1,2-Dichloropropane	ND		0.50	µg/L	59	1,2-Dibromo-3-chloropropane (DBCP)	ND		2.5	µg/L
25	Trichloroethene	ND		0.50	µg/L	60	1,2,4-Trichlorobenzene	ND		1.0	µg/L
26	Bromodichloromethane	ND		0.50	µg/L	61	Naphthalene	ND	Q	1.0	µg/L
27	4-Methyl-2-pentanone (MIBK)	ND		2.5	µg/L	62	Hexachlorobutadiene	ND		1.0	µg/L
28	cis-1,3-Dichloropropene	ND		0.50	µg/L	63	1,2,3-Trichlorobenzene	ND		1.0	µg/L
29	trans-1,3-Dichloropropene	ND		0.50	µg/L	64	Surr: 1,2-Dichloroethane-d4	102		(70-130)	%REC
30	1,1,2-Trichloroethane	ND		0.50	µg/L	65	Surr: Toluene-d8	102		(70-130)	%REC
31	Toluene	ND		0.50	µg/L	66	Surr: 4-Bromofluorobenzene	94		(70-130)	%REC
32	1,3-Dichloropropane	ND		0.50	µg/L						
33	Dibromochloromethane	ND		0.50	µg/L						
34	1,2-Dibromoethane (EDB)	ND		1.0	µg/L						
35	Tetrachloroethene	1.4		0.50	µg/L						

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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Alpha certifies that the test results meet all requirements of NELAC unless footnoted otherwise.

6/2/11
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101
Job: G005862/JPL Groundwater Monitoring

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Alpha Analytical Number: BMI11052004-02A
Client I.D. Number: MW-21-4

Sampled: 05/19/11 08:29
Received: 05/20/11
Extracted: 05/25/11 13:04
Analyzed: 05/25/11 13:04

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		0.50	µg/L	36	1,1,1,2-Tetrachloroethane	ND		0.50	µg/L
2	Chloromethane	ND		1.0	µg/L	37	Chlorobenzene	ND		0.50	µg/L
3	Vinyl chloride	ND		0.50	µg/L	38	Ethylbenzene	ND		0.50	µg/L
4	Chloroethane	ND		0.50	µg/L	39	m,p-Xylene	ND		0.50	µg/L
5	Bromomethane	ND		1.0	µg/L	40	Bromoform	ND		0.50	µg/L
6	Trichlorofluoromethane	ND		0.50	µg/L	41	Styrene	ND		0.50	µg/L
7	1,1-Dichloroethene	ND		0.50	µg/L	42	o-Xylene	ND		0.50	µg/L
8	Dichloromethane	ND		1.0	µg/L	43	1,1,2,2-Tetrachloroethane	ND		0.50	µg/L
9	Freon-113	ND		0.50	µg/L	44	1,2,3-Trichloropropane	ND		1.0	µg/L
10	trans-1,2-Dichloroethene	ND		0.50	µg/L	45	Isopropylbenzene	ND		0.50	µg/L
11	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	46	Bromobenzene	ND		0.50	µg/L
12	1,1-Dichloroethane	ND		0.50	µg/L	47	n-Propylbenzene	ND		0.50	µg/L
13	2-Butanone (MEK)	ND		10	µg/L	48	4-Chlorotoluene	ND		0.50	µg/L
14	cis-1,2-Dichloroethene	ND		0.50	µg/L	49	2-Chlorotoluene	ND		0.50	µg/L
15	Bromochloromethane	ND		0.50	µg/L	50	1,3,5-Trimethylbenzene	ND		0.50	µg/L
16	Chloroform	6.1		0.50	µg/L	51	tert-Butylbenzene	ND		0.50	µg/L
17	2,2-Dichloropropane	ND		0.50	µg/L	52	1,2,4-Trimethylbenzene	ND		0.50	µg/L
18	1,2-Dichloroethane	ND		0.50	µg/L	53	sec-Butylbenzene	ND		0.50	µg/L
19	1,1,1-Trichloroethane	ND		0.50	µg/L	54	1,3-Dichlorobenzene	ND		0.50	µg/L
20	1,1-Dichloropropene	ND		0.50	µg/L	55	1,4-Dichlorobenzene	ND		0.50	µg/L
21	Carbon tetrachloride	ND		0.50	µg/L	56	4-Isopropyltoluene	ND		0.50	µg/L
22	Benzene	ND		0.50	µg/L	57	1,2-Dichlorobenzene	ND		0.50	µg/L
23	Dibromomethane	ND		0.50	µg/L	58	n-Butylbenzene	ND		0.50	µg/L
24	1,2-Dichloropropane	ND		0.50	µg/L	59	1,2-Dibromo-3-chloropropane (DBCP)	ND		2.5	µg/L
25	Trichloroethene	ND		0.50	µg/L	60	1,2,4-Trichlorobenzene	ND		1.0	µg/L
26	Bromodichloromethane	ND		0.50	µg/L	61	Naphthalene	ND	Q	1.0	µg/L
27	4-Methyl-2-pentanone (MIBK)	ND		2.5	µg/L	62	Hexachlorobutadiene	ND		1.0	µg/L
28	cis-1,3-Dichloropropene	ND		0.50	µg/L	63	1,2,3-Trichlorobenzene	ND		1.0	µg/L
29	trans-1,3-Dichloropropene	ND		0.50	µg/L	64	Surr: 1,2-Dichloroethane-d4	102		(70-130)	%REC
30	1,1,2-Trichloroethane	ND		0.50	µg/L	65	Surr: Toluene-d8	102		(70-130)	%REC
31	Toluene	ND		0.50	µg/L	66	Surr: 4-Bromofluorobenzene	90		(70-130)	%REC
32	1,3-Dichloropropane	ND		0.50	µg/L						
33	Dibromochloromethane	ND		0.50	µg/L						
34	1,2-Dibromoethane (EDB)	ND		1.0	µg/L						
35	Tetrachloroethene	1.2		0.50	µg/L						

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101
Job: G005862/JPL Groundwater Monitoring

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Alpha Analytical Number: BMI11052004-03A
Client I.D. Number: MW-21-3

Sampled: 05/19/11 08:57
Received: 05/20/11
Extracted: 05/25/11 13:25
Analyzed: 05/25/11 13:25

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		0.50	µg/L	36	1,1,1,2-Tetrachloroethane	ND		0.50	µg/L
2	Chloromethane	ND		1.0	µg/L	37	Chlorobenzene	ND		0.50	µg/L
3	Vinyl chloride	ND		0.50	µg/L	38	Ethylbenzene	ND		0.50	µg/L
4	Chloroethane	ND		0.50	µg/L	39	m,p-Xylene	ND		0.50	µg/L
5	Bromomethane	ND		1.0	µg/L	40	Bromoform	ND		0.50	µg/L
6	Trichlorofluoromethane	ND		0.50	µg/L	41	Styrene	ND		0.50	µg/L
7	1,1-Dichloroethene	ND		0.50	µg/L	42	o-Xylene	ND		0.50	µg/L
8	Dichloromethane	ND		1.0	µg/L	43	1,1,2,2-Tetrachloroethane	ND		0.50	µg/L
9	Freon-113	ND		0.50	µg/L	44	1,2,3-Trichloropropane	ND		1.0	µg/L
10	trans-1,2-Dichloroethene	ND		0.50	µg/L	45	Isopropylbenzene	ND		0.50	µg/L
11	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	46	Bromobenzene	ND		0.50	µg/L
12	1,1-Dichloroethane	ND		0.50	µg/L	47	n-Propylbenzene	ND		0.50	µg/L
13	2-Butanone (MEK)	ND		10	µg/L	48	4-Chlorotoluene	ND		0.50	µg/L
14	cis-1,2-Dichloroethene	0.61		0.50	µg/L	49	2-Chlorotoluene	ND		0.50	µg/L
15	Bromochloromethane	ND		0.50	µg/L	50	1,3,5-Trimethylbenzene	ND		0.50	µg/L
16	Chloroform	4.5		0.50	µg/L	51	tert-Butylbenzene	ND		0.50	µg/L
17	2,2-Dichloropropane	ND		0.50	µg/L	52	1,2,4-Trimethylbenzene	ND		0.50	µg/L
18	1,2-Dichloroethane	ND		0.50	µg/L	53	sec-Butylbenzene	ND		0.50	µg/L
19	1,1,1-Trichloroethane	ND		0.50	µg/L	54	1,3-Dichlorobenzene	ND		0.50	µg/L
20	1,1-Dichloropropene	ND		0.50	µg/L	55	1,4-Dichlorobenzene	ND		0.50	µg/L
21	Carbon tetrachloride	ND		0.50	µg/L	56	4-Isopropyltoluene	ND		0.50	µg/L
22	Benzene	ND		0.50	µg/L	57	1,2-Dichlorobenzene	ND		0.50	µg/L
23	Dibromomethane	ND		0.50	µg/L	58	n-Butylbenzene	ND		0.50	µg/L
24	1,2-Dichloropropane	ND		0.50	µg/L	59	1,2-Dibromo-3-chloropropane (DBCP)	ND		2.5	µg/L
25	Trichloroethene	0.97		0.50	µg/L	60	1,2,4-Trichlorobenzene	ND		1.0	µg/L
26	Bromodichloromethane	ND		0.50	µg/L	61	Naphthalene	ND	Q	1.0	µg/L
27	4-Methyl-2-pentanone (MIBK)	ND		2.5	µg/L	62	Hexachlorobutadiene	ND		1.0	µg/L
28	cis-1,3-Dichloropropene	ND		0.50	µg/L	63	1,2,3-Trichlorobenzene	ND		1.0	µg/L
29	trans-1,3-Dichloropropene	ND		0.50	µg/L	64	Surr: 1,2-Dichloroethane-d4	102		(70-130)	%REC
30	1,1,2-Trichloroethane	ND		0.50	µg/L	65	Surr: Toluene-d8	101		(70-130)	%REC
31	Toluene	ND		0.50	µg/L	66	Surr: 4-Bromofluorobenzene	93		(70-130)	%REC
32	1,3-Dichloropropane	ND		0.50	µg/L						
33	Dibromochloromethane	ND		0.50	µg/L						
34	1,2-Dibromoethane (EDB)	ND		1.0	µg/L						
35	Tetrachloroethene	3.5		0.50	µg/L						

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer

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Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101
Job: G005862/JPL Groundwater Monitoring

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Alpha Analytical Number: BMI11052004-04A
Client I.D. Number: MW-21-2

Sampled: 05/19/11 09:29
Received: 05/20/11
Extracted: 05/25/11 13:47
Analyzed: 05/25/11 13:47

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND	0.50	µg/L	36	1,1,1,2-Tetrachloroethane	ND		0.50	µg/L
2	Chloromethane	ND	1.0	µg/L	37	Chlorobenzene	ND		0.50	µg/L
3	Vinyl chloride	ND	0.50	µg/L	38	Ethylbenzene	ND		0.50	µg/L
4	Chloroethane	ND	0.50	µg/L	39	m,p-Xylene	ND		0.50	µg/L
5	Bromomethane	ND	1.0	µg/L	40	Bromoform	ND		0.50	µg/L
6	Trichlorofluoromethane	ND	0.50	µg/L	41	Styrene	ND		0.50	µg/L
7	1,1-Dichloroethene	ND	0.50	µg/L	42	o-Xylene	ND		0.50	µg/L
8	Dichloromethane	ND	1.0	µg/L	43	1,1,2,2-Tetrachloroethane	ND		0.50	µg/L
9	Freon-113	ND	0.50	µg/L	44	1,2,3-Trichloropropane	ND		1.0	µg/L
10	trans-1,2-Dichloroethene	ND	0.50	µg/L	45	Isopropylbenzene	ND		0.50	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	46	Bromobenzene	ND		0.50	µg/L
12	1,1-Dichloroethane	ND	0.50	µg/L	47	n-Propylbenzene	ND		0.50	µg/L
13	2-Butanone (MEK)	ND	10	µg/L	48	4-Chlorotoluene	ND		0.50	µg/L
14	cis-1,2-Dichloroethene	ND	0.50	µg/L	49	2-Chlorotoluene	ND		0.50	µg/L
15	Bromochloromethane	ND	0.50	µg/L	50	1,3,5-Trimethylbenzene	ND		0.50	µg/L
16	Chloroform	2.0	0.50	µg/L	51	tert-Butylbenzene	ND		0.50	µg/L
17	2,2-Dichloropropane	ND	0.50	µg/L	52	1,2,4-Trimethylbenzene	ND		0.50	µg/L
18	1,2-Dichloroethane	ND	0.50	µg/L	53	sec-Butylbenzene	ND		0.50	µg/L
19	1,1,1-Trichloroethane	ND	0.50	µg/L	54	1,3-Dichlorobenzene	ND		0.50	µg/L
20	1,1-Dichloropropene	ND	0.50	µg/L	55	1,4-Dichlorobenzene	ND		0.50	µg/L
21	Carbon tetrachloride	ND	0.50	µg/L	56	4-Isopropyltoluene	ND		0.50	µg/L
22	Benzene	ND	0.50	µg/L	57	1,2-Dichlorobenzene	ND		0.50	µg/L
23	Dibromomethane	ND	0.50	µg/L	58	n-Butylbenzene	ND		0.50	µg/L
24	1,2-Dichloropropane	ND	0.50	µg/L	59	1,2-Dibromo-3-chloropropane (DBCP)	ND		2.5	µg/L
25	Trichloroethene	ND	0.50	µg/L	60	1,2,4-Trichlorobenzene	ND		1.0	µg/L
26	Bromodichloromethane	ND	0.50	µg/L	61	Naphthalene	ND	Q	1.0	µg/L
27	4-Methyl-2-pentanone (MIBK)	ND	2.5	µg/L	62	Hexachlorobutadiene	ND		1.0	µg/L
28	cis-1,3-Dichloropropene	ND	0.50	µg/L	63	1,2,3-Trichlorobenzene	ND		1.0	µg/L
29	trans-1,3-Dichloropropene	ND	0.50	µg/L	64	Surr: 1,2-Dichloroethane-d4	103		(70-130)	%REC
30	1,1,2-Trichloroethane	ND	0.50	µg/L	65	Surr: Toluene-d8	102		(70-130)	%REC
31	Toluene	ND	0.50	µg/L	66	Surr: 4-Bromofluorobenzene	88		(70-130)	%REC
32	1,3-Dichloropropane	ND	0.50	µg/L						
33	Dibromochloromethane	ND	0.50	µg/L						
34	1,2-Dibromoethane (EDB)	ND	1.0	µg/L						
35	Tetrachloroethene	3.5	0.50	µg/L						

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / Carson, CA • (714) 386-2901 / info@alpha-analytical.com

Alpha certifies that the test results meet all requirements of NELAC unless footnoted otherwise.

6/2/11
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101
Job: G005862/JPL Groundwater Monitoring

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Alpha Analytical Number: BMI11052004-05A
Client I.D. Number: MW-21-1

Sampled: 05/19/11 10:05
Received: 05/20/11
Extracted: 05/25/11 14:08
Analyzed: 05/25/11 14:08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		0.50	µg/L	36	1,1,1,2-Tetrachloroethane	ND		0.50	µg/L
2	Chloromethane	ND		1.0	µg/L	37	Chlorobenzene	ND		0.50	µg/L
3	Vinyl chloride	ND		0.50	µg/L	38	Ethylbenzene	ND		0.50	µg/L
4	Chloroethane	ND		0.50	µg/L	39	m,p-Xylene	ND		0.50	µg/L
5	Bromomethane	ND		1.0	µg/L	40	Bromoform	ND		0.50	µg/L
6	Trichlorofluoromethane	ND		0.50	µg/L	41	Styrene	ND		0.50	µg/L
7	1,1-Dichloroethene	ND		0.50	µg/L	42	o-Xylene	ND		0.50	µg/L
8	Dichloromethane	ND		1.0	µg/L	43	1,1,2,2-Tetrachloroethane	ND		0.50	µg/L
9	Freon-113	ND		0.50	µg/L	44	1,2,3-Trichloropropane	ND		1.0	µg/L
10	trans-1,2-Dichloroethene	ND		0.50	µg/L	45	Isopropylbenzene	ND		0.50	µg/L
11	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	46	Bromobenzene	ND		0.50	µg/L
12	1,1-Dichloroethane	ND		0.50	µg/L	47	n-Propylbenzene	ND		0.50	µg/L
13	2-Butanone (MEK)	ND		10	µg/L	48	4-Chlorotoluene	ND		0.50	µg/L
14	cis-1,2-Dichloroethene	ND		0.50	µg/L	49	2-Chlorotoluene	ND		0.50	µg/L
15	Bromochloromethane	ND		0.50	µg/L	50	1,3,5-Trimethylbenzene	ND		0.50	µg/L
16	Chloroform	0.91		0.50	µg/L	51	tert-Butylbenzene	ND		0.50	µg/L
17	2,2-Dichloropropane	ND		0.50	µg/L	52	1,2,4-Trimethylbenzene	ND		0.50	µg/L
18	1,2-Dichloroethane	ND		0.50	µg/L	53	sec-Butylbenzene	ND		0.50	µg/L
19	1,1,1-Trichloroethane	ND		0.50	µg/L	54	1,3-Dichlorobenzene	ND		0.50	µg/L
20	1,1-Dichloropropene	ND		0.50	µg/L	55	1,4-Dichlorobenzene	ND		0.50	µg/L
21	Carbon tetrachloride	ND		0.50	µg/L	56	4-Isopropyltoluene	ND		0.50	µg/L
22	Benzene	ND		0.50	µg/L	57	1,2-Dichlorobenzene	ND		0.50	µg/L
23	Dibromomethane	ND		0.50	µg/L	58	n-Butylbenzene	ND		0.50	µg/L
24	1,2-Dichloropropane	ND		0.50	µg/L	59	1,2-Dibromo-3-chloropropane (DBCP)	ND		2.5	µg/L
25	Trichloroethene	ND		0.50	µg/L	60	1,2,4-Trichlorobenzene	ND		1.0	µg/L
26	Bromodichloromethane	ND		0.50	µg/L	61	Naphthalene	ND	Q	1.0	µg/L
27	4-Methyl-2-pentanone (MIBK)	ND		2.5	µg/L	62	Hexachlorobutadiene	ND		1.0	µg/L
28	cis-1,3-Dichloropropene	ND		0.50	µg/L	63	1,2,3-Trichlorobenzene	ND		1.0	µg/L
29	trans-1,3-Dichloropropene	ND		0.50	µg/L	64	Surr: 1,2-Dichloroethane-d4	103		(70-130)	%REC
30	1,1,2-Trichloroethane	ND		0.50	µg/L	65	Surr: Toluene-d8	103		(70-130)	%REC
31	Toluene	ND		0.50	µg/L	66	Surr: 4-Bromofluorobenzene	93		(70-130)	%REC
32	1,3-Dichloropropane	ND		0.50	µg/L						
33	Dibromochloromethane	ND		0.50	µg/L						
34	1,2-Dibromoethane (EDB)	ND		1.0	µg/L						
35	Tetrachloroethene	ND		0.50	µg/L						

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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Alpha certifies that the test results meet all requirements of NELAC unless footnoted otherwise.

Alpha Analytical, Inc. currently holds appropriate and available California (#2019) and NELAC (01154CA) certifications for the data reported. Test results relate only to reported samples.

6/2/11
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101
Job: G005862/JPL Groundwater Monitoring

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Alpha Analytical Number: BMI11052004-06A
Client I.D. Number: EB-15-5/19/11

Sampled: 05/19/11 09:47
Received: 05/20/11
Extracted: 05/25/11 12:20
Analyzed: 05/25/11 12:20

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND	0.50 µg/L	36	1,1,1,2-Tetrachloroethane	ND		0.50	µg/L
2	Chloromethane	ND	1.0 µg/L	37	Chlorobenzene	ND		0.50	µg/L
3	Vinyl chloride	ND	0.50 µg/L	38	Ethylbenzene	ND		0.50	µg/L
4	Chloroethane	ND	0.50 µg/L	39	m,p-Xylene	ND		0.50	µg/L
5	Bromomethane	ND	1.0 µg/L	40	Bromoform	ND		0.50	µg/L
6	Trichlorofluoromethane	ND	0.50 µg/L	41	Styrene	ND		0.50	µg/L
7	1,1-Dichloroethene	ND	0.50 µg/L	42	o-Xylene	ND		0.50	µg/L
8	Dichloromethane	ND	1.0 µg/L	43	1,1,2,2-Tetrachloroethane	ND		0.50	µg/L
9	Freon-113	ND	0.50 µg/L	44	1,2,3-Trichloropropane	ND		1.0	µg/L
10	trans-1,2-Dichloroethene	ND	0.50 µg/L	45	Isopropylbenzene	ND		0.50	µg/L
11	Methyl tert-butyl ether (MTBE)	ND	0.50 µg/L	46	Bromobenzene	ND		0.50	µg/L
12	1,1-Dichloroethane	ND	0.50 µg/L	47	n-Propylbenzene	ND		0.50	µg/L
13	2-Butanone (MEK)	ND	10 µg/L	48	4-Chlorotoluene	ND		0.50	µg/L
14	cis-1,2-Dichloroethene	ND	0.50 µg/L	49	2-Chlorotoluene	ND		0.50	µg/L
15	Bromochloromethane	ND	0.50 µg/L	50	1,3,5-Trimethylbenzene	ND		0.50	µg/L
16	Chloroform	ND	0.50 µg/L	51	tert-Butylbenzene	ND		0.50	µg/L
17	2,2-Dichloropropane	ND	0.50 µg/L	52	1,2,4-Trimethylbenzene	ND		0.50	µg/L
18	1,2-Dichloroethane	ND	0.50 µg/L	53	sec-Butylbenzene	ND		0.50	µg/L
19	1,1,1-Trichloroethane	ND	0.50 µg/L	54	1,3-Dichlorobenzene	ND		0.50	µg/L
20	1,1-Dichloropropene	ND	0.50 µg/L	55	1,4-Dichlorobenzene	ND		0.50	µg/L
21	Carbon tetrachloride	ND	0.50 µg/L	56	4-Isopropyltoluene	ND		0.50	µg/L
22	Benzene	ND	0.50 µg/L	57	1,2-Dichlorobenzene	ND		0.50	µg/L
23	Dibromomethane	ND	0.50 µg/L	58	n-Butylbenzene	ND		0.50	µg/L
24	1,2-Dichloropropane	ND	0.50 µg/L	59	1,2-Dibromo-3-chloropropane (DBCP)	ND		2.5	µg/L
25	Trichloroethene	ND	0.50 µg/L	60	1,2,4-Trichlorobenzene	ND		1.0	µg/L
26	Bromodichloromethane	ND	0.50 µg/L	61	Naphthalene	ND	Q	1.0	µg/L
27	4-Methyl-2-pentanone (MIBK)	ND	2.5 µg/L	62	Hexachlorobutadiene	ND		1.0	µg/L
28	cis-1,3-Dichloropropene	ND	0.50 µg/L	63	1,2,3-Trichlorobenzene	ND		1.0	µg/L
29	trans-1,3-Dichloropropene	ND	0.50 µg/L	64	Surr: 1,2-Dichloroethane-d4	99		(70-130)	%REC
30	1,1,2-Trichloroethane	ND	0.50 µg/L	65	Surr: Toluene-d8	101		(70-130)	%REC
31	Toluene	ND	0.50 µg/L	66	Surr: 4-Bromofluorobenzene	91		(70-130)	%REC
32	1,3-Dichloropropane	ND	0.50 µg/L						
33	Dibromochloromethane	ND	0.50 µg/L						
34	1,2-Dibromoethane (EDB)	ND	1.0 µg/L						
35	Tetrachloroethene	ND	0.50 µg/L						

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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6/2/11
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
655 West Broadway
San Diego, CA 92101
Job: G005862/JPL Groundwater Monitoring

Attn: David Conner
Phone: (619) 726-7311
Fax: (614) 458-6641

Alpha Analytical Number: BMI11052004-07A
Client I.D. Number: TB-15-5/19/11

Sampled: 05/19/11 00:00
Received: 05/20/11
Extracted: 05/25/11 11:59
Analyzed: 05/25/11 11:59

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		0.50	µg/L	36	1,1,1,2-Tetrachloroethane	ND		0.50	µg/L
2	Chloromethane	ND		1.0	µg/L	37	Chlorobenzene	ND		0.50	µg/L
3	Vinyl chloride	ND		0.50	µg/L	38	Ethylbenzene	ND		0.50	µg/L
4	Chloroethane	ND		0.50	µg/L	39	m,p-Xylene	ND		0.50	µg/L
5	Bromomethane	ND		1.0	µg/L	40	Bromoform	ND		0.50	µg/L
6	Trichlorofluoromethane	ND		0.50	µg/L	41	Styrene	ND		0.50	µg/L
7	1,1-Dichloroethene	ND		0.50	µg/L	42	o-Xylene	ND		0.50	µg/L
8	Dichloromethane	ND		1.0	µg/L	43	1,1,2,2-Tetrachloroethane	ND		0.50	µg/L
9	Freon-113	ND		0.50	µg/L	44	1,2,3-Trichloropropane	ND		1.0	µg/L
10	trans-1,2-Dichloroethene	ND		0.50	µg/L	45	Isopropylbenzene	ND		0.50	µg/L
11	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	46	Bromobenzene	ND		0.50	µg/L
12	1,1-Dichloroethane	ND		0.50	µg/L	47	n-Propylbenzene	ND		0.50	µg/L
13	2-Butanone (MEK)	ND		10	µg/L	48	4-Chlorotoluene	ND		0.50	µg/L
14	cis-1,2-Dichloroethene	ND		0.50	µg/L	49	2-Chlorotoluene	ND		0.50	µg/L
15	Bromochloromethane	ND		0.50	µg/L	50	1,3,5-Trimethylbenzene	ND		0.50	µg/L
16	Chloroform	ND		0.50	µg/L	51	tert-Butylbenzene	ND		0.50	µg/L
17	2,2-Dichloropropane	ND		0.50	µg/L	52	1,2,4-Trimethylbenzene	ND		0.50	µg/L
18	1,2-Dichloroethane	ND		0.50	µg/L	53	sec-Butylbenzene	ND		0.50	µg/L
19	1,1,1-Trichloroethane	ND		0.50	µg/L	54	1,3-Dichlorobenzene	ND		0.50	µg/L
20	1,1-Dichloropropene	ND		0.50	µg/L	55	1,4-Dichlorobenzene	ND		0.50	µg/L
21	Carbon tetrachloride	ND		0.50	µg/L	56	4-Isopropyltoluene	ND		0.50	µg/L
22	Benzene	ND		0.50	µg/L	57	1,2-Dichlorobenzene	ND		0.50	µg/L
23	Dibromomethane	ND		0.50	µg/L	58	n-Butylbenzene	ND		0.50	µg/L
24	1,2-Dichloropropane	ND		0.50	µg/L	59	1,2-Dibromo-3-chloropropane (DBCP)	ND		2.5	µg/L
25	Trichloroethene	ND		0.50	µg/L	60	1,2,4-Trichlorobenzene	ND		1.0	µg/L
26	Bromodichloromethane	ND		0.50	µg/L	61	Naphthalene	ND	Q	1.0	µg/L
27	4-Methyl-2-pentanone (MIBK)	ND		2.5	µg/L	62	Hexachlorobutadiene	ND		1.0	µg/L
28	cis-1,3-Dichloropropene	ND		0.50	µg/L	63	1,2,3-Trichlorobenzene	ND		1.0	µg/L
29	trans-1,3-Dichloropropene	ND		0.50	µg/L	64	Surr: 1,2-Dichloroethane-d4	99		(70-130)	%REC
30	1,1,2-Trichloroethane	ND		0.50	µg/L	65	Surr: Toluene-d8	103		(70-130)	%REC
31	Toluene	ND		0.50	µg/L	66	Surr: 4-Bromofluorobenzene	91		(70-130)	%REC
32	1,3-Dichloropropane	ND		0.50	µg/L						
33	Dibromochloromethane	ND		0.50	µg/L						
34	1,2-Dibromoethane (EDB)	ND		1.0	µg/L						
35	Tetrachloroethene	ND		0.50	µg/L						

Data flags are DOD specified with criteria that may differ from EPA or inhouse statistical criteria.

Note: Analysis conducted using EPA Method 524.2 criteria.

Q = One or more quality control criteria failed.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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6/2/11
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

VOC Sample Preservation Report

Work Order: BMI11052004 **Job:** G005862/JPL Groundwater Monitoring

Alpha's Sample ID	Client's Sample ID	Matrix	pH
11052004-01A	MW-21-5	Aqueous	2
11052004-02A	MW-21-4	Aqueous	2
11052004-03A	MW-21-3	Aqueous	2
11052004-04A	MW-21-2	Aqueous	2
11052004-05A	MW-21-1	Aqueous	2
11052004-06A	EB-15-5/19/11	Aqueous	2
11052004-07A	TB-15-5/19/11	Aqueous	2

6/2/11
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *26-May-11*

QC Summary Report

Work Order: 11052004

Method Blank

Type **MBLK** Test Code: **EPA Method 300.0**

File ID: **23** Batch ID: **26586** Analysis Date: **05/20/2011 11:25**

Sample ID: **MB-26586** Units : **mg/L** Run ID: **IC_1_110520A** Prep Date: **05/20/2011 12:28**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	ND	0.5								
Nitrite (NO2) - N	ND	0.25								
Nitrate (NO3) - N	ND	0.25								
Phosphate, ortho - P	ND	0.5								
Sulfate (SO4)	ND	0.5								

Laboratory Fortified Blank

Type **LFB** Test Code: **EPA Method 300.0**

File ID: **24** Batch ID: **26586** Analysis Date: **05/20/2011 11:44**

Sample ID: **LFB-26586** Units : **mg/L** Run ID: **IC_1_110520A** Prep Date: **05/20/2011 12:28**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	50	0.5	50		99.9	90	110			
Nitrite (NO2) - N	5.37	0.25	5		107	90	110			
Nitrate (NO3) - N	5.1	0.25	5		102	90	110			
Phosphate, ortho - P	5.4	0.5	5		108	90	110			
Sulfate (SO4)	101	0.5	100		101	90	110			

Sample Matrix Spike

Type **LFM** Test Code: **EPA Method 300.0**

File ID: **27** Batch ID: **26586** Analysis Date: **05/20/2011 12:58**

Sample ID: **11052004-01ALFM** Units : **mg/L** Run ID: **IC_1_110520A** Prep Date: **05/20/2011 12:28**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	171	0.5	100	74.25	96	80	120			
Nitrite (NO2) - N	11.3	0.25	10	0	113	80	120			
Nitrate (NO3) - N	18.7	0.25	10	7.763	109	80	120			
Phosphate, ortho - P	12.3	0.5	10	0	123	80	120			M1
Sulfate (SO4)	307	0.5	200	134.5	86	80	120			

Sample Matrix Spike Duplicate

Type **LFMD** Test Code: **EPA Method 300.0**

File ID: **28** Batch ID: **26586** Analysis Date: **05/20/2011 13:16**

Sample ID: **11052004-01ALFMD** Units : **mg/L** Run ID: **IC_1_110520A** Prep Date: **05/20/2011 12:28**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloride	172	0.5	100	74.25	98	80	120	170.5	1.0(15)	
Nitrite (NO2) - N	11.3	0.25	10	0	113	80	120	11.26	0.1(15)	
Nitrate (NO3) - N	19	0.25	10	7.763	112	80	120	18.67	1.5(15)	
Phosphate, ortho - P	12.4	0.5	10	0	124	80	120	12.28	1.1(15)	M1
Sulfate (SO4)	310	0.5	200	134.5	88	80	120	306.6	1.0(15)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

M1 = Matrix spike recovery was high, the method control sample recovery was acceptable.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *02-Jun-11*

QC Summary Report

Work Order: 11052004

Method Blank

Type: **MBLK** Test Code: **EPA Method 314.0**

File ID: **14** Batch ID: **26583** Analysis Date: **05/20/2011 12:46**

Sample ID: **MB-26583** Units : **µg/L** Run ID: **IC_3_110520A** Prep Date: **05/20/2011 11:49**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	ND	1								

Laboratory Fortified Blank

Type: **LFB** Test Code: **EPA Method 314.0**

File ID: **15** Batch ID: **26583** Analysis Date: **05/20/2011 13:04**

Sample ID: **LFB-26583** Units : **µg/L** Run ID: **IC_3_110520A** Prep Date: **05/20/2011 11:49**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	23.8	2	25		95	85	115			

Sample Matrix Spike

Type: **LFM** Test Code: **EPA Method 314.0**

File ID: **22** Batch ID: **26583** Analysis Date: **05/20/2011 15:13**

Sample ID: **11052004-01ALFM** Units : **µg/L** Run ID: **IC_3_110520A** Prep Date: **05/20/2011 11:49**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	22.5	2	25	2.403	80	80	120			

Sample Matrix Spike Duplicate

Type: **LFMD** Test Code: **EPA Method 314.0**

File ID: **23** Batch ID: **26583** Analysis Date: **05/20/2011 15:31**

Sample ID: **11052004-01ALFMD** Units : **µg/L** Run ID: **IC_3_110520A** Prep Date: **05/20/2011 11:49**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Perchlorate	24	2	25	2.403	86	80	120	22.52	6.3(15)	

Comments:

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Date: *23-May-11*

QC Summary Report

Work Order: 11052004

Laboratory Control Spike Type **LCS** Test Code: **SM2320B**

File ID: Batch ID: **W0520AL** Analysis Date: **05/20/2011 14:40**

Sample ID: **LCS-W0520AL** Units : **mg/L** Run ID: **WETLAB_110520D** Prep Date: **05/20/2011 14:40**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Alkalinity, Bicarbonate (As CaCO3)	250.4	10	250		100	80	120			
Alkalinity, Carbonate (As CaCO3)	250.4	10	250		100	80	120			
Alkalinity, Total (As CaCO3 at pH 4.5)	250	10	250		100	80	120			

Comments:

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Date: 01-Jun-11

QC Summary Report

Work Order: 11052004

Method Blank

Type **MBLK** Test Code: **EPA Method 200.8**

File ID: **052511.B\016_M.D** Batch ID: **26608** Analysis Date: **05/25/2011 12:49**

Sample ID: **MB-26608** Units : **mg/L** Run ID: **ICP/MS_110525A** Prep Date: **05/24/2011 14:51**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Sodium (Na)	ND	0.5								
Magnesium (Mg)	ND	0.5								
Potassium (K)	ND	0.5								
Calcium (Ca)	ND	0.5								
Chromium (Cr)	ND	0.005								
Iron (Fe)	ND	0.3								
Arsenic (As)	ND	0.002								
Lead (Pb)	ND	0.005								

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method 200.8**

File ID: **052511.B\017_M.D** Batch ID: **26608** Analysis Date: **05/25/2011 12:55**

Sample ID: **LCS-26608** Units : **mg/L** Run ID: **ICP/MS_110525A** Prep Date: **05/24/2011 14:51**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Sodium (Na)	5	0.5	5		100	85	115			
Magnesium (Mg)	4.71	0.5	5		94	85	115			
Potassium (K)	5.02	0.5	5		100	85	115			
Calcium (Ca)	5.26	0.5	5		105	85	115			
Chromium (Cr)	0.0496	0.005	0.05		99	85	115			
Iron (Fe)	5.16	0.3	5		103	85	115			
Arsenic (As)	0.0515	0.002	0.05		103	85	115			
Lead (Pb)	0.0496	0.005	0.05		99	85	115			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method 200.8**

File ID: **052511.B\022_M.D\02** Batch ID: **26608** Analysis Date: **05/25/2011 13:23**

Sample ID: **11052004-01AMS** Units : **mg/L** Run ID: **ICP/MS_110525A** Prep Date: **05/24/2011 14:51**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Sodium (Na)	36.1	0.5	5	31.78	86	70	130			
Magnesium (Mg)	32	0.5	5	26.88	102	70	130			
Potassium (K)	7.31	0.5	5	2.542	95	70	130			
Calcium (Ca)	120	0.5	5	115.8	82	70	130			
Chromium (Cr)	0.0527	0.005	0.05	0	105	70	130			
Iron (Fe)	5.84	0.3	5	0.4961	107	70	130			
Arsenic (As)	0.0534	0.002	0.05	0	107	70	130			
Lead (Pb)	0.0487	0.005	0.05	0	97	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method 200.8**

File ID: **052511.B\023_M.D** Batch ID: **26608** Analysis Date: **05/25/2011 13:29**

Sample ID: **11052004-01AMSD** Units : **mg/L** Run ID: **ICP/MS_110525A** Prep Date: **05/24/2011 14:51**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Sodium (Na)	34.6	0.5	5	31.78	57	70	130	36.09	4.2(20)	M3
Magnesium (Mg)	29.8	0.5	5	26.88	59	70	130	31.98	7.0(20)	M3
Potassium (K)	7.2	0.5	5	2.542	93	70	130	7.309	1.6(20)	
Calcium (Ca)	121	0.5	5	115.8	100	70	130	119.9	0.7(20)	
Chromium (Cr)	0.0543	0.005	0.05	0	109	70	130	0.05274	3.0(20)	
Iron (Fe)	5.86	0.3	5	0.4961	107	70	130	5.838	0.4(20)	
Arsenic (As)	0.0542	0.002	0.05	0	108	70	130	0.05342	1.5(20)	
Lead (Pb)	0.0496	0.005	0.05	0	99	70	130	0.04873	1.7(20)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

M3 = The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to the spike level. The method control sample recovery was acceptable.

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Date: *23-May-11*

QC Summary Report

Work Order: 11052004

Laboratory Control Spike Type **LCS** Test Code: **EPA Method 150.1 / SM4500HB / SW9040C**

File ID: Batch ID: **W0520PH** Analysis Date: **05/20/2011 14:58**

Sample ID: **LCS-W0520PH** Units : **pH Units** Run ID: **WETLAB_110520E** Prep Date: **05/20/2011 14:58**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
pH	5.09	1.7	5		102	90	110			

Comments:

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Date: *26-May-11*

QC Summary Report

Work Order: 11052004

Method Blank

Type **MBLK** Test Code: **SM2540C**

File ID: Batch ID: **W0520DS** Analysis Date: **05/25/2011 00:00**

Sample ID: **MBLK-W0520DS** Units : **mg/L** Run ID: **WETLAB_110520G** Prep Date: **05/25/2011 00:00**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Solids, Total Dissolved (TDS)	ND	10								

Laboratory Control Spike

Type **LCS** Test Code: **SM2540C**

File ID: Batch ID: **W0520DS** Analysis Date: **05/25/2011 00:00**

Sample ID: **LCS-W0520DS** Units : **mg/L** Run ID: **WETLAB_110520G** Prep Date: **05/25/2011 00:00**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Solids, Total Dissolved (TDS)	100	10	100		100	70	130			

Comments:

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Date: *01-Jun-2011*

QC Summary Report

Work Order: 11052004

Method Blank Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **11052506.D** Batch ID: **MS15W0525M** Analysis Date: **05/25/2011 09:49**

Sample ID: **MBLK MS15W0525M** Units : **µg/L** Run ID: **MSD_15_110525D** Prep Date: **05/25/2011 09:49**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	ND	0.5								
Chloromethane	ND	1								
Vinyl chloride	ND	0.5								
Chloroethane	ND	0.5								
Bromomethane	ND	1								
Trichlorofluoromethane	ND	0.5								
1,1-Dichloroethene	ND	0.5								
Dichloromethane	ND	1								
Freon-113	ND	0.5								
trans-1,2-Dichloroethene	ND	0.5								
Methyl tert-butyl ether (MTBE)	ND	0.5								
1,1-Dichloroethane	ND	0.5								
2-Butanone (MEK)	ND	10								
cis-1,2-Dichloroethene	ND	0.5								
Bromochloromethane	ND	0.5								
Chloroform	ND	0.5								
2,2-Dichloropropane	ND	0.5								
1,2-Dichloroethane	ND	0.5								
1,1,1-Trichloroethane	ND	0.5								
1,1-Dichloropropene	ND	0.5								
Carbon tetrachloride	ND	0.5								
Benzene	ND	0.5								
Dibromomethane	ND	0.5								
1,2-Dichloropropane	ND	0.5								
Trichloroethene	ND	0.5								
Bromodichloromethane	ND	0.5								
4-Methyl-2-pentanone (MIBK)	ND	2.5								
cis-1,3-Dichloropropene	ND	0.5								
trans-1,3-Dichloropropene	ND	0.5								
1,1,2-Trichloroethane	ND	0.5								
Toluene	ND	0.5								
1,3-Dichloropropane	ND	0.5								
Dibromochloromethane	ND	0.5								
1,2-Dibromoethane (EDB)	ND	1								
Tetrachloroethene	ND	0.5								
1,1,1,2-Tetrachloroethane	ND	0.5								
Chlorobenzene	ND	0.5								
Ethylbenzene	ND	0.5								
m,p-Xylene	ND	0.5								
Bromoform	ND	0.5								
Styrene	ND	0.5								
o-Xylene	ND	0.5								
1,1,2,2-Tetrachloroethane	ND	0.5								
1,2,3-Trichloropropane	ND	1								
Isopropylbenzene	ND	0.5								
Bromobenzene	ND	0.5								
n-Propylbenzene	ND	0.5								
4-Chlorotoluene	ND	0.5								
2-Chlorotoluene	ND	0.5								
1,3,5-Trimethylbenzene	ND	0.5								
tert-Butylbenzene	ND	0.5								
1,2,4-Trimethylbenzene	ND	0.5								
sec-Butylbenzene	ND	0.5								
1,3-Dichlorobenzene	ND	0.5								
1,4-Dichlorobenzene	ND	0.5								
4-Isopropyltoluene	ND	0.5								
1,2-Dichlorobenzene	ND	0.5								
n-Butylbenzene	ND	0.5								
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.5								
1,2,4-Trichlorobenzene	ND	1								
Naphthalene	ND	1								
Hexachlorobutadiene	ND	1								
1,2,3-Trichlorobenzene	ND	1								
Surr: 1,2-Dichloroethane-d4	9.74		10		97	70	130			
Surr: Toluene-d8	10.3		10		103	70	130			

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Surr: 4-Bromofluorobenzene	9.08	10	91	70	130	

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Date: *01-Jun-2011*

QC Summary Report

Work Order: 11052004

Laboratory Control Spike Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **11052503.D** Batch ID: **MS15W0525M** Analysis Date: **05/25/2011 08:35**

Sample ID: **LCS MS15W0525M** Units : **µg/L** Run ID: **MSD_15_110525D** Prep Date: **05/25/2011 08:35**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	9.22	1	10		92	70	130			
Chloromethane	9.15	2	10		92	70	130			
Vinyl chloride	9.83	1	10		98	70	130			
Chloroethane	9.69	1	10		97	70	130			
Bromomethane	12.4	2	10		124	70	130			
Trichlorofluoromethane	11	1	10		110	70	130			
1,1-Dichloroethene	10.6	1	10		106	70	130			
Dichloromethane	9.86	2	10		99	70	130			
Freon-113	11.7	1	10		117	70	137			
trans-1,2-Dichloroethene	10.6	1	10		106	70	130			
Methyl tert-butyl ether (MTBE)	8.97	0.5	10		90	70	130			
1,1-Dichloroethane	9.71	1	10		97	70	130			
2-Butanone (MEK)	197	10	200		98	70	130			
cis-1,2-Dichloroethene	10.1	1	10		101	70	130			
Bromochloromethane	10.4	1	10		104	70	130			
Chloroform	10.2	1	10		102	70	130			
2,2-Dichloropropane	9.95	1	10		100	70	130			
1,2-Dichloroethane	9.56	1	10		96	70	130			
1,1,1-Trichloroethane	10.6	1	10		106	70	130			
1,1-Dichloropropene	10.4	1	10		104	70	130			
Carbon tetrachloride	10.7	1	10		107	70	130			
Benzene	9.75	0.5	10		98	70	130			
Dibromomethane	9.24	1	10		92	70	130			
1,2-Dichloropropane	9.4	1	10		94	70	130			
Trichloroethene	10.4	1	10		104	70	130			
Bromodichloromethane	9.6	1	10		96	70	130			
4-Methyl-2-pentanone (MIBK)	20.9	2.5	25		84	20	182			
cis-1,3-Dichloropropene	9.13	1	10		91	70	130			
trans-1,3-Dichloropropene	8.52	1	10		85	70	130			
1,1,2-Trichloroethane	8.69	1	10		87	70	130			
Toluene	10.3	0.5	10		103	70	130			
1,3-Dichloropropane	9.31	1	10		93	70	130			
Dibromochloromethane	9.11	1	10		91	70	130			
1,2-Dibromoethane (EDB)	20	2	20		99.8	70	130			
Tetrachloroethene	11.3	1	10		113	70	130			
1,1,1,2-Tetrachloroethane	10.1	1	10		101	70	130			
Chlorobenzene	10.2	1	10		102	70	130			
Ethylbenzene	10.3	0.5	10		103	70	130			
m,p-Xylene	10.5	0.5	10		105	70	130			
Bromoform	8.61	1	10		86	70	130			
Styrene	10.1	1	10		101	70	130			
o-Xylene	10.2	0.5	10		102	70	130			
1,1,2,2-Tetrachloroethane	8.45	1	10		85	70	130			
1,2,3-Trichloropropane	18.5	2	20		93	70	130			
Isopropylbenzene	9.67	1	10		97	70	130			
Bromobenzene	9.69	1	10		97	70	130			
n-Propylbenzene	9.85	1	10		99	70	130			
4-Chlorotoluene	10.1	1	10		101	70	130			
2-Chlorotoluene	9.76	1	10		98	70	130			
1,3,5-Trimethylbenzene	9.75	1	10		98	70	130			
tert-Butylbenzene	9.75	1	10		98	70	130			
1,2,4-Trimethylbenzene	9.61	1	10		96	70	130			
sec-Butylbenzene	10	1	10		100	70	130			
1,3-Dichlorobenzene	9.96	1	10		99.6	70	130			
1,4-Dichlorobenzene	9.43	1	10		94	70	130			
4-Isopropyltoluene	9.84	1	10		98	70	130			
1,2-Dichlorobenzene	9.2	1	10		92	70	130			
n-Butylbenzene	9.97	1	10		99.7	70	130			
1,2-Dibromo-3-chloropropane (DBCP)	37.1	3	50		74	67	130			
1,2,4-Trichlorobenzene	9.89	2	10		99	70	130			
Naphthalene	6.72	2	10		67	70(70)	130			L50
Hexachlorobutadiene	19.7	2	20		98	70	130			
1,2,3-Trichlorobenzene	9.37	2	10		94	70	130			
Surr: 1,2-Dichloroethane-d4	9.71		10		97	70	130			
Surr: Toluene-d8	10.3		10		103	70	130			

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Surr: 4-Bromofluorobenzene	9.51	10	95	70	130	

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Date: *01-Jun-2011*

QC Summary Report

Work Order: 11052004

Sample Matrix Spike Type **MS** Test Code: **EPA Method SW8260B**

File ID: **11052507.D** Batch ID: **MS15W0525M** Analysis Date: **05/25/2011 10:11**

Sample ID: **11051902-01AMS** Units : **µg/L** Run ID: **MSD_15_110525D** Prep Date: **05/25/2011 10:11**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	51.8	2.5	50	0	104	21	138			
Chloromethane	47.8	10	50	0	96	23	144			
Vinyl chloride	57.6	2.5	50	0	115	49	136			
Chloroethane	51.2	2.5	50	0	102	21	159			
Bromomethane	74.6	10	50	0	149	10	174			
Trichlorofluoromethane	61.2	2.5	50	0	122	32	154			
1,1-Dichloroethene	54.7	2.5	50	0	109	64	130			
Dichloromethane	49.9	10	50	0	99.8	69	130			
Freon-113	59.1	2.5	50	0	118	55	141			
trans-1,2-Dichloroethene	53.3	2.5	50	0	107	63	130			
Methyl tert-butyl ether (MTBE)	49.1	1.3	50	0	98	47	150			
1,1-Dichloroethane	49.5	2.5	50	0	99	66	130			
2-Butanone (MEK)	723	50	1000	0	72	23	182			
cis-1,2-Dichloroethene	51.2	2.5	50	0	102	70	130			
Bromochloromethane	54.2	2.5	50	0	108	70	132			
Chloroform	51.7	2.5	50	0	103	70	130			
2,2-Dichloropropane	49.4	2.5	50	0	99	38	154			
1,2-Dichloroethane	51.8	2.5	50	0	104	65	134			
1,1,1-Trichloroethane	52.4	2.5	50	0	105	65	136			
1,1-Dichloropropene	53.3	2.5	50	0	107	68	132			
Carbon tetrachloride	54.7	2.5	50	0	109	58	148			
Benzene	49.2	1.3	50	0	98	59	138			
Dibromomethane	50.2	2.5	50	0	100	70	130			
1,2-Dichloropropane	48.2	2.5	50	0	96	70	131			
Trichloroethene	51.7	2.5	50	0	103	65	144			
Bromodichloromethane	50.4	2.5	50	0	101	50	157			
4-Methyl-2-pentanone (MIBK)	109	13	125	0	87	20	182			
cis-1,3-Dichloropropene	47.4	2.5	50	0	95	63	131			
trans-1,3-Dichloropropene	45.4	2.5	50	0	91	65	136			
1,1,2-Trichloroethane	47.1	2.5	50	0	94	70	131			
Toluene	50.4	1.3	50	0	101	68	130			
1,3-Dichloropropane	48.7	2.5	50	0	97	70	130			
Dibromochloromethane	48.1	2.5	50	0	96	42	155			
1,2-Dibromoethane (EDB)	103	5	100	0	103	70	130			
Tetrachloroethene	54.1	2.5	50	0	108	65	130			
1,1,1,2-Tetrachloroethane	51.2	2.5	50	0	102	70	130			
Chlorobenzene	51	2.5	50	0	102	70	130			
Ethylbenzene	50.5	1.3	50	0	101	68	130			
m,p-Xylene	51.9	1.3	50	0	104	68	131			
Bromoform	46.2	2.5	50	0	92	65	143			
Styrene	50.7	2.5	50	0	101	59	153			
o-Xylene	51	1.3	50	0	102	70	130			
1,1,2,2-Tetrachloroethane	45.1	2.5	50	0	90	67	130			
1,2,3-Trichloropropane	98.1	10	100	0	98	70	130			
Isopropylbenzene	47.1	2.5	50	0	94	55	138			
Bromobenzene	47.8	2.5	50	0	96	70	130			
n-Propylbenzene	48.6	2.5	50	0	97	67	133			
4-Chlorotoluene	49.6	2.5	50	0	99	70	130			
2-Chlorotoluene	47.4	2.5	50	0	95	70	130			
1,3,5-Trimethylbenzene	47.8	2.5	50	0	96	67	134			
tert-Butylbenzene	47.9	2.5	50	0	96	55	147			
1,2,4-Trimethylbenzene	47.2	2.5	50	0	94	65	135			
sec-Butylbenzene	50.1	2.5	50	0	100	68	135			
1,3-Dichlorobenzene	49.5	2.5	50	0	99	70	130			
1,4-Dichlorobenzene	47	2.5	50	0	94	70	130			
4-Isopropyltoluene	48.3	2.5	50	0	97	68	132			
1,2-Dichlorobenzene	46.1	2.5	50	0	92	70	130			
n-Butylbenzene	49.1	2.5	50	0	98	62	134			
1,2-Dibromo-3-chloropropane (DBCP)	196	15	250	0	78	64	130			
1,2,4-Trichlorobenzene	47.3	10	50	0	95	62	133			
Naphthalene	30.8	10	50	0	62	32	166			
Hexachlorobutadiene	94.8	10	100	0	95	63	130			
1,2,3-Trichlorobenzene	43.4	10	50	0	87	55	138			
Surr: 1,2-Dichloroethane-d4	49.2		50		98	70	130			
Surr: Toluene-d8	49.5		50		99	70	130			

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *01-Jun-2011*

QC Summary Report

Work Order: 11052004

Surr: 4-Bromofluorobenzene	46.7	50	93	70	130	

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: 01-Jun-2011

QC Summary Report

Work Order: 11052004

Sample Matrix Spike Duplicate Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **11052508.D** Batch ID: **MS15W0525M** Analysis Date: **05/25/2011 10:32**

Sample ID: **11051902-01AMSD** Units : **µg/L** Run ID: **MSD_15_110525D** Prep Date: **05/25/2011 10:32**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	48.2	2.5	50	0	96	21	138	51.81	7.3(33)	
Chloromethane	44.6	10	50	0	89	23	144	47.78	6.9(27)	
Vinyl chloride	54.3	2.5	50	0	109	49	136	57.55	5.9(21)	
Chloroethane	48	2.5	50	0	96	21	159	51.19	6.4(40)	
Bromomethane	79.2	10	50	0	158	10	174	74.62	6.0(40)	
Trichlorofluoromethane	58.3	2.5	50	0	117	32	154	61.16	4.8(37)	
1,1-Dichloroethene	51.3	2.5	50	0	103	64	130	54.73	6.4(21)	
Dichloromethane	46.2	10	50	0	92	69	130	49.88	7.7(20)	
Freon-113	55.8	2.5	50	0	112	55	141	59.13	5.8(40)	
trans-1,2-Dichloroethene	50	2.5	50	0	100	63	130	53.3	6.4(20)	
Methyl tert-butyl ether (MTBE)	47.4	1.3	50	0	95	47	150	49.14	3.7(40)	
1,1-Dichloroethane	45.9	2.5	50	0	92	66	130	49.49	7.5(20)	
2-Butanone (MEK)	689	50	1000	0	69	23	182	722.7	4.8(22)	
cis-1,2-Dichloroethene	48.6	2.5	50	0	97	70	130	51.17	5.2(20)	
Bromochloromethane	49.8	2.5	50	0	99.6	70	132	54.2	8.4(20)	
Chloroform	48	2.5	50	0	96	70	130	51.67	7.3(20)	
2,2-Dichloropropane	46.2	2.5	50	0	92	38	154	49.42	6.8(22)	
1,2-Dichloroethane	47.5	2.5	50	0	95	65	134	51.75	8.7(20)	
1,1,1-Trichloroethane	49.9	2.5	50	0	99.8	65	136	52.42	4.9(20)	
1,1-Dichloropropene	49.7	2.5	50	0	99	68	132	53.33	7.0(20)	
Carbon tetrachloride	52.6	2.5	50	0	105	58	148	54.65	3.8(20)	
Benzene	45.8	1.3	50	0	92	59	138	49.15	7.0(21)	
Dibromomethane	46.9	2.5	50	0	94	70	130	50.18	6.7(20)	
1,2-Dichloropropane	45.4	2.5	50	0	91	70	131	48.19	5.9(20)	
Trichloroethene	48.8	2.5	50	0	98	65	144	51.72	5.7(20)	
Bromodichloromethane	47.6	2.5	50	0	95	50	157	50.41	5.7(20)	
4-Methyl-2-pentanone (MIBK)	103	13	125	0	82	20	182	109.3	5.9(20)	
cis-1,3-Dichloropropene	44.1	2.5	50	0	88	63	131	47.43	7.3(20)	
trans-1,3-Dichloropropene	43.1	2.5	50	0	86	65	136	45.39	5.1(20)	
1,1,2-Trichloroethane	44.7	2.5	50	0	89	70	131	47.06	5.3(20)	
Toluene	48.9	1.3	50	0	98	68	130	50.41	3.1(20)	
1,3-Dichloropropane	47.1	2.5	50	0	94	70	130	48.68	3.4(20)	
Dibromochloromethane	48.1	2.5	50	0	96	42	155	48.12	0.1(20)	
1,2-Dibromoethane (EDB)	102	5	100	0	102	70	130	102.8	1.1(20)	
Tetrachloroethene	53.1	2.5	50	0	106	65	130	54.14	1.9(20)	
1,1,1,2-Tetrachloroethane	50	2.5	50	0	99.9	70	130	51.22	2.5(20)	
Chlorobenzene	49.3	2.5	50	0	99	70	130	51.01	3.4(20)	
Ethylbenzene	49.2	1.3	50	0	98	68	130	50.49	2.6(20)	
m,p-Xylene	51	1.3	50	0	102	68	131	51.94	1.9(20)	
Bromoform	46.1	2.5	50	0	92	65	143	46.16	0.1(20)	
Styrene	49.8	2.5	50	0	99.6	59	153	50.69	1.8(37)	
o-Xylene	49.4	1.3	50	0	99	70	130	51.01	3.1(20)	
1,1,2,2-Tetrachloroethane	45	2.5	50	0	90	67	130	45.12	0.3(20)	
1,2,3-Trichloropropane	96.3	10	100	0	96	70	130	98.11	1.9(20)	
Isopropylbenzene	45.5	2.5	50	0	91	55	138	47.05	3.3(20)	
Bromobenzene	46.7	2.5	50	0	93	70	130	47.83	2.3(20)	
n-Propylbenzene	46.8	2.5	50	0	94	67	133	48.59	3.7(30)	
4-Chlorotoluene	47.8	2.5	50	0	96	70	130	49.57	3.7(20)	
2-Chlorotoluene	46.7	2.5	50	0	93	70	130	47.42	1.6(20)	
1,3,5-Trimethylbenzene	46.2	2.5	50	0	92	67	134	47.8	3.5(21)	
tert-Butylbenzene	46.3	2.5	50	0	93	55	147	47.9	3.4(20)	
1,2,4-Trimethylbenzene	45.6	2.5	50	0	91	65	135	47.17	3.4(25)	
sec-Butylbenzene	47.8	2.5	50	0	96	68	135	50.09	4.7(20)	
1,3-Dichlorobenzene	47.9	2.5	50	0	96	70	130	49.5	3.3(20)	
1,4-Dichlorobenzene	45.6	2.5	50	0	91	70	130	47.02	3.1(20)	
4-Isopropyltoluene	46.8	2.5	50	0	94	68	132	48.28	3.0(20)	
1,2-Dichlorobenzene	45.3	2.5	50	0	91	70	130	46.08	1.7(20)	
n-Butylbenzene	47.3	2.5	50	0	95	62	134	49.1	3.8(21)	
1,2-Dibromo-3-chloropropane (DBCP)	190	15	250	0	76	64	130	195.8	3.3(20)	
1,2,4-Trichlorobenzene	46.3	10	50	0	93	62	133	47.26	2.0(29)	
Naphthalene	28.4	10	50	0	57	32	166	30.76	8.2(40)	
Hexachlorobutadiene	90.5	10	100	0	91	63	130	94.81	4.6(21)	
1,2,3-Trichlorobenzene	40	10	50	0	80	55	138	43.37	8.1(36)	
Surr: 1,2-Dichloroethane-d4	49.6		50		99	70	130			
Surr: Toluene-d8	51.4		50		103	70	130			

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *01-Jun-2011*

QC Summary Report

Work Order: 11052004

Surr: 4-Bromofluorobenzene	46.9	50	94	70	130	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha uses descriptive data qualifier flags, which could be replaced with either a DOD Q or J flag.

L50 = Analyte recovery was below acceptance limits for the LCS, but was acceptable in the MS/MSD.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : BMIS11052004

Report Due By : 5:00 PM On : 03-Jun-2011

Client:
Battelle Memorial Institute
655 West Broadway
Suite 1420
San Diego, CA 92101

Report Attention	Phone Number	EMail Address
David Conner	(619) 726-7311 x	connerd@battelle.org
Betsy Cutie	(614) 424-4899 x	cutiee@batelle.org
Shane Walton	(614) 424-4117 x	waltons@battelle.org

EDD Required : **Yes**

Sampled by : Client

PO : 218013

Client's COC # : 29200 Job : G005862/JPL Groundwater Monitoring

Cooler Temp	Samples Received	Date Printed
0 °C	20-May-2011	**20-May-2011**

QC Level : DS4 = DOD QC Required : Final Rpt, MBLK, InitCal/ConCal data, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests 300_0_W	314_W	ALKALINITY_W	METALS_DW	PH_W	TDS_W	VOC_TIC_W	VOC_W	Sample Remarks
BMI11052004-01A	MW-21-5	AQ	05/19/11 07:48	5	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11052004-02A	MW-21-4	AQ	05/19/11 08:29	5	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11052004-03A	MW-21-3	AQ	05/19/11 08:57	5	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11052004-04A	MW-21-2	AQ	05/19/11 09:29	5	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11052004-05A	MW-21-1	AQ	05/19/11 10:05	5	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11052004-06A	EB-15-5/19/11	AQ	05/19/11 09:47	5	0	9	NO2, NO3, SO4, Cl, PO4	Perchlorate	Alk (Carb/Bicarb)	Cr, As, Pb, Ca, Mg, K, Na, Fe	pH	TDS	VOC by 524 Criteria	VOC by 524 Criteria	
BMI11052004-07A	TB-15-5/19/11	AQ	05/19/11 00:00	1	0	9							VOC by 524 Criteria	VOC by 524 Criteria	Reno Trip Blank 4/6/11

Comments: Security seals intact. Frozen ice. Temp Blank #6908 received @ 0°C. Level IV QC. Samples should be used as the control spike sample if possible (I.E.: MS/MSD). :

	Signature	Print Name	Company	Date/Time
Logged in by:	Elizabeth Adcox	Elizabeth Adcox	**Alpha Analytical, Inc.**	5.20.11 11:18

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information:

Name BATTELLE / GERALD TOMPKINS
Address 505 KING AVE
City, State, Zip COLUMBUS, OH 43201
Phone Number _____ Fax _____

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044
Fax (775) 355-0406

Samples Collected From Which State? AZ ___ CA X NV ___ WA ___ ID ___ OR ___ OTHER ___

29200

Page # 1 of 1

Client Name: BATTELLE / DAVID CONNER
Address: 3990 OLD TOWN AVE, C-205
City, State, Zip: SAN DIEGO, CA 92110
P.O. #: 218013
Job #: G005862
EMail Address: CONNERD@BATTELLE.ORG
Phone #: (619) 726-7311
Fax #: (614) 458-6641
Report Attention: DAVID CONNER

Required QC Level? I II III IV

EDD? YES X NO ___

Global ID # _____

Time Sampled	Date Sampled	Matrix* See Key Below	Sampled by / Lab ID Number (Office Use Only)	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	VOC's (524.2)	Lead, Arsenic, Total Cr (200.8)	<10µ (314.0) Na, K, Ca, Mg, Fe (200.8)	CO_3, HCO3, TDS, pH, Alkalinity (SM2320B, SM2540, 1602)	Cl⁻, NO_3, NO_2, SO_4, PO_4^{-3} (300.0)		REMARKS
748	5/19/11	AQ	BMT1105200101	MW-21-5	NORM		5	X	X	X	X	X	X	
829			-02	MW-21-4			5	X	X	X	X	X	X	
857			-03	MW-21-3			5	X	X	X	X	X	X	
929			-04	MW-21-2			5	X	X	X	X	X	X	
1005			-05	MW-21-1			5	X	X	X	X	X	X	
947			-06	EB-15-5/19/11			5	X	X	X	X	X	X	EQUIP BLANK
—														
—			-07	TB-15-5/19/11			1	X						TRIP BLANK

ADDITIONAL INSTRUCTIONS:

Signature	Print Name	Company	Date	Time
Relinquished by	MARCUS MENDOZA	INSIGHT	5/19/11	1100
Received by	Anthony Stalk	Alpha Analytical	5/19/11	1100
Relinquished by	"	"	"	1100
Received by	Elizabeth Adcox	Elizabeth Adcox	Alpha	5·20·11	11:18
Relinquished by				
Received by				

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air **: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this coc. The liability of the laboratory is limited to the amount paid for the report.

Columbia Analytical Services™ 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

LABORATORY REPORT

April 26, 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 April 25, 2011. For your reference, these analyses have been assigned our service request number P1101547.

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

Client: Battelle CAS Project No: P1101547
Project: JPL GW Mon 2Q11 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on April 25, 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.

DETAIL SUMMARY REPORT

Client: Battelle
Project ID: JPL GW Mon 2Q11 / G486090
Service Request: P1101547

Date Received: 4/25/2011
Time Received: 15:37

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	7196A - Cr6
MW-14-5	P1101547-001	Water	4/25/2011	08:35	X
MW-14-4	P1101547-002	Water	4/25/2011	09:17	X
MW-14-3	P1101547-003	Water	4/25/2011	09:56	X
MW-14-2	P1101547-004	Water	4/25/2011	10:36	X
MW-14-1	P1101547-005	Water	4/25/2011	11:44	X
EB-1-4/25/11	P1101547-006	Water	4/25/2011	11:30	X
SB-1-4/25/11	P1101547-007	Water	4/25/2011	12:11	X

Acronyms

CA LUFT	California DHS LUFT Methoc
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 *tert* -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	*Standard Methods for the Examination of Water and Wastewater* , 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* , 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

Page 1 of 1

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

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. 1101547

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE. C-205 SAN DIEGO CA 92110	SPL GW. MON. 2Q11
	Project Number: GW860900
Project Manager: DAVID CONNOR	P.O. # / Billing Information: 214319 / BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone: (614) 726-7311	Fax: (614) 458-6604
Email Address for Result Reporting	Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics 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)	0														Remarks
												CAM VI (7196)														
MW-14-5	1	4/25/11	835	W	1							X														
MW-14-4	2		917		1							X														
MW-14-3	3		956		1							X														
MW-14-2	4		1036		2							X														MS/MSD, IV QC
MW-14-1	5		1144		1							X														
												add														
EB-1-4/25/11	6		1130		1							X														EQUIP BLANK
	7																									
SB-1-4/25/11			1211		1							X														SOURCE BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

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)

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	4/25/11	1454		4/25/11	1455
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	4/25/11	1537		4/25/11	1537
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time

Cooler (Blank / Ice / No Ice)
Temperature 4 °C

5 of 23

Client: Battelle **Service Request:** P1101547
Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101547-001.01					
	7196A				
		4/25/11	1549	SMO / SSTAPLES	
		4/25/11	1550	P-37 / SSTAPLES	
		4/25/11	1606	In Lab / SANDERSON	
		4/25/11	1723	P-37 / SANDERSON	
P1101547-002.01					
	7196A				
		4/25/11	1549	SMO / SSTAPLES	
		4/25/11	1550	P-37 / SSTAPLES	
		4/25/11	1606	In Lab / SANDERSON	
		4/25/11	1723	P-37 / SANDERSON	
P1101547-003.01					
	7196A				
		4/25/11	1549	SMO / SSTAPLES	
		4/25/11	1550	P-37 / SSTAPLES	
		4/25/11	1606	In Lab / SANDERSON	
		4/25/11	1723	P-37 / SANDERSON	
P1101547-004.01					
	7196A				
		4/25/11	1549	SMO / SSTAPLES	
		4/25/11	1550	P-37 / SSTAPLES	
		4/25/11	1606	In Lab / SANDERSON	
		4/25/11	1723	P-37 / SANDERSON	
P1101547-004.02					
		4/25/11	1549	SMO / SSTAPLES	
		4/25/11	1550	P-37 / SSTAPLES	
		4/25/11	1606	In Lab / SANDERSON	
		4/25/11	1723	P-37 / SANDERSON	
P1101547-005.01					
	7196A				
		4/25/11	1549	SMO / SSTAPLES	
		4/25/11	1550	P-37 / SSTAPLES	
		4/25/11	1606	In Lab / SANDERSON	
		4/25/11	1723	P-37 / SANDERSON	
P1101547-006.01					
	7196A				
		4/25/11	1549	SMO / SSTAPLES	
		4/25/11	1550	P-37 / SSTAPLES	
		4/25/11	1606	In Lab / SANDERSON	
		4/25/11	1723	P-37 / SANDERSON	
P1101547-007.01					
	7196A				

Client: Battelle **Service Request:** P1101547
Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
		4/25/11	1549	SMO / SSTAPLES	
		4/25/11	1550	P-37 / SSTAPLES	
		4/25/11	1606	In Lab / SANDERSON	
		4/25/11	1723	P-37 / SANDERSON	

Columbia Analytical Services | 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

Sample Acceptance Check Form

Client: Battelle Work order: P1101547

Project: JPL GW Mon 2Q11 / G486090

Sample(s) received on: 4/25/11 Date opened: 4/25/11 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?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 4 °C			
9	Was a **trip blank** received?	☐	☐	☒
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☐	☒
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☒	☐
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101547-001.01	125mL Plastic NP					
P1101547-002.01	125mL Plastic NP					
P1101547-003.01	125mL Plastic NP					
P1101547-004.01	125mL Plastic NP					
P1101547-004.02	125mL Plastic NP					
P1101547-005.01	125mL Plastic NP					
P1101547-006.01	125mL Plastic NP					
P1101547-007.01	125mL Plastic NP					

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

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101547
Date Collected : 04/25/11
Date Received : 04/25/11

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-14-5	P1101547-001	0.010	0.004	1	NA	04/25/11 16:55	ND	
MW-14-4	P1101547-002	0.010	0.004	1	NA	04/25/11 16:55	ND	
MW-14-3	P1101547-003	0.010	0.004	1	NA	04/25/11 16:55	ND	
MW-14-2	P1101547-004	0.010	0.004	1	NA	04/25/11 16:55	ND	
MW-14-1	P1101547-005	0.010	0.004	1	NA	04/25/11 16:55	ND	
EB-1-4/25/11	P1101547-006	0.010	0.004	1	NA	04/25/11 16:55	ND	
SB-1-4/25/11	P1101547-007	0.010	0.004	1	NA	04/25/11 16:55	ND	
Method Blank	P1101547-MB	0.010	0.004	1	NA	04/25/11 16:55	ND	

Approved By Karen Ryan Date : 4/26/11

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Service Request: P1101547
Date Analyzed: 04/25/11

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	0.004	ND
CCB1	0.010	0.004	ND
CCB2	0.010	0.004	ND

Approved By: Karen Ryan Date: 4/26/11

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Service Request: P1101547
Date Analyzed: 04/25/11

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	0.0521	104	90-110
CCV1	0.0500	0.0504	101	90-110
CCV2	0.0500	0.0504	101	90-110

Approved By: Karen Ryan Date: 4/26/11

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1101547
Project Name :	JPL GW Mon 2Q11	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	04/25/11

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1101547-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0417	104	90-110	

Approved By Karen Ryan Date : 4/26/11

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1101547
Project Name :	JPL GW Mon 2Q11	**Date Collected :**	04/25/11
Project Number :	G486090	**Date Received :**	04/25/11
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	04/25/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-14-2
Lab Code : P1101547-004MS P1101547-004DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0478	0.0478	96	96	73-119	<1	

Approved By Karen Ryan Date : 4/26/11

Report By:SAnderson

Columbia Analytical Services™

pH Run Log

Service Request #(s): 1547

Time: 0910

Sample	VWR lot #	Exp.
pH 2 Buffer	524-11041002	1/2012
pH 4 Buffer	524-11041003	8/31/12
pH 7 Buffer	524-11041004	9/30/12
pH 10 Buffer	524-03021001	9/30/11

Slope	Prep.Run #
99.4%	—
	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	22.0°
pH 4.000	T	4.012	22.0°
pH 7.000	|	7.003	22.3°
pH 10.000	|	10.011	22.3°
Ref#: SPA-1230-1030 TWE 0.96 Exp. 1/2012	2	6.378	22.4°
DI H2O	|	2.096	20.6°
pH 2.000	↓	2.003	22.0°
TIME: 1610			
pH 2.000	5	2.011	22.4°
1547-1.01		2.629	13.0°
T -2.01		1.884	12.8°
| -3.01		1.827	13.2°
| -4.01		2.092	12.4°
| -5.01		2.167	13.5°
| -6.01		1.852	13.9°
↓ -7.01		2.069	14.2°
pH 2.000		2.014	22.6°

Sample	#	pH	Temp. °C

space not used

pH Adjustments: ~~7196A~~: Diluted/Conc H_2SO_4 EMD 49284 EXP: 11/30/14

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 caiculation is not necessary.

Analyst: _____ Date: 4/25/11

Reviewer: KR Date: 4/26/11

pH.XLS

Columbia Analytical Services™

Hexavalent Chromium (Liquids)

Method EPA 7196A

Service Request#(s): P1101547 Run#: 243621

Stock#: S24-02281103 T.V=0.05ppm EXP: 2/28/12 Prep Run#: —

ICV/CCV#: S24 10151001 T.V=100PPM EXP: 3/2012 Conc. H_2SO_4 Lot#: EMD 49284 EXP: 11/20/14

Coloring Reagent Ref#: S24-04151102 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	0.9999
Absorbance @ 540 nm	0.000	0.011	0.058	0.115	

	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	0.001	0.001	0.000979	<0.003
2	ICV 0.050PPM		—	✓0.000	0.060	0.060	0.0521	104%
3	MB		—	✓0.000	0.001	0.001	0.000979	<0.003
4	LCS 0.040PPM		—	✓0.000	0.048	0.048	0.0417	104%
5	1547-1.01		—	✓0.001	0.003	0.002	0.00185	<0.003
6	-1.01 MS 0.03PPM		—	✓0.001	0.037	0.036	0.0313	104%
7	-2.01		—	✓0.000	0.002	0.002	0.00185	<0.003
8	-3.01		—	✓0.000	0.003	0.003	0.00271	<0.003
9	-4.01		—	✓0.000	0.003	0.003	0.00271	<0.003
10	-4.01 MS 0.05PPM		—	✓0.000	0.055	0.055	0.0478	96%
11	-4.01 MSD		—	✓0.000	0.055	0.055	0.0478	96% 0% RPD
12	-5.01		—	✓0.000	0.000	0.000	0.000112	<0.003
13	CCV1 0.050PPM		—	✓0.000	0.058	0.058	0.0504	101%
14	CCB1		—	✓0.000	0.000	0.000	0.000112	<0.003
15	1547-6.01		—	✓0.000	0.000	0.000	0.000112	
16	-7.01		—	✓0.000	0.001	0.001	0.000979	
17	CCV2 0.050PPM / CCB2	✓	—	✓0.000 / 0.000	0.055 / 0.000	0.058 / 0.000	0.0504 / 0.000112	101% / <0.003

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

ICV/CCV spiked with 0.25 ml of S24-10151001 @ 10 ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of S24-02281103 ↑ 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: 4/25/11 @ 1640

Analyzed By: [signature] Date/Time: 4/25/11 @ 1655

Reviewed By: [signature] Date: 4/26/11

160

11/23/09 SIG-1123090Z 1000 ppm SO_3 (ICV/CCV)
JA 0.1607g Na_2SO_3 (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/ DI
EXP: 5/23/10

11/23/09 SIG-1123090 3 A,B,C,D pH REFERENCE
JA PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 SIG-1124090 1 1000 ppm SO_4 Standard
JA PURCHASED CAT # ICC-006
LOT # K60794
EXP: 9/30/13

11/25/09 SIG-~~H25~~ 1125090 1 0.1N H_2SO_4
JA 5.6ml Conc H_2SO_4 (EMD 47050 EXP: 9/13/10)
EXP: ~~9/13/10~~ 9/13/10
SM 11/25/09 SM 11/25/09

11/30/09 SIG-1130090 1 Cr^{6+} Coloring Reagent
JA 0.250g Diphenylcarbohydrazide (EMD) 47103ED; EXP: 1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 9/24/12)
EXP: 12/30/09

11/30/09 SIG-1130090 2 25133 ppb Stock for O_3 in Air
JA 0.05ml Pyridine-4-Carboxaldehyde (Alfa Aesar LOT 10140598; EXP 8/11/12)
↑ 500ml deionized H_2O
EXP: 12/14/09

11/30/09 SIG-1130090 3 25133ppb ICV/CCV for O_3 in Air
JA 0.05ml Pyridine-4-carboxaldehyde (TCI LOT # IGTINC; EXP: 8/10/12)
↑ 500ml w/ DI H_2O
EXP: 12/14/09

Reviewed And Approved By:
Initial: KL Date: 12/22/09

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

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

3/1/10 SV
524-03011003 1000 PPM Cl (LCS)
Purchased 120ml Cat # 1955-4
RICCA CHEM CO LOT # 1001395
EXP: 7/2011

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

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

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 ppb ICV/CCV for O3

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

EXP: 10/20/10

10/6/10 SL 524-10061003 MBTH SO/17

0.5000 g MBTH (Aldrich 546966K ;Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 44284; EXP 11/20/

EXP: 10/7/10

10/15/10 SL 524-10151001 Cr6+ ICV/CCV Stock 100PPM Cr6+

Purchased
RICCA Chemical Co
500ml Plastic
LOT # 101077
EXP: 3/30/12

Cat No 2095-16

10/15/10 SL 524-10151002 500PPM NO_2 Stock

Purchased
RICCA Chemical Co
LOT # 101071
EXP: 4/2011

Cat No: 5444.5-4
120ml amber glass

10/28/10 S24-10281002 1000 ppm SO_3 ICV/CCV

0.1607 Na_2SO_3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 S24-11011001 ICV/CCV Cr^{6+} T.V = 0.579 ppm

0.5ml 519-04090904 (T.V = 115.8 mg/L ; EXP: 12/2010)

↑ 100ml W/ DI

EXP: 11/15/10

11/1/10 S24-11011002 Cr^{6+} Coloring Reagent

0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP: 1/30/13) ↑ 50ml W/ Acetone (EMD 47154D; EXP: 9/24/12).

EXP: 11/15/10

11/4/10 S24-11041001 A→E pH Filling Soln

PURCHASED (3M KCl) P/N 702613-A02

Thermo Scientific

LOT Code: 0R1

EXP: 11/4/11

11/4/10 S24-11041002 pH 2.000 Buffer

Purchased

BDH CAT NO: 5010-500ml

LOT # 100219

EXP: 1/2012

11/4/10 524-1104100 3 pH 4.000 Buffer
Purchased
J T Baker Cat No: 5657-01 500 ml
LOT # J30507
EXP: 8/31/12

11/4/10 524-1104100 4 pH 7.000 Buffer
Purchased
J.T. Baker Cat No: 5656-01 500 ml
LOT # J35515
EXP: 9/30/12

11/5/10 524-1105100 1 MBTH Std

0.5000 g MBTH (Aldrich 521696EK ;Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 4984 EXP: 11/20/14

EXP: 11/6/10

11/8/10 524-1108100 1 1000 ppm NH_3
0.3141g NH_4Cl (EMD 49198931; EXP: 10/19/14) to 100 ml
w/ 524-1021006 EXP: 10/22/11
EXP: 10/22/11

11/12/10 524-1112100 1 1000 ppm SO_3 STOCK

0.1591 Na2SO3 (JT Baker Lot #H10627; Exp: 8/31/14) up to 100 ml w/ DI Water.

EXP: 11/26/10

524-0221101 1:1 H_2SO_4

2/21/11 SC
250 mL H_2SO_4 (EMD 49284; EXP: 11/20/14
ADDED SLOWLY TO 250 mL DI. COOL
COMPLETELY
EXP: 2/21/12

2/21/11 SC
524-0221102 Cr6+ Coloring Reagent
0.2500 g 1,5-diphenylcarbohydrazide (EMD LOT 4710372;
EXP: 1/30/13) + 50 mL w/ Acetone (EMD
LOT# 47154D; EXP: 9/24/12).
EXP: 3/21/11

2/28/11 SC
524-0228101 0.1 H_2SO_4
5.6 mL conc H_2SO_4 (EMD 49284 EXP: 11/20/14) + 2L
w/ DI H_2O
EXP: 2/28/12

2/28/11 SC
524-0228102 1001 mg/L Cr6+
Purchased
Inorganic Ventures CGCR(6)1-1
125 mL Clear Glass
LOT# D2-CR0304O
EXP: 3/1/2012

2/28/11 SR — S24-02281103 — 100ppm Cr6+ Std
1.0 mL S24-02281102 (Lot: 100ppm Cr6+ 3/2/11; EXP: 3/1/12) ↑
100 mL w/ DI H2O
EXP: 2/28/12

3/7/11 SR — S24-03071101 — Cr6+ Colorimetric Reagent
0.2500g 1,5-Diphenylcarbohydrazide
(EMD Lot 47103721, EXP: 1/30/13) ↑ 50 mL w/
Acetone (EMD 47154, EXP: 9/24/12).
EXP: 4/7/11

3/7/11 SR — S24-03071102 — 500ppm NO2
Purchased
FLUKA CHEM Co — Cat No 54445-4
LOT # 1102544
EXP: 8/30/11

3/17/11 SR (3/17/11) — S24-03171101 — Alkaline Digestion Std
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: KL Date: 3/18/11

7/14/11 SR — S24-04141101 — ICO2 Eluent
75ml S24-04291002 (10X Conc Eluent, EXP 4/29/11)
↑ 750ml w/ DI H2O. DEGAS
EXP: 4/28/11

524-04151101 ICO2 PCL

4/15/11 SR

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EMD 4710372) exp: 1/30/13) in 100 mL Methanol (B&J C 2-931K exp: 12/13). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 4 9284 exp: 1/30/14). Bring up to volume w/ DI H2O; mix and degas.

EXP: 4/30/11

4/15/11 SR

524-04151102 Cr6+ Coloring Reagent

0.2500g 1,5-Diphenylcarbohydrazide (EMD 4710372 EXP: 1/30/13) + 50 mL W/ Acetone (EMD 4715420; EXP: 9/24/12)

EXP: 5/15/11

4/15/11 SR

524-04151102 13.5 N NaOH

100g NaOH (EMD 4702713 EXP 10/1/12) + 100 DI H2O

EXP: 4/15/12

4/18/11 SR

524-04181101 1000ppb Cr6+

0.1mL 524-02281102 (1000 ppm Cr6+; EXP 3/1/12) ↑ 100mL W/ pH ADJUSTED DI (9.391)

Exp: 3/1/12

4/18/11 SR

524-04181102 ICN ICO2 2.5ppb

0.25 mL Ref 524-1015/001 @ 0.1/10 exp: 3/2012 up to 100 mL with pH adjusted (pH= 9.391), degassed DI Water.

Exp. 5/2/11

LABORATORY REPORT

April 29, 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 April 26, 2011. For your reference, these analyses have been assigned our service request number P1101560.

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

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

CAS Project No: P1101560

CASE NARRATIVE

The samples were received intact under chain of custody on April 25, 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.

DETAIL SUMMARY REPORT

Client: Battelle
Project ID: JPL GW Mon 2Q11 / G486090
Service Request: P1101560

Date Received: 4/26/2011
Time Received: 15:47

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	7196A - Cr6
MW-22-5	P1101560-001	Water	4/26/2011	08:10	X
MW-22-4	P1101560-002	Water	4/26/2011	08:45	X
MW-22-3	P1101560-003	Water	4/26/2011	09:21	X
MW-22-2	P1101560-004	Water	4/26/2011	09:54	X
MW-22-1	P1101560-005	Water	4/26/2011	10:28	X
EB-2-4/26/11	P1101560-006	Water	4/26/2011	10:14	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 *tert*-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	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, 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

Page 1 of 1

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

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. P110160

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE. C-205 SAN DIEGO, CA 92110	JPL GW. MON. 2011
	Project Number: G486090
Project Manager: DAVID CONNER	P.O. # / Billing Information: 214319 / BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone: (619) 726 7311 / Fax: (614) 458 6641	
Email Address for Result Reporting	Sampler (Print & Sign): MARCO MENDEZ

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics 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)	0	Remarks
MW-22-5	1	4/26/11	810	W	1							X	IV QC
MW-22-4	2	"	845	"	1							X	
MW-22-3	3	"	921	"	1							X	
MW-22-2	4	"	954	"	1							X	
MW-22-1	5	"	1028	"	1							X	
EB-2-4/26/11	6	"	1014	"	1							X	EQUIP BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

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)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	4/26/11	1505		4/26/11	1505
	4/26/11	1547		4/26/11	1547
	Date:	Time:		Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3.0 °C

5 of 22

Client: Battelle **Service Request:** P1101560
Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101560-001.01					
	7196A				
		4/26/11	1553	SMO / MZAMORA	
		4/26/11	1554	P-37 / MZAMORA	
		4/26/11	1605	In Lab / SANDERSON	
		4/26/11	1702	P-37 / SANDERSON	
P1101560-002.01					
	7196A				
		4/26/11	1553	SMO / MZAMORA	
		4/26/11	1554	P-37 / MZAMORA	
		4/26/11	1605	In Lab / SANDERSON	
		4/26/11	1702	P-37 / SANDERSON	
P1101560-003.01					
	7196A				
		4/26/11	1553	SMO / MZAMORA	
		4/26/11	1554	P-37 / MZAMORA	
		4/26/11	1605	In Lab / SANDERSON	
		4/26/11	1702	P-37 / SANDERSON	
P1101560-004.01					
	7196A				
		4/26/11	1553	SMO / MZAMORA	
		4/26/11	1554	P-37 / MZAMORA	
		4/26/11	1606	In Lab / SANDERSON	
		4/26/11	1702	P-37 / SANDERSON	
P1101560-005.01					
	7196A				
		4/26/11	1553	SMO / MZAMORA	
		4/26/11	1554	P-37 / MZAMORA	
		4/26/11	1606	In Lab / SANDERSON	
		4/26/11	1702	P-37 / SANDERSON	
P1101560-006.01					
	7196A				
		4/26/11	1553	SMO / MZAMORA	
		4/26/11	1554	P-37 / MZAMORA	
		4/26/11	1605	In Lab / SANDERSON	
		4/26/11	1702	P-37 / SANDERSON	

Columbia Analytical Services | 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

Sample Acceptance Check Form

Client: Battelle Work order: P1101560

Project: JPL GW. Mon. 2Q11 / G486090

Sample(s) received on: 4/26/11 Date opened: 4/26/11 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?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature 3 °C Blank Temperature ____ °C			
9	Was a **trip blank** received?	☐	☒	☐
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? ____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? ____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101560-001.01	125mL Plastic NP					
P1101560-002.01	125mL Plastic NP					
P1101560-003.01	125mL Plastic NP					
P1101560-004.01	125mL Plastic NP					
P1101560-005.01	125mL Plastic NP					
P1101560-006.01	125mL Plastic NP					

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

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101560
Date Collected : 04/26/11
Date Received : 04/26/11

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-22-5	P1101560-001	0.010	0.003	1	NA	04/26/11 16:40	ND	
MW-22-4	P1101560-002	0.010	0.003	1	NA	04/26/11 16:40	ND	
MW-22-3	P1101560-003	0.010	0.003	1	NA	04/26/11 16:40	ND	
MW-22-2	P1101560-004	0.010	0.003	1	NA	04/26/11 16:40	ND	
MW-22-1	P1101560-005	0.010	0.003	1	NA	04/26/11 16:40	ND	
EB-2-4/26/11	P1101560-006	0.010	0.003	1	NA	04/26/11 16:40	ND	
Method Blank	P1101560-MB	0.010	0.003	1	NA	04/26/11 16:40	ND	

Approved By Karen Rya Date : 4/27/11

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Service Request: P1101560
Date Analyzed: 04/26/11

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: Kara Ryan Date: 4/27/11

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Service Request: P1101560
Date Analyzed: 04/26/11

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	0.0477	95	90-110
CCV1	0.0500	0.0486	97	90-110
CCV2	0.0500	0.0486	97	90-110

Approved By: Karen Rya Date: 4/27/11

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1101560
Project Name :	JPL GW Mon 2Q11	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	04/26/11

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1101560-LCS	Basis :	NA
Test Notes :			

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 Ryan Date : 4/27/11

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1101560
Project Name :	JPL GW Mon 2Q11	**Date Collected :**	04/26/11
Project Number :	G486090	**Date Received :**	04/26/11
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	04/26/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-22-5 Units : mg/L (ppm)
Lab Code : P1101560-001MS P1101560-001DMS Basis : NA
Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0468	0.0468	94	94	73-119	<1	

Approved By Karen Ryan Date : 4/27/11

Report By:SAnderson

Columbia Analytical Services

pH Run Log

Service Request #(s): R1101560, R1101561

Time: 0737

Sample	VWR lot #	Exp.
pH 2 Buffer	524-11041002	1/2012
pH 4 Buffer	524-11041003	8/31/12
pH 7 Buffer	524-11041004	9/30/12
pH 10 Buffer	524-03021001	9/30/11

Slope	Prep.Run #
99.2%	—
	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 #)

Time: 1010

Sample	#	pH	Temp. °C
pH 2.000	5	2.019	22.9°
pH 4.000	↓	4.009	22.6°
pH 7.000	↓	6.995	22.6°
pH 10.000	↓	10.004	22.8°
Ref#: 519-11230903D	↓	6.339	98% 22.9°
DI	↓	2.012	21.3°
pH 2.000	↓	2.020	22.8°
TIME: 1606			
pH 2.000	5	2.015	23.8°
R1101560-1.01	↓	2.021	8.4°C
-2.01	↓	2.001	8.4°C
-3.01	↓	2.012	8.0°C
-4.01	↓	1.928	9.0°C
-5.01	↓	1.827	8.9°C
-6.01	↓	1.802	9.0°C
R1101561-1.01	↓	2.006	9.7°C
pH 2.000	↓	2.012	23.0°

Sample	#	pH	Temp. °C
Space not used			

pH Adjustments: ☒ **7196A**: Diluted/Conc H_2SO_4 RMD 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: 4/25/11

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

Analyst: [signature] Date: 4/26/11

Reviewer: KR Date: 4/26/11

pH.XLS

Hexavalent Chromium (Liquids)

Columbia Analytical Services

Method EPA 7196A

Service Request#(s): P110560, P110561 Run#: 243771

Stock#: 524-0228/103 IV=100PPM EXP: 2/28/12 Prep Run#:

CV/CCV#: 524-1015/001 IV=100PPM EXP: 3/2012 Conc. H_2SO_4 Lot#: EMD 45284 EXP: 11/20/14

Coloring Reagent Ref#: 524-0415/102 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	0.99999544
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	10ml	—	✓	0.000	0.000	0.000	0.000318	<0.003
2	ICV 0.050PPM		—	✓	0.000	0.054	0.054	0.0477	95%
3	MB		—	✓	0.000	0.001	0.001	0.00120	<0.003
4	LCS 0.04 PPM		—	✓	0.000	0.047	0.047	0.0415	104%
5	1560-1.01		—	✓	0.000	0.001	0.001	0.00120	<0.003
6	-1.01 MS 0.05PPM		—	✓	0.000	0.053	0.053	0.0468	94% 1% RPD
7	-1.01 MSD		—	✓	0.000	0.053	0.053	0.0468	94%
8	-2.01		—	✓	0.000	0.000	0.000	0.000318	<0.003
9	-2.01 VS 0.03PPM		—	✓	0.000	0.036	0.036	0.0319	106%
10	-3.01		—	✓	0.000	0.001	0.001	0.00120	<0.003
11	-4.01		—	✓	0.000	0.000	0.000	0.000318	
12	-5.01		—	✓	0.001	0.003	0.001	0.00120	
13	CCV 0.050 PPM		—	✓	0.000	0.055	0.055	0.0486	97%
	CCB1		—	✓	0.000	0.000	0.000	0.000318	<0.003
	1560-6.01		—	✓	0.000	0.000	0.000	0.000318	
14	1561-1.01		—	✓	0.000	0.016	0.016	0.0143	
	-1.01 LVS 0.03PPM		—	✓	0.000	0.052	0.052	0.0459	105%
15	-1.01 MS 0.05PPM		—	✓	0.000	0.077	0.077	0.0678	107% 2% RPD
16	-1.01 MSD		—	✓	0.000	0.076	0.076	0.0670	105%
	CCV2		—	✓	0.000	0.055	0.055	0.0486	97%
17	CCB2		—	✓	0.000	0.000	0.000	0.000318	<0.003

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

ICV/CCV spiked with 0.25 ml of 524-1015/001 @1/10 ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-0228/103 ↑ 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 ↓ @1/10 ↑ 10 ml of sample (T.V.= 0.03ppm)

Comments:

Prepared By: Date/Time: 4/26/11 @1625

Analyzed By: Date/Time: 4/26/11 @1440

Reviewed By: KR Date: 4/26/11

Cr6LIQ.xls

160

11/23/09 SIG-1123090 2 1000 ppm SO_3 (ICV/CCV)
SR 0.1607g Na_2SO_3 (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100 ml w/ DI
EXP: 5/23/10

11/23/09 SIG-1123090 3 A, B, C, D pH REFERENCE
SR PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 SIG-1124090 1 1000 ppm SO_4 Standard
SR PURCHASED CAT # ICC-006
LOT # K607794
EXP: 9/30/13

SR 11/25/09
11/25/09 SIG-~~H35~~ 1125090 1 0.1N H_2SO_4
5.6ml Conc H_2SO_4 (EMD 47050 EXP: 9/13/10)
EXP: ~~H35~~ 9/13/10
SR 11/25/09

11/30/09 SIG-1130090 1 Cr^{6+} Coloring Reagent
SR 0.2500g Diphenylcarbohydrazide (EMD) 47103ED; EXP: 1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 5/24/12)
EXP: 12/30/09

11/30/09 SIG-1130090 2 25133 ppb Stock for O_3 in Air
SR 0.05ml Pyridine-4-Carboxaldehyde (Alfa Aesar LOT 10140558; EXP 8/11/12)
↑ 500ml deionized H_2O
EXP: 12/14/09

11/30/09 SIG-1130090 3 25733 ppb ICV/CCV for O_3 in Air
SR 0.05ml Pyridine-4-carboxaldehyde (TCI LOT # IGINC; EXP: 5/10/12)
↑ 500ml w/ DI H_2O
EXP: 12/14/09

Reviewed And Approved By:
Initial: VL Date: 12/22/09

14

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

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

3/1/10 524-03011003 1000 PPM Cl (HCS)
SR Purchased 120ml Cat # 1955-4
RICCA CHEM CO LOT # 1001395
EXP: 7/2011

3/1/10 524-03011004 NH3 Filling Sol'n
SR Purchased 60ml Order 95120-2
Thermo Scientific LOT # MT1
P/N. 703613-A04
EXP: 3/1/11

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

40

10/6/10 SL — 524-1006/001 — 25/33 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 — 524-1006/002 — 25/33 ppb ICV/CCV for O3

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

EXP: 10/20/10

10/6/10 SL — 524-1006/003 — MBTH SD/17

0.5000 g MBTH (Aldrich 54646CK :Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 44,284; exp 11/20

EXP: 10/7/10

10/15/10 SL — 524-10151001 — Cr6+ ICV/CCV Stock 100ppm Cr6+

Purchased
RICCA Chemical Co
500ml Plastic
LOT # 101077
EXP: 3/20/12
Cat No 2095-16

10/15/10 SL — 524-10157002 — 500ppm NO_2 Stock

Purchased
RICCA Chemical Co
LOT # 101071
EXP: 4/2011
Cat No: 5444.54
120ml amber glass

10/28/10 S24-10781002 1000 PPM SO_3 ICV/CCV

0.1607 Na_2SO_3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 S24-11011001 ICV/CCV Cr^{6+} T.V = 0.579 PPM

0.5ml S19-04090604 (T.V = 115.8 mg/L ; EXP: 12/2010)

↑ 100ml W/ DI

EXP: 11/15/10

11/1/10 S24-11011002 Cr^{6+} Coloring Reagent

0.250g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP. 1/30/13) ↑ 50ml W/ Acetone (EMD 47154D; EXP. 9/24/12)

EXP: 11/15/10

11/4/10 S24-11041001 A→E pH Filling Sol'n

PURCHASED (3M KCl) P/N 702613-A02

Thermo Scientific

LOT Code: 0R1

EXP: 11/4/11

11/4/10 S24-11041002 pH 2.000 Buffer

Purchased

BDH CAT NO: 5010-500ml

LOT # 100219G

EXP: 1/2012

77

11/4/10 524-1104L003 pH 4.00 Buffer
Purchased
JT Baker Cat No: 5657-01 500 ml
LOT # J30507
EXP 8/31/12

11/4/10 524-1104L004 pH 7.00 Buffer
Purchased
J.T. Baker Cat No: 5656-01 500 ml
LOT # J35515
EXP: 9/30/12

11/5/10 524-1105L001 MBTH Std

0.5000 g MBTH (Aldrich 521696EK ;Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 49884 Exp: 11/20/14

EXP: 11/6/10

11/8/10 524-1108L001 1000 ppm NH_3
0.3141g NH_4Cl (EMD 4919893; EXP: 10/19/14) to 100 ml
W/ 524-1221006 EXP: 10/22/11
EXP: 10/22/11

11/12/10 524-1112L001 1000 ppm SO_3 STOCK

0.1591 Na_2SO_3 (JT Baker Lot #H10627; Exp: 8/31/14) up to 100 ml w/ DI Water.

EXP: 11/26/10

54

524-0221101 1:1 H_2SO_4

2/21/11 SC

250 mL H_2SO_4 (EMD 49284; EXP: 11/20/14) ADDED SLOWLY TO 250 mL DI. COOL COMPLETELY
EXP: 2/21/12

2/21/11 SC

524-0221102 Cr6+ Coloring Reagent

0.2500 g 1,5-diphenylcarbohydrazide (EMD LOT 47103721 EXP: 11/30/13) + 50 mL w/ Acetone (EMD LOT# 47154D, EXP: 9/30/12).
EXP: 3/21/11

2/28/11 SC

524-0228101 0.1 H_2SO_4

5.6 mL Conc H_2SO_4 (EMD 49284 EXP: 11/20/14) + 2L W/ DI H_2O
EXP: 2/28/12

2/28/11 SC

524-0228102 1001 mg/L Cr6+

Purchased Inorganic Ventures CGCR(6)1-1
125 mL Clear Glass
LOT# D2-CR030410
EXP: 3/1/2012

2/28/11 SR
524-022811 03 10PPM Cr6+ Std/Ver
1.0 mL 524-022811 02 (~~10PPM Cr6+~~ 100PPM Cr6+ 3/21/11; Exp: 3/1/12) ↑
100 mL w/ DI H2O
Exp: 2/28/12

3/7/11 SR
524-030711 01 Cr6+ Colorimetric Reagent
0.2500g 1,5-Diphenylcarbohydrazide (EMD Lot 47103721, Exp: 1/30/13) ↑ 50 mL w/ Acetone (EMD 47154; Exp: 9/24/12).
Exp: 4/7/11

3/7/11 SR
524-030711 02 500PPM NO2
Purchased
RICCA CHEM Co Cat No 5444.5-4
LOT # 1162524
EXP: 8/2011

3/17/11 SR
524-031711 01 Alkaline Digestion Std/Ver
20.0g NaOH (EMD 47022713B; Exp: 10/11/12) + 30.0g Na2CO3 (EMD 46221715B; Exp: 10/11/12) ↑ 1L w/ DI H2O.
Exp: 4/17/11

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

4/14/11 SR
524-041411 01 ICO2 Effluent
75ml 524-042911 02 (10X Conc Effluent, Exp 4/29/11)
↑ 750ml w/ DI H2O. DEGAS
Exp: 4/28/11

56

S24-0415/1101 ICO3 PCE

4/15/11 SC

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EMD 470323 exp: 11/2012) in 100 mL Methanol (B&J 230-21K exp: 10/2012). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 4.7250 exp: 11/2012). Bring up to volume w/ DI H2O; mix and degas.

EXP: 4/30/11

4/19/11 SC

S24-0419/1103 Cr6+ Staining Reagent

0.250g 1,5-Diphenylcarbohydrazide (EMD 470323 EXP: 1/30/13) + 50mL M/Acetone (EMD 471540; EXP 5/31/12)

EXP: 5/15/11

4/12/11 SC

S24-0415/1102 1.5 N NaOH

100g NaOH (EMD 4702713 EXP 10/1/12) + 100 DI H2O

EXP 4/15/12

4/18/11 SC

S24-0418/1101 1000ppb Cr6+

0.1mL S24-0238/1102 (1000 ppm Cr6+; EXP 3/1/12) + 100mL w/ pH ADJUSTED DI (9.39)

EXP: 3/1/12

4/18/11 SC

S24-0418/1102 ICN ICO2 25ppb

0.25 mL Ref S24-0415/1001 @ 0.1/10 exp: 3/2012 up to 100 mL with pH adjusted (pH= 9.39), degassed DI Water.

EXP. 5/2/11

LABORATORY REPORT

April 29, 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 April 26, 2011. For your reference, this analysis has been assigned our service request number P1101561.

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

Digitally signed by Sue Anderson
Date: 2011.04.29 15:57:40 -07'00'

Sue Anderson
Project Manager

Client: Battelle CAS Project No: P1101561
Project: JPL-GW-2Q11 / G005862 / JPL GWM

CASE NARRATIVE

The sample was received intact under chain of custody on April 25, 2011 and was 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 sample 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.

DETAIL SUMMARY REPORT

Client: Battelle
Service Request: P1101561
Project ID: JPL-GW-2Q11 / G005862 / JPL GWM

Date Received: 4/26/2011
Time Received: 15:47

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	7196A - Cr6
MW-7	P1101561-001	Water	4/26/2011	09:35	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 *tert*-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	*Standard Methods for the Examination of Water and Wastewater*, 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, 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

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

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.: P110167

CAS Contact:

Company Name & Address (Reporting Information)	Project Name	Project Number	P.O. # / Billing Information
Battelle 505 King Ave Columbus OH 43201	SPL-GW-2011	60058162/SPL GWM	214375/Battelle 505 King Ave Columbus OH 43201

Project Manager	Phone	Fax
David Conner	614 726-7311	614 458-6641

Email Address for Result Reporting	Sampler (Print & Sign)
connerd@battelle.org	David Loex/DavidL

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics 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)	0 Hexavalent Cr (7196)	Remarks
MW-7	(1)	4/26/11	0935	AQ	2P						X	MS/MSD

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

5 of 22

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge X
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
David L	4-26-11	1451		4/26/11	1451
	4/26/11	1505		4/26/11	1505
	4/26/11	1547		4/26/11	1547

Cooler / Blank / Ice / No Ice

Temperature ____ °C

Client: Battelle **Service Request:** P1101561
Project: JPL-GW-2Q11/G005862 / JPL GWM

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101561-001.01					
	7196A				
		4/26/11	1606	SMO / MZAMORA	
		4/26/11	1606	P-37 / MZAMORA	
		4/26/11	1613	In Lab / SANDERSON	
		4/26/11	1702	P-37 / SANDERSON	
P1101561-001.02					
		4/26/11	1606	SMO / MZAMORA	
		4/26/11	1606	P-37 / MZAMORA	
		4/26/11	1613	In Lab / SANDERSON	
		4/26/11	1702	P-37 / SANDERSON	

Columbia Analytical Services | 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

Sample Acceptance Check Form

Client: Battelle Work order: P1101561

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

Sample(s) received on: 4/26/11 Date opened: 4/26/11 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?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
9	Was a **trip blank** received?	☐	☒	☐
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101561-001.01	125mL Plastic NP					
P1101561-001.02	125mL Plastic NP					

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

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

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

Service Request : P1101561
Date Collected : 04/26/11
Date Received : 04/26/11

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-7	P1101561-001	0.010	0.003	1	NA	04/26/11 16:40	0.014	
Method Blank	P1101561-MB	0.010	0.003	1	NA	04/26/11 16:40	ND	

Approved By Karen Ryan Date : 4/27/11

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Service Request: P1101561
Date Analyzed: 04/26/11

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 Ryan Date: 4/27/11

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Service Request: P1101561
Date Analyzed: 04/26/11

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	0.0477	95	90-110
CCV1	0.0500	0.0486	97	90-110
CCV2	0.0500	0.0486	97	90-110

Approved By: Karen Ryan Date: 4/27/11

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1101561
Project Name :	JPL-GW-2Q11	**Date Collected :**	NA
Project Number :	G005862 / JPL GWM	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	04/26/11

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1101561-LCS	Basis :	NA
Test Notes :			

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 Ryan Date : 4/27/11

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1101561
Project Name :	JPL-GW-2Q11	**Date Collected :**	04/26/11
Project Number :	G005862 / JPL GWM	**Date Received :**	04/26/11
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	04/26/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-7		Units :	mg/L (ppm)
Lab Code :	P1101561-001MS	P1101561-001DMS	Basis :	NA
Test Notes :				

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	0.0143	0.0678	0.0670	107	105	73-119	1	

Approved By Karen Ryan Date : 4/27/11

Report By:SAnderson

Columbia Analytical Services

pH Run Log

Service Request #(s): A1101560, A1101561

Time: 0737

Sample	VWR lot #	Exp.
pH 2 Buffer	S24-1104100 2	1/2012
pH 4 Buffer	S24-1104100 3	8/31/12
pH 7 Buffer	S24-1104100 4	9/30/12
pH 10 Buffer	S24-0302100 1	9/30/11

Slope	Prep.Run #
99.2%	—
	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
TIME: 1010 SD							
pH 2.000	5	2.019	22.9°				
pH 4.000	|	4.009	22.6°				
pH 7.000	|	6.995	22.6°				
pH 10.000	|	10.004	22.8°				
Ref#: S19-1230903D	|	6.337	99% 22.9°				
DI	|	2.012	21.3°				
pH 2.000	↓	2.020	22.8°				
TIME: 1606	SD						
pH 2.000	5	2.015	23.8°				
A1101560-1.01	T	2.021	8.4°C				
-2.01	|	2.001	8.4°C				
-3.01	|	2.012	8.0°C				
-4.01	|	1.928	9.0°C				
-5.01	|	1.827	8.4°C				
-6.01	↓	1.802	9.0°C				
A1101561-1.01	|	2.006	9.7°C				
pH 2.006	↓	2.012	23.0°				

5pt 10pt 7pt

pH Adjustments: ☒ **7196A**: Diluted/Conc H_2SO_4 PMD 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: 4/25/11

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

Analyst: _____ Date: 4/26/11

Reviewer: KR Date: 4/26/11

pH.XLS

Hexavalent Chromium (Liquids)

Columbia Analytical Services

Method EPA 7196A

Service Request#(s): P110560, P110561 Run#: 243771

Stock#: 524-0228/103 IV=100PPM EXP: 2/28/12 Prep Run#:

CV/CCV#: 524-1015/001 IV=100PPM EXP: 3/2012 Conc. H_2SO_4 Lot#: EMD 45284 EXP: 11/20/14

Coloring Reagent Ref#: 524-0415/102 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	0.99999544
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	10ml	—	✓	0.000	0.000	0.000	0.000318	<0.003
2	ICV 0.050PPM		—	✓	0.000	0.054	0.054	0.0477	95%
3	MB		—	✓	0.000	0.001	0.001	0.00120	<0.003
4	LCS 0.04 PPM		—	✓	0.000	0.047	0.047	0.0415	104%
5	1560-1.01		—	✓	0.000	0.001	0.001	0.00120	<0.003
6	-1.01 MS 0.05PPM		—	✓	0.000	0.053	0.053	0.0468	94% 1% RPD
7	-1.01 MSD		—	✓	0.000	0.053	0.053	0.0468	94%
8	-2.01		—	✓	0.000	0.000	0.000	0.000318	<0.003
9	-2.01 VS 0.03PPM		—	✓	0.000	0.036	0.036	0.0319	106%
10	-3.01		—	✓	0.000	0.001	0.001	0.00120	<0.003
11	-4.01		—	✓	0.000	0.000	0.000	0.000318	
12	-5.01		—	✓	0.001	0.003	0.001	0.00120	
13	CCV 0.050 PPM		—	✓	0.000	0.055	0.055	0.0486	97%
	CCB1		—	✓	0.000	0.000	0.000	0.000318	<0.003
	1560-6.01		—	✓	0.000	0.000	0.000	0.000318	
14	1561-1.01		—	✓	0.000	0.016	0.016	0.0143	
	-1.01 LVS 0.03PPM		—	✓	0.000	0.052	0.052	0.0459	105%
15	-1.01 MS 0.05PPM		—	✓	0.000	0.077	0.077	0.0678	107% 2% RPD
16	-1.01 MSD		—	✓	0.000	0.076	0.076	0.0670	105%
	CCV2		—	✓	0.000	0.055	0.055	0.0486	97%
17	CCB2		—	✓	0.000	0.000	0.000	0.000318	<0.003

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

ICV/CCV spiked with 0.25 ml of 524-1015/001 @1/10 ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-0228/103 ↑ 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 ↓ @1/10 ↑ 10 ml of sample (T.V.= 0.03ppm)

Comments:

Prepared By: Date/Time: 4/26/11 @1625

Analyzed By: Date/Time: 4/26/11 @1440

Reviewed By: KR Date: 4/26/11

Cr6LIQ.xls

160

11/23/09 SIG-1123090 2 1000 ppm SO_3 (ICV/CCV)
SR 0.1607g Na_2SO_3 (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100 ml w/ DI
EXP: 5/23/10

11/23/09 SIG-1123090 3 A, B, C, D pH REFERENCE
SR PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 SIG-1124090 1 1000 ppm SO_4 Standard
SR PURCHASED CAT # ICC-006
LOT # K607794
EXP: 9/30/13

SR 11/25/09
11/25/09 SIG-~~H35~~ 1125090 1 0.1N H_2SO_4
5.6ml Conc H_2SO_4 (EMD 47050 EXP: 9/13/10)
EXP: ~~H35~~ 9/13/10
SR 11/25/09

11/30/09 SIG-1130090 1 Cr^{6+} Coloring Reagent
SR 0.2500g Diphenylcarbohydrazide (EMD) 47103ED; EXP: 1/30/13) ↑ 50ml w/ Acetone (EMD 47154D; EXP: 5/24/12)
EXP: 12/30/09

11/30/09 SIG-1130090 2 25133 ppb Stock for O_3 in Air
SR 0.05ml Pyridine-4-Carboxaldehyde (Alfa Aesar LOT 10140558; EXP 8/11/12)
↑ 500ml deionized H_2O
EXP: 12/14/09

11/30/09 SIG-1130090 3 25733 ppb ICV/CCV for O_3 in Air
SR 0.05ml Pyridine-4-carboxaldehyde (TCI LOT # IGINC; EXP: 5/10/12)
↑ 500ml w/ DI H_2O
EXP: 12/14/09

Reviewed And Approved By:
Initial: VL Date: 12/22/09

14

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

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

3/1/10 524-03011003 1000 PPM Cl (HCS)
SR Purchased 120ml Cat # 1955-4
RICCA CHEM CO LOT # 1001395
EXP: 7/2011

3/1/10 524-03011004 NH3 Filling Sol'n
SR Purchased 60ml Order 95120-2
Thermo Scientific LOT # MT1
P/N. 703613-A04
EXP: 3/1/11

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

40

10/6/10 SL — 524-1006/001 — 25/33 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 — 524-1006/002 — 25/33 ppb ICV/CCV for O3

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

EXP: 10/20/10

10/6/10 SL — 524-1006/003 — MBTH SD/17

0.5000 g MBTH (Aldrich 54646CK :Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 44,284; exp 11/20

EXP: 10/7/10

10/15/10 SL — 524-10151001 — Cr6+ ICV/CCV Stock 100ppm Cr6+

Purchased
RICCA Chemical Co
500ml Plastic
LOT # 101077
EXP: 3/20/12
Cat No 2095-16

10/15/10 SL — 524-10157002 — 500ppm NO_2 Stock

Purchased
RICCA Chemical Co
LOT # 101071
EXP: 4/2011
Cat No: 5444.54
120ml amber glass

10/28/10 S24-10781002 1000 PPM SO_3 ICV/CCV

0.1607 Na_2SO_3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 S24-11011001 ICV/CCV Cr^{6+} T.V = 0.579 PPM

0.5ml S19-04090604 (T.V = 115.8 mg/L ; EXP: 12/2010)

↑ 100ml W/ DI

EXP: 11/15/10

11/1/10 S24-11011002 Cr^{6+} Coloring Reagent

0.250g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP. 1/30/13) ↑ 50ml W/ Acetone (EMD 47154D; EXP. 9/24/12)

EXP: 11/15/10

11/4/10 S24-11041001 A→E pH Filling Sol'n

PURCHASED (3M KCl) P/N 702613-A02

Thermo Scientific

LOT Code: 0R1

EXP: 11/4/11

11/4/10 S24-11041002 pH 2.000 Buffer

Purchased

BDH CAT NO: 5010-500ml

LOT # 100219G

EXP: 1/2012

77

11/4/10 524-1104L003 pH 4.00 Buffer
Purchased
JT Baker Cat No: 5657-01 500 ml
LOT # J30507
EXP 8/31/12

11/4/10 524-1104L004 pH 7.00 Buffer
Purchased
J.T. Baker Cat No: 5656-01 500 ml
LOT # J35515
EXP: 9/30/12

11/5/10 524-1105L001 MBTH Std

0.5000 g MBTH (Aldrich 521696EK ;Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 49884 Exp: 11/20/14

EXP: 11/6/10

11/8/10 524-1108L001 1000 ppm NH_3
0.3141g NH_4Cl (EMD 4919893; EXP: 10/19/14) to 100 ml
W/ 524-1221006 EXP: 10/22/11
EXP: 10/22/11

11/12/10 524-1112L001 1000 ppm SO_3 STOCK

0.1591 Na_2SO_3 (JT Baker Lot #H10627; Exp: 8/31/14) up to 100 ml w/ DI Water.

EXP: 11/26/10

54

524-0221101 1:1 H_2SO_4

2/21/11 SC

250 mL H_2SO_4 (EMD 49284; EXP: 11/20/14) ADDED SLOWLY TO 250 mL DI. COOL COMPLETELY
EXP: 2/21/12

2/21/11 SC

524-0221102 Cr6+ Coloring Reagent

0.2500 g 1,5-diphenylcarbohydrazide (EMD LOT 47103721 EXP: 11/30/13) + 50 mL w/ Acetone (EMD LOT# 47154D, EXP: 9/30/12).
EXP: 3/21/11

2/28/11 SC

524-0228101 0.1 H_2SO_4

5.6 mL Conc H_2SO_4 (EMD 49284 EXP: 11/20/14) + 2L W/ DI H_2O
EXP: 2/28/12

2/28/11 SC

524-0228102 1001 mg/L Cr6+

Purchased Inorganic Ventures CGCR(6)1-1
125 mL Clear Glass
LOT# D2-CR030410
EXP: 3/1/2012

2/28/11 SR
524-022811 03 10PPM Cr6+ Std/Ver
1.0 mL 524-022811 02 (~~10PPM Cr6+~~ 100PPM Cr6+ 3/21/11; Exp: 3/1/12) ↑
100 mL w/ DI H2O
Exp: 2/28/12

3/7/11 SR
524-030711 01 Cr6+ Colorimetric Reagent
0.2500g 1,5-Diphenylcarbohydrazide (EMD Lot 47103721, Exp: 1/30/13) ↑ 50 mL w/ Acetone (EMD 47154; Exp: 9/24/12).
Exp: 4/7/11

3/7/11 SR
524-030711 02 500PPM NO2
Purchased
RICCA CHEM Co Cat No 5444.5-4
LOT # 1162524
EXP: 8/2011

3/17/11 SR
524-031711 01 Alkaline Digestion Std/Ver
20.0g NaOH (EMD 47022713B; Exp: 10/11/12) + 30.0g Na2CO3 (EMD 46221715B; Exp: 10/11/12) ↑ 1L w/ DI H2O.
Exp: 4/17/11

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

4/14/11 SR
524-041411 01 ICO2 Effluent
75ml 524-042911 02 (10X Conc Effluent, Exp 4/29/11)
↑ 750ml w/ DI H2O. DEGAS
Exp: 4/28/11

56

S24-0415/1101 ICO3 PCE

4/15/11 SC

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EMD 470323 exp: 11/2012) in 100 mL Methanol (B&J 230-21K exp: 10/2012). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD 4.7250 exp: 11/2012). Bring up to volume w/ DI H2O; mix and degas.

EXP: 4/30/11

4/19/11 SC

S24-0419/1103 Cr6+ Staining Reagent

0.250g 1,5-Diphenylcarbohydrazide (EMD 470323 EXP: 1/30/13) + 50mL M/Acetone (EMD 471540; EXP 5/31/12)

EXP: 5/15/11

4/12/11 SC

S24-0415/1102 1.5 N NaOH

100g NaOH (EMD 4702713 EXP 10/1/12) + 100 DI H2O

EXP 4/15/12

4/18/11 SC

S24-0418/1101 1000ppb Cr6+

0.1mL S24-0238/1102 (1000 ppm Cr6+; EXP 3/1/12) + 100mL w/ pH ADJUSTED DI (9.39)

EXP: 3/1/12

4/18/11 SC

S24-0418/1102 ICN ICO2 25ppb

0.25 mL Ref S24-0415/1001 @ 0.1/10 exp: 3/2012 up to 100 mL with pH adjusted (pH= 9.39), degassed DI Water.

EXP. 5/2/11

LABORATORY REPORT

May 19, 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 April 27, 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 P1101579.

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 1:46 pm, May 19, 2011

Sue Anderson
Project Manager

Client: Battelle CAS Project No: P1101579
Project: JPL GW Mon 2Q11 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on April 27, 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: P1101579

Date Received: 4/27/2011
Time Received: 15:50

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	7196A - Cr6	8270C SIM - 14_DIOXANE	521 - Nitrosamines
MW-24-5	P1101579-001	Water	4/27/2011	07:56	X		
MW-24-4	P1101579-002	Water	4/27/2011	08:40	X		
MW-24-3	P1101579-003	Water	4/27/2011	09:25	X		
MW-24-2	P1101579-004	Water	4/27/2011	10:10	X		
MW-24-1	P1101579-005	Water	4/27/2011	11:15	X	X	X
DUPE-1-2Q11	P1101579-006	Water	4/27/2011	00:00	X		
EB-3-4/27/11	P1101579-007	Water	4/27/2011	11:00	X		

Acronyms

CA LUFT	California DHS LUFT Methoc
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 *tert* -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	*Standard Methods for the Examination of Water and Wastewater* , 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* , 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

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

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. P1101579

CAS Contact:

Company Name & Address (Reporting Information)	BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110
Project Name	JPL GW MON. 2Q11
Project Number	64866090
Project Manager	DAVID CONNEW
P.O. # / Billing Information	214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone	(619) 726-7311
Fax	(614) 458-6614
Email Address for Result Reporting	
Sampler (Print & Sign)	CHASE BROOKSON

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics 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)	0 Cr III (7196)	7 NDMA (521)	0 Dioxane (8270 s/m)	Remarks
MW-24-5	1	4/27/11	756	W	1							X			
MW-24-4	2		840		1							X			
MW-24-3	3		925		1							X			
MW-24-2	4		1010		1							X			
MW-24-1	5		1115		4							X	X	X	
DUPE-1-2Q11	6		—		1							X			DUPLICATE
EB-3-4/27/11	7		1100		1							X			EQUIP BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

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)

Relinquished by: (Signature)	Date: 4/27/11	Time: 1508	Received by: (Signature)	Date: 4/27/11	Time: 1508	
Relinquished by: (Signature)	Date: 4/27/11	Time: 1650	Received by: (Signature)	Date: 4/27/11	Time: 1550	Cooler / Blank / Ice / No Ice
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:	Temperature 2.0 °C

Client: Battelle **Service Request:** P1101579
Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101579-001.01					
	7196A				
		4/27/11	1557	SMO / MZAMORA	
		4/27/11	1600	P-37 / MZAMORA	
		4/27/11	1607	In Lab / SANDERSON	
		4/27/11	1712	P-37 / SANDERSON	
P1101579-002.01					
	7196A				
		4/27/11	1557	SMO / MZAMORA	
		4/27/11	1600	P-37 / MZAMORA	
		4/27/11	1607	In Lab / SANDERSON	
		4/27/11	1712	P-37 / SANDERSON	
P1101579-003.01					
	7196A				
		4/27/11	1557	SMO / MZAMORA	
		4/27/11	1600	P-37 / MZAMORA	
		4/27/11	1607	In Lab / SANDERSON	
		4/27/11	1712	P-37 / SANDERSON	
P1101579-004.01					
	7196A				
		4/27/11	1557	SMO / MZAMORA	
		4/27/11	1600	P-37 / MZAMORA	
		4/27/11	1607	In Lab / SANDERSON	
		4/27/11	1712	P-37 / SANDERSON	
P1101579-005.01					
		4/27/11	1557	SMO / MZAMORA	
		4/27/11	1600	SUBBED / MZAMORA	
		4/29/11	1149	K-Delilah-07 / FADAIR	
P1101579-005.02					
	521				
		4/27/11	1557	SMO / MZAMORA	
		4/27/11	1600	SUBBED / MZAMORA	
		4/29/11	1149	K-Delilah-07 / FADAIR	
		5/2/11	0845	Custodian / DMOORE	
		5/2/11	0845	In Lab / RHAYES	
		5/2/11	1542	K-Delilah-07 / SDAVIS	
		5/4/11	1642	In Lab / SJONES	
		5/4/11	1648	K-Delilah-07 / DMOORE	
P1101579-005.03					
	7196A				
		4/27/11	1557	SMO / MZAMORA	
		4/27/11	1600	P-37 / MZAMORA	
		4/27/11	1607	In Lab / SANDERSON	

Client: Battelle **Service Request:** P1101579
Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
		4/27/11	1712	P-37 / SANDERSON	
P1101579-005.04					
	8270C SIM				
		4/27/11	1557	SMO / MZAMORA	
		4/27/11	1600	P-37 / MZAMORA	
		4/27/11	1602	SUBBED / MZAMORA	
		4/29/11	1149	K-Delilah-07 / FADAIR	
		5/4/11	1141	Custodian / DMOORE	
		5/4/11	1141	In Lab / KGCOLLINS	
		5/4/11	1524	K-Delilah-07 / DMOORE	
P1101579-006.01					
	7196A				
		4/27/11	1557	SMO / MZAMORA	
		4/27/11	1600	P-37 / MZAMORA	
		4/27/11	1607	In Lab / SANDERSON	
		4/27/11	1712	P-37 / SANDERSON	
P1101579-007.01					
	7196A				
		4/27/11	1557	SMO / MZAMORA	
		4/27/11	1600	P-37 / MZAMORA	
		4/27/11	1607	In Lab / SANDERSON	
		4/27/11	1712	P-37 / SANDERSON	

Columbia Analytical Services | 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

Sample Acceptance Check Form

Client: Battelle Work order: P1101579

Project: JPL GW. Mon. 2Q11 / G486090

Sample(s) received on: 4/27/11 Date opened: 4/27/11 by: MZAMORA

Note: This form is used forall 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?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 2 °C			
9	Was a **trip blank** received?	☐	☒	☐
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101579-001.01	125mL Plastic NP					
P1101579-002.01	125mL Plastic NP					
P1101579-003.01	125mL Plastic NP					
P1101579-004.01	125mL Plastic NP					
P1101579-005.01	1000ml AG NP					
P1101579-005.02	1000ml AG NP					
P1101579-005.03	125mL Plastic NP					
P1101579-005.04	500mL AG NP					

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

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

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Sample Acceptance Check Form

Client: Battelle Work order: P1101579

Project: JPL GW. Mon. 2Q11 / G486090

Sample(s) received on: 4/27/11 Date opened: 4/27/11 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101579-006.01	125mL Plastic NP					
P1101579-007.01	125mL Plastic NP					

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

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101579
Date Collected : 04/27/11
Date Received : 04/27/11

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-24-5	P1101579-001	0.010	0.003	1	NA	04/27/11 16:45	ND	
MW-24-4	P1101579-002	0.010	0.003	1	NA	04/27/11 16:45	ND	
MW-24-3	P1101579-003	0.010	0.003	1	NA	04/27/11 16:45	ND	
MW-24-2	P1101579-004	0.010	0.003	1	NA	04/27/11 16:45	ND	
MW-24-1	P1101579-005	0.010	0.003	1	NA	04/27/11 16:45	ND	
DUPE-1-2Q11	P1101579-006	0.010	0.003	1	NA	04/27/11 16:45	ND	
EB-3-4/27/11	P1101579-007	0.010	0.003	1	NA	04/27/11 16:45	ND	
Method Blank	P1101579-MB	0.010	0.003	1	NA	04/27/11 16:45	ND	

Approved By Karen Ryan Date : 4/28/11

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11 / G486090	**Date Analyzed:**	04/27/11

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 Ryan Date: 4/28/11

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Service Request: P1101579
Date Analyzed: 04/27/11

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	0.0502	100	90-110
CCV1	0.0500	0.0511	102	90-110
CCV2	0.0500	0.0511	102	90-110

Approved By: Karen Ryan Date: 4/28/11

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1101579
Project Name :	JPL GW Mon 2Q11	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	04/27/11

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1101579-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0404	101	90-110	

Approved By Karen Ryan Date : 4/28/11

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1101579
Project Name :	JPL GW Mon 2Q11	**Date Collected :**	04/27/11
Project Number :	G486090	**Date Received :**	04/27/11
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	04/27/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-24-5
Lab Code : P1101579-001MS P1101579-001DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0476	0.0467	95	93	73-119	2	

Approved By Karen Ryan Date : 4/28/11

Report By:SAnderson

Columbia Analytical Services™

pH Run Log

Service Request #(s): P1101579, P1101581

Time: 0807

Sample	VWR lot #	Exp.
pH 2 Buffer	524-11041002	1/2012
pH 4 Buffer	524-11041003	8/31/12
pH 7 Buffer	524-11041004	9/30/12
pH 10 Buffer	524-10302001	9/30/11

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	2.002	23.0°
pH 4.000	↓	4.002	23.0°
pH 7.000		7.009	23.0°
pH 10.000		9.997	23.3°
Ref#: 7199-112304038 Lot#: 7199-646 Exp. 1/2012		6.361	98% 23.4°
DI		2.041	21.0°
pH 2.000	↓	1.979	22.7°
TIME: 1608			
pH 2.000	5	1.983	21.9°
1579-1.01	↓	1.921	9.5°
-2.01		1.845	9.2°
-3.01		1.984	8.6°
-4.01		2.058	9.6°
-5.01		2.067	11.5°
-6.01		2.112	8.9°
-7.01		2.014	10.0°
1581-1.01	↓	2.032	10.6°

Sample	#	pH	Temp. °C
1581-2.01	5	2.052	10.0°
-3.01	↓	2.088	10.1°
pH 2.000		1.990	21.8°
1581-4.01		1.976	9.9°
-5.01		2.057	11.0°
pH 2.000	↓	2.015	21.3°
		space not used	

pH Adjustments: ☒ **7196A**: Diluted/Conc H_2SO_4 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: 4/15/11

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

Analyst: _____ Date: 4/27/11

Reviewer: KR Date: 4/28/11

pH.XLS

Hexavalent Chromium (Liquids)

Columbia Analytical Services™

Method EPA 7196A

page 1 of 2

Service Request#(s): 1101579, 1581 Run#: 243958

Stock#: 524-022S/103 T.V=10ppm EXP: 2/25/12 Prep Run#:

ICV/CCV#: 524-1015/001 T.V=100ppm EXP: 3/20/12 Conc. H_2SO_4 Lot#: EMD 49284 EXP 11/20/14

Coloring Reagent Ref#: 524-0415/102 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	0.9999445
Absorbance @ 540 nm	0.000	0.010	0.056	0.112	

	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	0.000473	<0.003
2	ICV 0.05PPM		—	✓	0.000	0.056	0.056	0.0502	100%
3	MA		—	✓	0.000	0.000	0.000	0.000473	<0.003
4	LCS 0.040PPM		—	✓	0.000	0.045	0.045	0.0404	101%
5	1579-1.01		—	✓	0.001	0.003	0.002	0.00225	<0.003
6	1.01 MS 0.05PPM		—	✓	0.001	0.054	0.053	0.0476	95%
7	1.01 MSD 0.05PPM		—	✓	0.001	0.053	0.052	0.0467	93% 2% RPD
8	2.01		—	✓	0.005	0.005	0.000	0.000473	<0.003
9	2.01 LS 0.03PPM		—	✓	0.005	0.037	0.032	0.0289	96%
10	3.01		—	✓	0.002	0.004	0.002	0.00225	<0.003
11	4.01		—	✓	0.001	0.003	0.002	0.00225	↓
12	5.01		—	✓	0.004	0.004	0.000	0.000473	↓
13	CCV1 0.05PPM		—	✓	0.000	0.057	0.057	0.0511	102%
14	CCB1		—	✓	0.000	0.000	0.000	0.000473	<0.003
15	1579-6.01		—	✓	0.002	0.004	0.002	0.00225	↓
16	7.01		—	✓	0.000	0.000	0.000	0.000473	↓
17	1581-1.01	↓	—	✓	0.000	0.002	0.002	0.00225	↓

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

ICV/CCV spiked with 0.25 ml of 524-1015/001@1to ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-022S/003 ↑ 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 ↓ @1to ↑ 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: Date/Time: 4/27/11 @1630

Analyzed By: Date/Time: 4/27/11 @1645

Reviewed By: KR Date: 4/28/11

Cr6LIQ.xls

Hexavalent Chromium (Liquids)

Columbia Analytical Services

Method EPA 7196A

72

page 2 of 2

Service Request#(s): P110179, 1581 Run#: 243958

Stock#: S24-0228103 T.V=100ppm EXP: 2/28/12 Prep Run#:

ICV/CCV#: S24-1015001 T.V=100ppm EXP: 3/26/12 Conc. H_2SO_4 Lot#: BMD49284 EXP: 11/20/14

Coloring Reagent Ref#: S24-0415102 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					

	Sample #	Sample Vol.(mL)	Dilution	pH ✓	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1	1581-1.01 MS 0.05ppm	10ml	—	✓	0.000	0.057	0.057	0.0458	92%
2	-1.01 MSD	"	—	✓	0.000	0.051	0.051	0.0458	92% 0 RPD
3	-2.01		—	✓	0.000	0.002	0.002 (82.4%)	0.00225	<0.003
4	-2.01 MS 0.03ppm		—	✓	0.000	0.030	0.030	0.0271	90%
5	-3.01		—	✓	0.000	0.000	0.000	0.000473	<0.003
6	-4.01		—	✓	0.001	0.003	0.002	0.00225	"
7	-5.01		—	✓	0.000	0.000	0.000	0.000473	"
8	CCV2 0.050ppm		—	✓	0.000	0.057	0.057	0.0511	102%
9	CCB2	↓	—	✓	0.000	0.000	0.000	0.000473	<0.003
10									
11									
12									
13									
14									
15									
16									
17									

Space not used

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

ICV/CCV spiked with 0.25 ml of S24-1015/001 @1ppm ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of S24-0228103 ↑ 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: Date/Time: 4/27/11 @1630

Analyzed By: Date/Time: 4/27/11 @1645

Reviewed By: PR Date: 4/28/11

Cr6LIQ.xls

HOU

11/23/09 SIG-1123090Z 1000 PPM SO3 (ICV/CCV)
SR 0.1607g Na_2SO_3 (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/ DI
EXP: 5/23/10

11/23/09 SIG-1123090 3 A,B,C,D PH REFERENCE
SR PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 SIG-1124090 1 1000 PPM SO4 Standard
SR PURCHASED CAT # ICC-006
LOT # K007794
EXP: 9/30/13

SR 11/25/09
11/25/09 SIG-~~H25~~ 1125090 1 0.1N H_2SO_4
SR ~~5.6~~ml Conc H_2SO_4 (EMD 4705D EXP: 9/13/10)
EXP: ~~H25~~ 9/13/10
SR 11/25/09

11/30/09 SIG-1130090 1 Cr^{6+} Coloring Reagent
SR 0.2500g Diphenylcarbohydrazide (EMD) 47103ED; EXP: 1/30/13) ↑ 50ml w/ Acetone (EMD 4715D; EXP: 5/24/12)
EXP: 12/30/09

11/30/09 SIG-1130090 2 25133 ppb Stock for O3 in Air
SR 0.05ml Pyridine-4-Carboxaldehyde (Alfa Aesar LOT 10140598; EXP 8/11/12)
↑ 500ml deionized H_2O
EXP: 12/14/09

11/30/09 SIG-1130090 3 25133 ppb ICV/CCV FOR O3 in AIR
SR 0.05ml Pyridine-4-carboxaldehyde (TCI LOT # IGIINC; EXP: 5/10/12)
↑ 500ml w/ DI H_2O
EXP: 12/14/09

Reviewed And Approved By:
Initial: KL Date: 12/22/09

14

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

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

3/1/10 524-03011003 1000 PPM Cl (LCS)
SV Purchased 120 ml Cat # 1955-4
RICCA CHEM CO LOT # 1001395
EXP: 7/2011

3/1/10 524-03011004 NH3 Filling Sol'n
SV Purchased 60 ml Ord # 951202
Thermo Scientific LOT # MT1
P/N 703613-A04
EXP: 3/1/11

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

40

10/6/10 SL 524-10061001 25/33 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 25/33 ppb ICV/CCV for O3

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

EXP: 10/20/10

10/6/10 SL 524-10061003 MBTH SD/17

0.5000 g MBTH (Aldrich 546666K :Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 44284; EXP 11/20/

EXP: 10/7/10

10/15/10 SL 524-10151001 Cr6+ ICV/CCV Stock

Purchased
RICCA Chemical Co
500ml Plastic
LOT # 101077
EXP: 3/20/12

100PPM Cr6+
Cat No 2995-16

10/15/10 SL 524-10157002 500PPM NO_2 Stock

Purchased
RICCA Chemical Co
LOT# 101071
EXP: 4/2011

Cat No: 5444.54
120ml amber glass

10/28/10 S24-10281002 1000 ppm SO_3 ICV/CCV

0.1607 Na_2SO_3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 S24-11011001 ICV/CCV Cr^{6+} T.V = 0.579 ppm

0.5 ml SIG-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

0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721, EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD 47154D, EXP: 9/24/12).

EXP: 11/15/10

11/4/10 S24-11041001 A→E pH Filling Sol'n

PURCHASED (3M KCl)

Thermo Scientific

P/N 702613-A02

LOT Code: 0R1

EXP: 11/4/11

11/4/10 S24-11041002 pH 2.000 Buffer

Purchased

BDH CAT NO: 5010-500 ml

LOT # 100219G

EXP. 1/2012

11/4/10 524-1104003 pH 4.000 Buffer
Purchased
J.T. Baker Cat No: 5657-01 500 mL
LOT # J30507
EXP 8/31/12

11/4/10 524-1104004 pH 7.000 Buffer
Purchased
J.T. Baker Cat No: 5656-01 500 mL
LOT # J35515
EXP: 9/30/12

11/5/10 524-1105001 MBTH Std

0.5000 g MBTH (Aldrich 52666EK ;Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 49884 EXP: 11/20/14

EXP: 11/6/10

11/8/10 524-1108001 1000 ppm NH_3
0.3141g NH_4Cl (EMD 49R8931; EXP: 10/19/14) up to 100 ml
W/ 524-1021006 EXP: 10/22/11
EXP: 10/22/11

11/12/10 524-1112001 1000 ppm SO_3 Stock

0.1591 Na_2SO_3 (JT Baker Lot #H10627; Exp: 8/31/14) up to 100 ml w/ DI Water.

EXP: 11/26/10

54

524-0221101 1:1 H_2SO_4

2/21/11 SC
250ml H_2SO_4 (EMD 49284; EXP: 11/20/14 ADDED SLOWLY TO 250ml DI. COOL COMPLETELY
EXP: 2/21/12

2/21/11 SC
524-0221102 Cr6+ Coloring Reagent
0.2500g 1,5-diphenylcarbohydrazide (EMD LOT 47103721 EXP: 11/30/13) + 50ml w/ Acetone (EMD LOT# 47154D, EXP: 9/24/12).
EXP: 3/21/11

2/28/11 SC
524-0228101 0.1 H_2SO_4
5.6ml conc H_2SO_4 (EMD 49284 EXP: 11/20/14) + 2L w/ DI H_2O
EXP: 2/28/12

2/28/11 SC
524-0228102 1001 mg/L Cr6+
Purchased
Inorganic Ventures CGCR(6)1-1
125mL Clear Glass
LOT# D2-CR030KO
EXP: 3/1/2012

2/28/11 SR

524-022811 03 100ppm Cr6+ Std/n
1.0mL 524-022811 02 (~~lot~~ 100ppm Cr6+ Std/n; Exp: 3/1/12) ↑
100mL w/ DI H2O
Exp: 2/28/12

3/7/11 SR

524-030711 01 Cr6+ Coloring Reagent
0.2500g 1,5-Diphenylcarbohydrazide
(EMD Lot 47103721, Exp: 1/30/13) ↑ 50mL w/
Acetone (EMD 47124, Exp: 9/24/12).
Exp: 4/7/11

3/7/11 SR

524-030711 02 500ppm NO2
Purchased
RICCA Chem Co Cat No 5444-5-4
Lot # 1162524
Exp: 8/2011

3/17/11 SR 3/17/11

524-030711 01 Alkaline Digestion Std/n
20.0g NaOH (EMD 47022713B; Exp: 10/11/12) + 30.0g
Na2CO3 (EMD 46221715B; Exp: 10/11/12) ↑ 1L
w/ DI H2O.
Exp: 4/17/11

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

7/14/11 SR

524-041411 01 IC02 Eluent
75mL 524-042911 02 (10X Conc Eluent, Exp 4/29/11)
↑ 750mL w/ DI H2O. DEGAS
Exp: 4/28/11

56

524-04151101 ICO2 PCE

4/15/11 SR

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

EXP: 4/30/11

[illegible] 524-[illegible] Cyclic Silanes Reagent

SR 0.2500g 1,5-Diphenylcarbohydrazide (EMD #HX0372 EXP 1/30/13) + 50mL w/ Acetone (EMD #71540; EXP 5/24/12)

EXP: 5/15/11

4/12/11 SR 524-04151102 0.5N NaOH

100g NaOH (EMD #SX0593 EXP 10/1/12) + 100 DI H2O

EXP 4/15/12

4/18/11 SR 524-04181101 1000ppb Cr6+

0.1mL 524-02381102 (1000 PPM Cr6+; EXP 3/1/12) + 100mL w/ pH ADJUSTED DI (9.39)

EXP: 3/1/12

4/18/11 SR 524-04181102 ICN ICO2 25ppb

0.25 mL Ref 524-10151001 @ 0.1/10 exp: 3/2012 up to 100 mL with pH adjusted (pH= 9.39), degassed DI Water.

EXP. 5/2/11

Columbia Analytical Services, Inc.
1317 S. 13th Avenue, Kelso, WA 98626 360.577.7222 360.636.1068 (fax) www.caslab.com

May 16, 2011 Analytical Report for Service Request No: P1101579

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 April 27, 2011. For your reference, these analyses have been assigned our service request number P1101579.

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

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	**Service Request No.:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Received:**	4/27/11
Sample Matrix:	Water		

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 4/27/11. 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 Howard Holmes **Date** 5-17-11

Chain of Custody

Intra-Network Chain of Custody

2655 Park Center Drive, Suite A • Simi Valley, CA 93065 • 805-526-7161 • FAX 805-526-7270

CAS Contact: Sue Anderson

Project Name: JPL GW Mon 2Q11
Project Number: G486090
Project Manager: David Conner
Company: Battelle

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	14_DIOXANE 8270C SIM	Nitrosamines 521
P1101579-005	MW-24-1	3	Water	4/27/11	1115	4/27/11	KELSO	IV	IV

Test Comments

Nitrosamines - 521 P1101579-005 NDMA

8

Special Instructions/Comments	Turnaround Requirements	Report Requirements	Invoice Information
	____**RUSH** (Surcharges Apply) **PLEASE CIRCLE WORK DAYS** 1 2 3 4 5 ____ **STANDARD** Requested FAX Date: _____ Requested Report Date: 05/14/11	____ I. Results Only ____ II. Results + QC Summaries ____ III. Results + QC and Calibration Summaries X IV. Data Validation Report with Raw Data PQL/MDL/J Y EDD Y	PO# P1101579 Bill to

Relinquished By: U Zamora 4/28/11 1325 Received By: K Smith 4/29/11 1015 Airbill Number: _____

PC 412

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

Client / Project: CAS/Simi Valley Service Request ~~K11~~ P1101579

Received: 4/29/11 Opened: 4/29/11 By: AB Unloaded: 4/29/11 By: AB

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		311		1Z 759 05X 01 4139 6893	

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 Mon 2Q11/G486090
Service Request: P1101579

Cover Page - Organic Analysis Data Package
Nitrosamines by EPA 521

Sample Name	Lab Code	Date Collected	Date Received
MW-24-1	P1101579-005	04/27/2011	04/27/2011

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: 5/15/11
Title: Scientist

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	04/27/2011
Sample Matrix:	Water	**Date Received:**	04/27/2011

Nitrosamines by EPA 521

Sample Name:	MW-24-1	**Units:**	ng/L
Lab Code:	P1101579-005	**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	**0.46**	J	2.0	0.32	1	05/02/11	05/13/11	KWG1103886	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	105	70-130	05/13/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Drinking water	**Date Received:**	NA

Nitrosamines by EPA 521

Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KWG1103886-4	**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	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 Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101579

Surrogate Recovery Summary
Nitrosamines by EPA 521

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Level: Low

Sample Name	Lab Code	Sur1
MW-24-1	P1101579-005	105
Batch QC	P1101607-001	98
Method Blank	KWG1103886-4	92
Batch QCMS	KWG1103886-1	99
Batch QCDMS	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.

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/02/2011
Sample Matrix:	Water	**Date Analyzed:**	05/13/2011

Matrix Spike/Duplicate Matrix Spike Summary
Nitrosamines by EPA 521

Sample Name:	Batch QC	**Units:**	ng/L
Lab Code:	P1101607-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521	**Extraction Lot:**	KWG1103886

Analyte Name	Sample Result	Batch QCMS KWG1103886-1 Matrix Spike Result	Matrix Spike Expected	Matrix Spike %Rec	Batch QCDMS KWG1103886-2 Duplicate Matrix Spike Result	Duplicate Matrix Spike Expected	Duplicate Matrix Spike %Rec	%Rec Limits	RPD	RPD Limit
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 Mon 2Q11/G486090
Sample Matrix: Drinking water

Service Request: P1101579
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 Result	Expected	%Rec	%Rec Limits
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.

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/02/2011
Sample Matrix:	Drinking water	**Date Analyzed:**	05/13/2011
		Time Analyzed:	01:28

Method Blank Summary
Nitrosamines by EPA 521

Sample Name:	Method Blank	**File ID:**	J:\MS16\DATA\051211-521\0512025.D
Lab Code:	KWG1103886-4	**Instrument ID:**	MS16
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521	**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-24-1	P1101579-005	J:\MS16\DATA\051211-521\0512029.D	05/13/11	04:04
Batch QC	P1101607-001	J:\MS16\DATA\051211-521\0512031.D	05/13/11	05:22
Batch QCMS	KWG1103886-1	J:\MS16\DATA\051211-521\0512032.D	05/13/11	06:01
Batch QCDMS	KWG1103886-2	J:\MS16\DATA\051211-521\0512033.D	05/13/11	06:40

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/02/2011
Sample Matrix:	Drinking water	**Date Analyzed:**	05/13/2011
		Time Analyzed:	03:25

Lab Control Sample Summary
Nitrosamines by EPA 521

Sample Name:	Lab Control Sample	**File ID:**	J:\MS16\DATA\051211-521\0512028.D
Lab Code:	KWG1103886-3	**Instrument ID:**	MS16
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521	**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-24-1	P1101579-005	J:\MS16\DATA\051211-521\0512029.D	05/13/11	04:04
Batch QC	P1101607-001	J:\MS16\DATA\051211-521\0512031.D	05/13/11	05:22
Batch QCMS	KWG1103886-1	J:\MS16\DATA\051211-521\0512032.D	05/13/11	06:01
Batch QCDMS	KWG1103886-2	J:\MS16\DATA\051211-521\0512033.D	05/13/11	06:40

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

Service Request: P1101579
Calibration Date: 05/12/2011

Initial Calibration Summary
Nitrosamines by EPA 521

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

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

Analyte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level 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**

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

Service Request: P1101579
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**

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

Service Request: P1101579
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**

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

Service Request: P1101579
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**

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

Service Request: P1101579
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**

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

Service Request: P1101579

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	MW-24-1	P1101579-005	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	Batch QC	P1101607-001	5/13/2011	05:22		5/13/2011	05:51
\0512032.D	Batch QCMS	KWG1103886-1	5/13/2011	06:01		5/13/2011	06:30
\0512033.D	Batch QCDMS	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

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

Service Request: P1101579
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-24-1	P1101579-005	04/27/11	04/27/11	500ml	1ml	NA	
Method Blank	KWG1103886-4	NA	NA	500ml	1ml	NA	
Batch QCMS	KWG1103886-1	NA	NA	500ml	1ml	NA	
Batch QCDMS	KWG1103886-2	NA	NA	500ml	1ml	NA	
Batch QC	P1101607-001	NA	NA	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 Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101579

Surrogate Recovery Summary
Nitrosamines by EPA 521

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Level: Low

Sample Name	Lab Code	Sur1
MW-24-1	P1101579-005	105
Batch QC	P1101607-001	98
Method Blank	KWG1103886-4	92
Batch QCMS	KWG1103886-1	99
Batch QCDMS	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.

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

Service Request: P1101579
Date Extracted: 05/02/2011
Date Analyzed: 05/13/2011

Matrix Spike/Duplicate Matrix Spike Summary
Nitrosamines by EPA 521

Sample Name: Batch QC
Lab Code: P1101607-001

Units: ng/L
Basis: NA

Extraction Method: METHOD
Analysis Method: 521

Level: Low
Extraction Lot: KWG1103886

Analyte Name	Sample Result	Batch QCMS KWG1103886-1 Matrix Spike Result	Matrix Spike Expected	Matrix Spike %Rec	Batch QCDMS KWG1103886-2 Duplicate Matrix Spike Result	Duplicate Matrix Spike Expected	Duplicate Matrix Spike %Rec	%Rec Limits	RPD	RPD Limit
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	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/02/2011
Sample Matrix:	Drinking water	**Date Analyzed:**	05/13/2011

Lab Control Spike Summary
Nitrosamines by EPA 521

Extraction Method:	METHOD	**Units:**	ng/L
Analysis Method:	521	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1103886

	Lab Control Sample KWG1103886-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
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.

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/02/2011
Sample Matrix:	Drinking water	**Date Analyzed:**	05/13/2011
		Time Analyzed:	01:28

Method Blank Summary
Nitrosamines by EPA 521

Sample Name:	Method Blank	**File ID:**	J:\MS16\DATA\051211-521\0512025.D
Lab Code:	KWG1103886-4	**Instrument ID:**	MS16
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521	**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-24-1	P1101579-005	J:\MS16\DATA\051211-521\0512029.D	05/13/11	04:04
Batch QC	P1101607-001	J:\MS16\DATA\051211-521\0512031.D	05/13/11	05:22
Batch QCMS	KWG1103886-1	J:\MS16\DATA\051211-521\0512032.D	05/13/11	06:01
Batch QCDMS	KWG1103886-2	J:\MS16\DATA\051211-521\0512033.D	05/13/11	06:40

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/02/2011
Sample Matrix:	Drinking water	**Date Analyzed:**	05/13/2011
		Time Analyzed:	03:25

Lab Control Sample Summary
Nitrosamines by EPA 521

Sample Name:	Lab Control Sample	**File ID:**	J:\MS16\DATA\051211-521\0512028.D
Lab Code:	KWG1103886-3	**Instrument ID:**	MS16
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521	**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-24-1	P1101579-005	J:\MS16\DATA\051211-521\0512029.D	05/13/11	04:04
Batch QC	P1101607-001	J:\MS16\DATA\051211-521\0512031.D	05/13/11	05:22
Batch QCMS	KWG1103886-1	J:\MS16\DATA\051211-521\0512032.D	05/13/11	06:01
Batch QCDMS	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	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	04/27/2011
Sample Matrix:	Water	**Date Received:**	04/27/2011

Nitrosamines by EPA 521

Sample Name:	MW-24-1	**Units:**	ng/L
Lab Code:	P1101579-005	**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	**0.46**	J	2.0	0.32	1	05/02/11	05/13/11	KWG1103886	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	105	70-130	05/13/11	Acceptable

Comments:

Exception Report

Data File: J:\MS16\DATA\051211-521\0512029.D
Lab ID: P1101579-005
RunType: SMPL
Matrix: WATER

Date Acquired: 05/13/2011 04:04
Date Quantitated: 05/13/2011 12:50
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: _____

Secondary Review: _____

Quantitation Report

Bottle ID:		**Tier:**	IV	**Matrix:**	WATER
Prod Code:	521 Nitrosamine	**Collect Date:**	04/27/2011	**Receive Date:**	04/27/2011

Analysis Lot:	KWG1104312	**Prep Lot:**	KWG1103886	**Report Group:**	P1101579
Analysis Method:	521	**Prep Method:**	METHOD		
Prep Ref:	1015266	**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\0512029.D			**Instrument:**	MS16
Acqu Date:	05/13/2011 04:04	**Quant Date:**	05/13/2011 12:50	**Vial:**	10
Run Type:	SMPL			**Dilution:**	1.0
Lab ID:	P1101579-005			**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	25426	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	10.43	0.00	0.00	50	24315	10.52	105	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	237	0.2300	0.46	J	

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

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512029.D Vial: 10
Acq On : 13 May 2011 04:04 Operator: SVO-DW
Sample : P1101579-005 Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:27 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

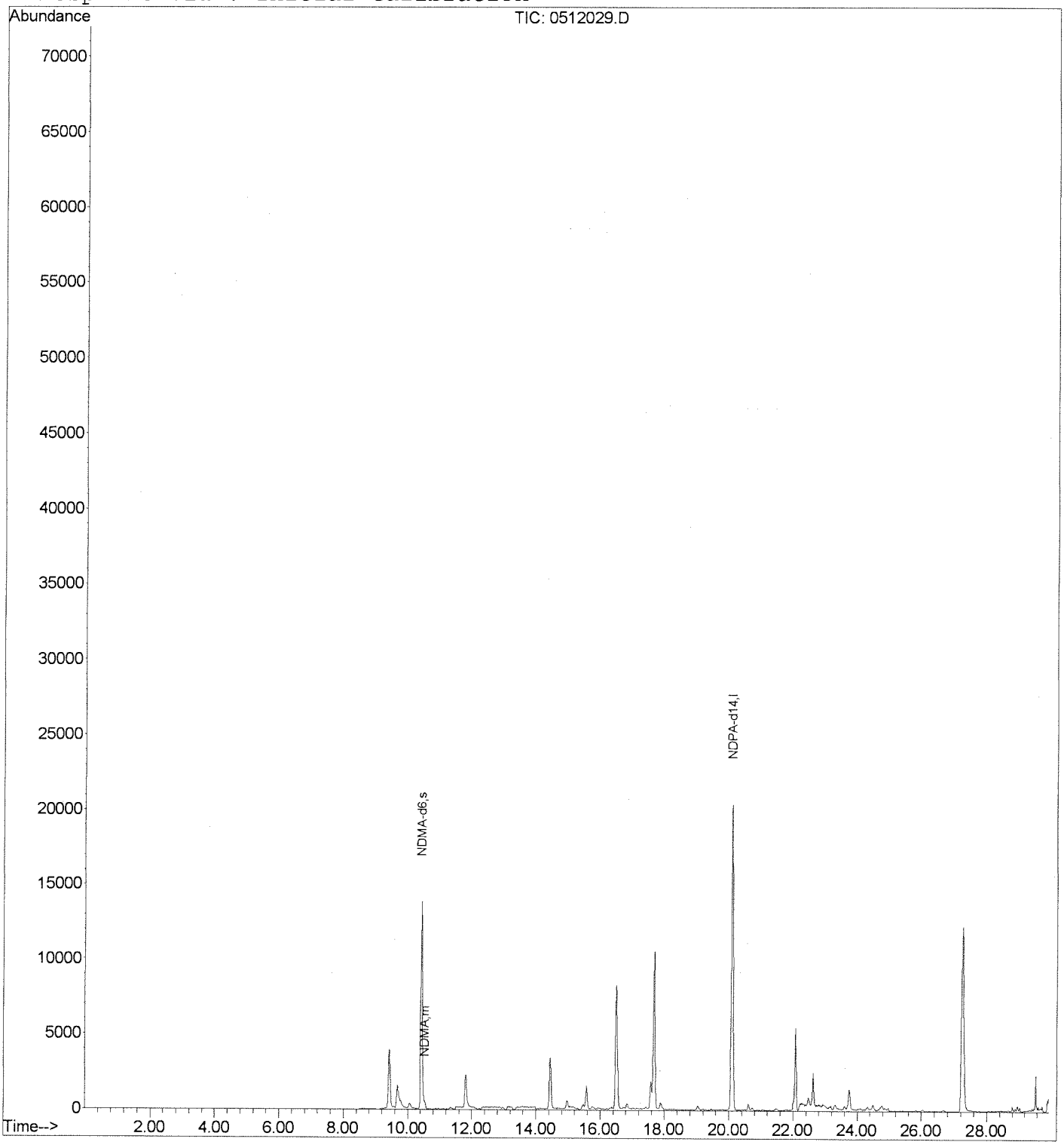
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	25426	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	24315	10.52	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.54	47	237	0.23	ug/L	# 20

(#) = qualifier out of range (m) = manual integration
0512029.D 051211_D14.M Fri May 13 12:55:36 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512029.D Vial: 10
Acq On : 13 May 2011 04:04 Operator: SVO-DW
Sample : P1101579-005 Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 12:50 2011 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



Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Drinking water	**Date Received:**	NA

Nitrosamines by EPA 521

Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KWG1103886-4	**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	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: 5/13/11

Secondary Review: 5/13/11

Quantitation Report

Bottle ID:		**Tier:**		**Matrix:**	DRINKING WATE
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:	1015271	**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:		**Quant based on Method**	

Data File:	J:\MS16\DATA\051211-521\0512025.D			**Instrument:**	MS16
Acqu Date:	05/13/2011 01:28	**Quant Date:**	05/13/2011 12:49	**Vial:**	8
Run Type:	MB			**Dilution:**	1.0
Lab ID:	KWG1103886-4			**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

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	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

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512025.D Vial: 8
Acq On : 13 May 2011 01:28 Operator: SVO-DW
Sample : 050211-MB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:26 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

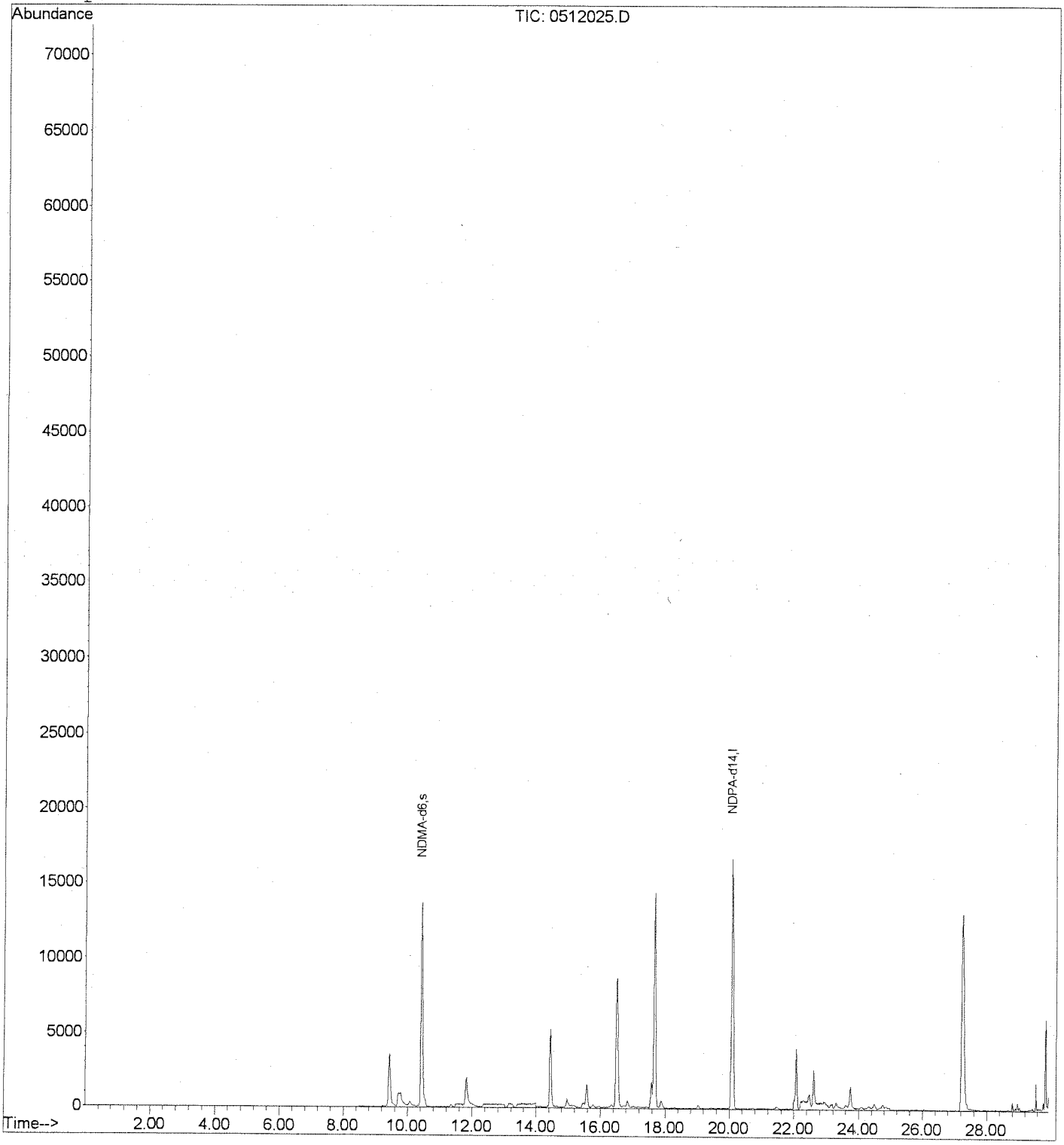
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	31460	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.44	50	25627	9.17	ug/L	0.00
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration
0512025.D 051211_D14.M Fri May 13 12:55:34 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512025.D Vial: 8
Acq On : 13 May 2011 01:28 Operator: SVO-DW
Sample : 050211-MB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 12:49 2011 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	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Nitrosamines by EPA 521

Sample Name:	Batch QCMS	**Units:**	ng/L
Lab Code:	KWG1103886-1	**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	**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: 5/13/11

Secondary Review: _____

Printed: 05/13/2011 14:53:04
u:\Stealth\Crystal.rpt\except2.rpt

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:			
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\0512032.D			**Instrument:**	MS16
Acqu Date:	05/13/2011 06:01	**Quant Date:**	05/13/2011 12:51	**Vial:**	13
Run Type:	MS			**Dilution:**	1.0
Lab ID:	KWG1103886-1 -- P1101607-001MS			**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 Vial: 13
Acq On : 13 May 2011 06:01 Operator: SVO-DW
Sample : P1101607-001 MS Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:27 2011 Quant Results File: 051211_D14.RES

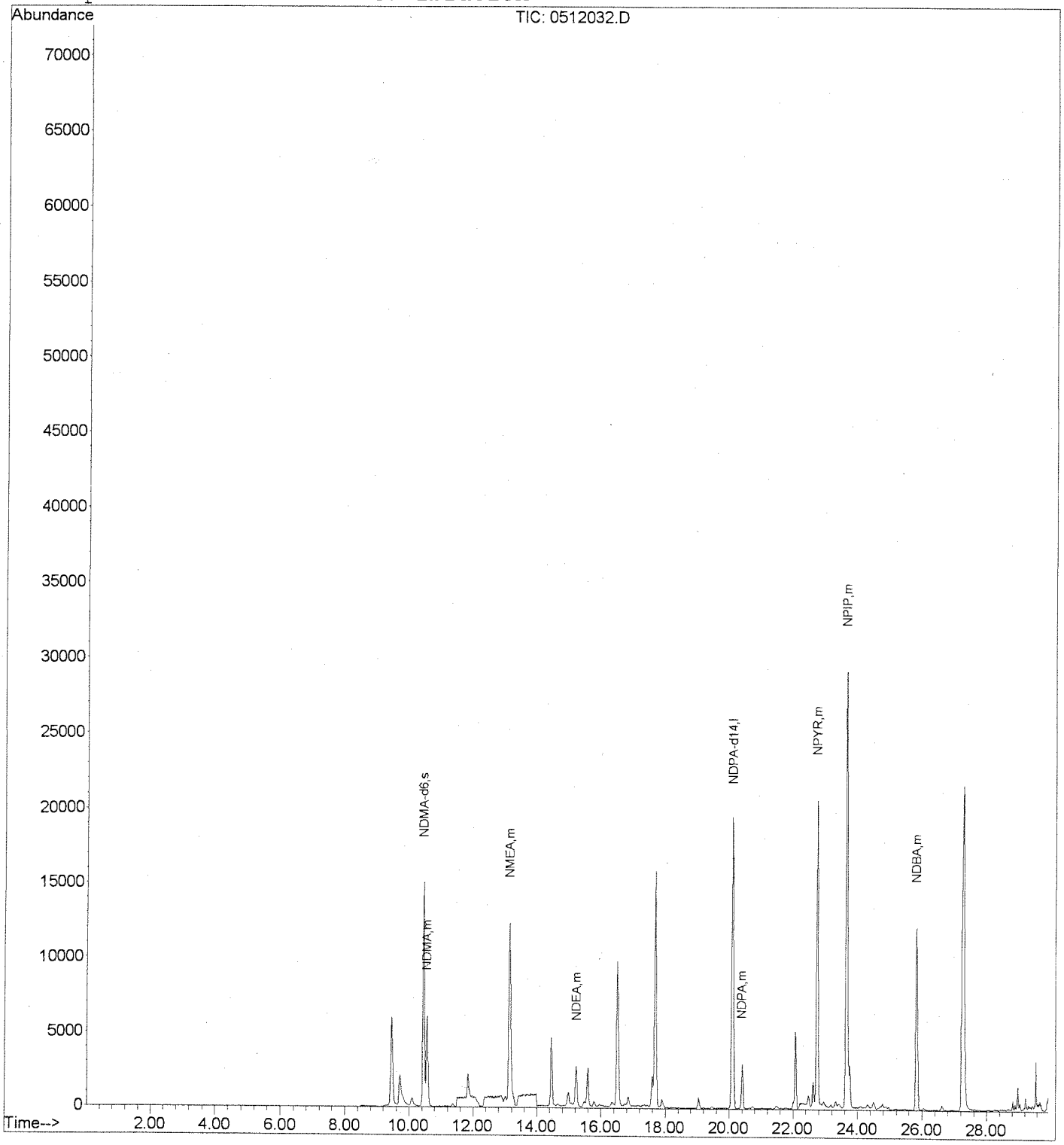
Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration
DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) NDPA-d14	20.11	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

(#) = qualifier out of range (m) = manual integration

Data File : J:\MS16\DATA\051211-521\0512032.D Vial: 13
Acq On : 13 May 2011 06:01 Operator: SVO-DW
Sample : P1101607-001 MS Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 12:51 2011 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	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Nitrosamines by EPA 521

Sample Name:	Batch QCDMS	**Units:**	ng/L
Lab Code:	KWG1103886-2	**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	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: _____

Printed: 05/13/2011 14:53:07
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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:	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	**Vial:**	14
Run Type:	DMS			**Dilution:**	1.0
Lab ID:	KWG1103886-2 -- P1101607-001DMS			**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	20.10	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

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512033.D Vial: 14
Acq On : 13 May 2011 06:40 Operator: SVO-DW
Sample : P1101607-001 DMS Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:28 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

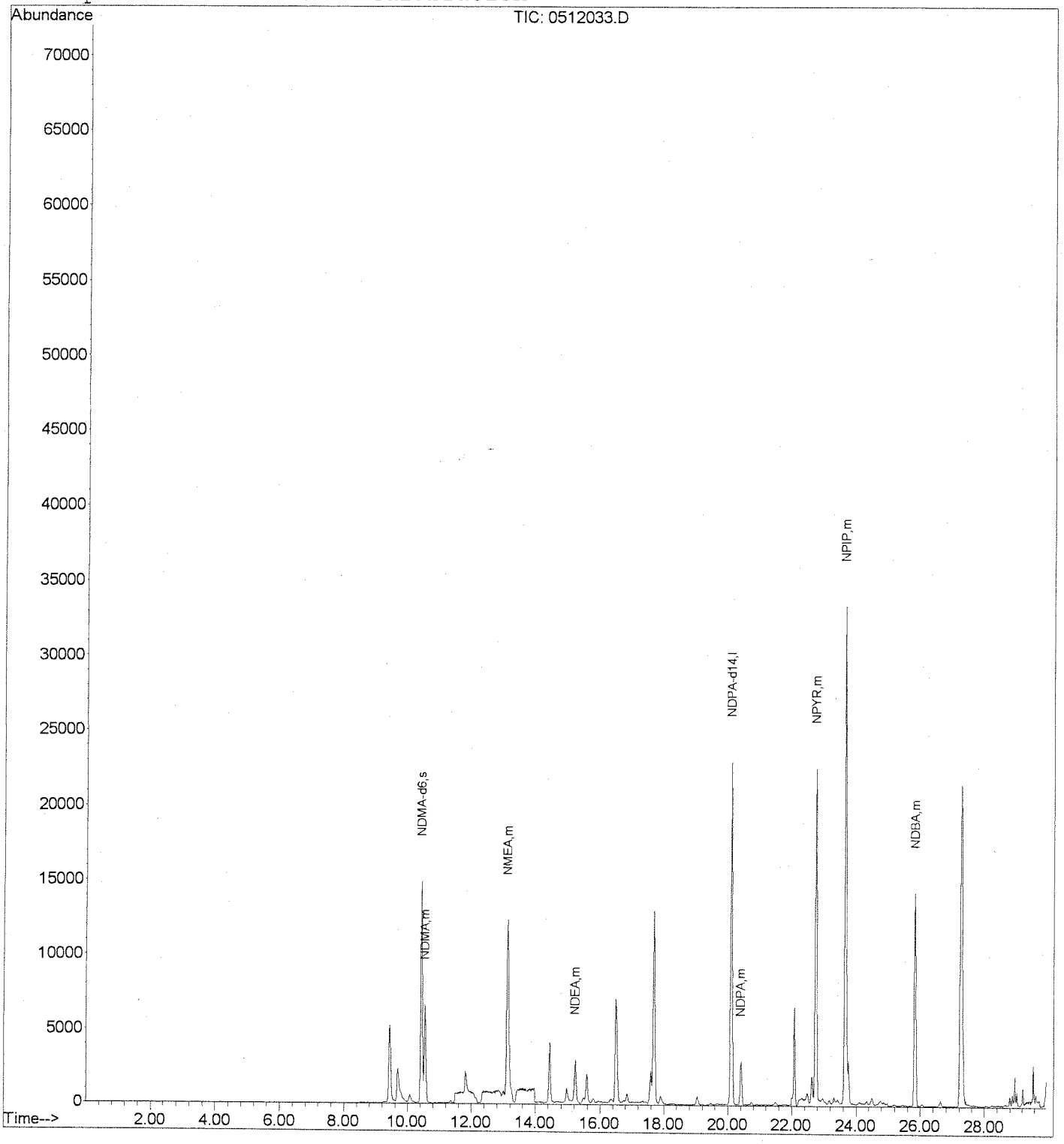
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) NDPA-d14	20.10	97	30515	50.00	ug/L		-0.01
System Monitoring Compounds							
3) NDMA-d6	10.43	50	26221	9.60	ug/L		0.00
Target Compounds							Qvalue
4) NDMA	10.55	47	6395	8.83	ug/L	#	50
5) NMEA	13.13	61	41110	7.34	ug/L		77
6) NDEA	15.23	75	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

(#) = qualifier out of range (m) = manual integration
0512033.D 051211_D14.M Fri May 13 12:55:38 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512033.D Vial: 14
Acq On : 13 May 2011 06:40 Operator: SVO-DW
Sample : P1101607-001 DMS Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 12:51 2011 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	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Nitrosamines by EPA 521

Sample Name:	Batch QC	**Units:**	ng/L
Lab Code:	P1101607-001	**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	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: _____

Secondary Review: _____

Printed: 05/13/2011 14:53:01
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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	**Vial:**	12
Run Type:	SMPL			**Dilution:**	1.0
Lab ID:	P1101607-001			**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 Vial: 12
Acq On : 13 May 2011 05:22 Operator: SVO-DW
Sample : P1101607-001 Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:27 2011 Quant Results File: 051211_D14.RES

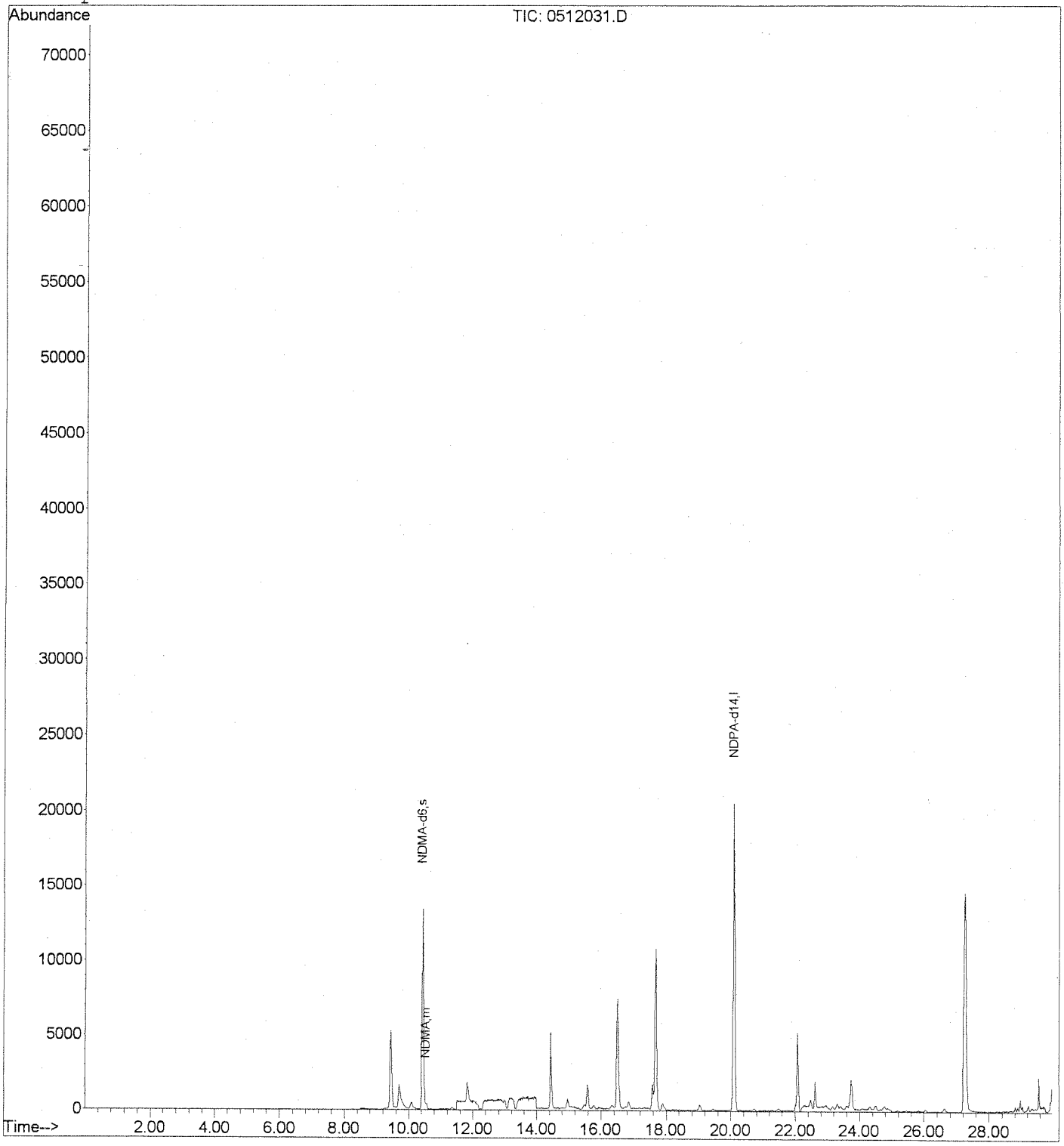
Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration
DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.10	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						Qvalue
4) NDMA	10.54	47	188	0.12	ug/L	# 22

(#) = qualifier out of range (m) = manual integration
0512031.D 051211_D14.M Fri May 13 12:55:37 2011 Page 1

Data File : J:\MS16\DATA\051211-521\0512031.D Vial: 12
Acq On : 13 May 2011 05:22 Operator: SVO-DW
Sample : P1101607-001 Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 12:51 2011 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	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Drinking water	**Date Received:**	NA

Nitrosamines by EPA 521

Sample Name:	Lab Control Sample	**Units:**	ng/L
Lab Code:	KWG1103886-3	**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	**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: 5/13/11

Secondary Review: _____

Quantitation Report

Bottle ID:		**Tier:**		**Matrix:**	DRINKING WATE
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:	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	**Vial:**	9
Run Type:	LCS			**Dilution:**	1.0
Lab ID:	KWG1103886-3			**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

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	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
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\0512028.D Vial: 9
Acq On : 13 May 2011 03:25 Operator: SVO-DW
Sample : 050211-LCS Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:26 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

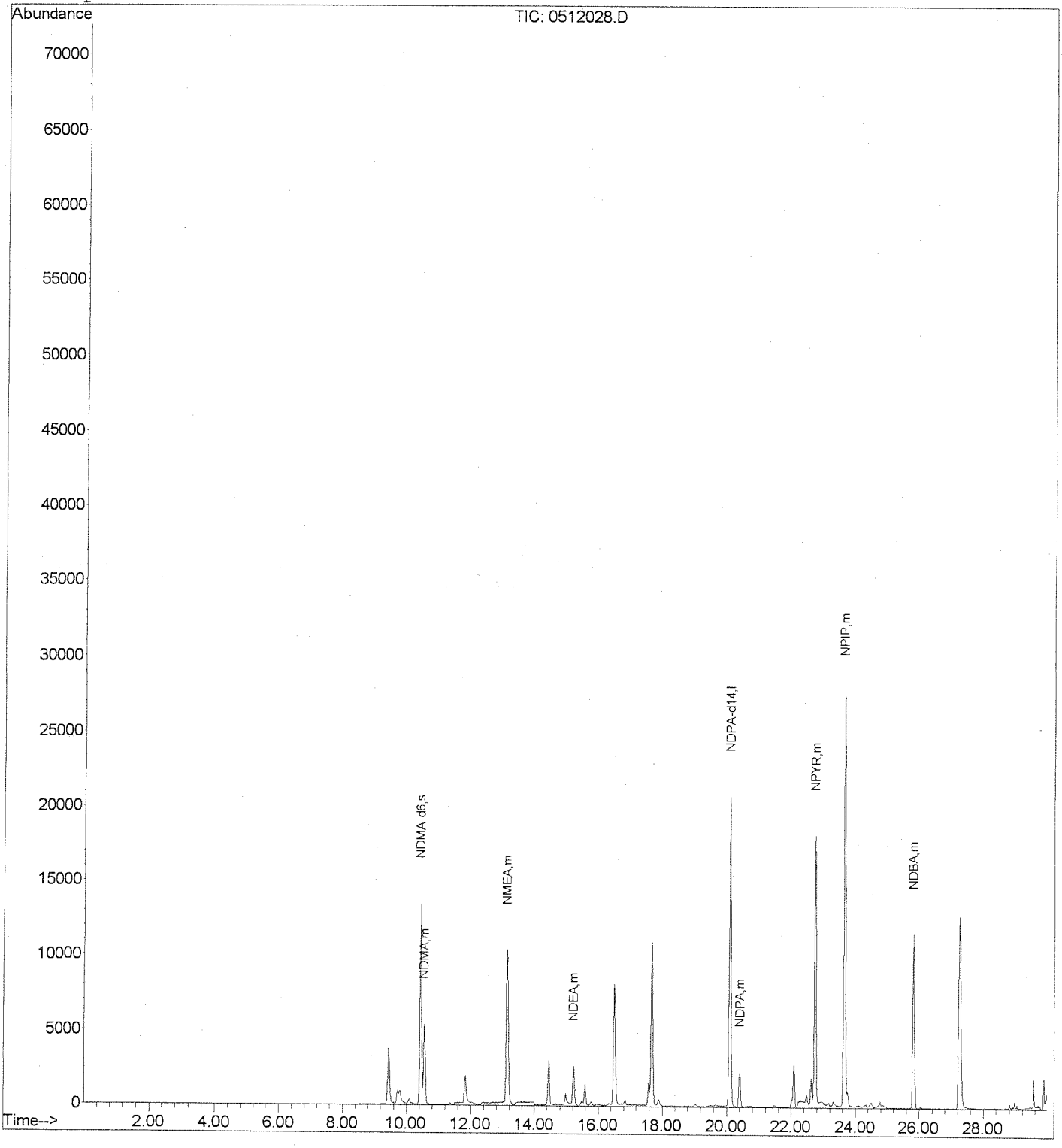
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) NDPA-d14	20.10	97	25467	50.00	ug/L		-0.01
System Monitoring Compounds							
3) NDMA-d6	10.43	50	23540	10.22	ug/L		0.00
Target Compounds							Qvalue
4) NDMA	10.55	47	5331	8.82	ug/L	#	1
5) NMEA	13.12	61	36494	7.76	ug/L		67
6) NDEA	15.22	75	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

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512028.D Vial: 9
Acq On : 13 May 2011 03:25 Operator: SVO-DW
Sample : 050211-LCS Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 12:50 2011 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

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

Service Request: P1101579
Calibration Date: 05/12/2011

Initial Calibration Summary
Nitrosamines by EPA 521

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

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

Analyte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level 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**

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

Service Request: P1101579
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**

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

Service Request: P1101579
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 0502

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

5/19/11

5/17/11

13 May 2011 09:48

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

051211_D14.m MJ808 CAL 10502
Calibration Last Updated: Fri May 13 09:55:14 2011

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
1)	I	NDPA-d14	ISTD								
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

(#) = Out of Range

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512015.D Vial: 1
Acq On : 12 May 11 18:58 Operator: SVO-DW
Sample : 5-11B 521 1 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 08:15:12 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 17:17:45 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

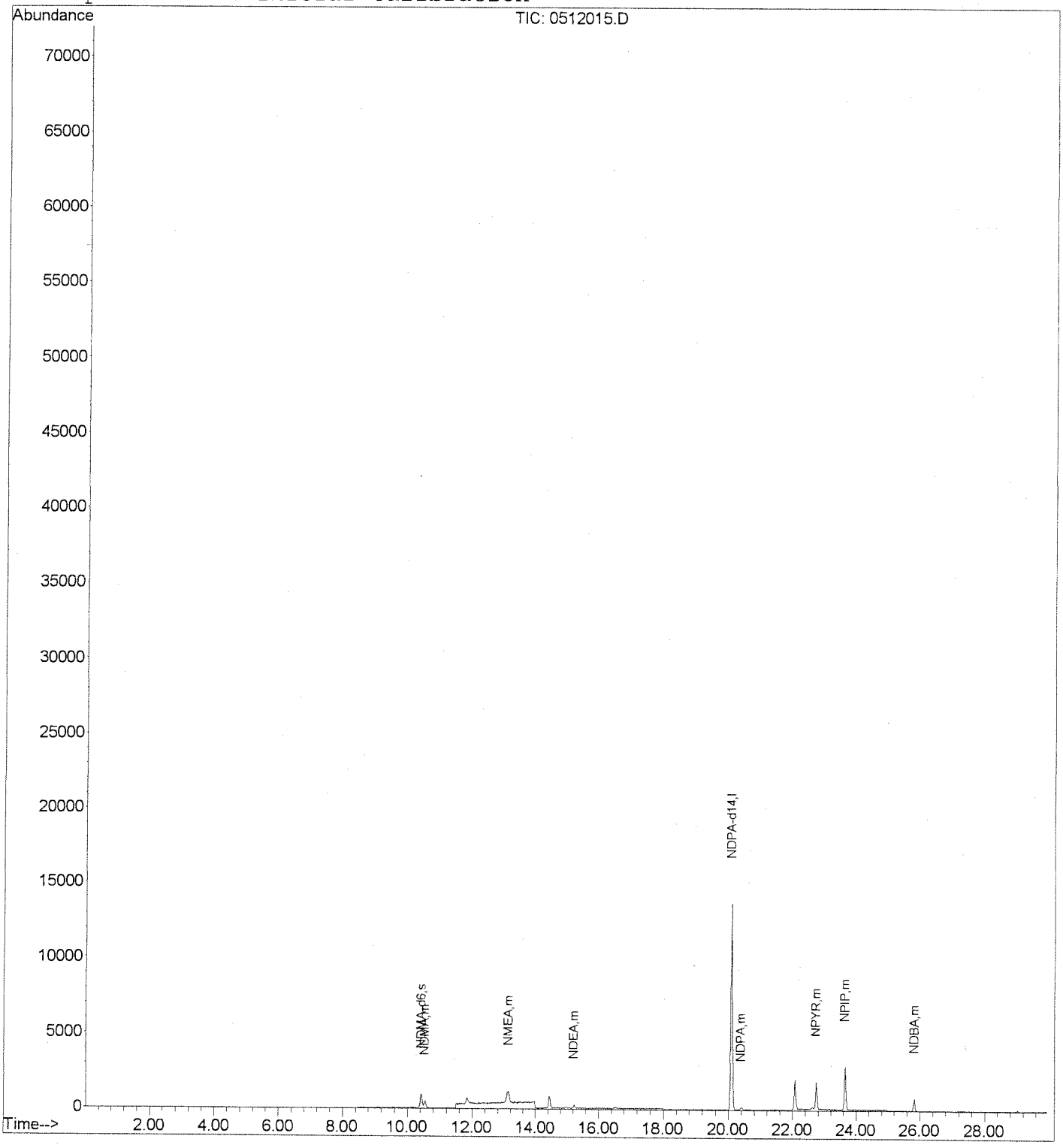
5/13/11

(#) = qualifier out of range (m) = manual integration
0512015.D 051211_D14.M Fri May 13 09:48:58 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512015.D Vial: 1
Acq On : 12 May 11 18:58 Operator: SVO-DW
Sample : 5-11B 521 1 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011 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



Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512016.D Vial: 2
Acq On : 12 May 11 19:37 Operator: SVO-DW
Sample : 5-11C 521 2 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 08:15:12 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

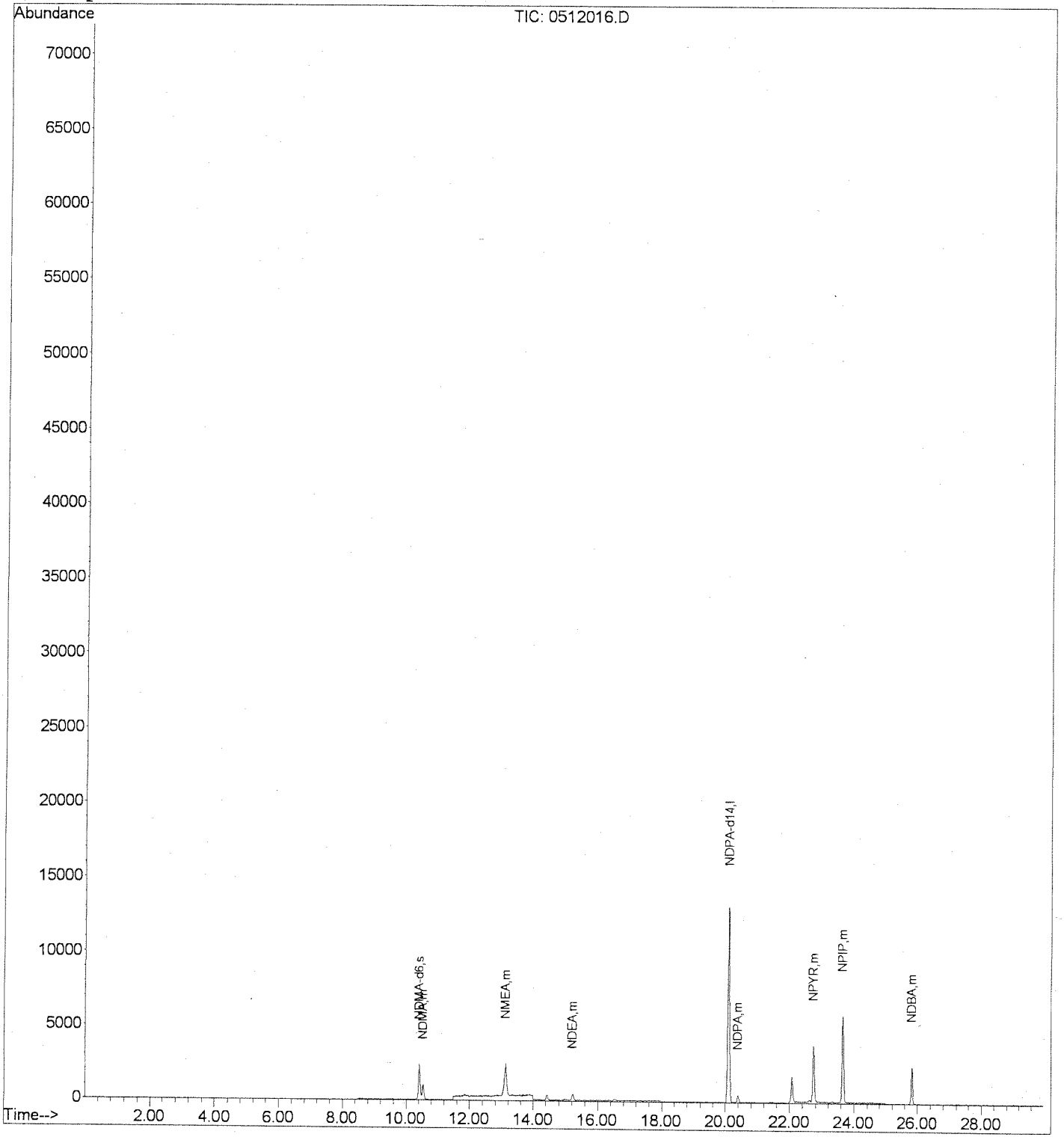
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.11	97	32642	50.00	ug/L	0.00
System Monitoring Compounds						
3) NDMA-d6	10.41	50	4501	1.93	ug/L	-0.02
Target Compounds						Qvalue
4) NDMA	10.54	47	1325	1.30	ug/L	86
5) NMEA	13.12	61	9214	1.88	ug/L	90
6) NDEA	15.22	75	1201	1.64	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

(#) = qualifier out of range (m) = manual integration
0512016.D 051211_D14.M Fri May 13 09:48:59 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512016.D Vial: 2
Acq On : 12 May 11 19:37 Operator: SVO-DW
Sample : 5-11C 521 2 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011 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



Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512017.D Vial: 3
Acq On : 12 May 11 20:16 Operator: SVO-DW
Sample : 5-11D 521 5 PPB Inst : MS16
Misc : 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

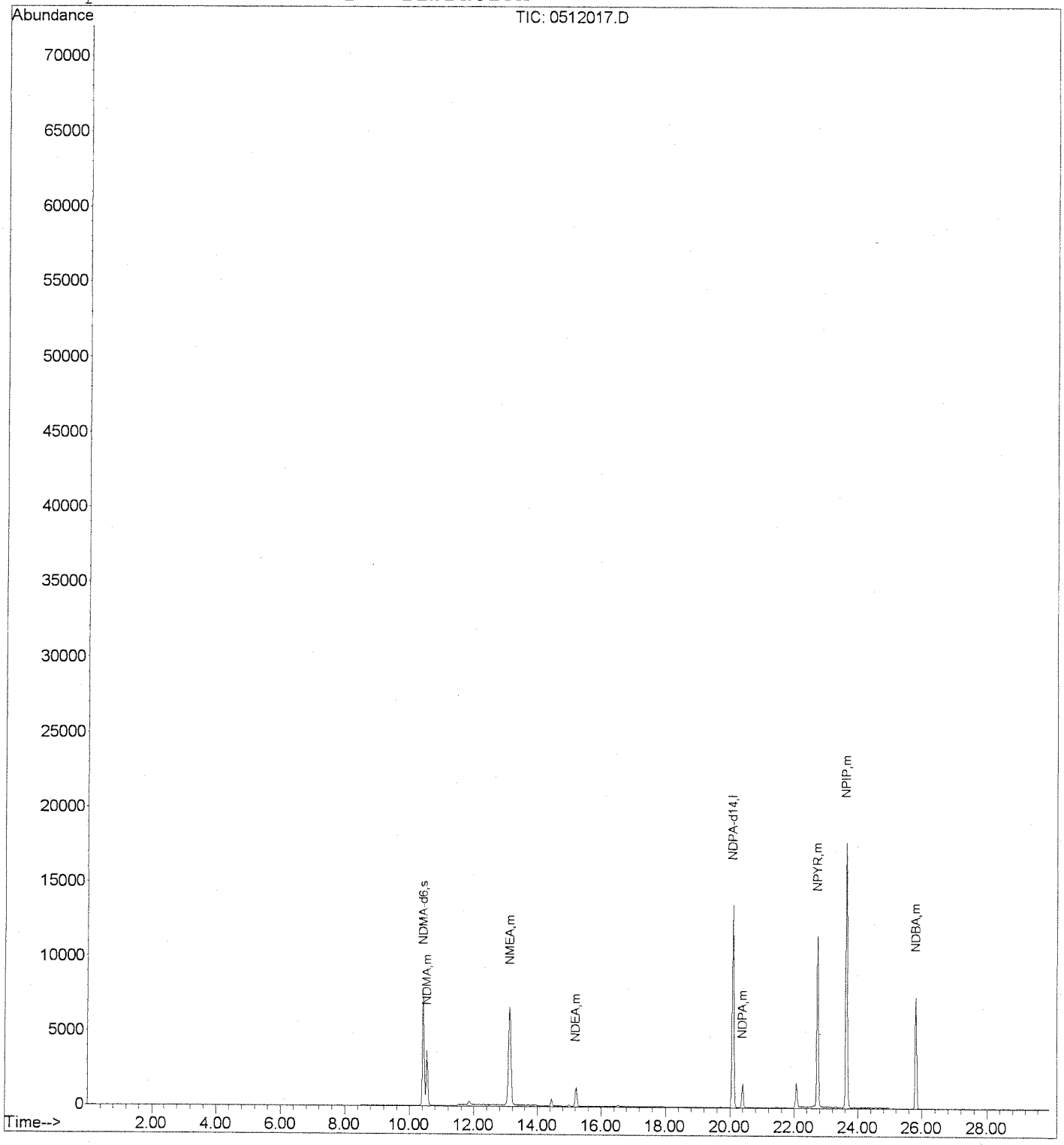
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	33027	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	14037	4.91	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.54	47	4463	4.38	ug/L	68
5) NMEA	13.12	61	29471	5.09	ug/L	93
6) NDEA	15.22	75	3824	5.15	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

(#) = qualifier out of range (m) = manual integration
0512017.D 051211_D14.M Fri May 13 09:49:01 2011 5/13/11 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512017.D Vial: 3
Acq On : 12 May 11 20:16 Operator: SVO-DW
Sample : 5-11D 521 5 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011 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



Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512018.D Vial: 4
Acq On : 12 May 11 20:55 Operator: SVO-DW
Sample : 5-11E 521 10 PPB Inst : MS16
Misc : 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

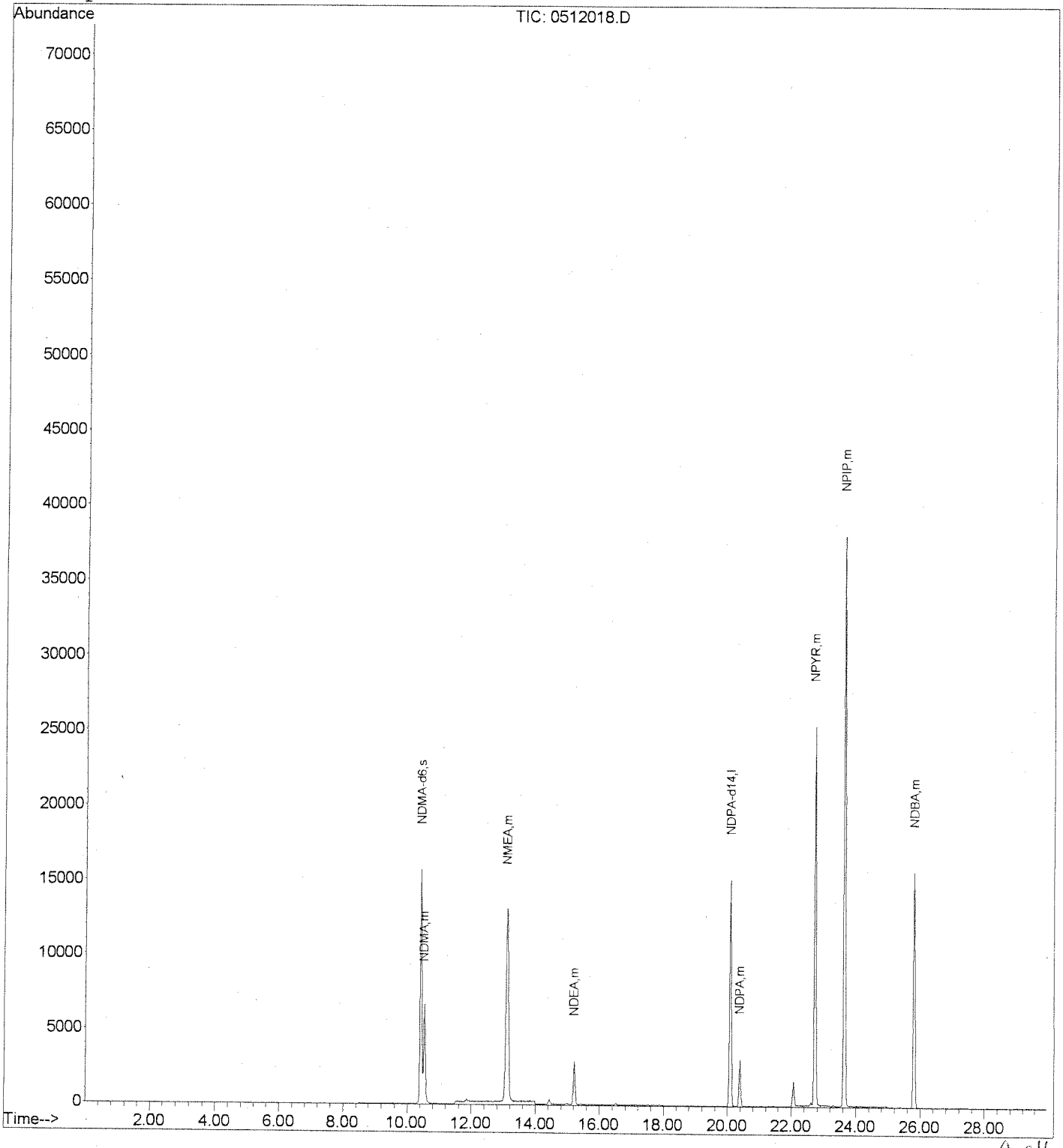
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	34066	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	30941	10.05	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.53	47	8429	8.17	ug/L	67
5) NMEA	13.11	61	60836	9.78	ug/L	87
6) NDEA	15.21	75	7990	10.43	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

(#) = qualifier out of range (m) = manual integration
0512018.D 051211_D14.M Fri May 13 09:49:04 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512018.D Vial: 4
Acq On : 12 May 11 20:55 Operator: SVO-DW
Sample : 5-11E 521 10 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011 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



0512018.D 051211_D14.M Fri May 13 09:49:04 2011 Page 2

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512019.D Vial: 5
Acq On : 12 May 11 21:34 Operator: SVO-DW
Sample : 5-11F 521 20 PPB Inst : MS16
Misc : 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

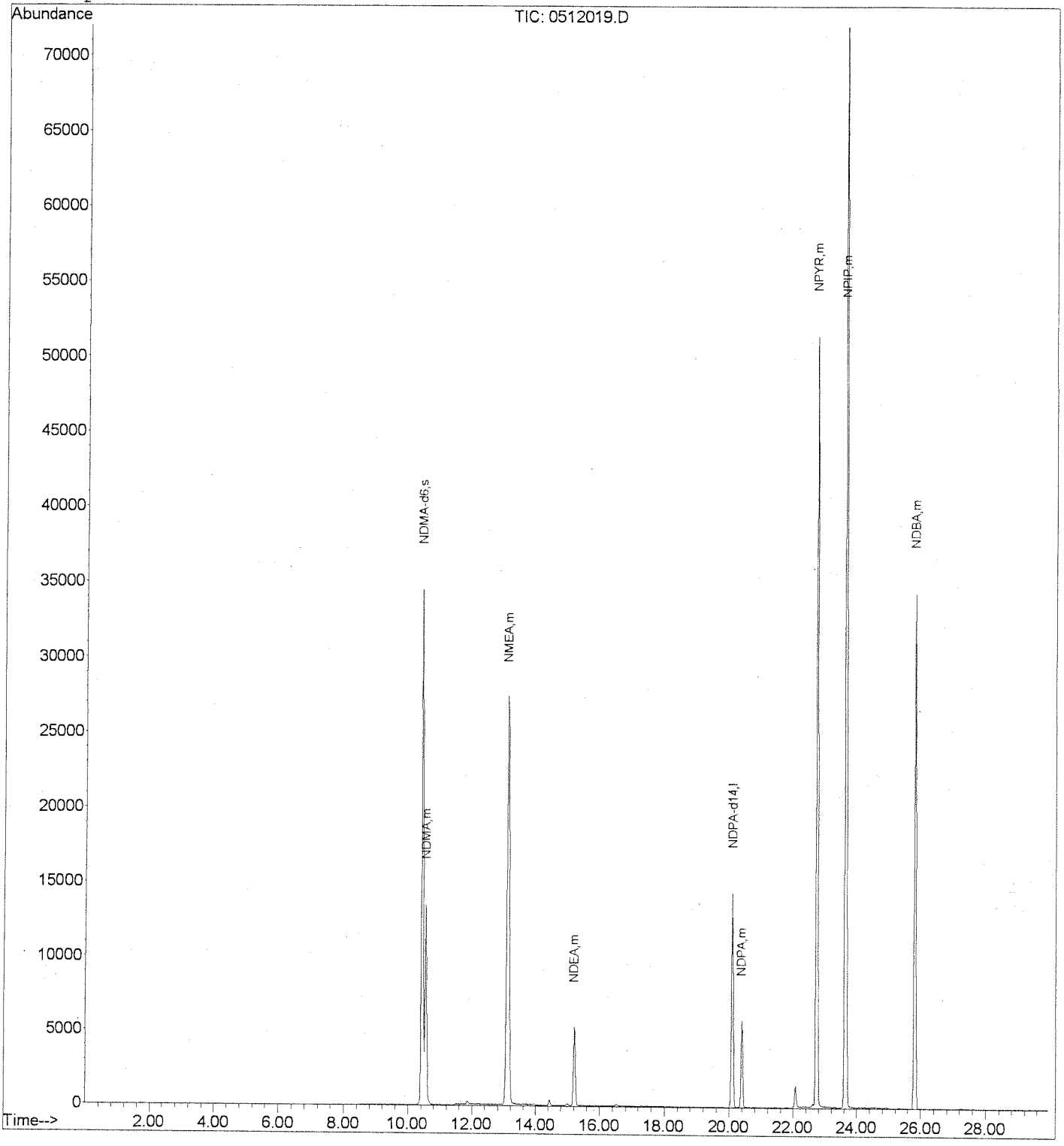
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	30941	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	64495	23.27	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.55	47	17071	19.26	ug/L	# 22
5) NMEA	13.13	61	126903	21.89	ug/L	88
6) NDEA	15.21	75	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

(#) = qualifier out of range (m) = manual integration
0512019.D 051211_D14.M Fri May 13 09:49:06 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512019.D Vial: 5
Acq On : 12 May 11 21:34 Operator: SVO-DW
Sample : 5-11F 521 20 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 8:18 2011 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



Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512020.D Vial: 6
Acq On : 12 May 11 22:13 Operator: SVO-DW
Sample : 5-11G 521 50 PPB Inst : MS16
Misc : 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

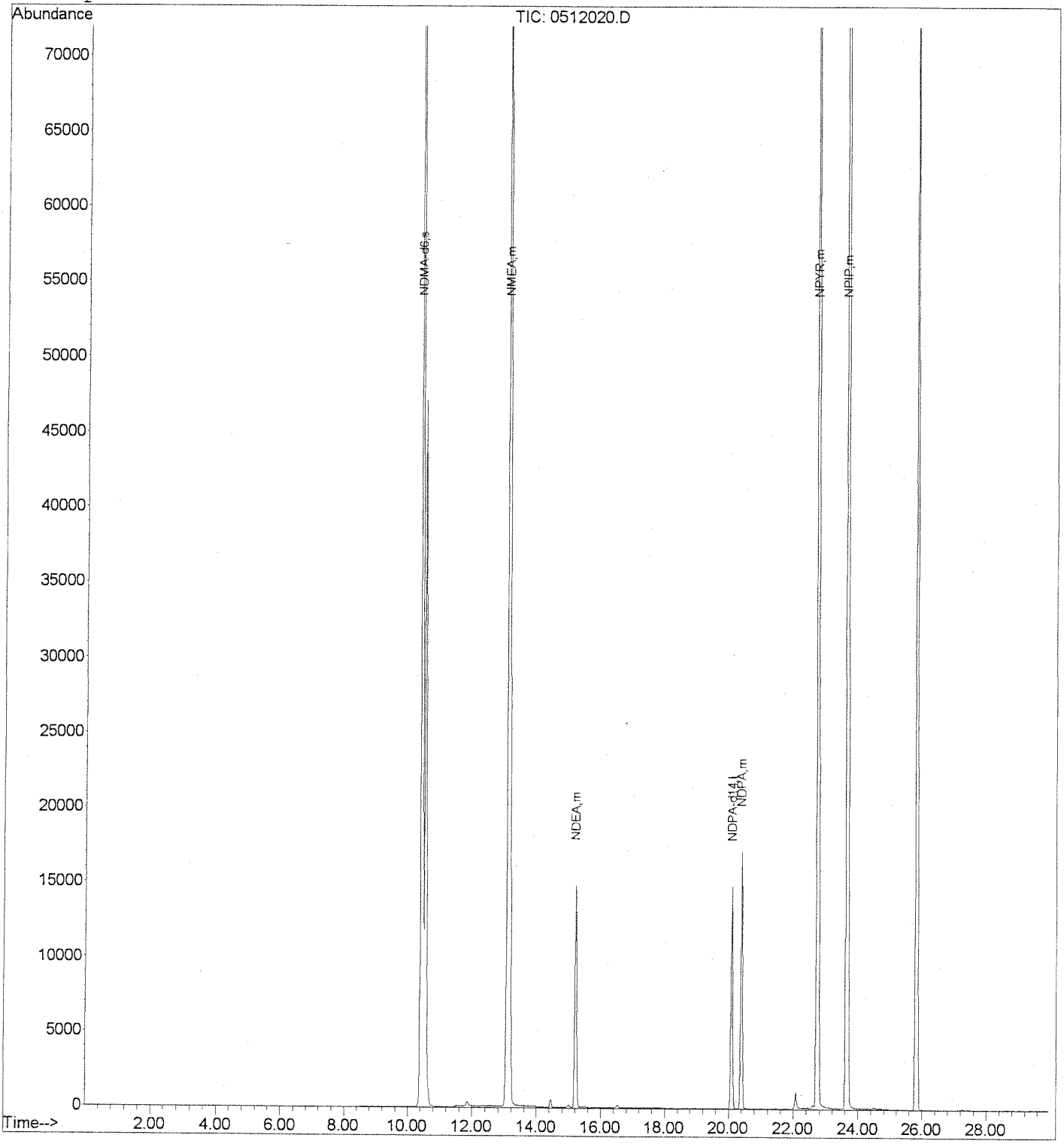
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.10	97	30878	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.42	50	226827	109.62	ug/L	-0.01
Target Compounds						Qvalue
4) NDMA	10.54	47	69326	Below Cal		59
5) NMEA	13.11	61	353142	59.78	ug/L	80
6) NDEA	15.21	75	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

(#) = qualifier out of range (m) = manual integration
0512020.D 051211_D14.M Fri May 13 09:49:07 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512020.D Vial: 6
Acq On : 12 May 11 22:13 Operator: SVO-DW
Sample : 5-11G 521 50 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 8:18 2011 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



Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512021.D Vial: 7
Acq On : 12 May 11 22:52 Operator: SVO-DW
Sample : 5-11H 521 ICV10 PPB Inst : MS16
Misc : 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

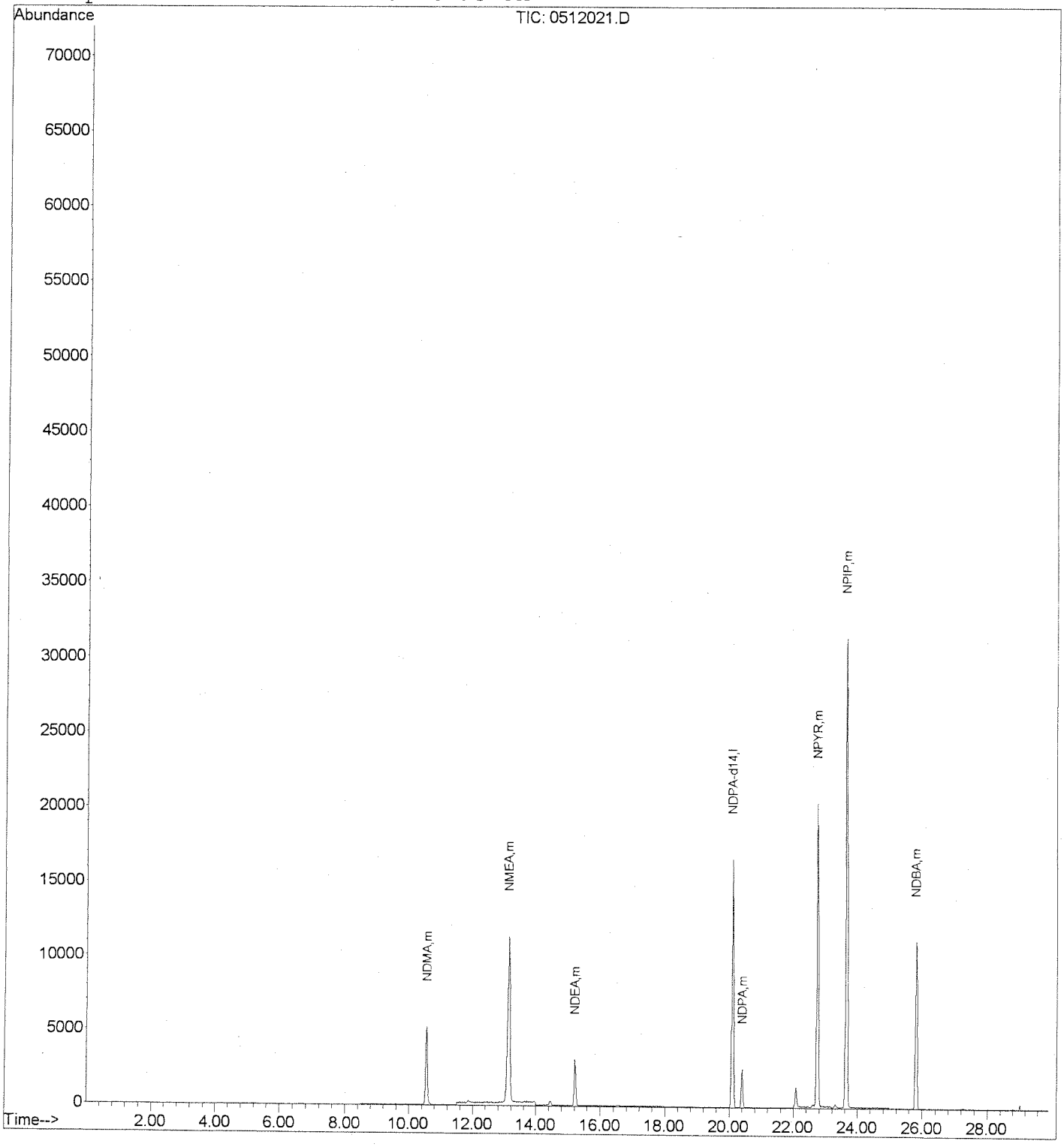
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) NDPA-d14	20.09	97	31927	50.00	ug/L		-0.02
System Monitoring Compounds							
3) NDMA-d6	0.00	50	0	0.00	ug/L		
Target Compounds							Qvalue
4) NDMA	10.56	47	5601	7.57	ug/L	#	1
5) NMEA	13.12	61	47068	7.97	ug/L		65
6) NDEA	15.21	75	6866	8.91	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

(#) = qualifier out of range (m) = manual integration
0512021.D 051211_D14.M Fri May 13 09:55:51 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512021.D Vial: 7
Acq On : 12 May 11 22:52 Operator: SVO-DW
Sample : 5-11H 521 ICV10 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 9:55 2011 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



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

Service Request: P1101579
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: 5/13/11

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	**Vial:**	3
Run Type:	CCV			**Dilution:**	1.0
Lab ID:	KWG1104312-2			**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

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	10.52			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 Vial: 3
Acq On : 13 May 2011 00:49 Operator: SVO-DW
Sample : 5-11D 521 5 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:25 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

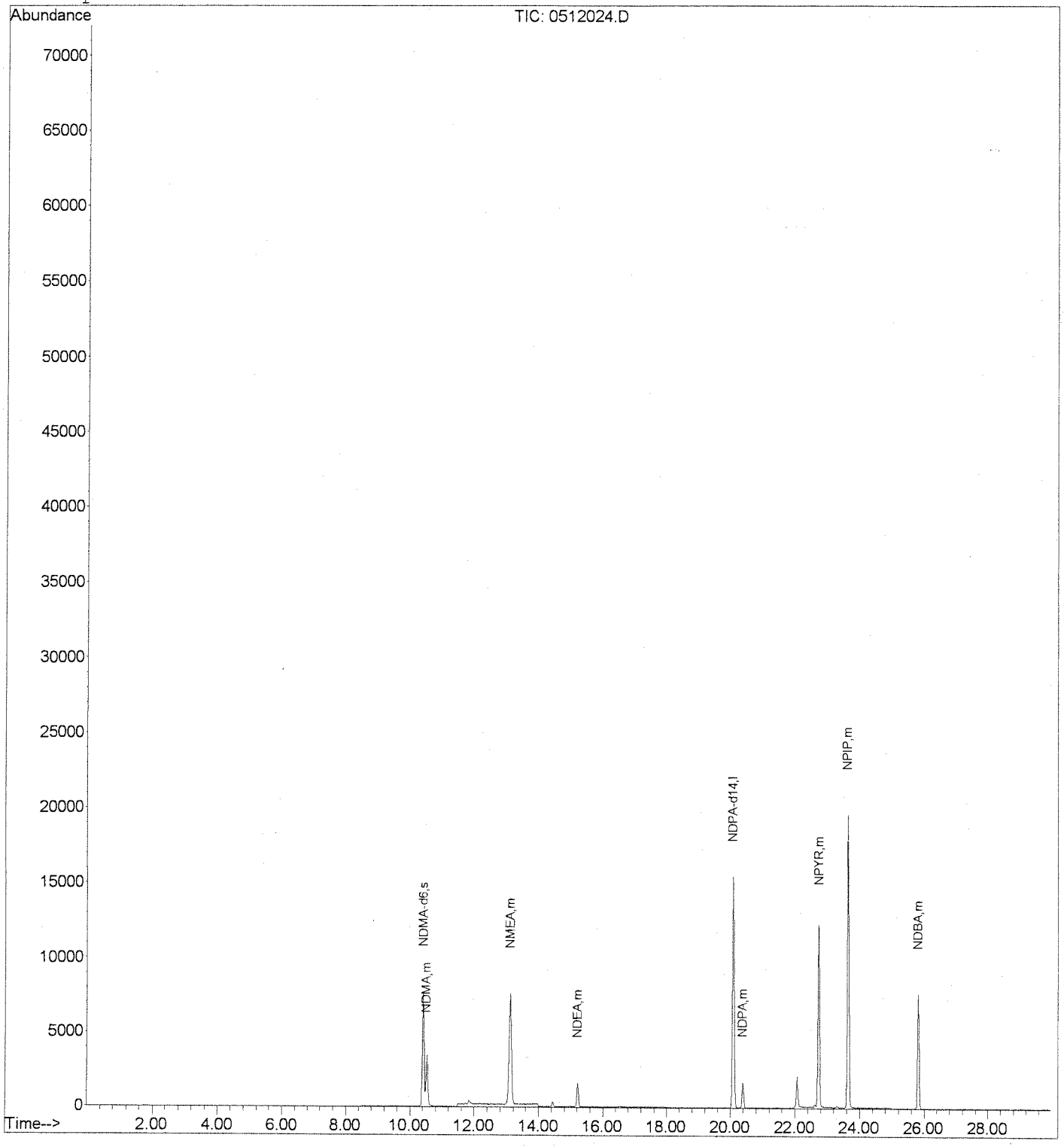
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) NDPA-d14	20.10	97	33516	50.00	ug/L		-0.01
System Monitoring Compounds							
3) NDMA-d6	10.43	50	15183	5.47	ug/L		0.00
Target Compounds							Qvalue
4) NDMA	10.52	47	3365	4.55	ug/L		70
5) NMEA	13.12	61	29595	5.03	ug/L		75
6) NDEA	15.21	75	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

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512024.D Vial: 3
Acq On : 13 May 2011 00:49 Operator: SVO-DW
Sample : 5-11D 521 5 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24 2011 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



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

Service Request: P1101579
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: 5/13/11

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\0512035.D			**Instrument:**	MS16
Acqu Date:	05/13/2011 07:58	**Quant Date:**	05/13/2011 11:24	**Vial:**	4
Run Type:	CCV			**Dilution:**	1.0
Lab ID:	KWG1104312-3			**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

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	10.56			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
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 Vial: 4
Acq On : 13 May 2011 07:58 Operator: SVO-DW
Sample : 5-11E 521 10 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:28 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

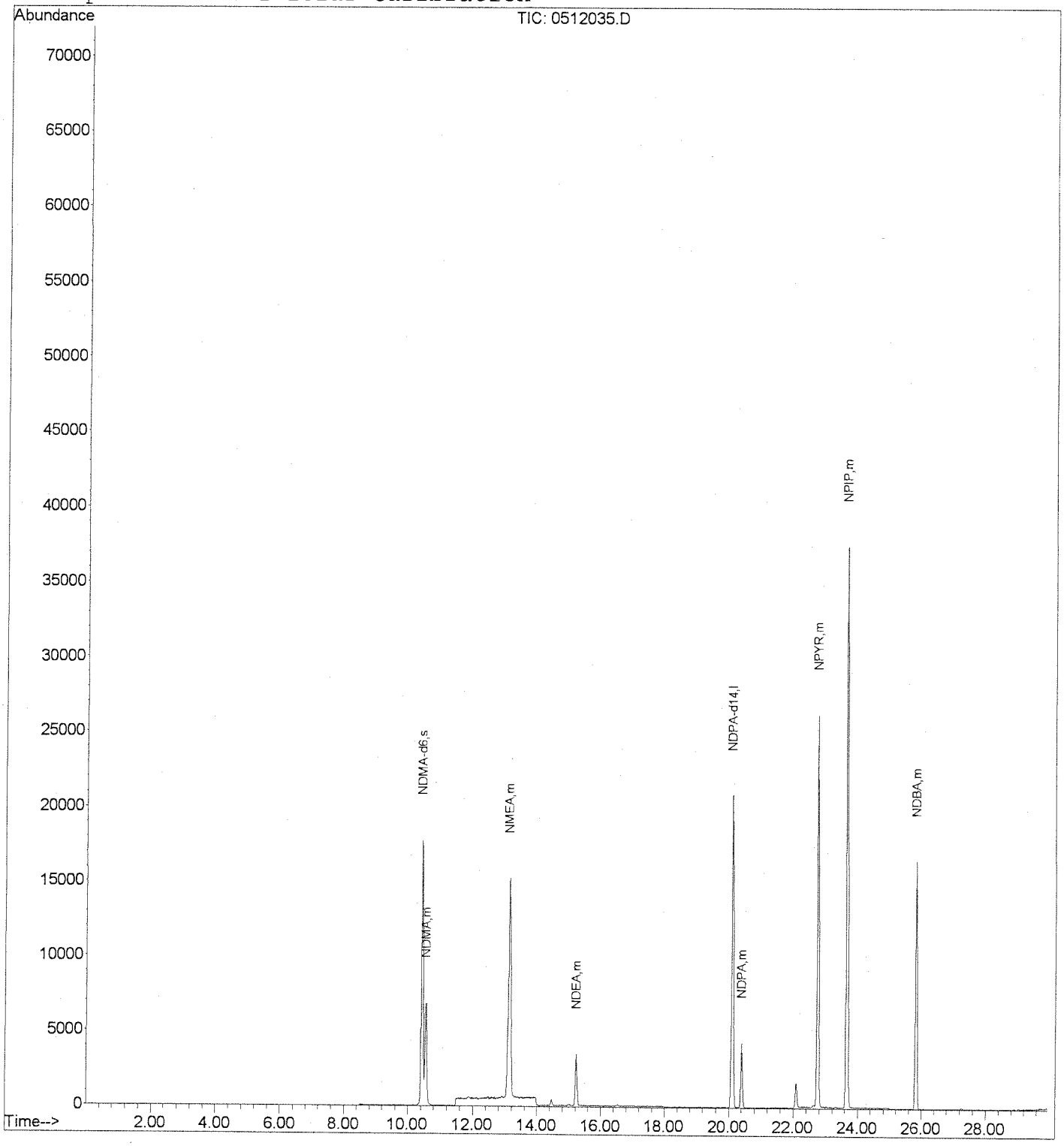
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) NDPA-d14	20.09	97	32248	50.00	ug/L		-0.02
System Monitoring Compounds							
3) NDMA-d6	10.44	50	32011	10.86	ug/L		0.00
Target Compounds							Qvalue
4) NDMA	10.56	47	7370	9.50	ug/L	#	42
5) NMEA	13.12	61	60530	9.93	ug/L		77
6) NDEA	15.23	75	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

(#) = qualifier out of range (m) = manual integration
0512035.D 051211_D14.M Fri May 13 12:55:39 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512035.D Vial: 4
Acq On : 13 May 2011 07:58 Operator: SVO-DW
Sample : 5-11E 521 10 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24 2011 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 WATER	500ml	1ml
KWG1103886-4	Method Blank	521 Nitrosamines	DRINKING WATER	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	DWSTD04-94O	10uL	DWSTD05-8I	100uL	
KWG1103886-2	1015269	DWSTD04-94O	10uL	DWSTD05-8I	100uL	
KWG1103886-3	1015270	DWSTD04-94O	10uL	DWSTD05-8I	100uL	
KWG1103886-4	1015271	DWSTD04-94O	10uL			
P1101579-005	1015266	DWSTD04-94O	10uL			
P1101605-005	1015267	DWSTD04-94O	10uL			
P1101607-001	1015265	DWSTD04-94O	10uL			

Comments:

Started By: RHayes Assisted By:

Completed By: RHayes Assisted By:

Training: Yes / No

Training: Yes / No

Reviewed By: [signature] Date: 5/13/11 Storage: 20A-F-06

Chain of Custody

Relinquished By: [signature] Date: 5/2/11

Received By: [signature] Date: 5/2/11

~~Extracts~~ Examined: Yes / No

COLUMBIA ANALYTICAL SERVICES, INC.

Service Request No.: As Listed

Date Extracted: 5-2-11

Analyst: Rob Hoyer

Method: EPA 521

StarLims Run :

Nitrosoamines in Water

Lab ID	Client ID	Sample Volume	Surr	MS	Residual Chlorine	Final Volume
	ISTD					
P1101579-005	10 uL	500 mL	10 uL		< 0.1	1 mL
P1101605-005						
P1101607-001						
MB						
LCS				100 uL		
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 5 ppm xp: 8/7/11

Spike ID : DWSTD05-8I 100 ppb xp 10/18/11

Vial: Amber Extract Storage: 215A-F-06 Extracts Received: 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

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

Service Request: P1101579

Cover Page - Organic Analysis Data Package
1,4-Dioxane by GC/MS

Sample Name	Lab Code	Date Collected	Date Received
MW-24-1MS	KWG1103961-1	04/27/2011	04/27/2011
MW-24-1DMS	KWG1103961-2	04/27/2011	04/27/2011
MW-24-1	P1101579-005	04/27/2011	04/27/2011

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: Supervisor

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	04/27/2011
Sample Matrix:	Water	**Date Received:**	04/27/2011

1,4-Dioxane by GC/MS

Sample Name:	MW-24-1	**Units:**	ug/L
Lab Code:	P1101579-005	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM		

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:

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

1,4-Dioxane by GC/MS

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1103961-4	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM		

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 Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101579

Surrogate Recovery Summary
1,4-Dioxane by GC/MS

Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
MW-24-1	P1101579-005	87
Method Blank	KWG1103961-4	99
MW-24-1MS	KWG1103961-1	94
MW-24-1DMS	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 Mon 2Q11/G486090

Service Request: P1101579
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
MW-24-1MS	KWG1103961-1	79,462	7.17
MW-24-1DMS	KWG1103961-2	83,825	7.17
MW-24-1	P1101579-005	76,259	7.17

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011

Matrix Spike/Duplicate Matrix Spike Summary
1,4-Dioxane by GC/MS

Sample Name:	MW-24-1	**Units:**	ug/L
Lab Code:	P1101579-005	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG1103961

		MW-24-1MS KWG1103961-1 Matrix Spike			MW-24-1DMS KWG1103961-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
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	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011

Lab Control Spike Summary
1,4-Dioxane by GC/MS

Extraction Method:	EPA 3510C	**Units:**	ug/L
Analysis Method:	8270C SIM	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1103961

	Lab Control Sample KWG1103961-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
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.

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011
		Time Analyzed:	14:42

Method Blank Summary
1,4-Dioxane by GC/MS

Sample Name:	Method Blank	**File ID:**	J:\MS26\DATA\050911\0509F015.D
Lab Code:	KWG1103961-4	**Instrument ID:**	MS26
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM	**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
MW-24-1MS	KWG1103961-1	J:\MS26\DATA\050911\0509F017.D	05/09/11	15:21
MW-24-1DMS	KWG1103961-2	J:\MS26\DATA\050911\0509F018.D	05/09/11	15:41
MW-24-1	P1101579-005	J:\MS26\DATA\050911\0509F019.D	05/09/11	16:01

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011
		Time Analyzed:	15:02

Lab Control Sample Summary
1,4-Dioxane by GC/MS

Sample Name:	Lab Control Sample	**File ID:**	J:\MS26\DATA\050911\0509F016.D
Lab Code:	KWG1103961-3	**Instrument ID:**	MS26
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM	**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
MW-24-1MS	KWG1103961-1	J:\MS26\DATA\050911\0509F017.D	05/09/11	15:21
MW-24-1DMS	KWG1103961-2	J:\MS26\DATA\050911\0509F018.D	05/09/11	15:41
MW-24-1	P1101579-005	J:\MS26\DATA\050911\0509F019.D	05/09/11	16:01

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

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

Service Request: P1101579
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	
MW-24-1MS	KWG1103961-1	J:\MS26\DATA\050911\0509F017.D	05/09/2011	15:21	
MW-24-1DMS	KWG1103961-2	J:\MS26\DATA\050911\0509F018.D	05/09/2011	15:41	
MW-24-1	P1101579-005	J:\MS26\DATA\050911\0509F019.D	05/09/2011	16:01	

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

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

Service Request: P1101579
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
A	J:\MS26\DATA\050911\0509F007.D
B	J:\MS26\DATA\050911\0509F008.D
C	J:\MS26\DATA\050911\0509F009.D
D	J:\MS26\DATA\050911\0509F010.D
E	J:\MS26\DATA\050911\0509F011.D
F	J:\MS26\DATA\050911\0509F012.D
G	J:\MS26\DATA\050911\0509F013.D

Analyte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level 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**

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

Service Request: P1101579
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**

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

Service Request: P1101579
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 Mon 2Q11/G486090

Service Request: P1101579
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

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

Service Request: P1101579

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	MW-24-1MS	KWG1103961-1	5/9/2011	15:21		5/9/2011	15:33
0509F018.D	MW-24-1DMS	KWG1103961-2	5/9/2011	15:41		5/9/2011	15:53
0509F019.D	MW-24-1	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	ZZZZZZ	ZZZZZZ	5/9/2011	16:40		5/9/2011	16:52

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

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

Service Request: P1101579
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-24-1	P1101579-005	04/27/11	04/27/11	100ml	50ml	NA	
Method Blank	KWG1103961-4	NA	NA	100ml	50ml	NA	
MW-24-1MS	KWG1103961-1	04/27/11	04/27/11	100ml	50ml	NA	
MW-24-1DMS	KWG1103961-2	04/27/11	04/27/11	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 Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101579

Surrogate Recovery Summary
1,4-Dioxane by GC/MS

Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
MW-24-1	P1101579-005	87
Method Blank	KWG1103961-4	99
MW-24-1MS	KWG1103961-1	94
MW-24-1DMS	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 Mon 2Q11/G486090

Service Request: P1101579
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
MW-24-1MS	KWG1103961-1	79,462	7.17
MW-24-1DMS	KWG1103961-2	83,825	7.17
MW-24-1	P1101579-005	76,259	7.17

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011

Matrix Spike/Duplicate Matrix Spike Summary
1,4-Dioxane by GC/MS

Sample Name:	MW-24-1	**Units:**	ug/L
Lab Code:	P1101579-005	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG1103961

		MW-24-1MS KWG1103961-1 Matrix Spike			MW-24-1DMS KWG1103961-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
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.

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

Service Request: P1101579
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 Result	Expected	%Rec	%Rec Limits
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.

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011
		Time Analyzed:	14:42

Method Blank Summary
1,4-Dioxane by GC/MS

Sample Name:	Method Blank	**File ID:**	J:\MS26\DATA\050911\0509F015.D
Lab Code:	KWG1103961-4	**Instrument ID:**	MS26
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM	**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
MW-24-1MS	KWG1103961-1	J:\MS26\DATA\050911\0509F017.D	05/09/11	15:21
MW-24-1DMS	KWG1103961-2	J:\MS26\DATA\050911\0509F018.D	05/09/11	15:41
MW-24-1	P1101579-005	J:\MS26\DATA\050911\0509F019.D	05/09/11	16:01

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011
		Time Analyzed:	15:02

Lab Control Sample Summary
1,4-Dioxane by GC/MS

Sample Name:	Lab Control Sample	**File ID:**	J:\MS26\DATA\050911\0509F016.D
Lab Code:	KWG1103961-3	**Instrument ID:**	MS26
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM	**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
MW-24-1MS	KWG1103961-1	J:\MS26\DATA\050911\0509F017.D	05/09/11	15:21
MW-24-1DMS	KWG1103961-2	J:\MS26\DATA\050911\0509F018.D	05/09/11	15:41
MW-24-1	P1101579-005	J:\MS26\DATA\050911\0509F019.D	05/09/11	16:01

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

Validation Package

Raw Data

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	04/27/2011
Sample Matrix:	Water	**Date Received:**	04/27/2011

1,4-Dioxane by GC/MS

Sample Name:	MW-24-1	**Units:**	ug/L
Lab Code:	P1101579-005	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM		

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
RunType: 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:
PLC05
PLC07

Primary Review: LB 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	**Vial:**	15
Run Type:	SMPL			**Dilution:**	1.0
Lab ID:	P1101579-005			**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	1352**m**	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

Quantitation Report (QT Reviewed)

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						Qvalue
3) 1,4-Dioxane	3.95	88	1352m	2.23	ng/ml	

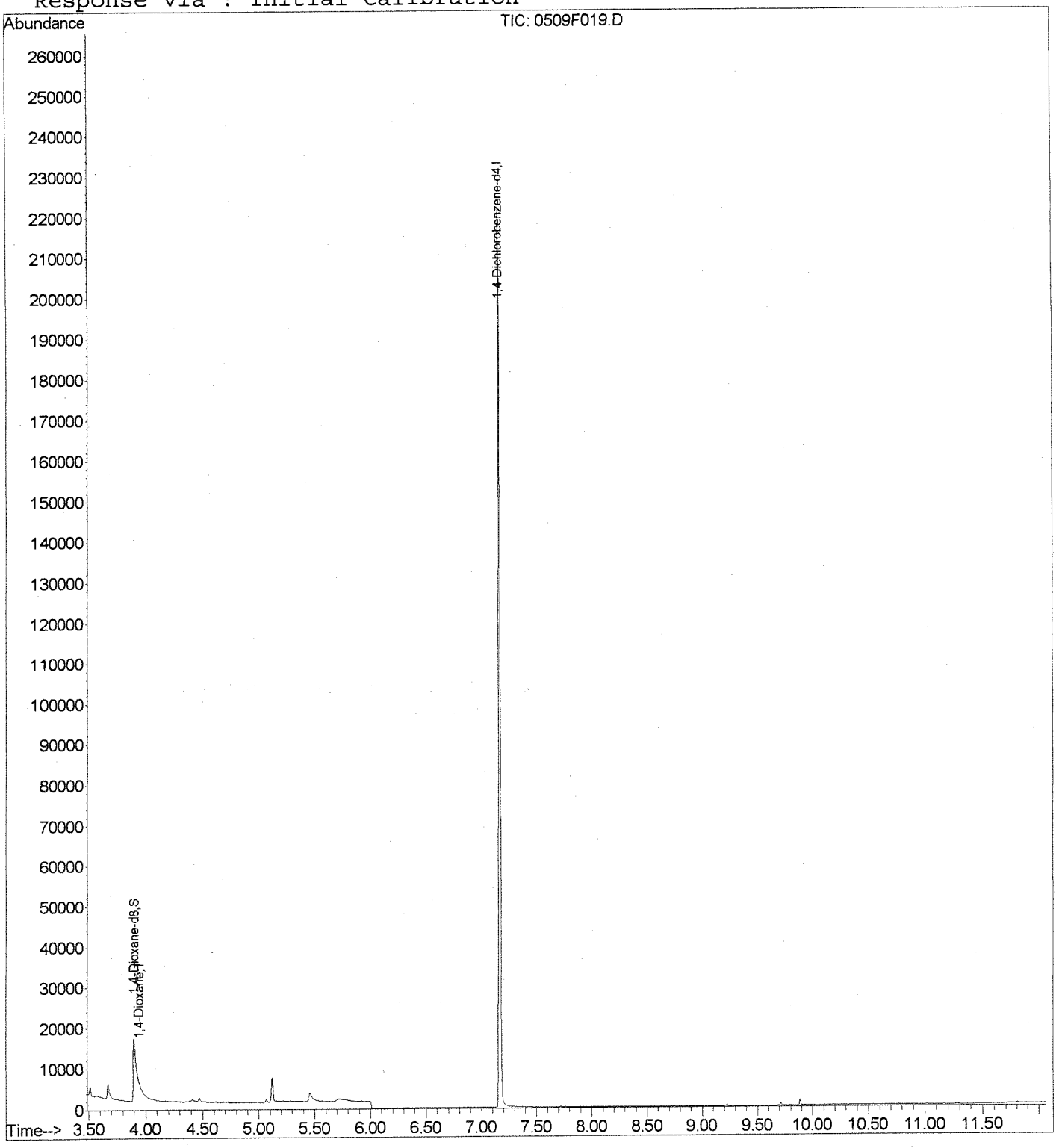
(#) = qualifier out of range (m) = manual integration
0509F019.D 050911_DX.M Mon May 09 17:04:27 2011 Page 1

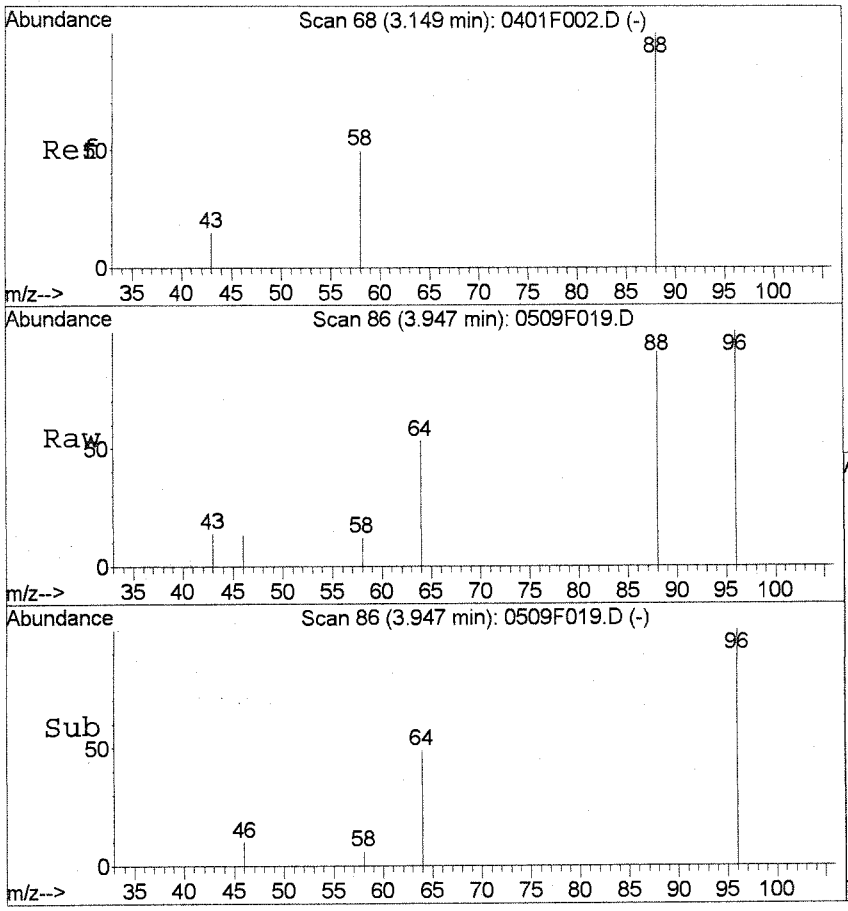
Quantitation Report (QT Reviewed)

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: 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

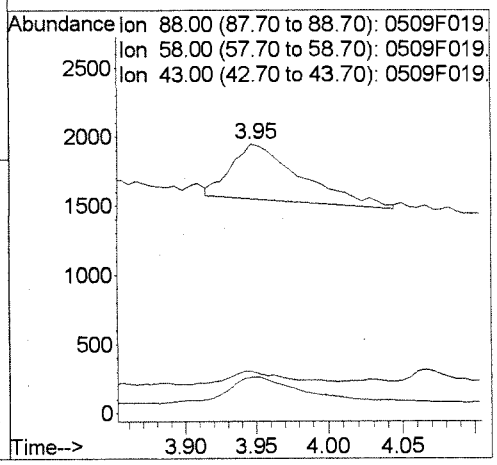




#3
1,4-Dioxane
Concen: 2.23 ng/ml m
RT: 3.95 min Scan# 86
Delta R.T. -0.02 min
Lab File: 0509F019.D
Acq: 9 May 2011 4:01 pm

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

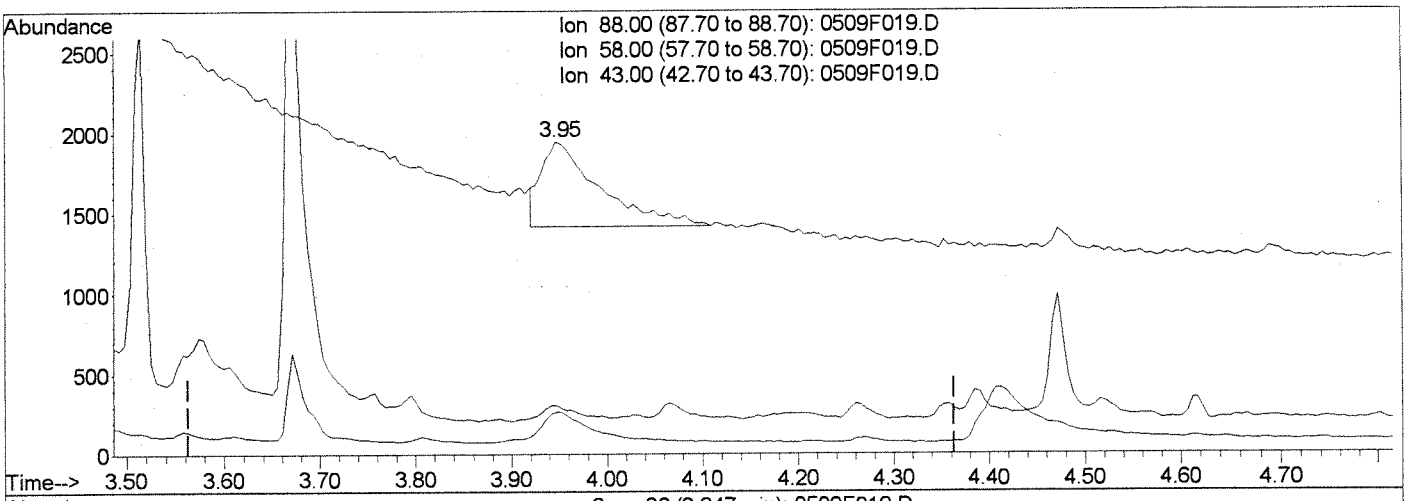


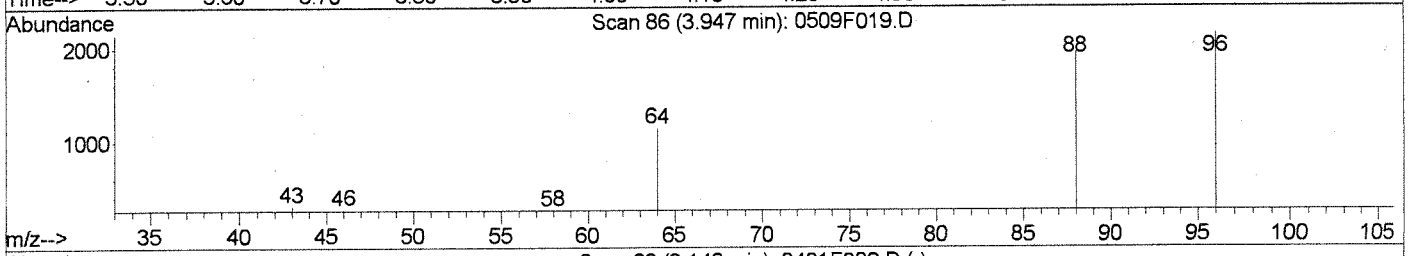
Quantitation Report (Qedit)

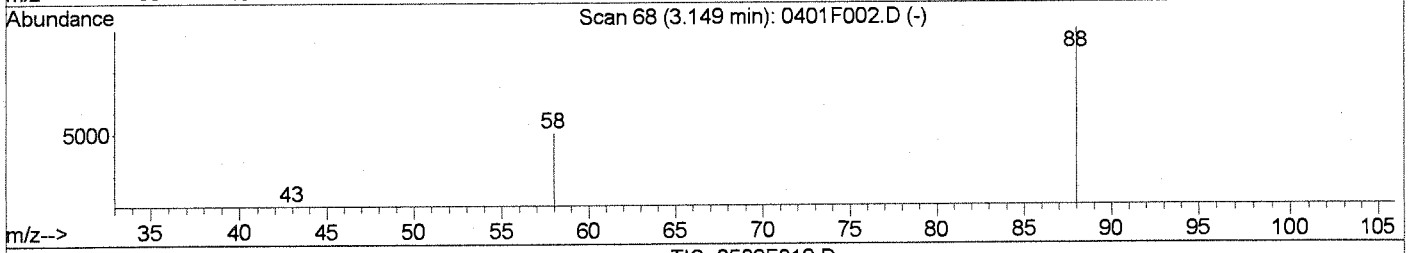
Data File : J:\MS26\DATA\050911\0509F019.D
Acq On : 9 May 2011 4:01 pm
Sample : P1101579-005
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 16:18 2011

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

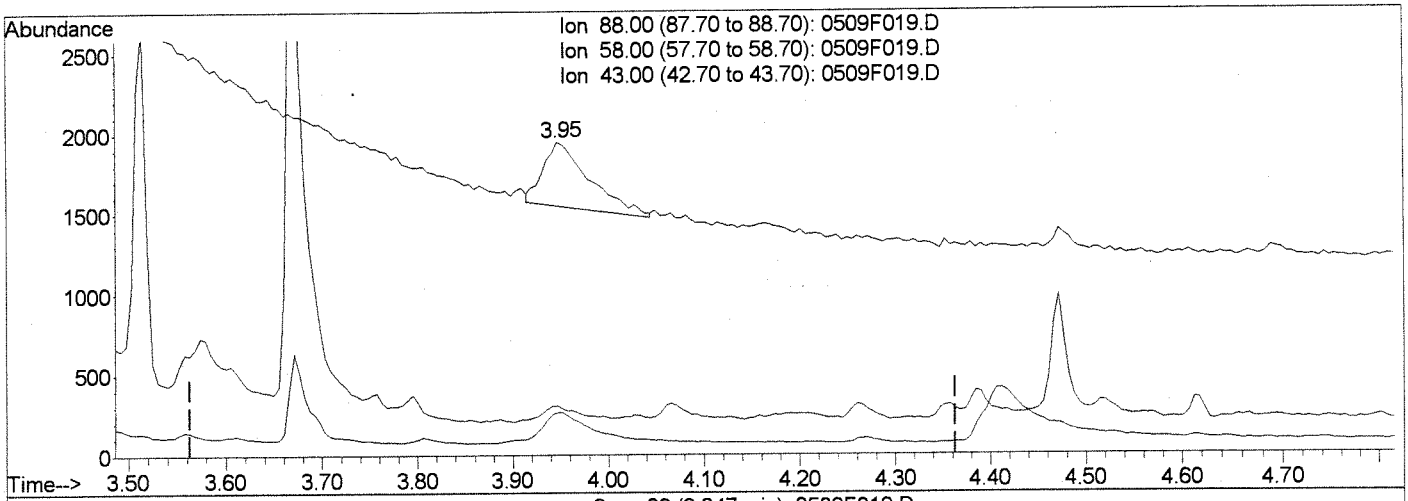
Quantitation Report (Qedit)

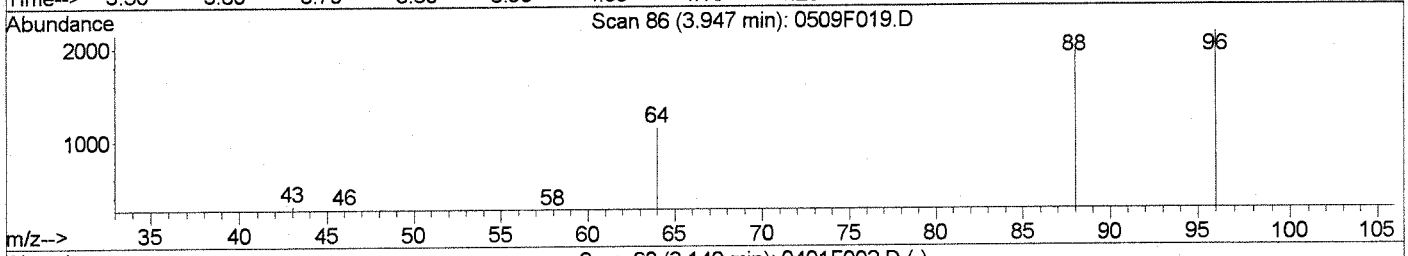
Data File : J:\MS26\DATA\050911\0509F019.D
Acq On : 9 May 2011 4:01 pm
Sample : P1101579-005
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 17:03 2011

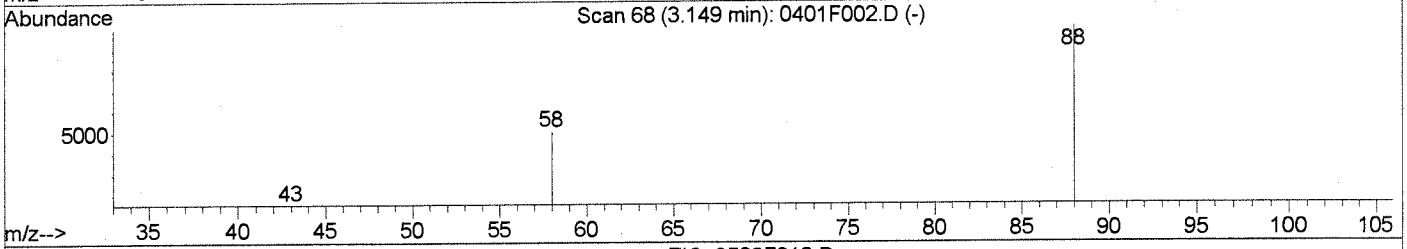
Vial: 15
Operator: KBailey
Inst : MS26
Multiplr: 1.00

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

LB 5/10/11

CH 05·10·11

0509F019.D 050911_DX.M Mon May 09 17:03:42 2011

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

1,4-Dioxane by GC/MS

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1103961-4	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM		

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	

P1579
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:	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	**Vial:**	11
Run Type:	MB			**Dilution:**	1.0
Lab ID:	KWG1103961-4			**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

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				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

Quantitation Report (QT Reviewed)

Data File : J:\MS26\DATA\050911\0509F015.D Vial: 11
Acq On : 9 May 2011 2:42 pm Operator: KBailey
Sample : KWG1103961-4 | MB Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 09 15:09:31 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 14:26:14 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%		

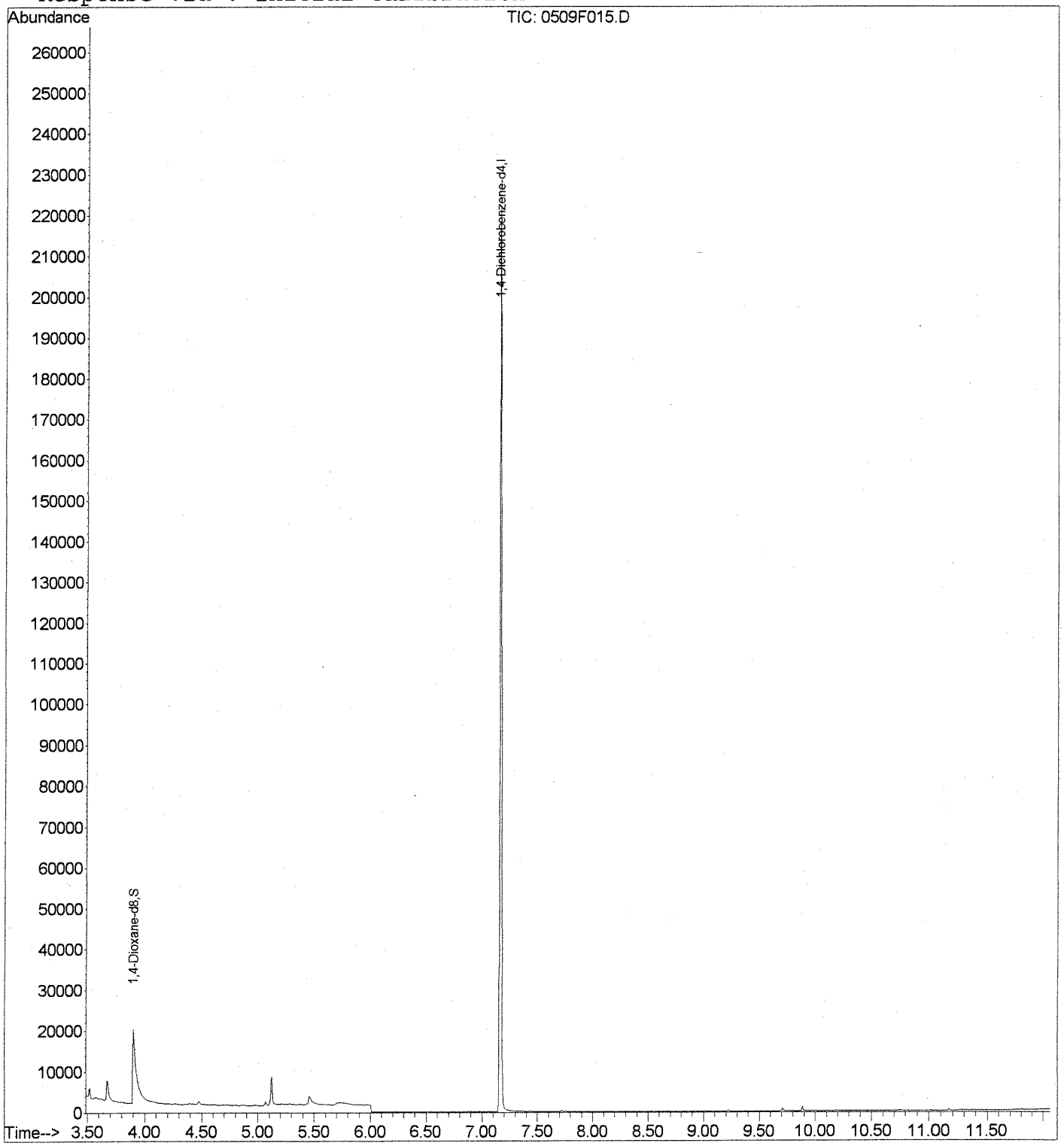
Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration
0509F015.D 050911_DX.M Mon May 09 15:09:43 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS26\DATA\050911\0509F015.D Vial: 11
Acq On : 9 May 2011 2:42 pm Operator: KBailey
Sample : KWG1103961-4 | MB Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 9 15:09 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



Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	04/27/2011
Sample Matrix:	Water	**Date Received:**	04/27/2011

1,4-Dioxane by GC/MS

Sample Name:	MW-24-1MS	**Units:**	ug/L
Lab Code:	KWG1103961-1	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM		

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
RunType: 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: 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:	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	**Vial:**	13
Run Type:	MS			**Dilution:**	1.0
Lab ID:	KWG1103961-1 -- P1101579-005MS			**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	

Final Conc. Units: ug/L

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

Quantitation Report (QT Reviewed)

Data File : J:\MS26\DATA\050911\0509F017.D Vial: 13
Acq On : 9 May 2011 3:21 pm Operator: KBailey
Sample : KWG1103961-1 | MS P1101579-005MS Inst : MS26
Misc : 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						Qvalue
3) 1,4-Dioxane	3.92	88	33163	52.52	ng/ml	89

(#) = qualifier out of range (m) = manual integration
0509F017.D 050911_DX.M Mon May 09 17:04:26 2011 Page 1

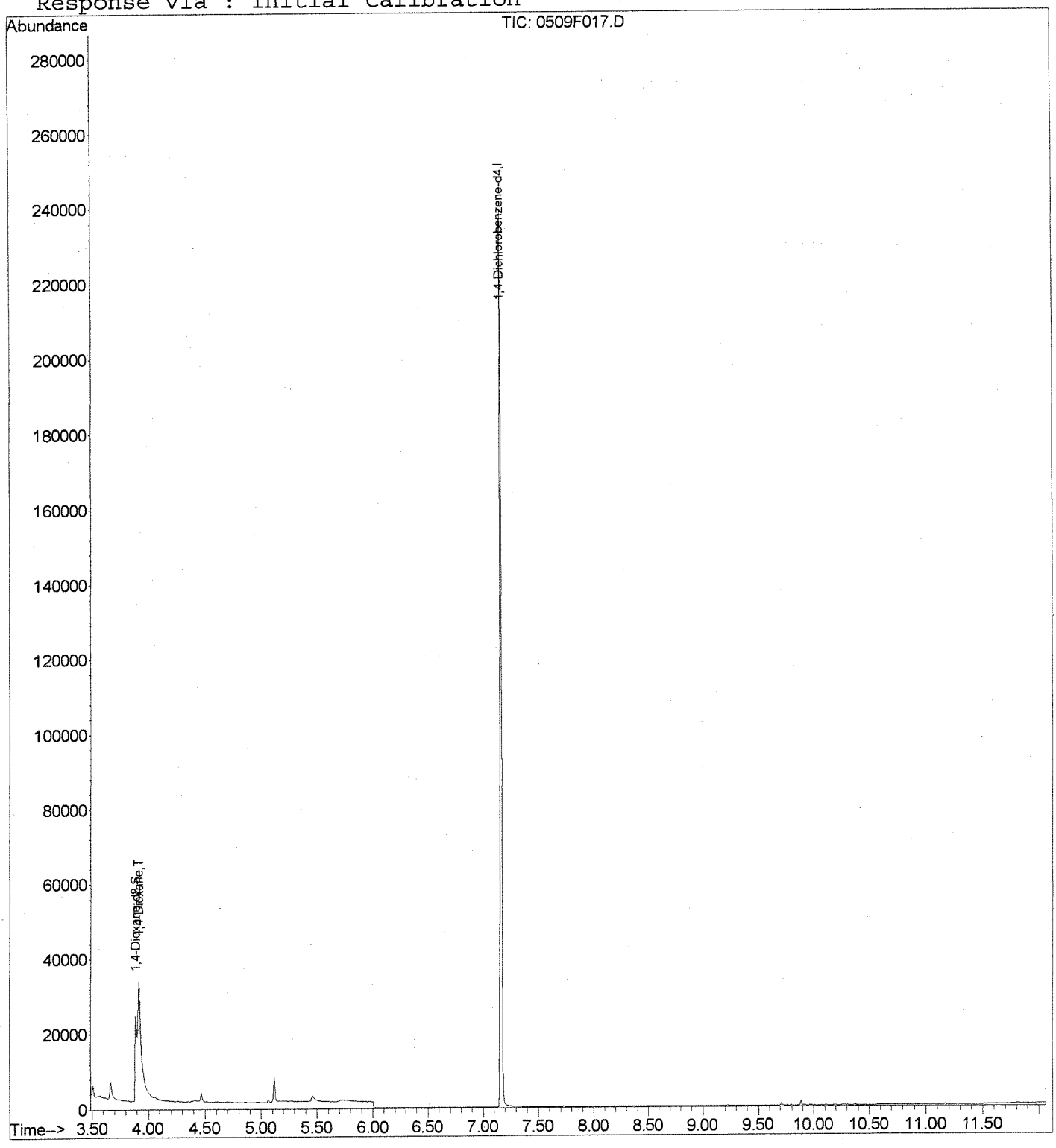
Quantitation Report (QT Reviewed)

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



Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	04/27/2011
Sample Matrix:	Water	**Date Received:**	04/27/2011

1,4-Dioxane by GC/MS

Sample Name:	MW-24-1DMS	**Units:**	ug/L
Lab Code:	KWG1103961-2	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM		

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
RunType: 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:
P1L05
P1L07

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	**Vial:**	14
Run Type:	DMS			**Dilution:**	1.0
Lab ID:	KWG1103961-2 -- P1101579-005DMS			**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	34045**m**	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

Quantitation Report (QT Reviewed)

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 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

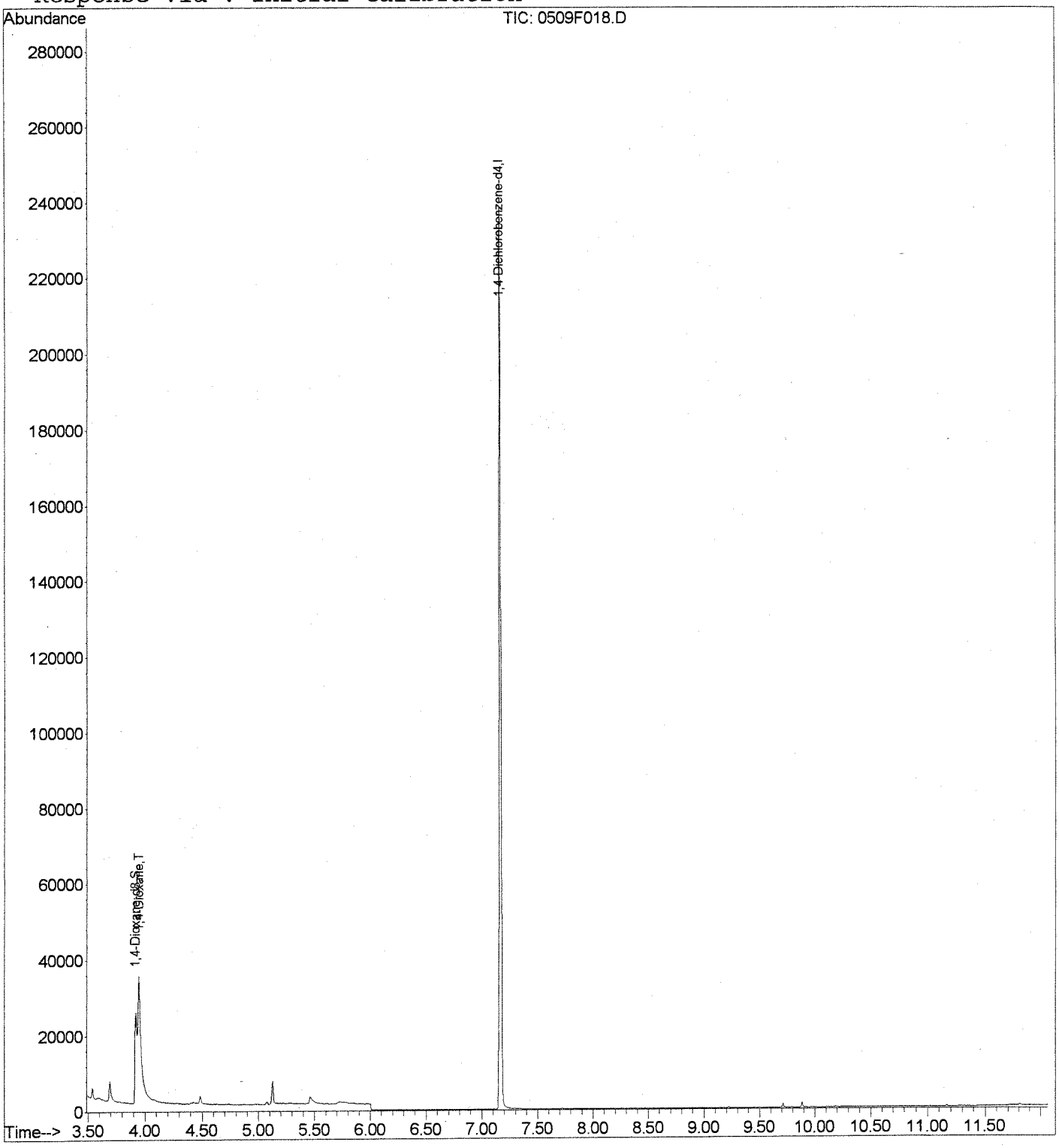
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	83825	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.91	96	30548	46.63	ng/ml	-0.02
Spiked Amount 50.000			Recovery =	93.26%		
Target Compounds						Qvalue
3) 1,4-Dioxane	3.94	88	34045m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

(#) = qualifier out of range (m) = manual integration
0509F018.D 050911_DX.M Mon May 09 17:04:27 2011 Page 1

Quantitation Report (QT Reviewed)

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

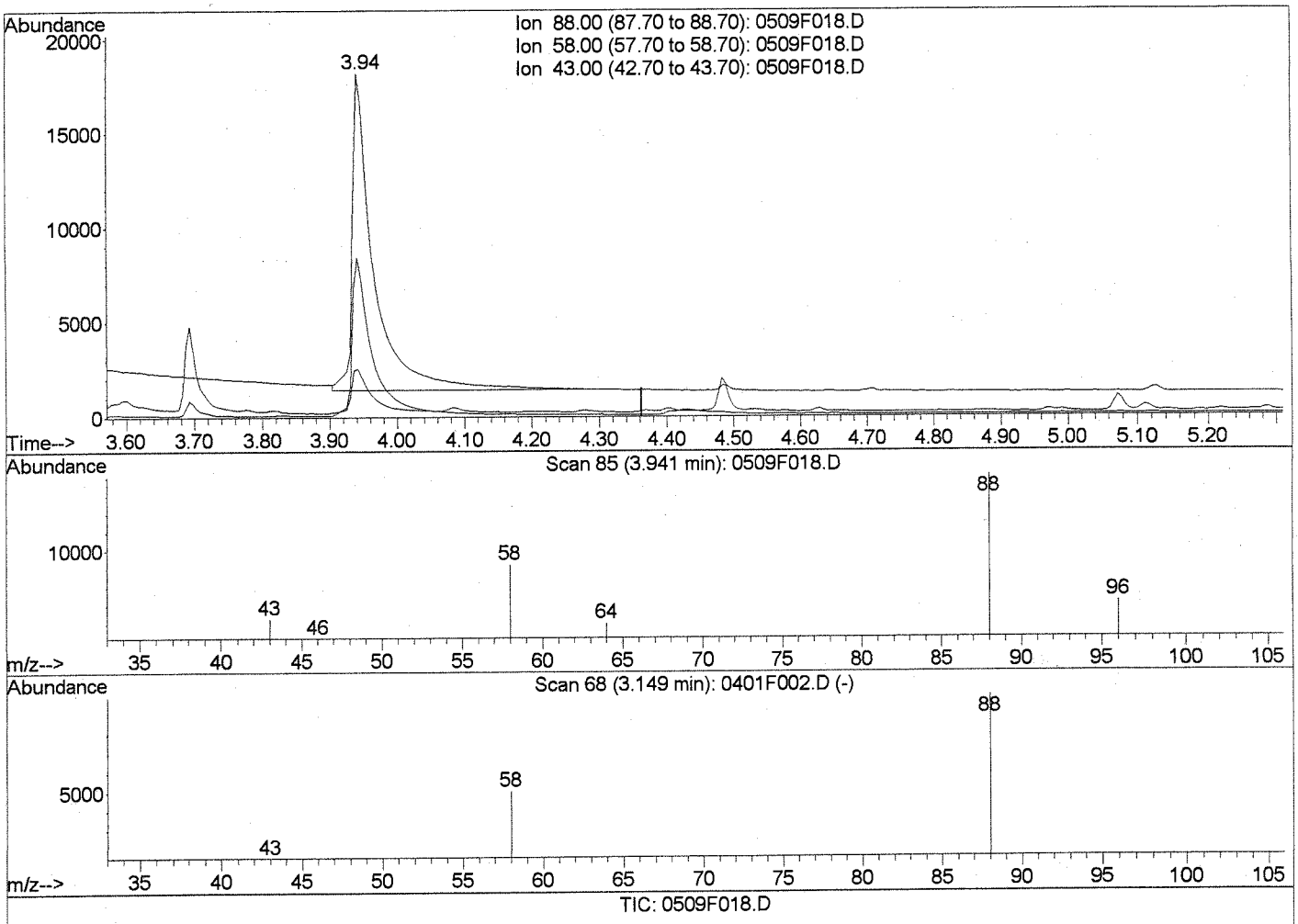
Method : J:\MS26\METHODS\SIM\050911_DX.M (RTE Integrator)
Title : 8270LL Calibration
Last Update : Mon May 09 14:26:14 2011
Response via : Initial Calibration



Quantitation Report (Qedit)

Data File : J:\MS26\DATA\050911\0509F018.D 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 16:09 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: 0509F018.D

(3) 1,4-Dioxane (T)

3.94min 56.32ng/ml

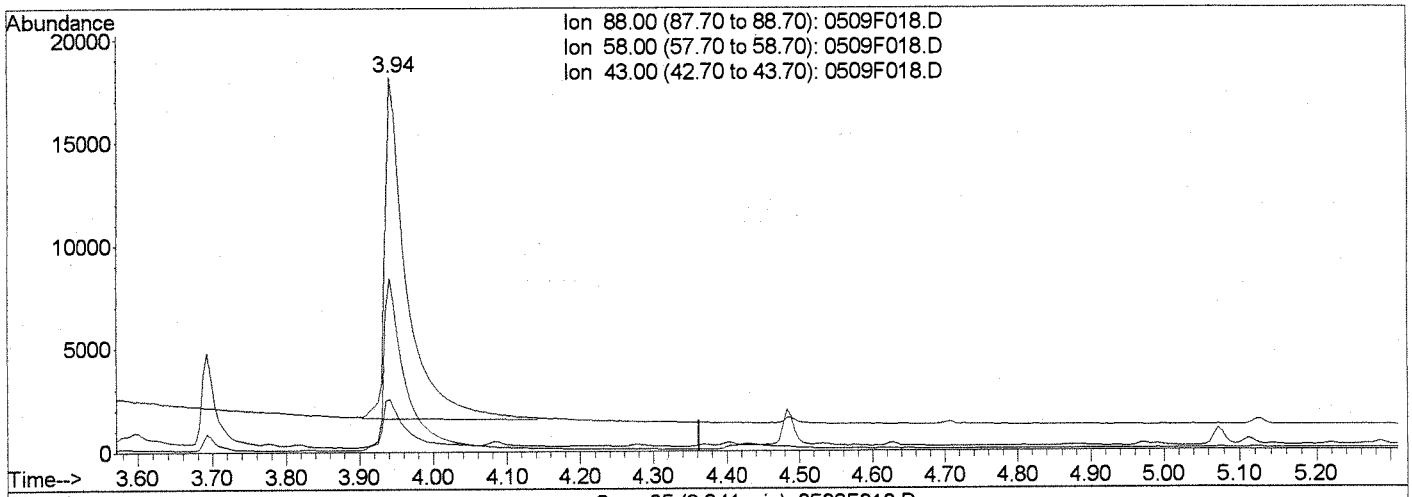
response 37510

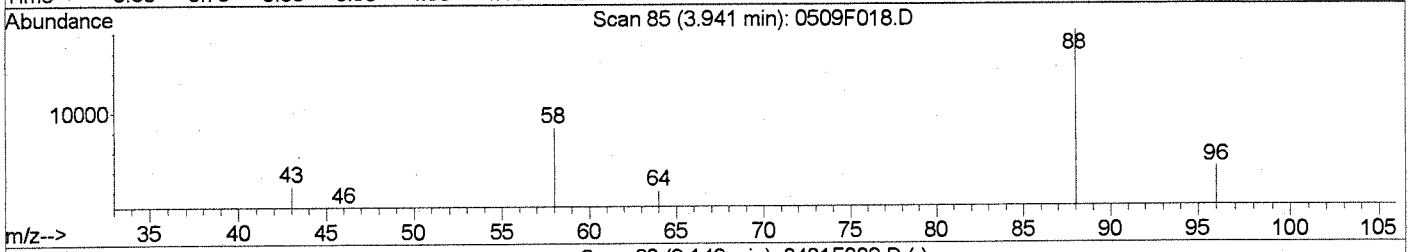
Ion	Exp%	Act%
88.00	100	100
58.00	39.30	49.65
43.00	14.10	13.77
0.00	0.00	0.00

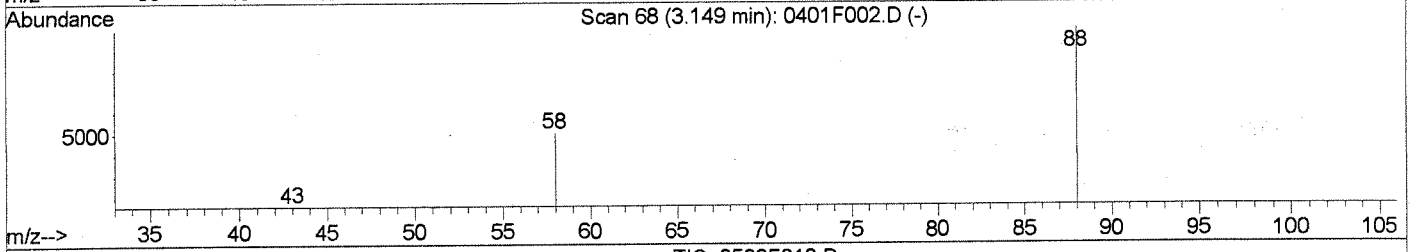
Quantitation Report (Qedit)

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

0509F018.D 050911_DX.M Mon May 09 17:03:21 2011

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P1101579
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

1,4-Dioxane by GC/MS

Sample Name:	Lab Control Sample	**Units:**	ug/L
Lab Code:	KWG1103961-3	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM		

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	

P1579
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 Date:	05/04/2011		
Prep Ref:	1015805				

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	**Vial:**	12
Run Type:	LCS			**Dilution:**	1.0
Lab ID:	KWG1103961-3			**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	7.17	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
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:\MS26\DATA\050911\0509F016.D Vial: 12
Acq On : 9 May 2011 3:02 pm Operator: KBailey
Sample : KWG1103961-3 | LCS Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 09 15:45:02 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

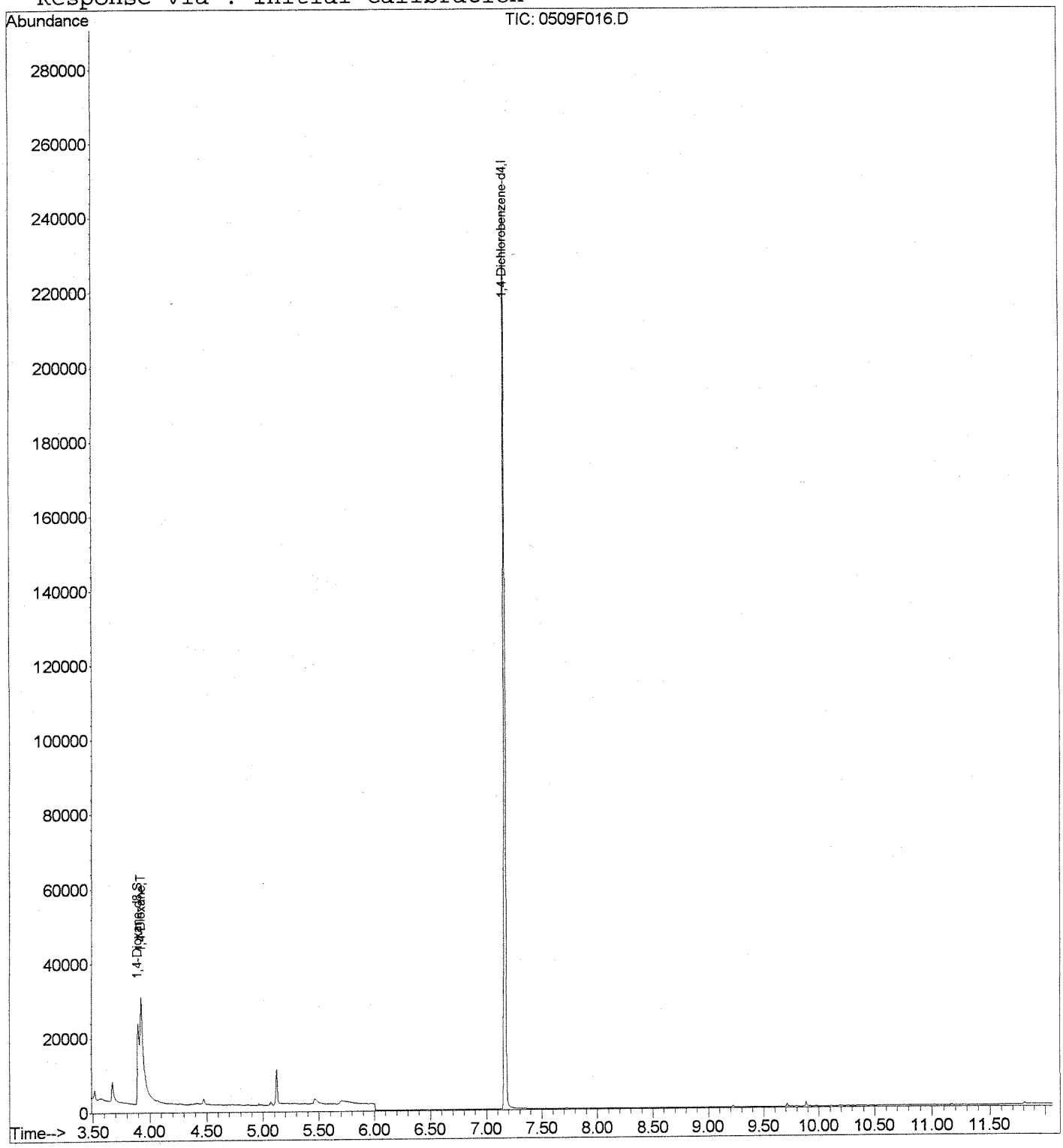
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	77544	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.89	96	28015	46.23	ng/ml	-0.04
Spiked Amount 50.000			Recovery = 92.46%			
Target Compounds						Qvalue
3) 1,4-Dioxane	3.93	88	30891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

(#) = qualifier out of range (m) = manual integration
0509F016.D 050911_DX.M Mon May 09 17:04:25 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS26\DATA\050911\0509F016.D Vial: 12
Acq On : 9 May 2011 3:02 pm Operator: KBailey
Sample : KWG1103961-3 | LCS Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 9 15:45 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



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: P1101579
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	
MW-24-1MS	KWG1103961-1	J:\MS26\DATA\050911\0509F017.D	05/09/2011	15:21	
MW-24-1DMS	KWG1103961-2	J:\MS26\DATA\050911\0509F018.D	05/09/2011	15:41	
MW-24-1	P1101579-005	J:\MS26\DATA\050911\0509F019.D	05/09/2011	16:01	

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
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: 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:**	05/10/2011

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:**		**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

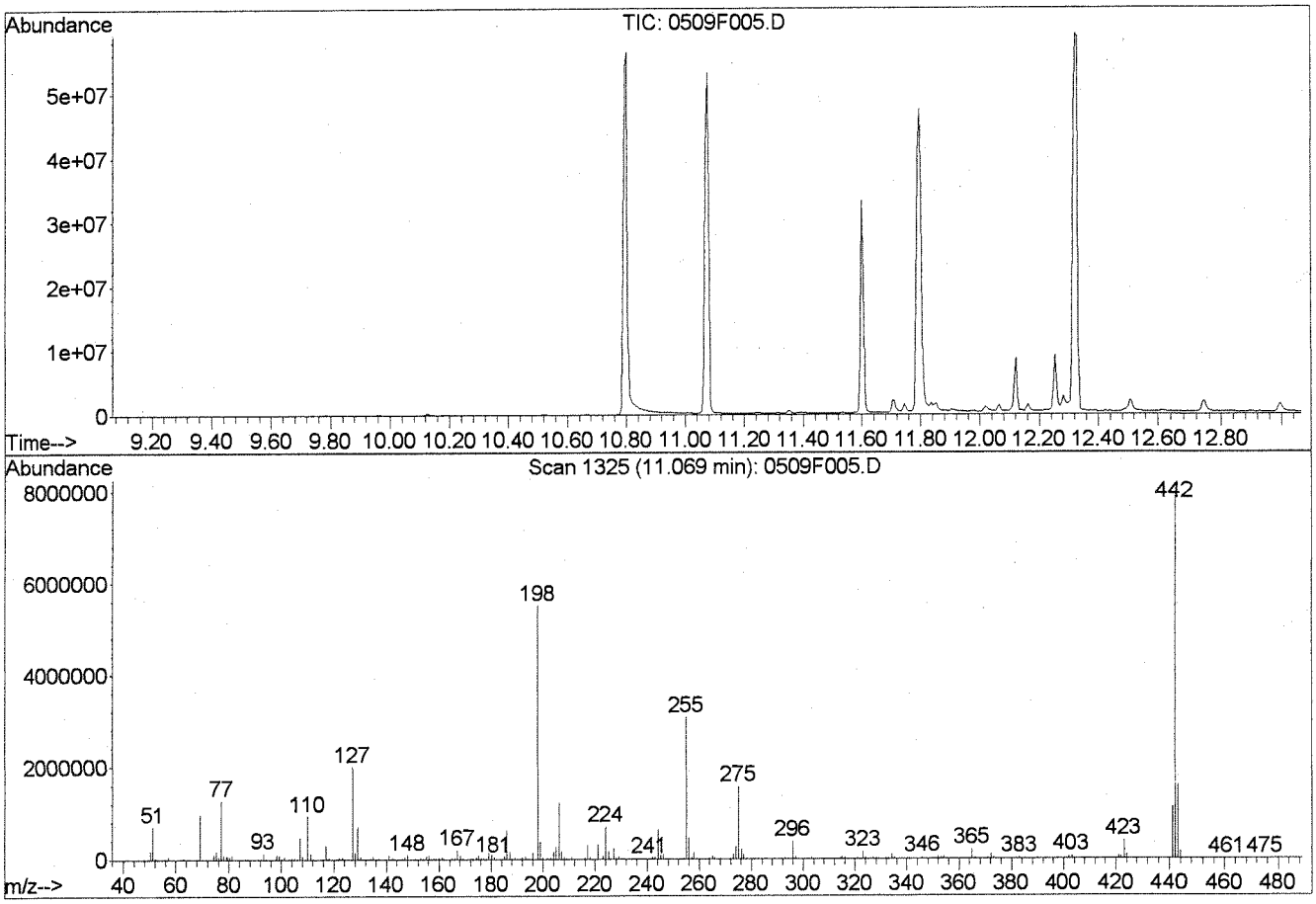
U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

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

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

0509F005.D A_DFTPP.M Mon May 09 14:55:59 2011

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 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.
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

CH 05.10.11

5/10/11

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

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
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						

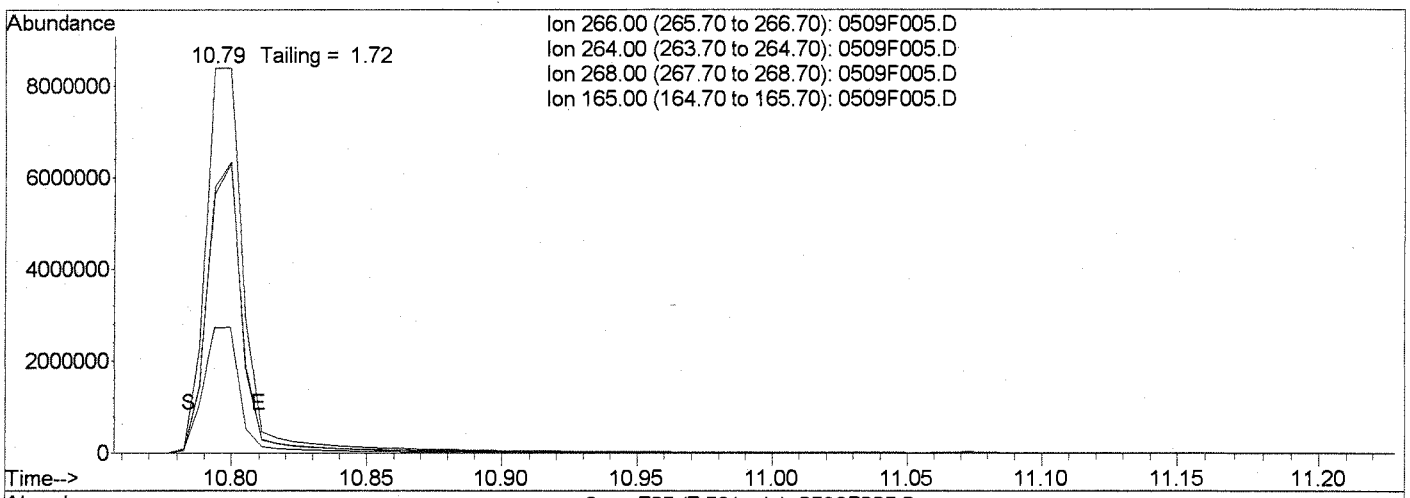
LB 5/10/11

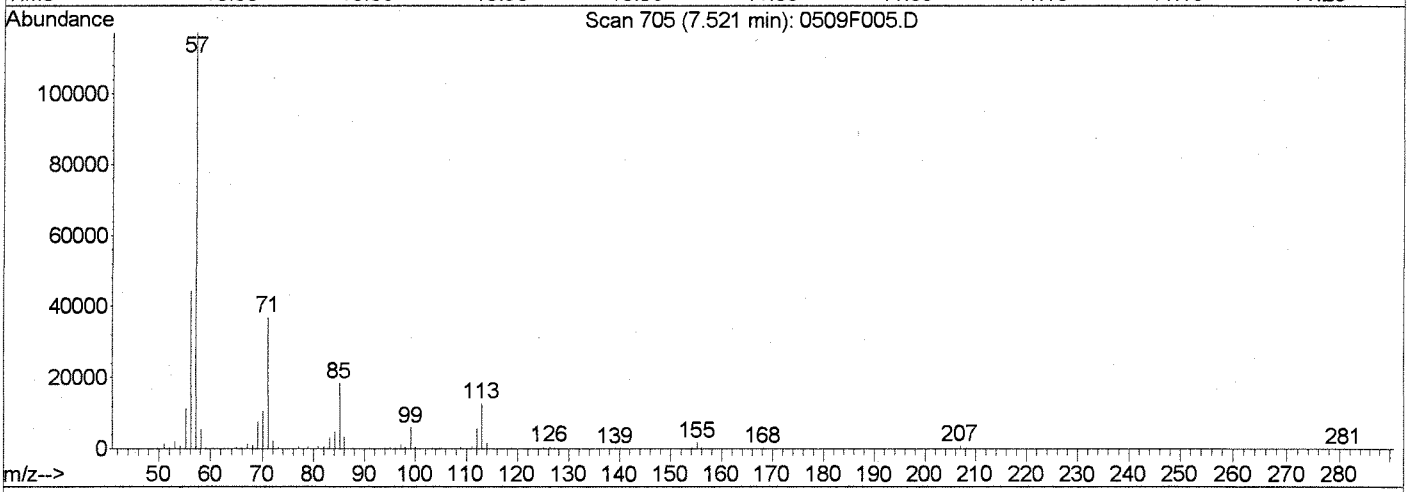
CH 05.10.11

Quantitation Report

Data File : J:\MS26\DATA\050911\0509F005.D Vial: 1
Acq On : 9 May 2011 11:15 am Operator: KBailey
Sample : 10ug/mL DFTPP | SVM34-33F Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: rteint.p

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

0509F005.D A_DFTPP.M Mon May 09 14:56:22 2011

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

Service Request: P1101579
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
A	J:\MS26\DATA\050911\0509F007.D
B	J:\MS26\DATA\050911\0509F008.D
C	J:\MS26\DATA\050911\0509F009.D
D	J:\MS26\DATA\050911\0509F010.D
E	J:\MS26\DATA\050911\0509F011.D
F	J:\MS26\DATA\050911\0509F012.D
G	J:\MS26\DATA\050911\0509F013.D

Analyte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level 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

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

Service Request: P1101579
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

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

Service Request: P1101579
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	NB	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 5/10/11

QH 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: 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:**	05/10/2011

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:**		**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

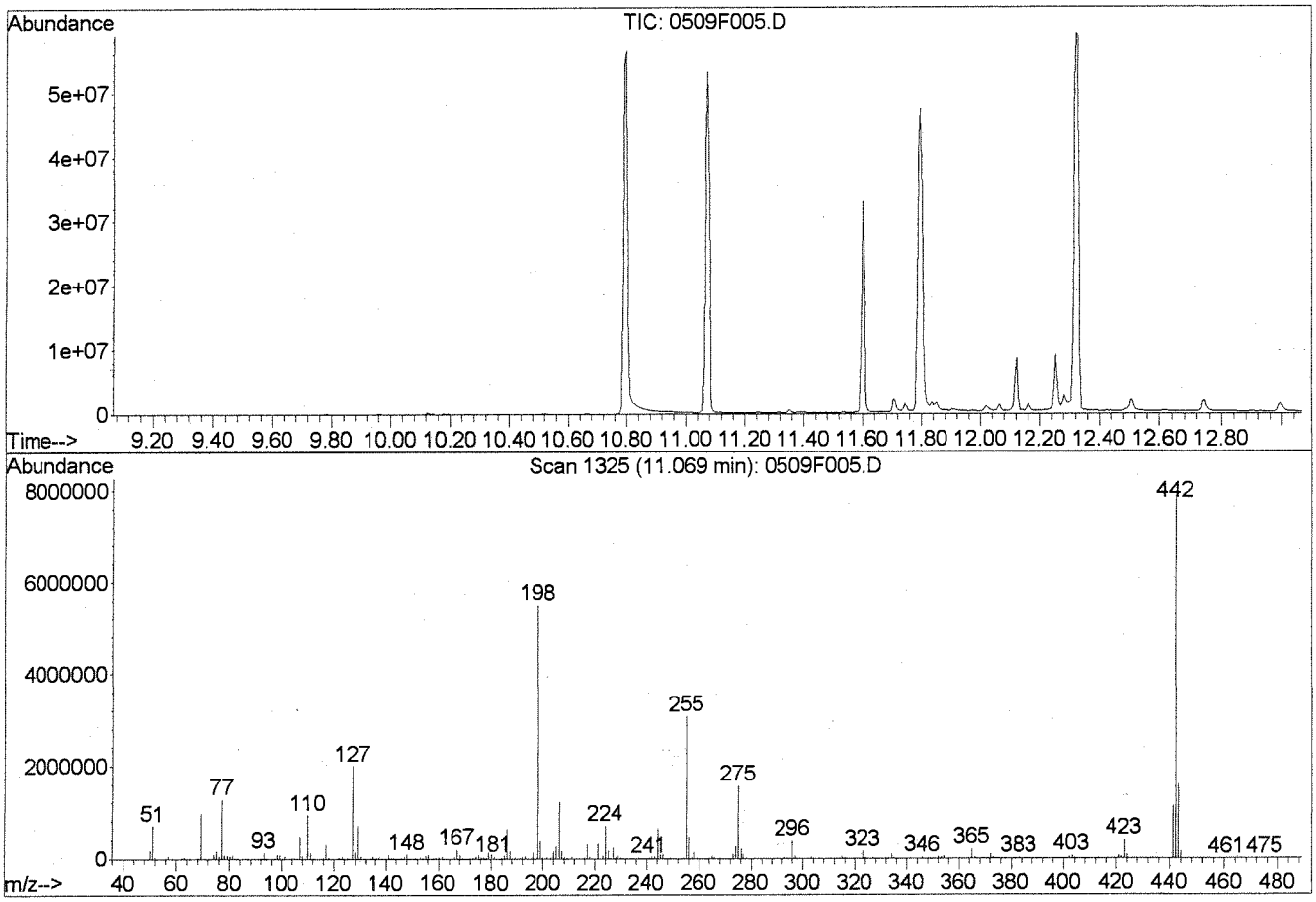
U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

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

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

0509F005.D A_DFTPP.M Mon May 09 14:55:59 2011

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 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.
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

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.
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

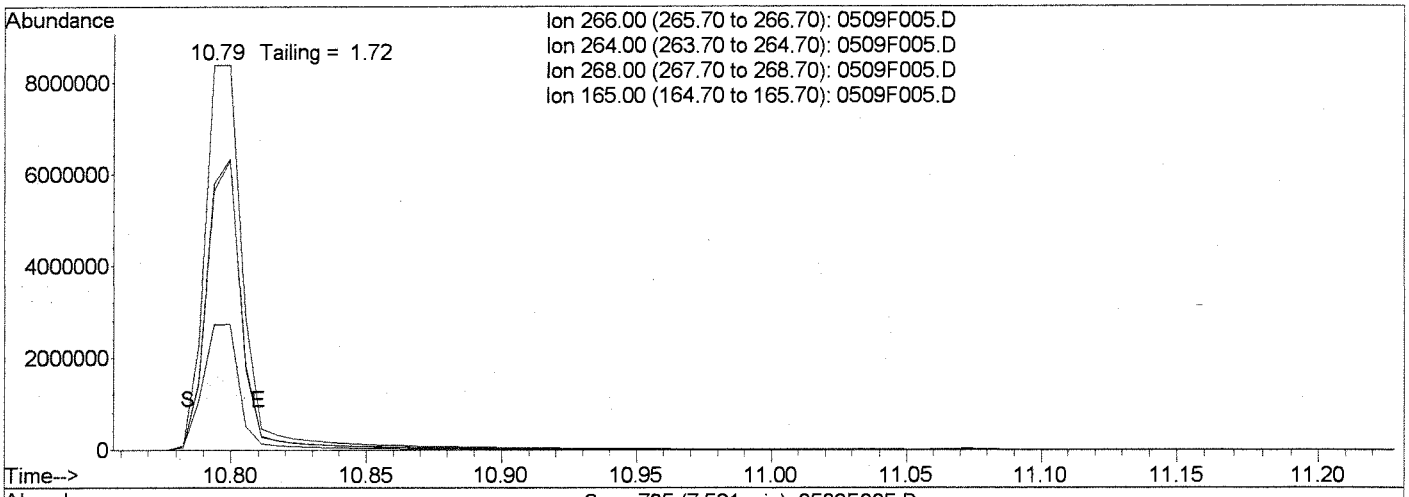
CH 05.10.11

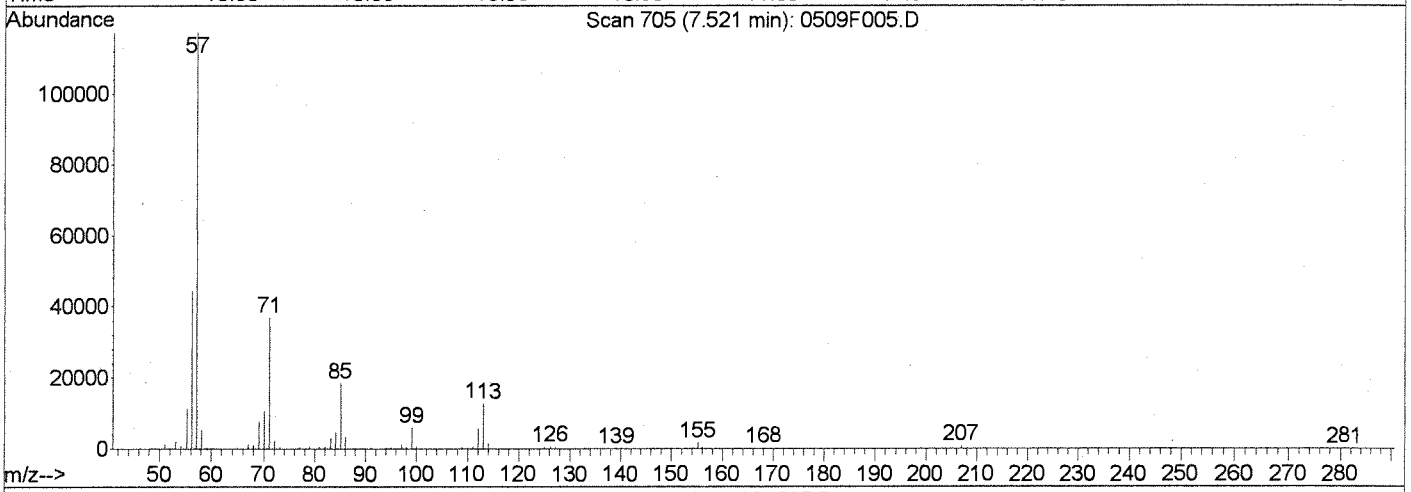
Quantitation Report

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

0509F005.D A_DFTPP.M Mon May 09 14:56:22 2011

Quantitation Report (QT Reviewed)

Data File : J:\MS26\DATA\050911\0509F006.D Vial: 2
Acq On : 9 May 2011 11:43 am Operator: KBailey
Sample : IB Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 09 14:56:54 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	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

LB
5/10/11

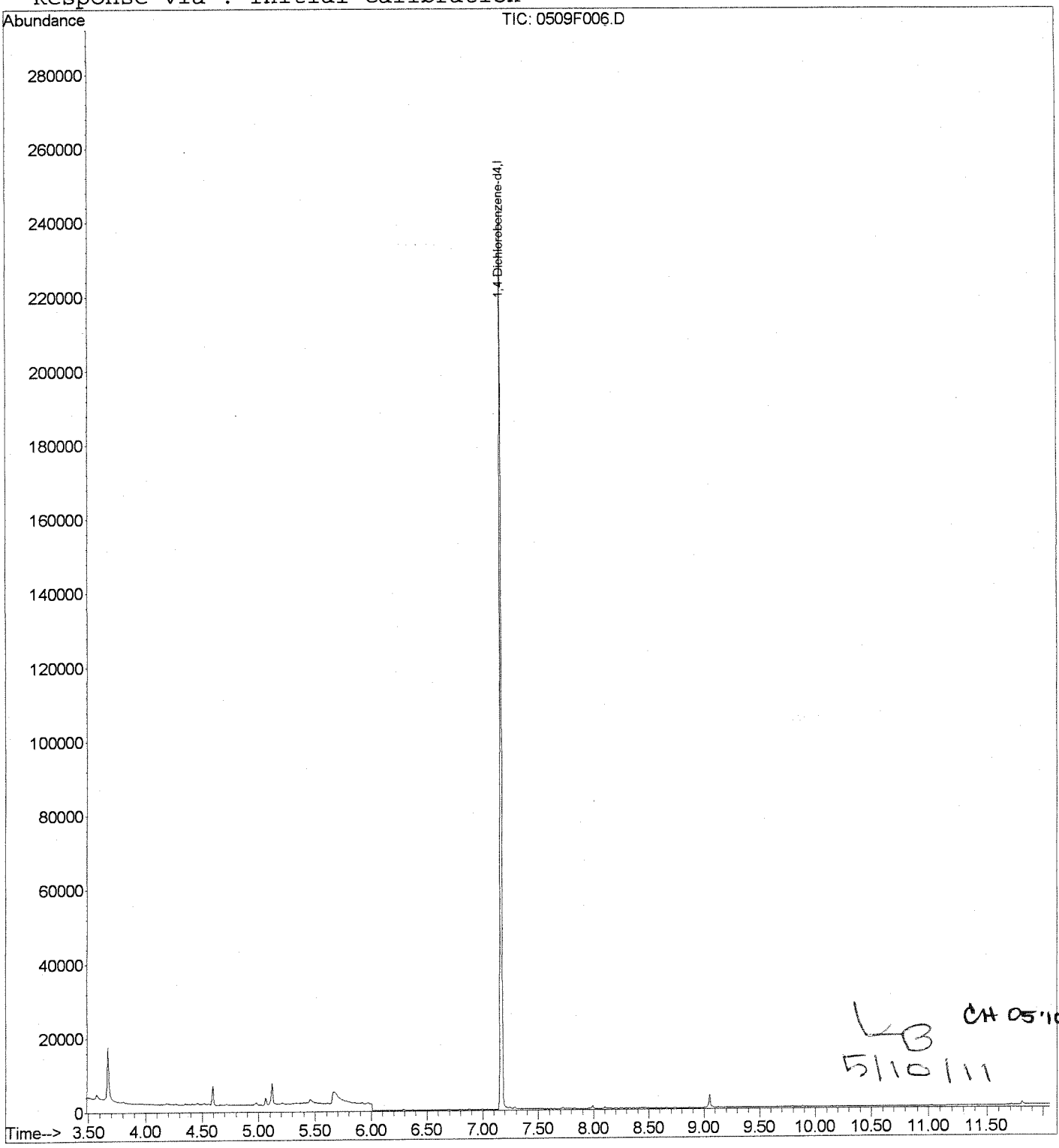
CH 05.10.11

(#) = qualifier out of range (m) = manual integration
0509F006.D 050911_DX.M Mon May 09 17:10:18 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS26\DATA\050911\0509F006.D Vial: 2
Acq On : 9 May 2011 11:43 am Operator: KBailey
Sample : IB Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 9 14:56 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



LB CH 05.10.11
5/10/11

Quantitation Report (QT Reviewed)

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

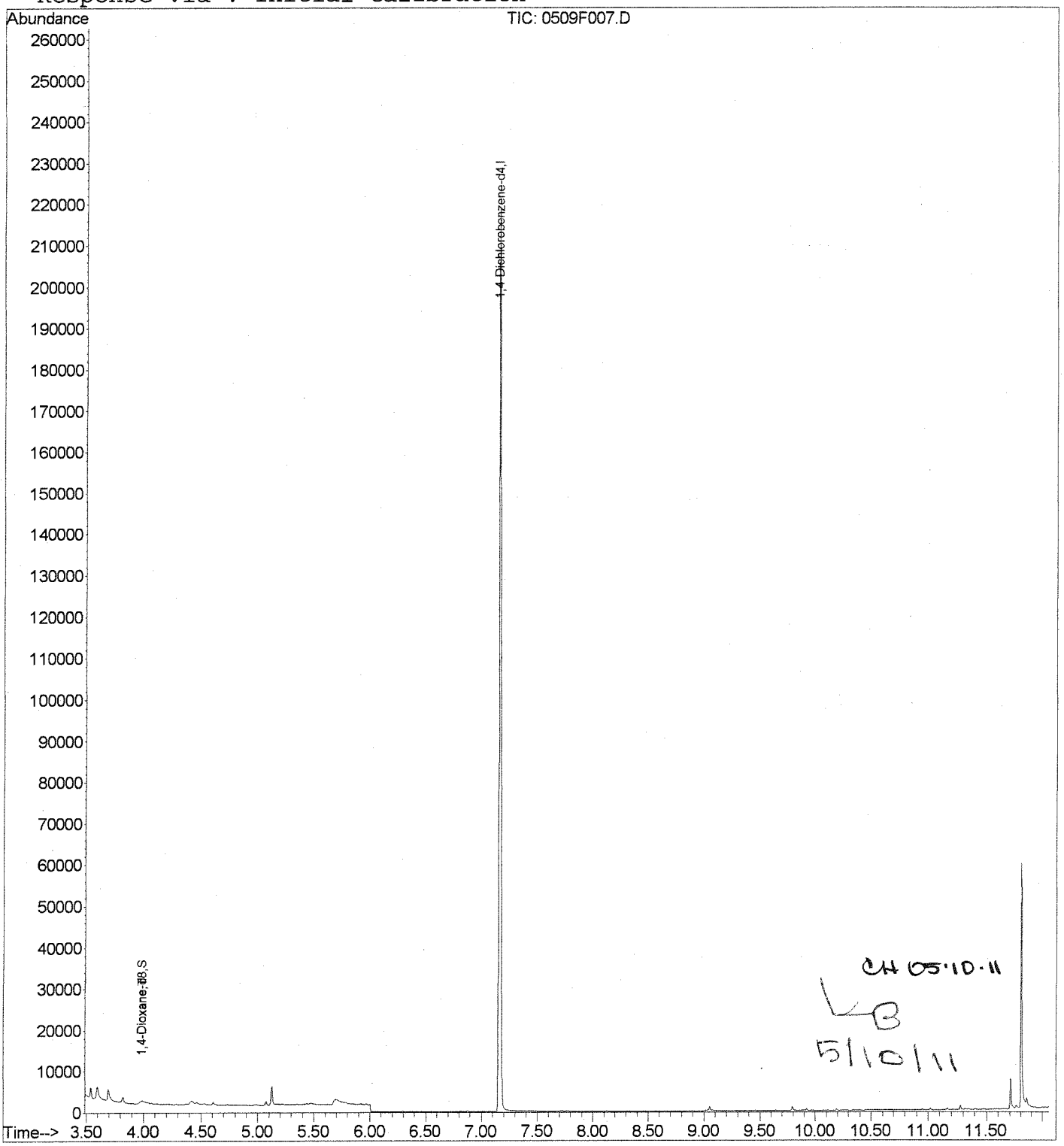
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.16	152	81459	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.98	96	1201m	1.98	ng/ml	0.04
Spiked Amount 50.000			Recovery =	3.96%		
Target Compounds						Qvalue
3) 1,4-Dioxane	3.99	88	1170m	1.88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

CH 05.10.11
LB
5/10/11

(#) = qualifier out of range (m) = manual integration
0509F007.D 050911_DX.M Mon May 09 14:57:13 2011 Page 1

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

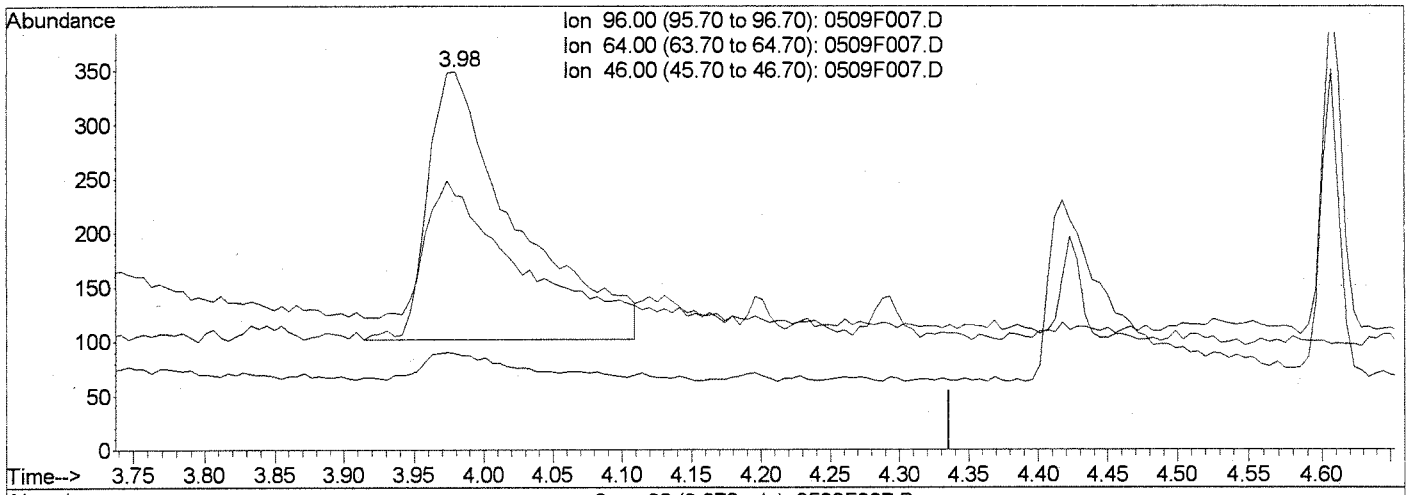


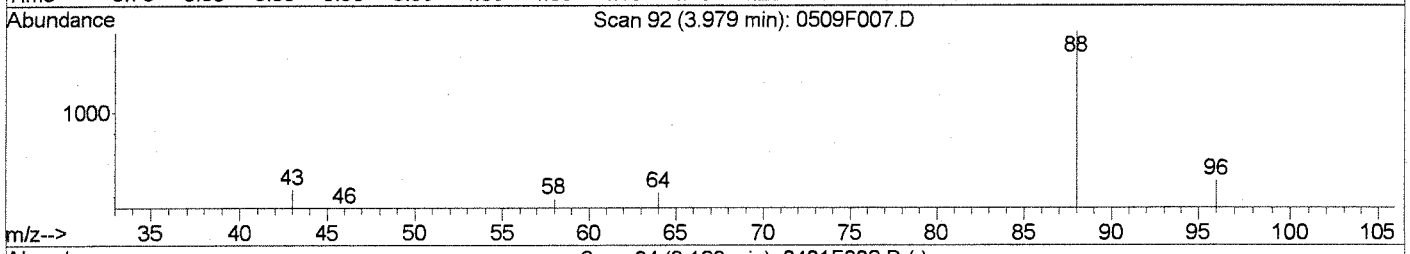
CH 05·10·11
LB
5/10/11

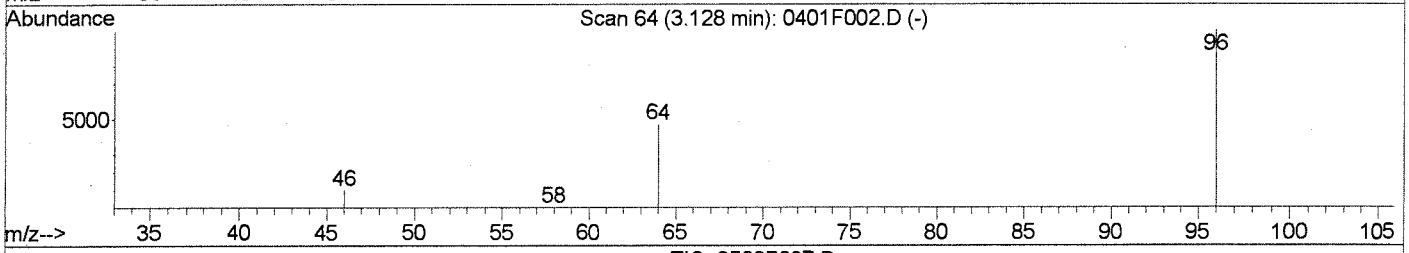
Quantitation Report (Qedit)

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

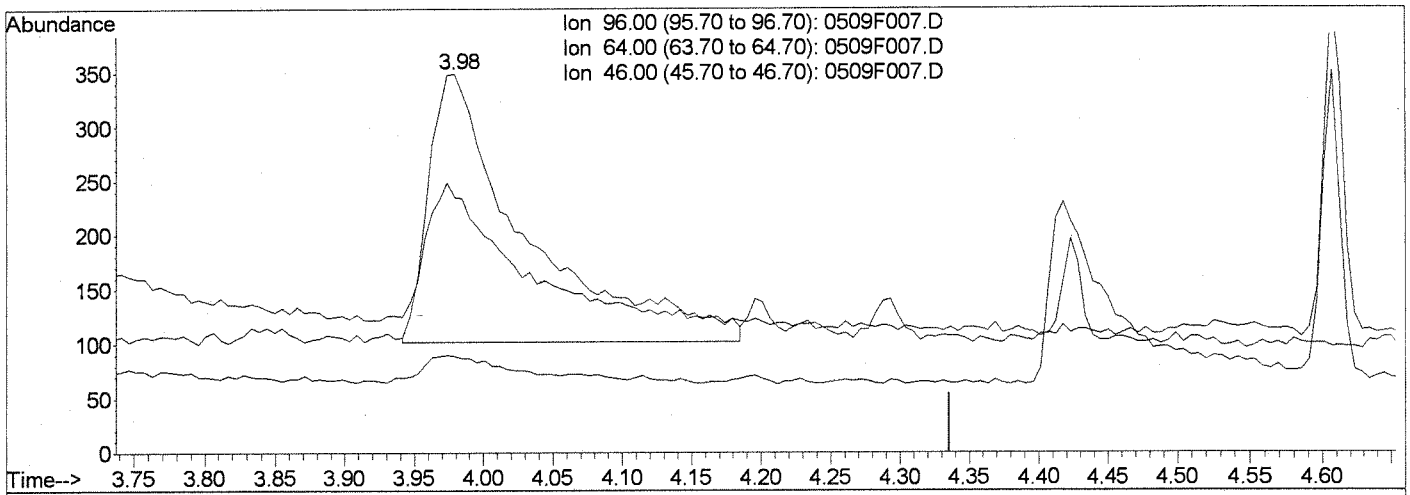
Ion	Exp%	Act%
96.00	100	100
64.00	55.60	45.75
46.00	11.70	8.91
0.00	0.00	0.00

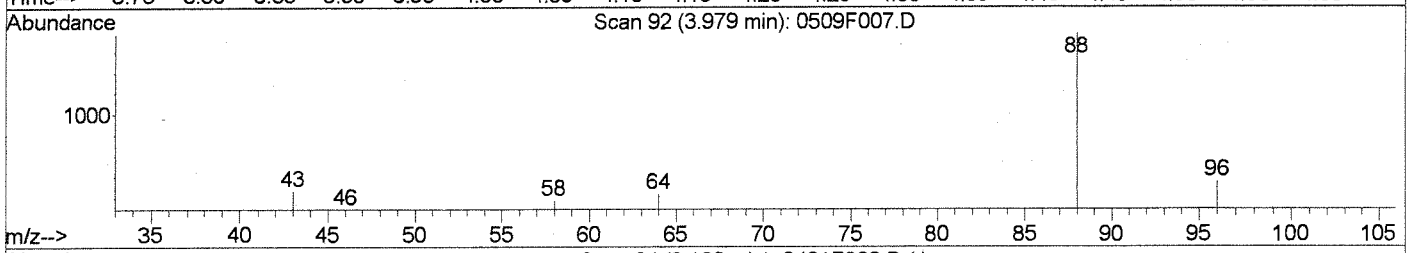
0509F007.D 050911_DX.M Mon May 09 14:21:48 2011

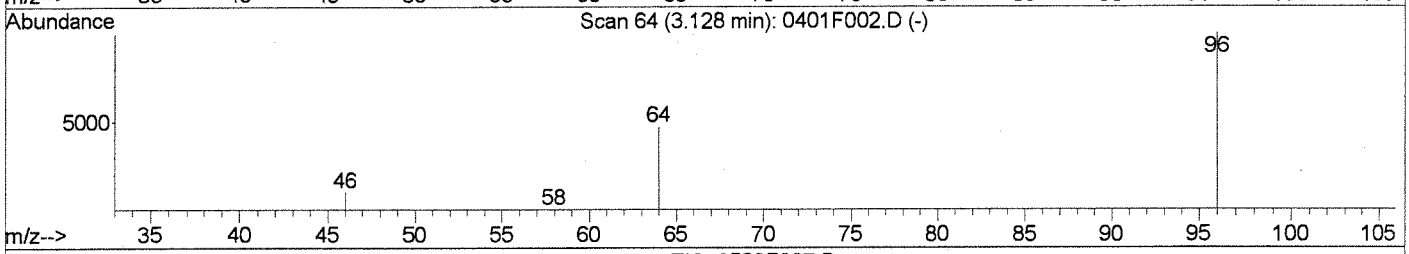
Data File : J:\MS26\DATA\050911\0509F007.D
Acq On : 9 May 2011 12:03 pm
Sample : 2.0ng/mL ICAL 1,4-Dioxane | SVM34-56B
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 14:21 2011

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

1C

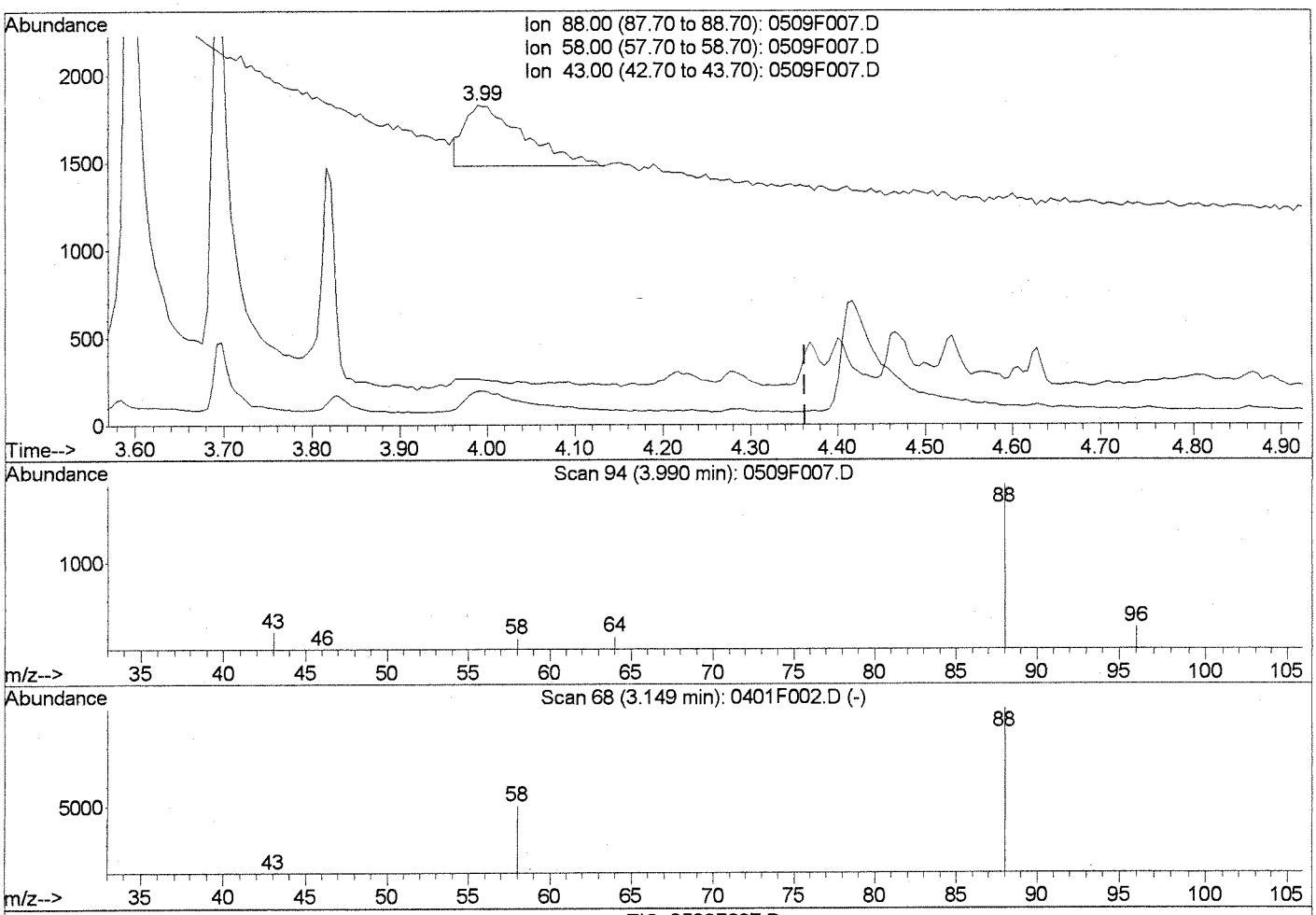
LB 5/10/11

CH 05.10.11

0509F007.D 050911_DX.M Mon May 09 14:21:55 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 14:21 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

(3) 1,4-Dioxane (T)

3.99min 2.67ng/ml

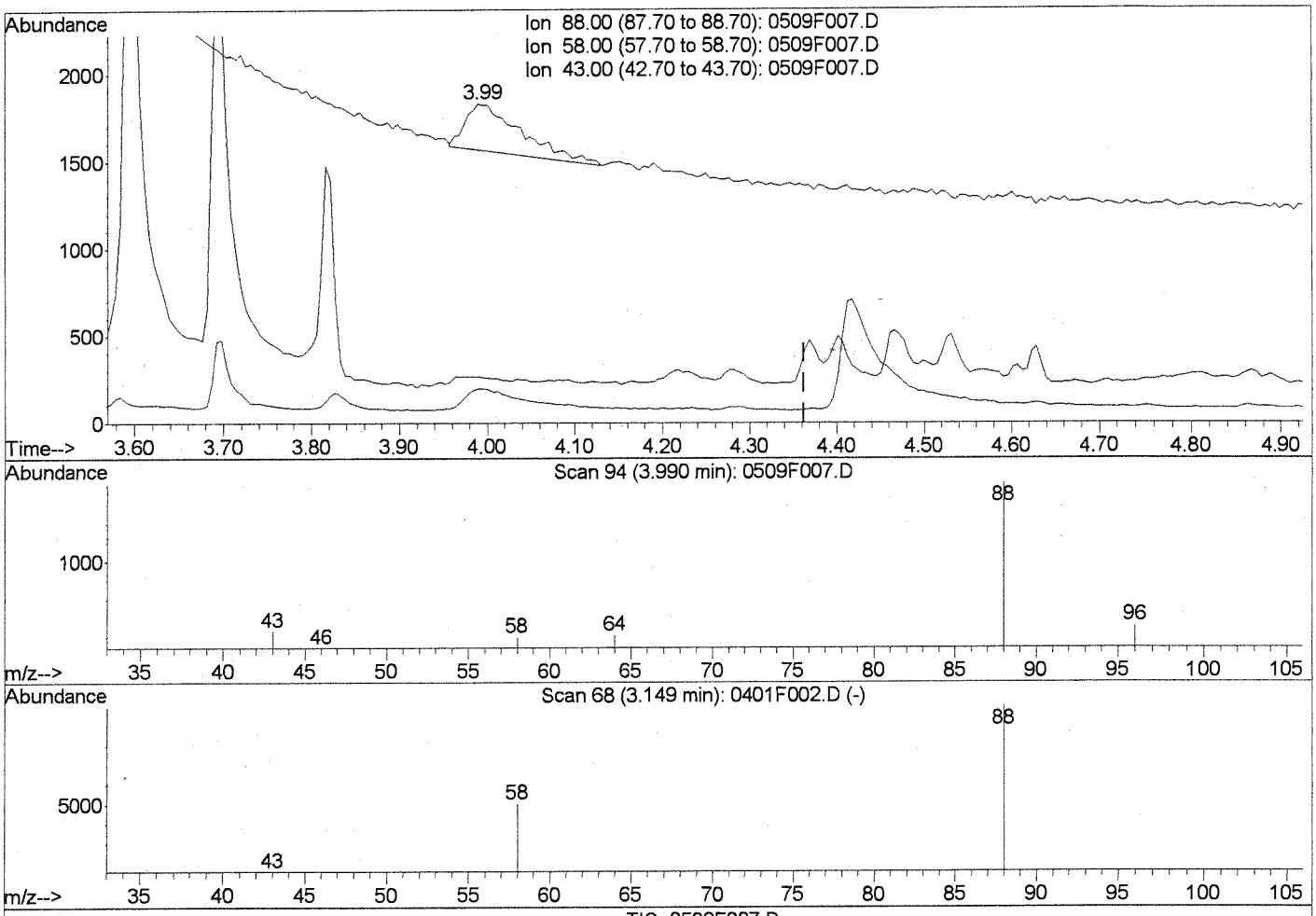
response 1657

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

0509F007.D 050911_DX.M Mon May 09 14:22:08 2011

Quantitation Report (QT Reviewed)

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						Qvalue
3) 1,4-Dioxane	3.97	88	2314m	3.75	ng/ml	

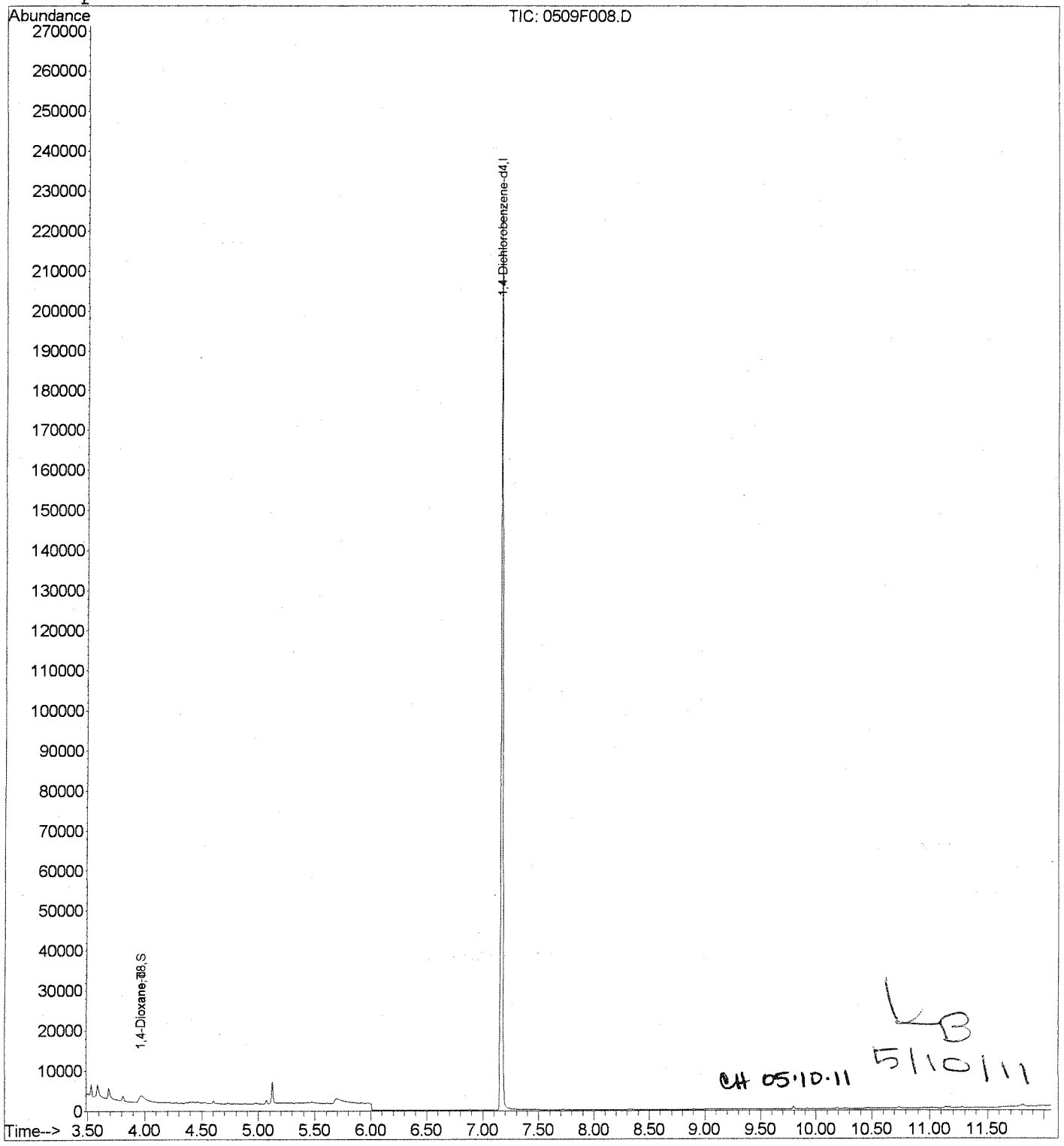
LB
5/10/11

CA 05-10-11

(#) = qualifier out of range (m) = manual integration
0509F008.D 050911_DX.M Mon May 09 14:57:14 2011 Page 1

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

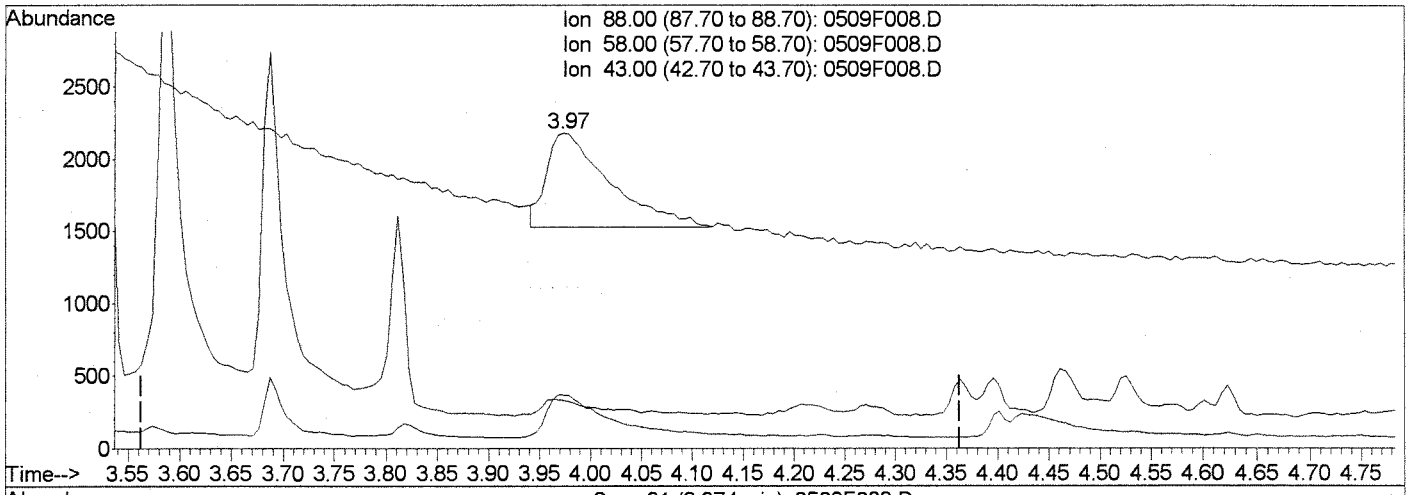


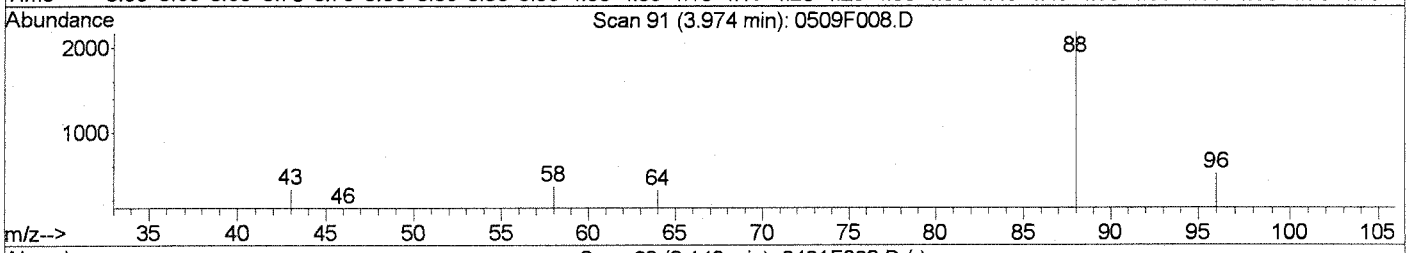
LB 5/10/11
CH 05.10.11

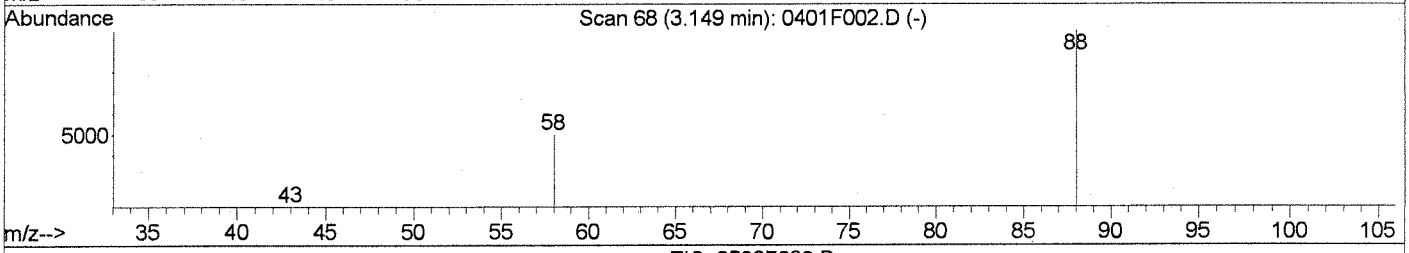
Quantitation Report (Qedit)

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

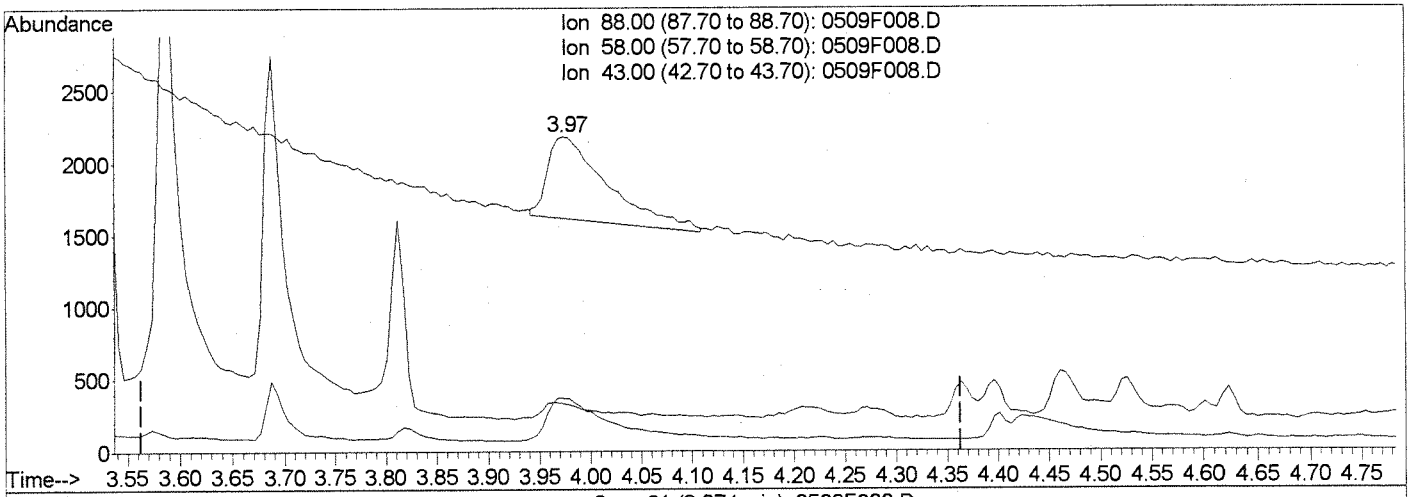
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	42.09
43.00	15.30	14.90
0.00	0.00	0.00

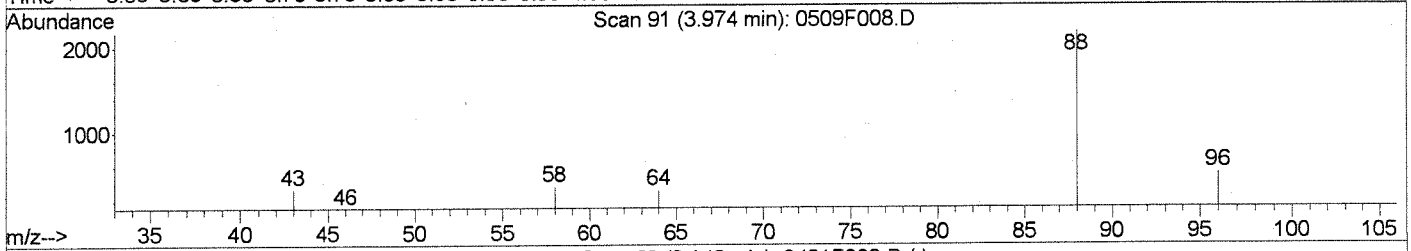
0509F008.D 050911_DX.M Mon May 09 14:22:27 2011

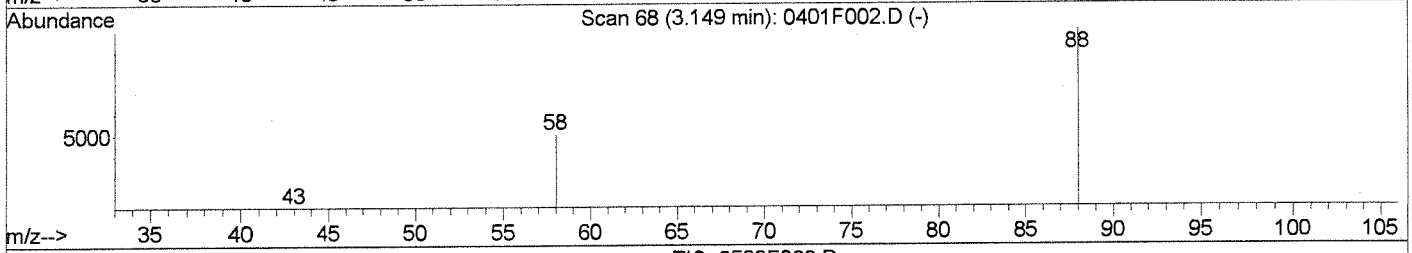
Quantitation Report (Qedit)

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 14:22 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: 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

CH 05.10.11

0509F008.D 050911_DX.M Mon May 09 14:22:32 2011

Quantitation Report (QT Reviewed)

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						Qvalue
3) 1,4-Dioxane	3.97	88	6107m	9.64	ng/ml	

KB
5/10/11

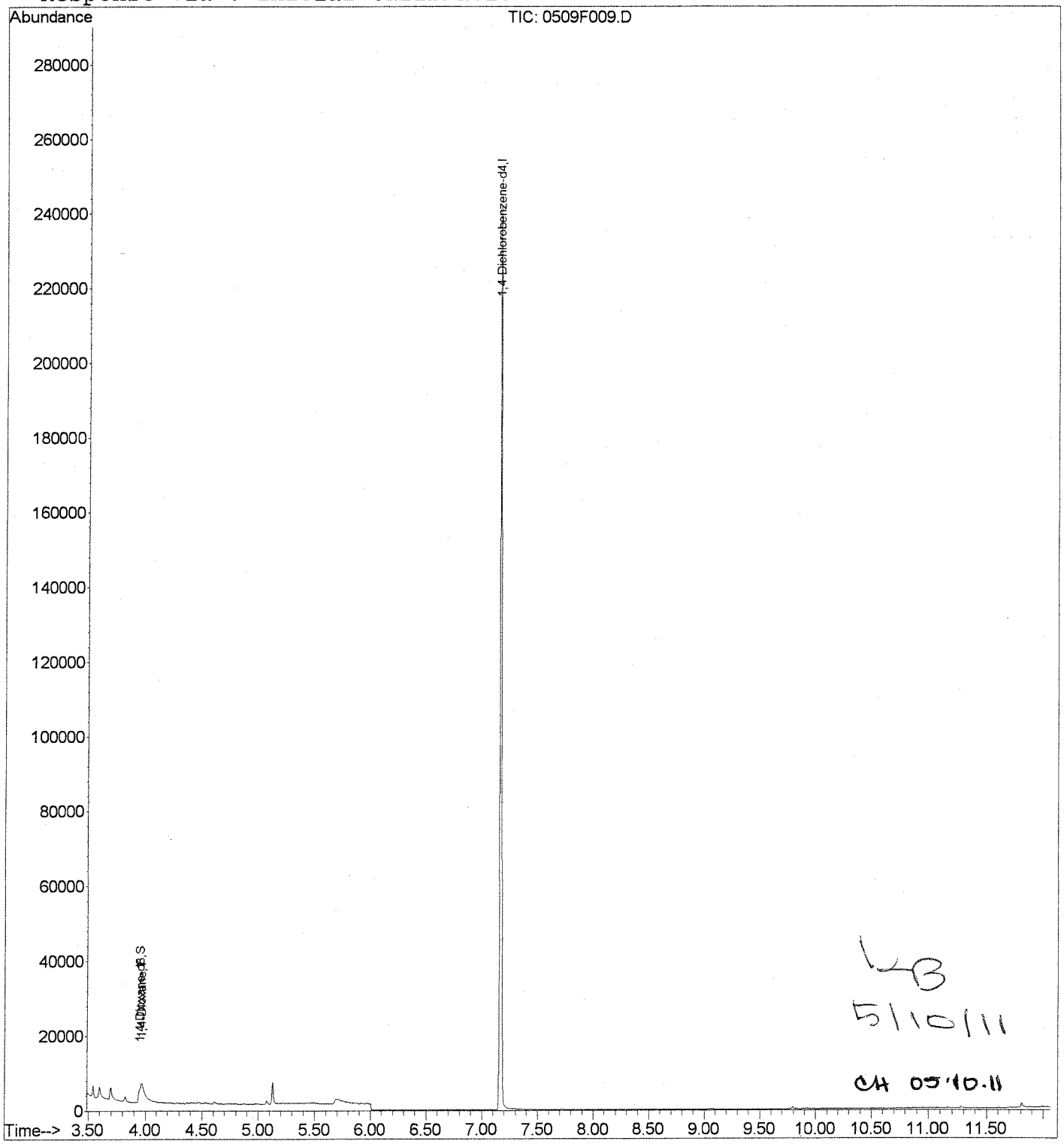
CH 05.10.11

(#) = qualifier out of range (m) = manual integration
0509F009.D 050911_DX.M Mon May 09 14:57:15 2011 Page 1

Quantitation Report (QT Reviewed)

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

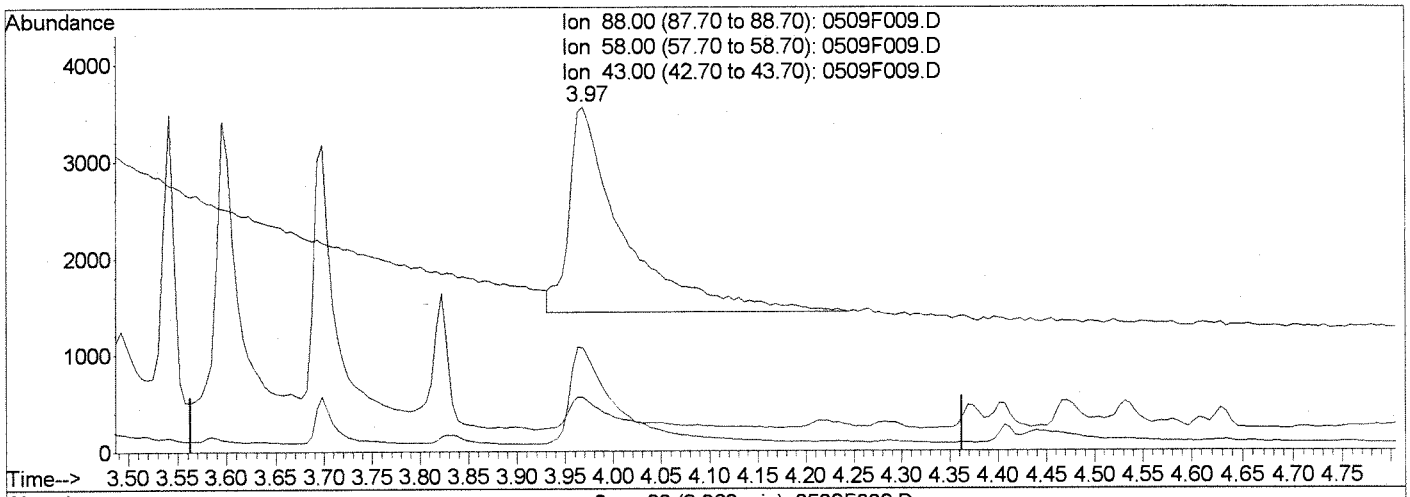


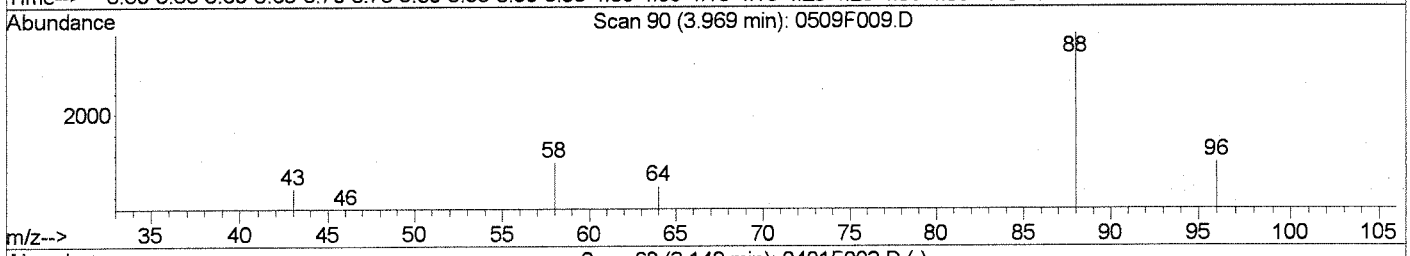
LB
5/10/11
CH 05.10.11

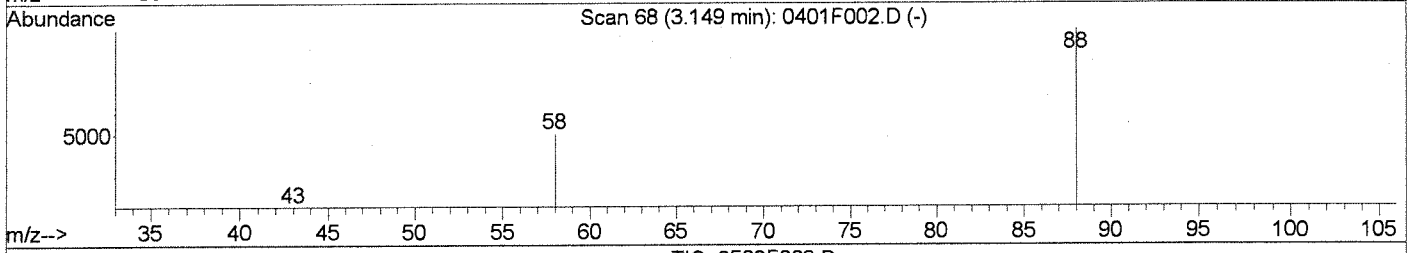
Quantitation Report (Qedit)

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 14:21 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

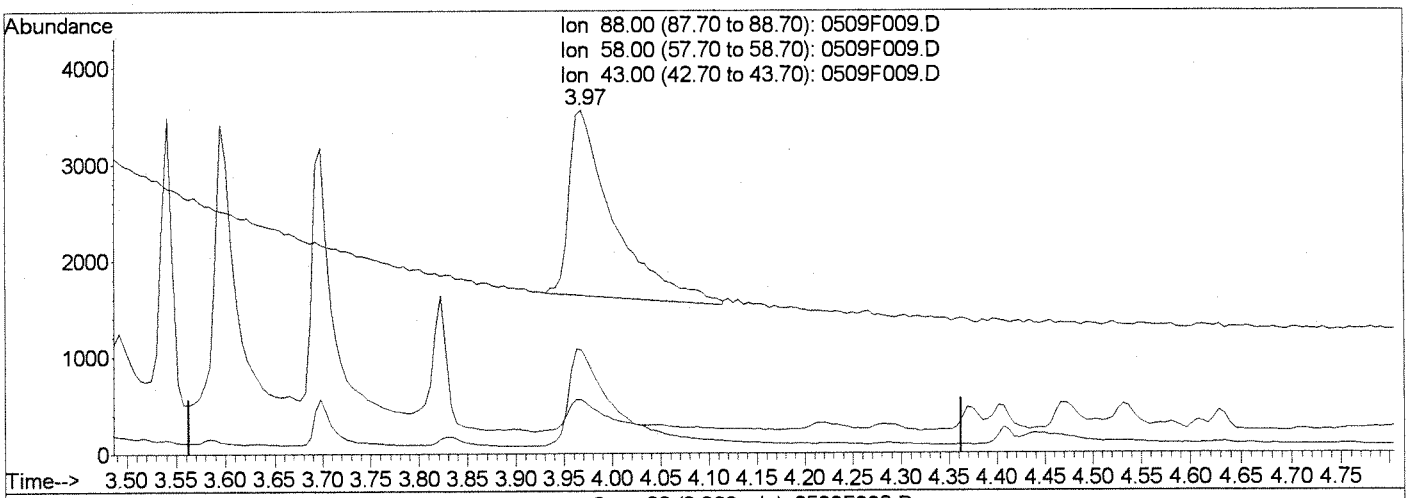
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	46.26
43.00	15.30	14.95
0.00	0.00	0.00

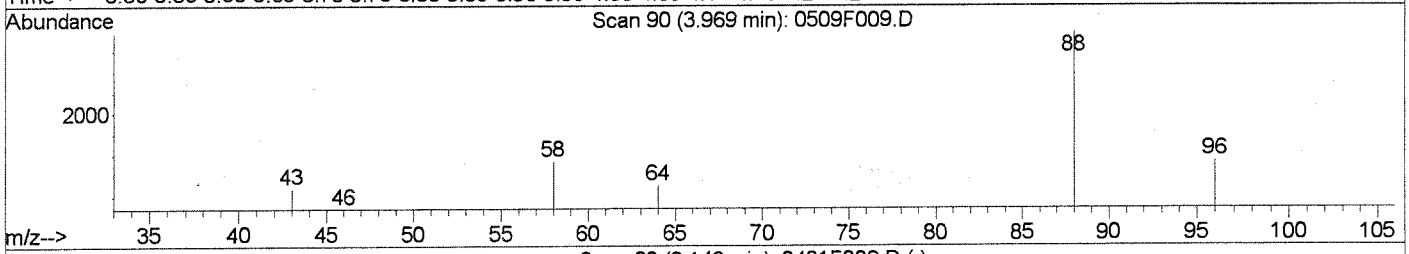
0509F009.D 050911_DX.M Mon May 09 14:22:43 2011

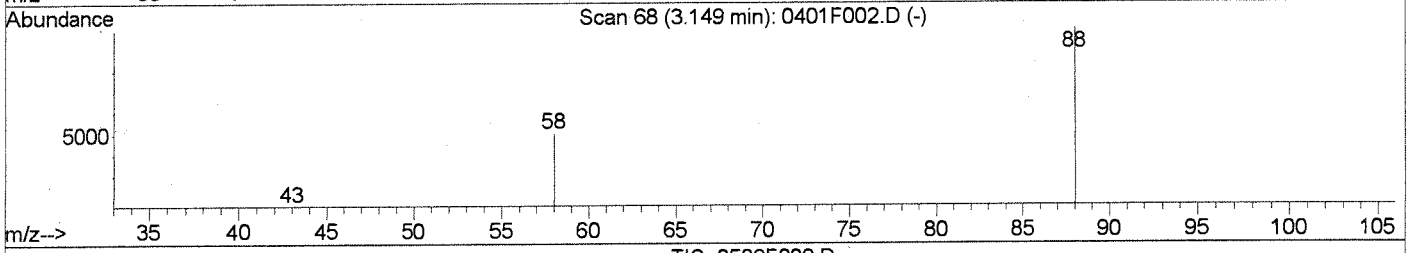
Quantitation Report (Qedit)

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

LB 5/10/11

CH 05·10·11

0509F009.D 050911_DX.M Mon May 09 14:22:52 2011

Quantitation Report (QT Reviewed)

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						Qvalue
3) 1,4-Dioxane	3.96	88	13117m	20.40	ng/ml	

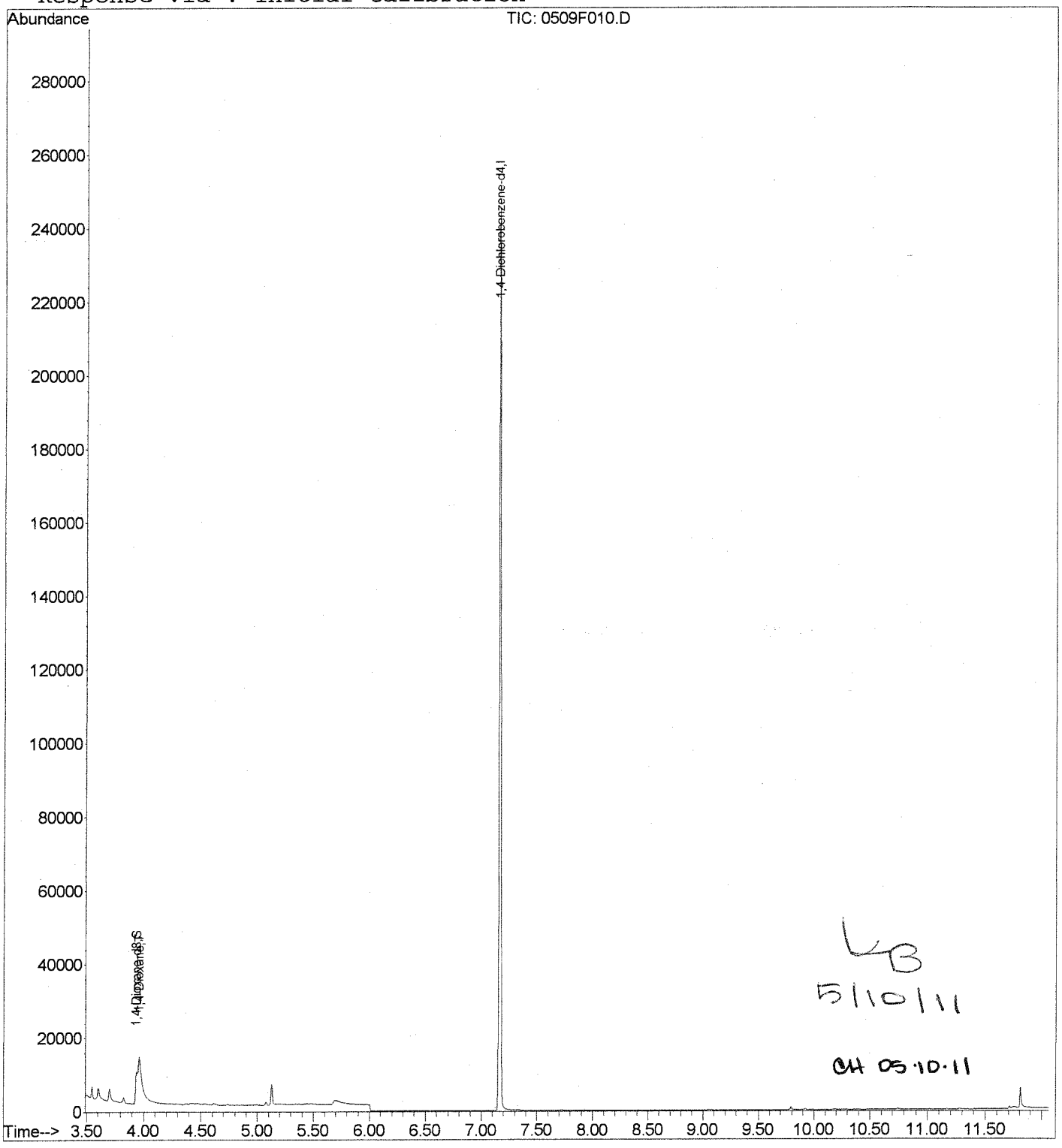
LB
5/10/11

CH 05·10·11

(#) = qualifier out of range (m) = manual integration
0509F010.D 050911_DX.M Mon May 09 14:57:15 2011 Page 1

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 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



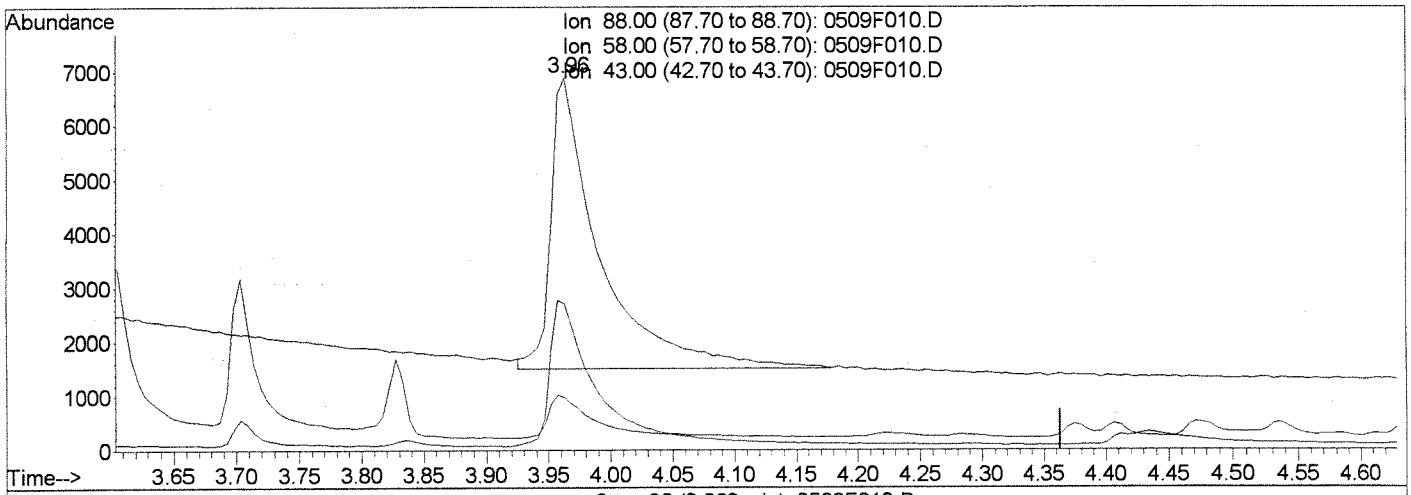
LB
5/10/11

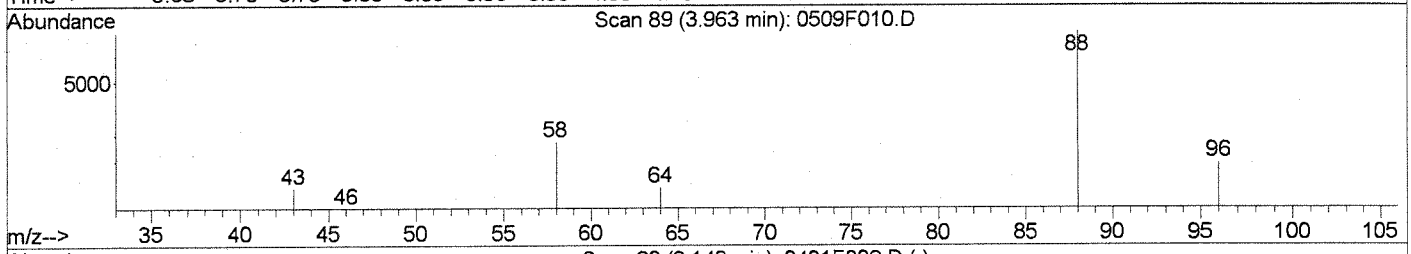
CH 05.10.11

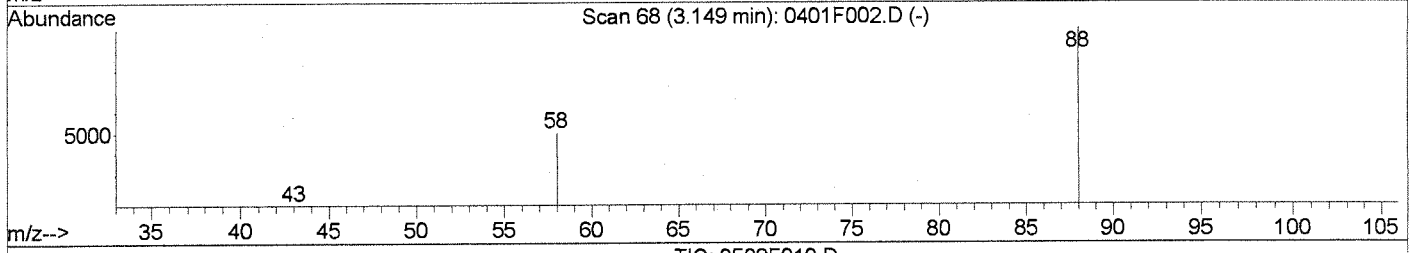
Quantitation Report (Qedit)

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 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: 0509F010.D

(3) 1,4-Dioxane (T)

3.96min 22.91ng/ml

response 14729

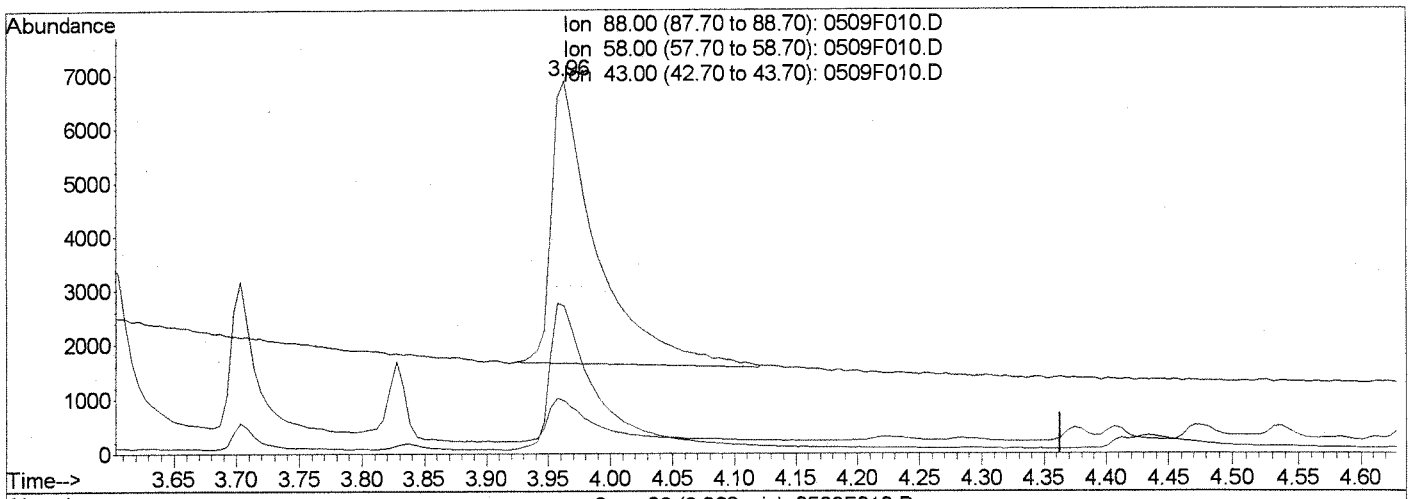
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	48.60
43.00	15.30	13.88
0.00	0.00	0.00

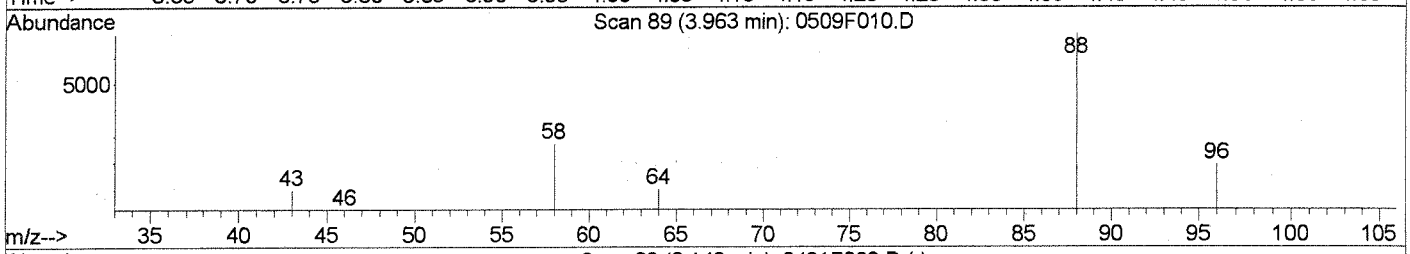
0509F010.D 050911_DX.M Mon May 09 14:23:01 2011

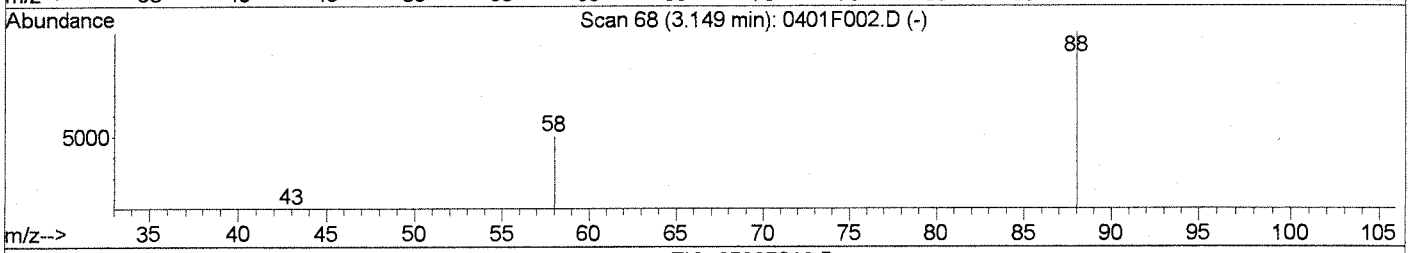
Quantitation Report (Qedit)

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 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: 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
CH 05.10.11

0509F010.D 050911_DX.M Mon May 09 14:23:07 2011

Quantitation Report (QT Reviewed)

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						Qvalue
3) 1,4-Dioxane	3.93	88	35042	55.80	ng/ml	93

LB
5/10/11

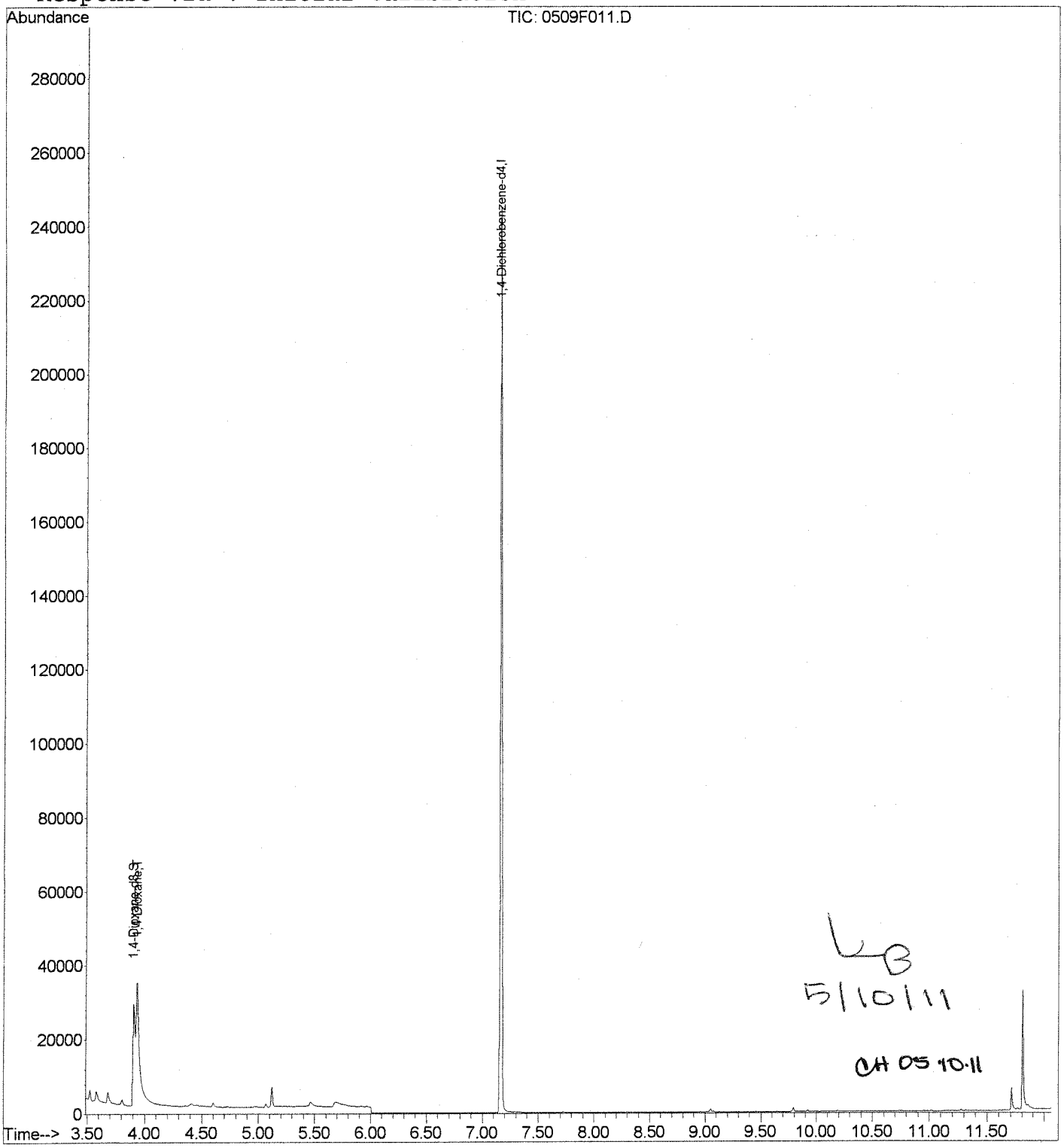
CH 05·10·11

(#) = qualifier out of range (m) = manual integration
0509F011.D 050911_DX.M Mon May 09 14:57:16 2011 Page 1

Quantitation Report (QT Reviewed)

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 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



LB
5/10/11
DH 05 10-11

Quantitation Report (QT Reviewed)

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						Qvalue
3) 1,4-Dioxane	3.94	88	72508m	113.21	ng/ml	

LB
5/10/11

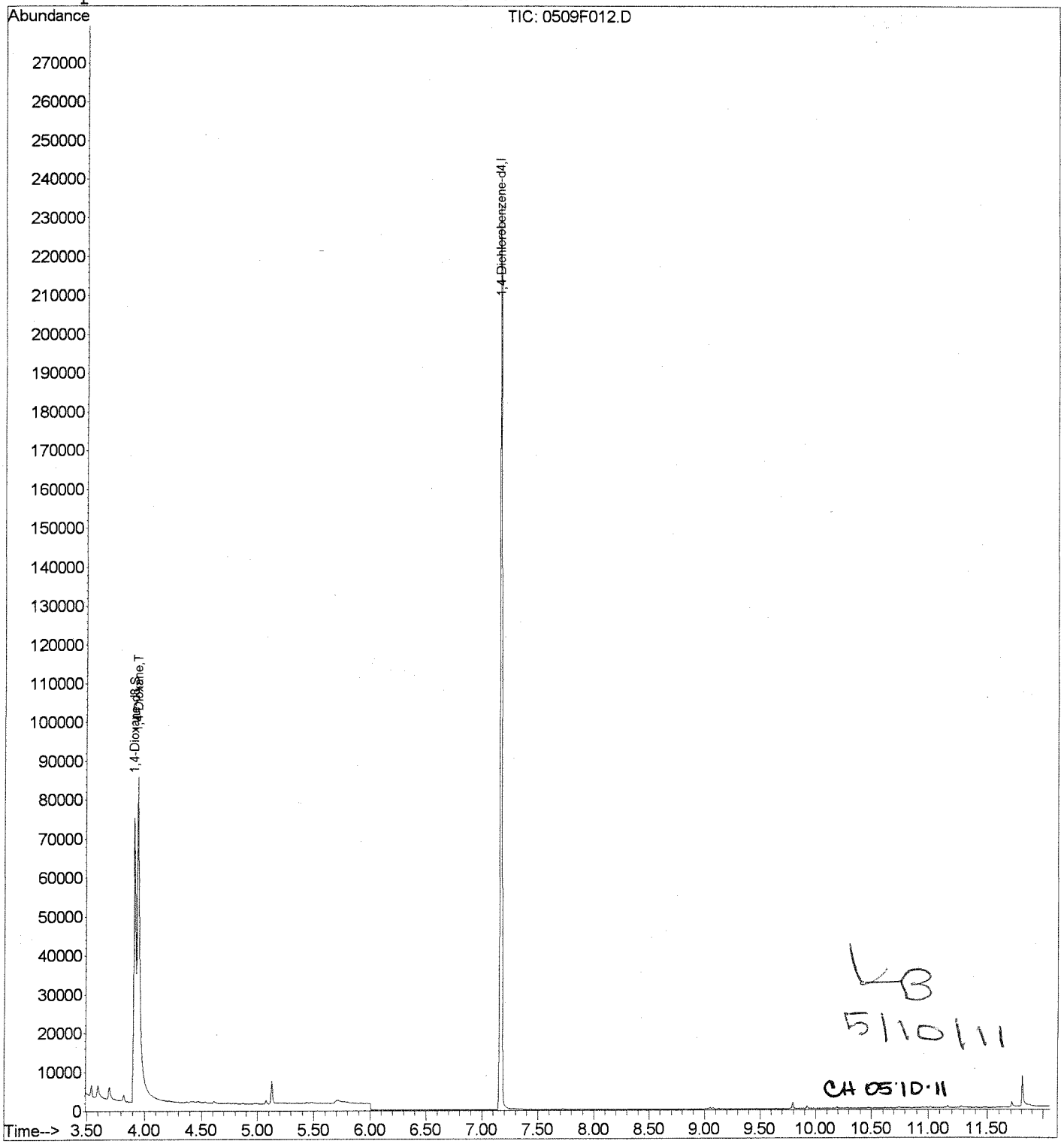
CH 05.10.11

(#) = qualifier out of range (m) = manual integration
0509F012.D 050911_DX.M Mon May 09 14:57:17 2011 Page 1

Quantitation Report (QT Reviewed)

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

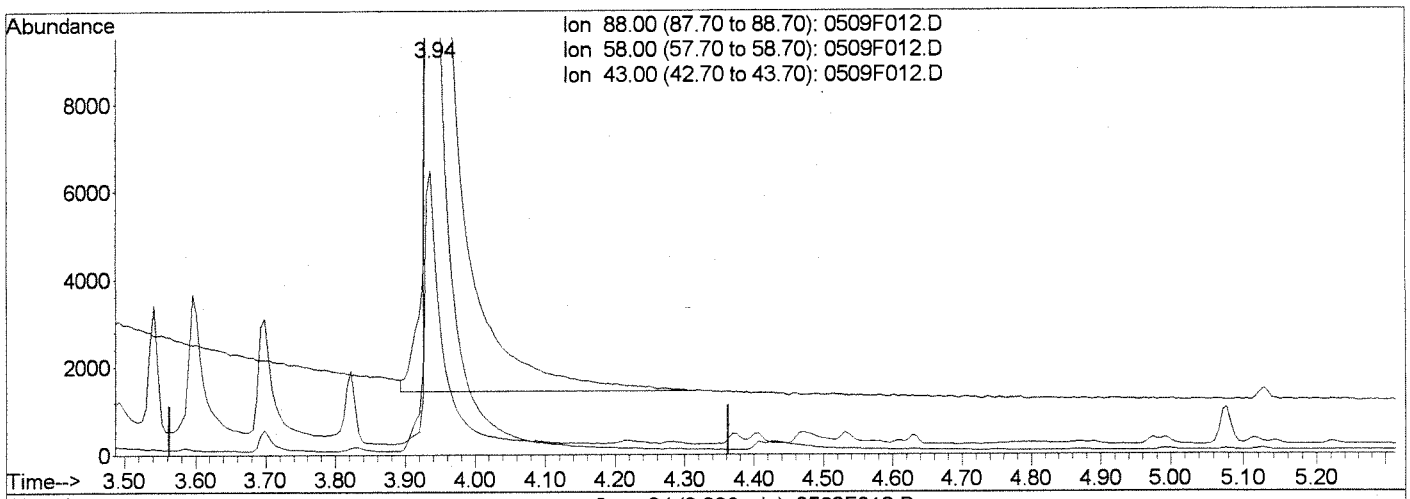


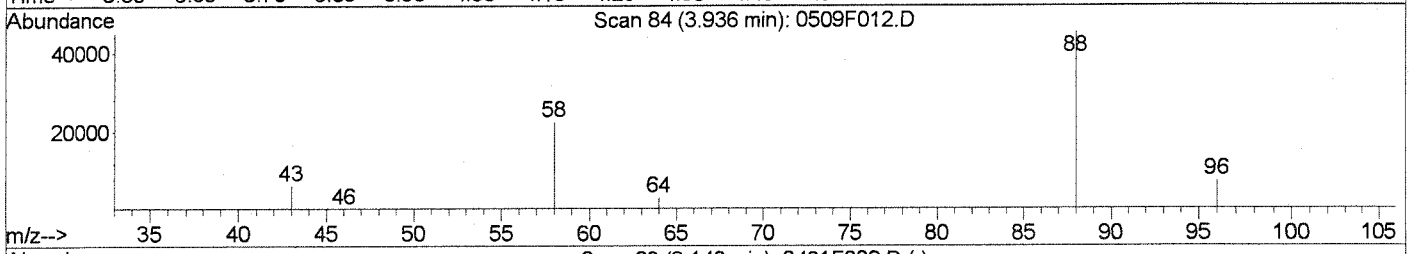
LB
5/10/11
CH 05·10·11

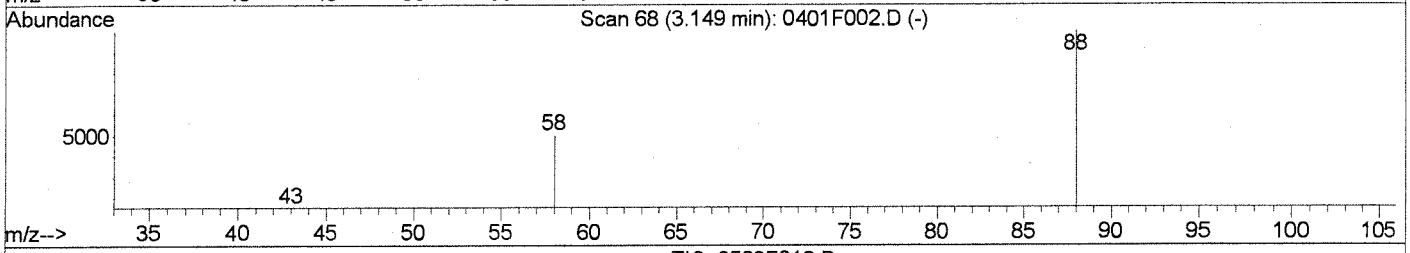
Quantitation Report (Qedit)

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 14:21 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: 0509F012.D

(3) 1,4-Dioxane (T)

3.94min 118.97ng/ml

response 76193

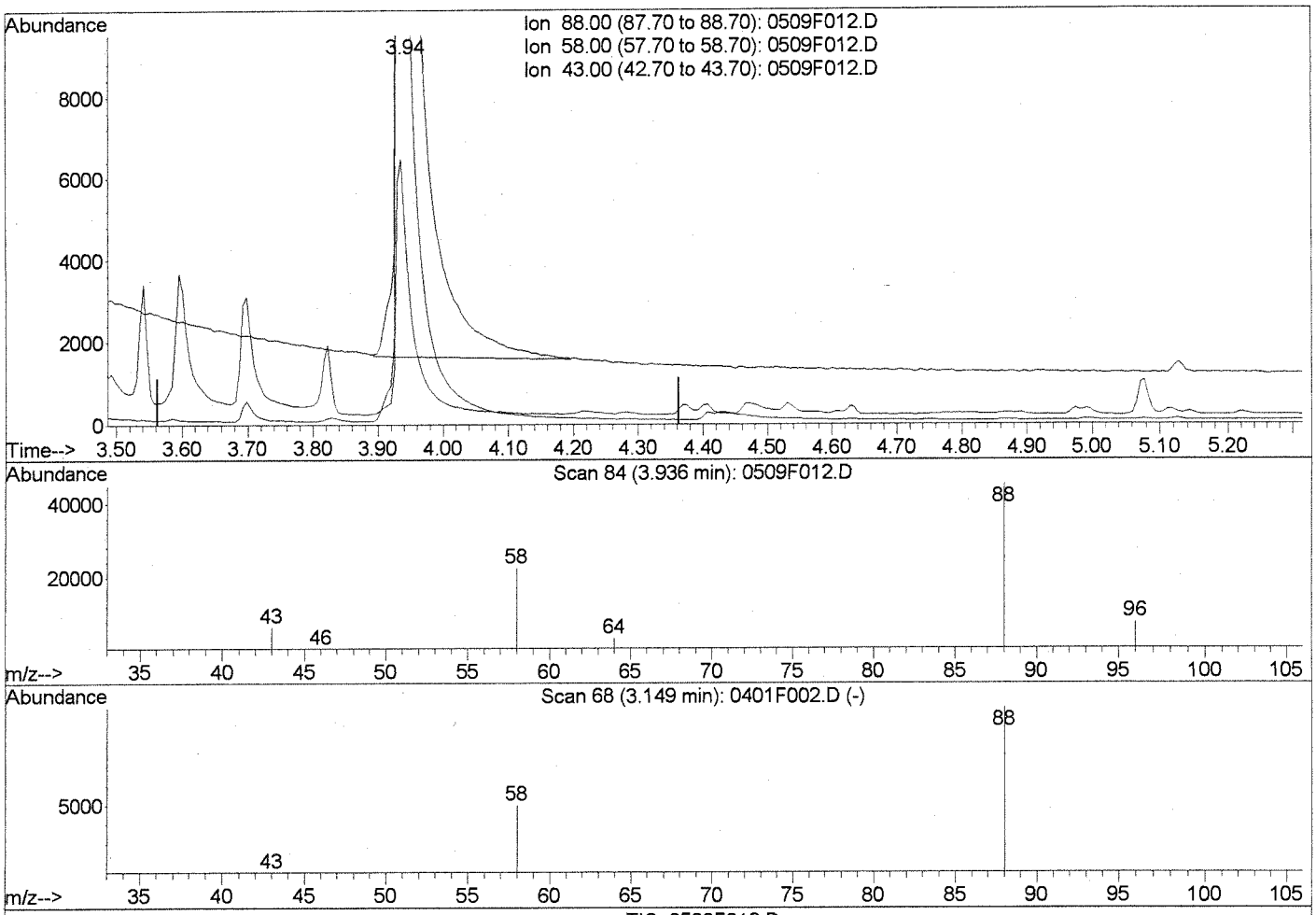
Ion	Exp%	Act%
88.00	100	100
58.00	44.20	51.28
43.00	15.30	14.29
0.00	0.00	0.00

0509F012.D 050911_DX.M Mon May 09 14:23:36 2011

Quantitation Report (Qedit)

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

CH 05·10·11

0509F012.D 050911_DX.M Mon May 09 14:23:41 2011

Quantitation Report (QT Reviewed)

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						Qvalue
3) 1,4-Dioxane	3.93	88	152893	235.98	ng/ml	89

LB
5/10/11

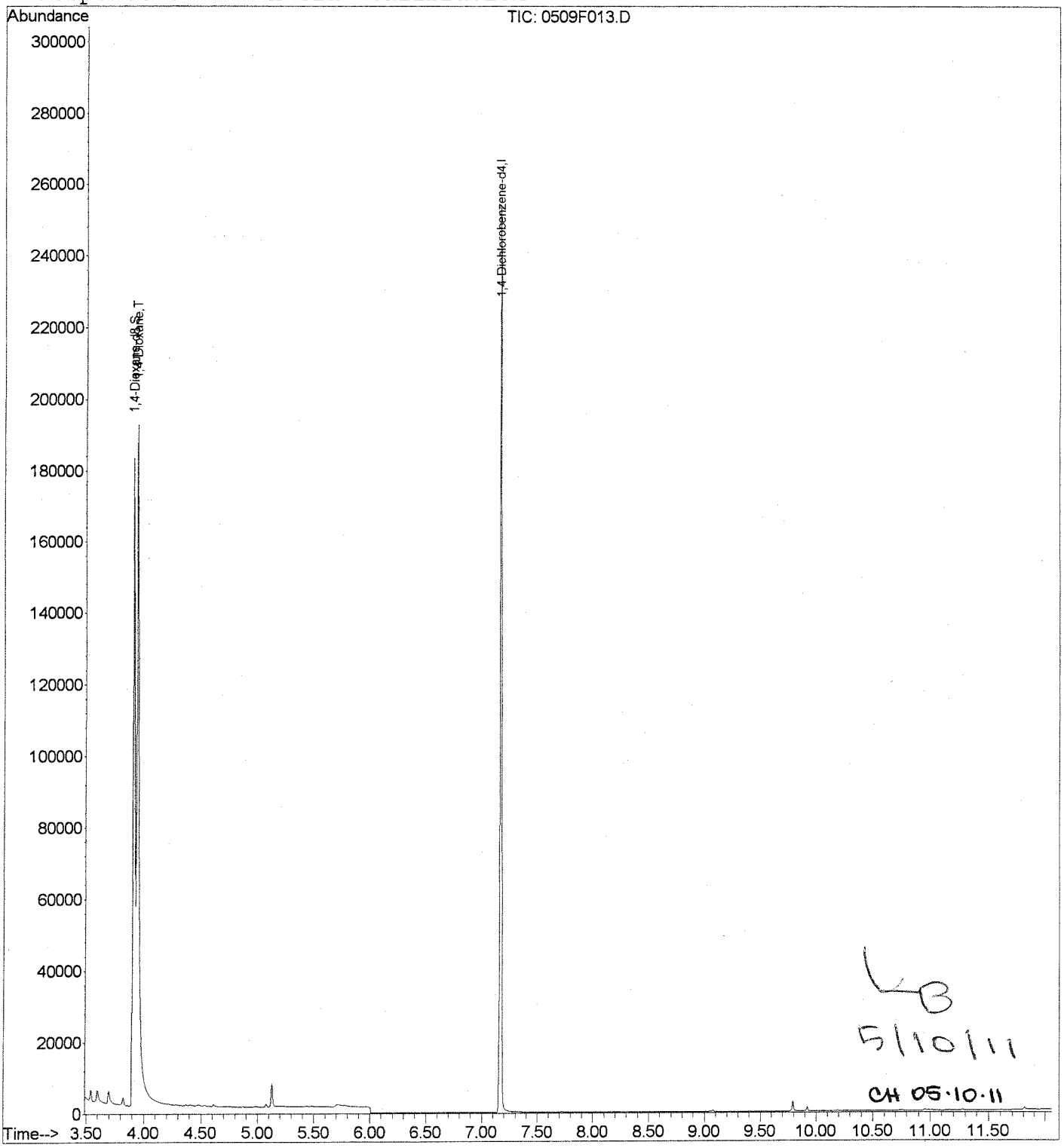
CH 05.10.11

(#) = qualifier out of range (m) = manual integration
0509F013.D 050911_DX.M Mon May 09 14:57:17 2011 Page 1

Quantitation Report (QT Reviewed)

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



LB 5/10/11

CH 05·10·11

Quantitation Report (QT Reviewed)

Data File : J:\MS26\DATA\050911\0509F014.D Vial: 10
Acq On : 9 May 2011 2:21 pm Operator: KBailey
Sample : 20ng/mL ICV 1,4-Dioxane | SVM34-57L Inst : MS26
Misc : 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						Qvalue
3) 1,4-Dioxane	3.94	88	14084	22.41	ng/ml	86

LB
5/10/11

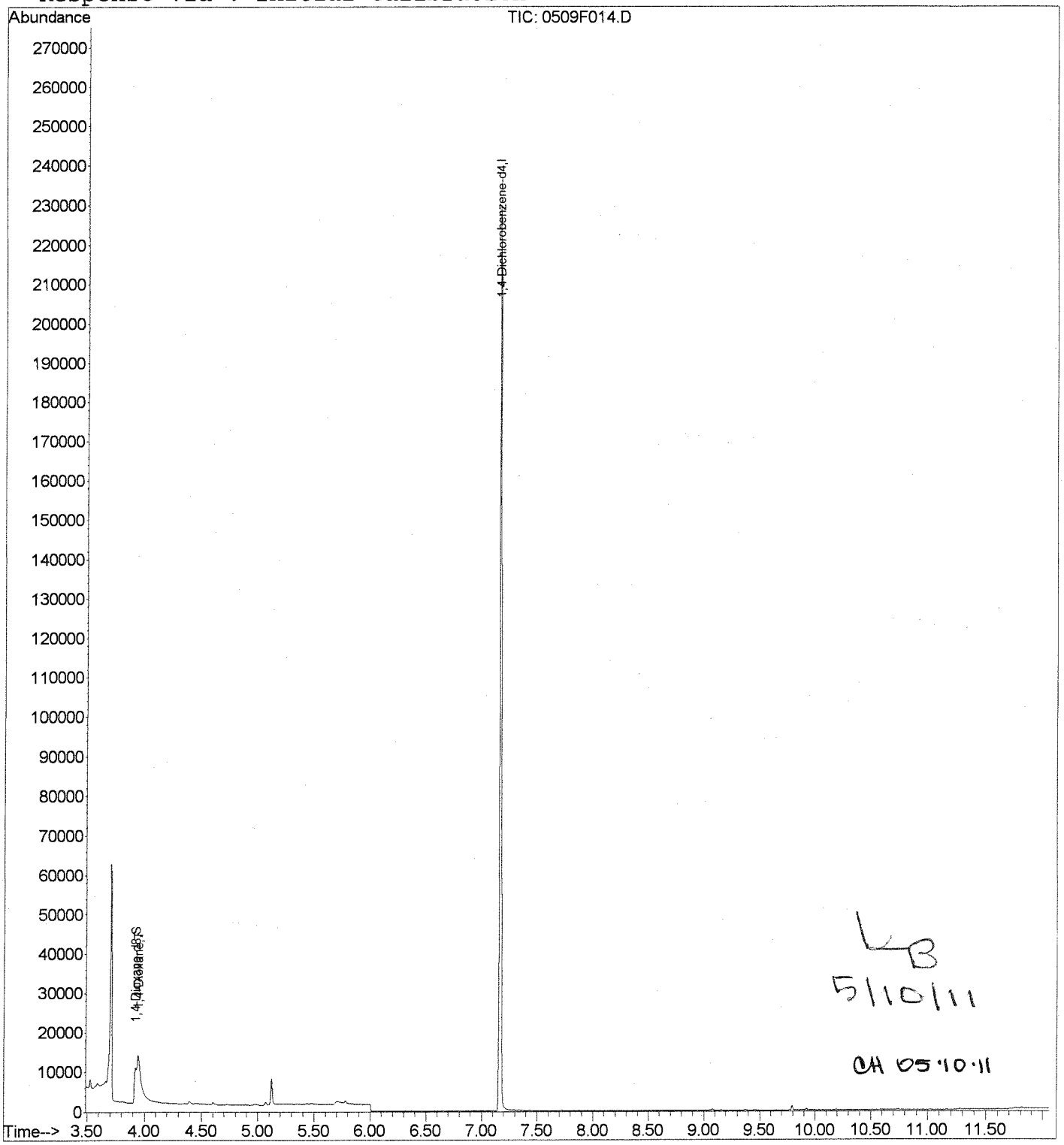
CH 05.10.11

(#) = qualifier out of range (m) = manual integration
0509F014.D 050911_DX.M Mon May 09 14:57:18 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS26\DATA\050911\0509F014.D Vial: 10
Acq On : 9 May 2011 2:21 pm Operator: KBailey
Sample : 20ng/mL ICV 1,4-Dioxane | SVM34-57L Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 9 14:38 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



LB
5/10/11

CH 05.10.11

Exception Report

Data File: J:\MS26\DATA\050911A\0509F010.D
Lab ID: KWG1104145-2
RunType: 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: 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

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

Parameter Name	Type	PARM Type	Curve Fit	Method Criteria	Min RF	ICAL RF	CCV RF	%Diff	Sol'n Conc.	True Value	% Drift
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

(#) = Out of Range SPCC's out = 0 CCC's out = 0
0509F010.D 050911_DX.M Mon May 09 17:06:23 2011 Page 1

Quantitation Report (QT Reviewed)

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

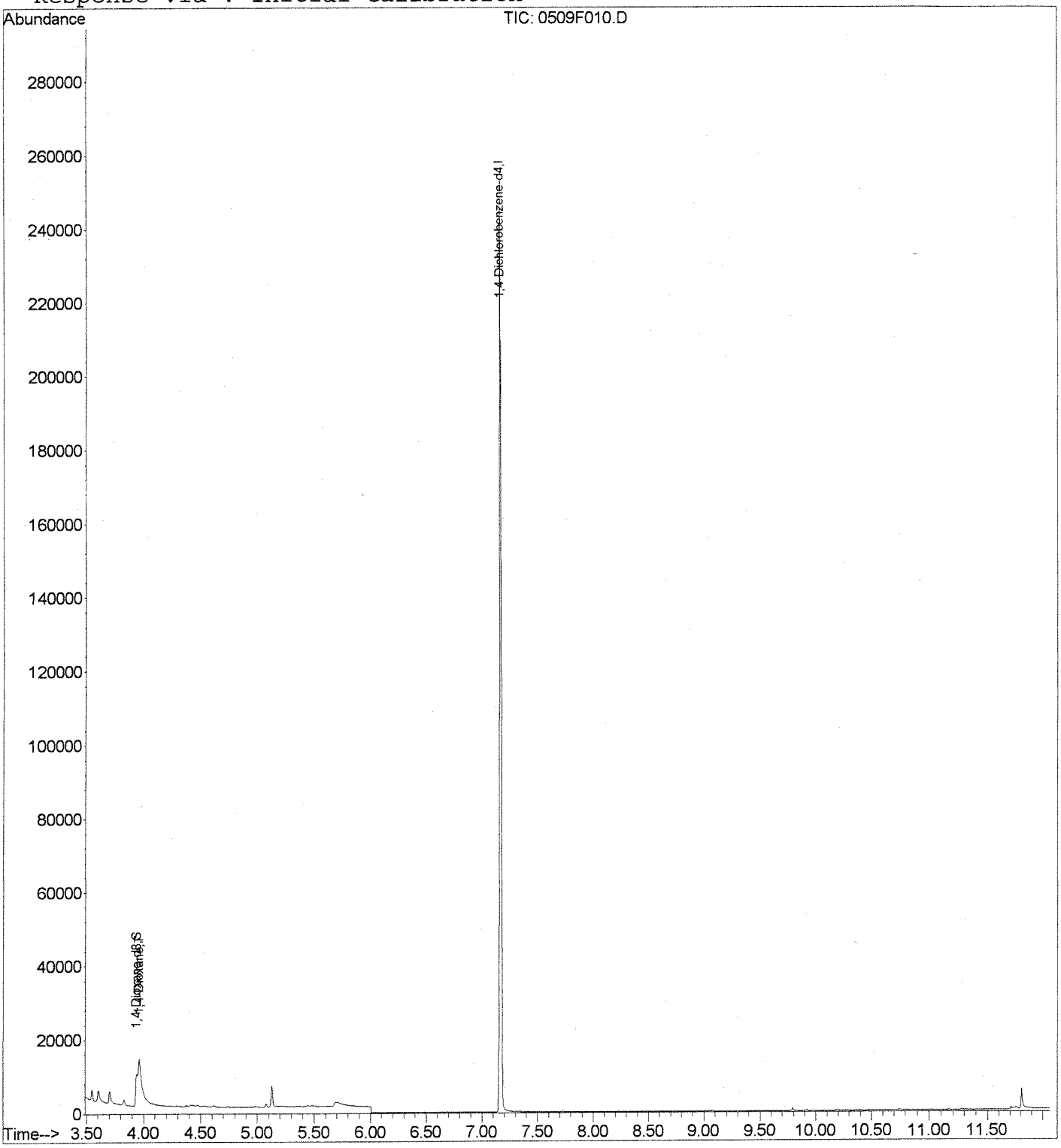
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	84266	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.94	96	13588	20.63	ng/ml	0.00
Spiked Amount 50.000			Recovery =	41.26%		
Target Compounds						Qvalue
3) 1,4-Dioxane	3.96	88	13696m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

(#) = qualifier out of range (m) = manual integration
0509F010.D 050911_DX.M Mon May 09 17:06:25 2011 Page 1

Quantitation Report (QT Reviewed)

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

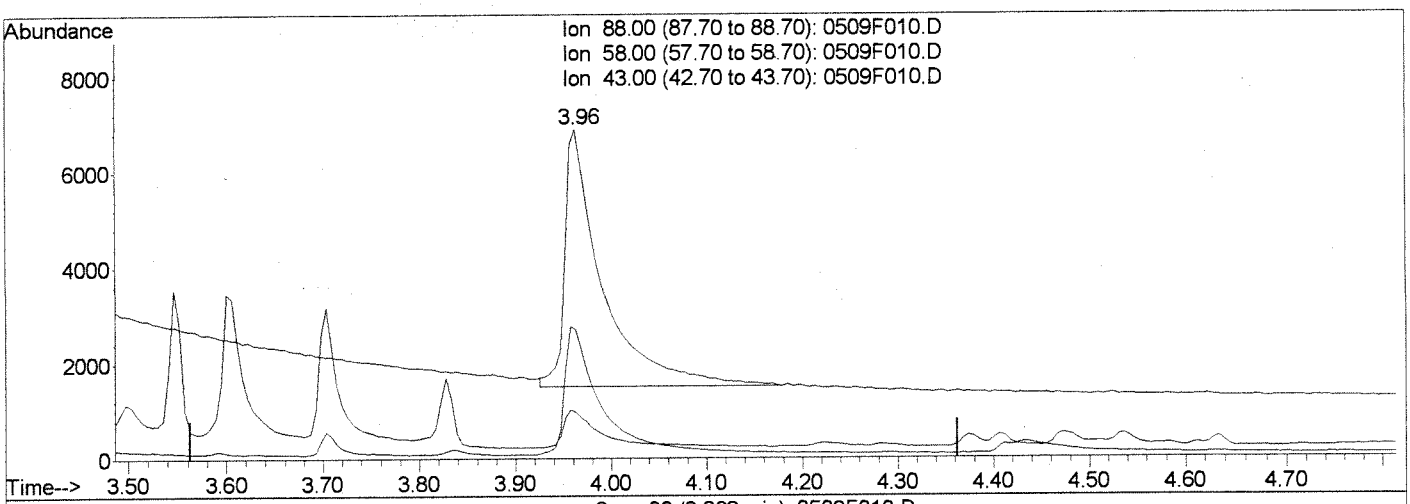


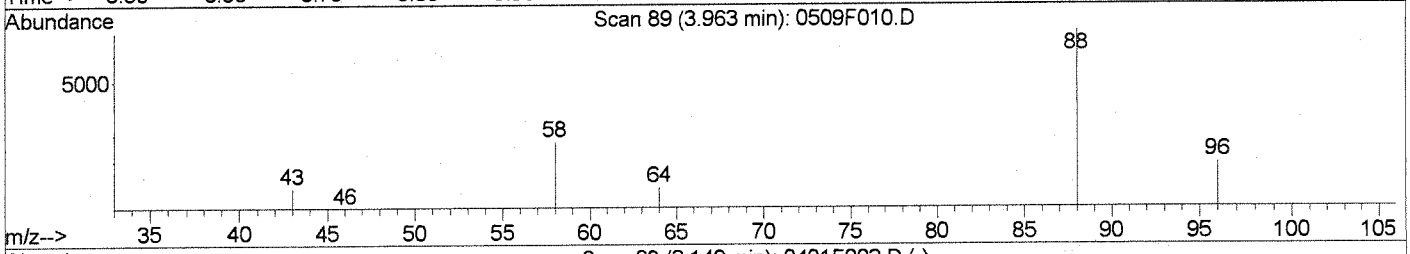
Quantitation Report (Qedit)

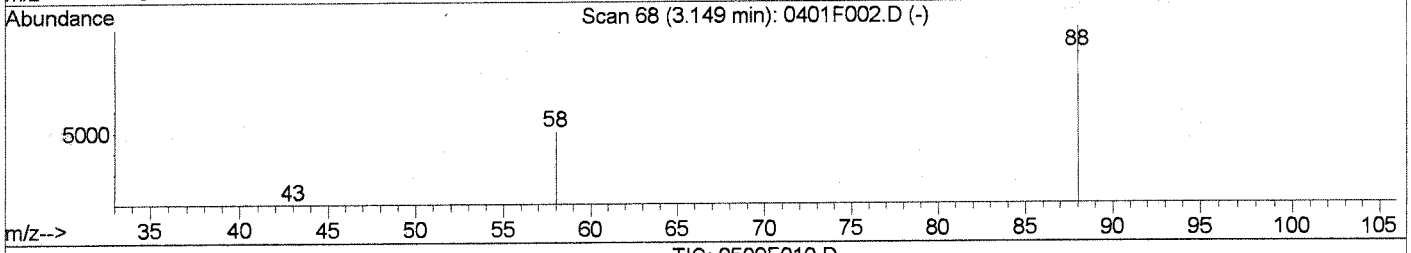
Data File : J:\MS26\DATA\050911A\0509F010.D
Acq On : 9 May 2011 1:02 pm
Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 17:05 2011

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

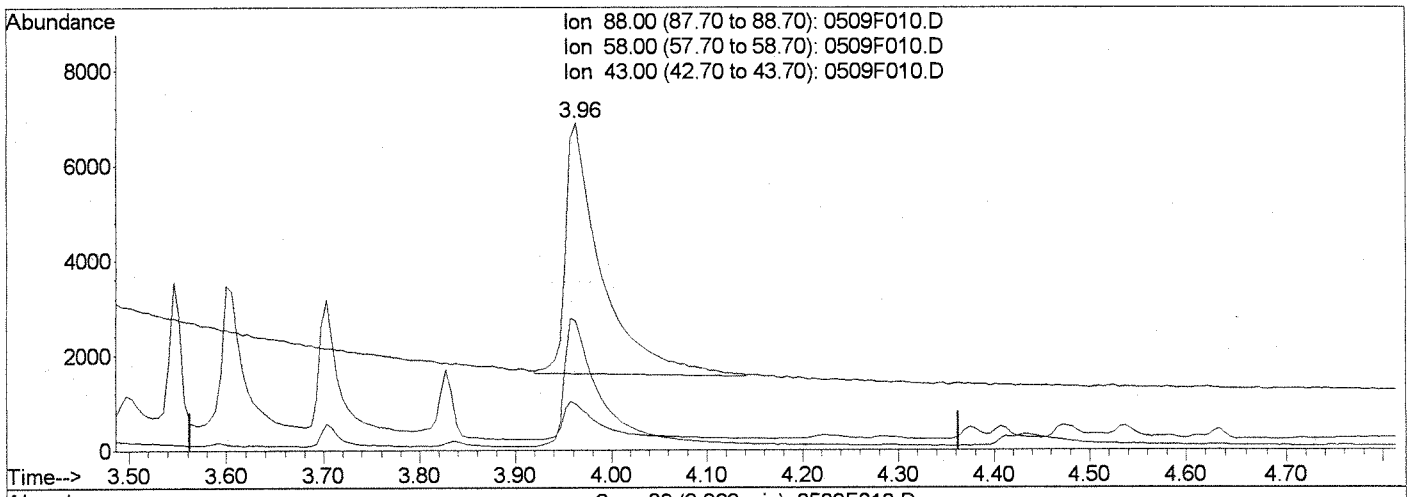
response 14729

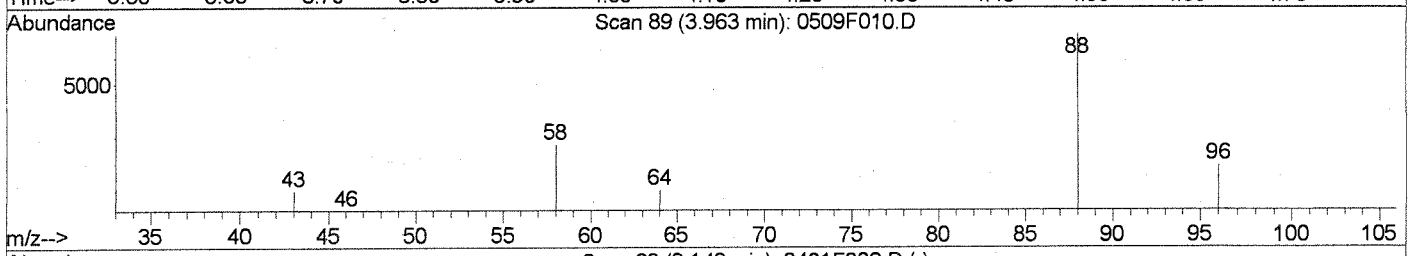
Ion	Exp%	Act%
88.00	100	100
58.00	39.30	48.60
43.00	14.10	13.88
0.00	0.00	0.00

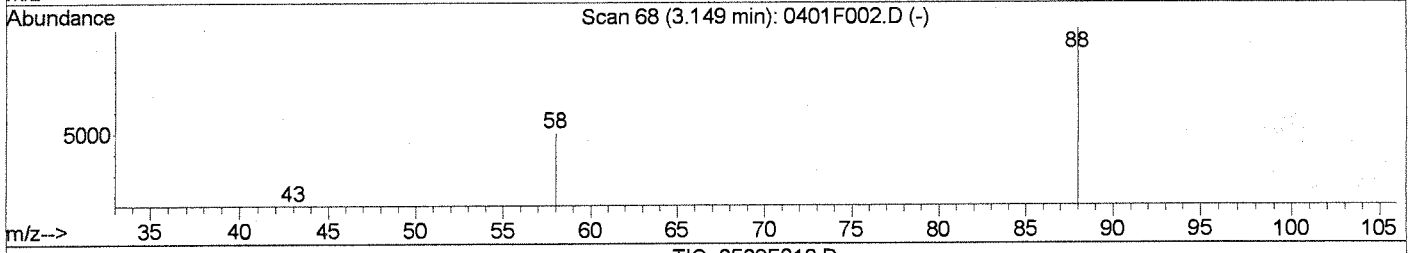
Quantitation Report (Qedit)

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

0509F010.D 050911_DX.M Mon May 09 17:06:03 2011

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

Service Request: P1101579
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
RunType: 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: LG 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

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

Quantitation Report (QT Reviewed)

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

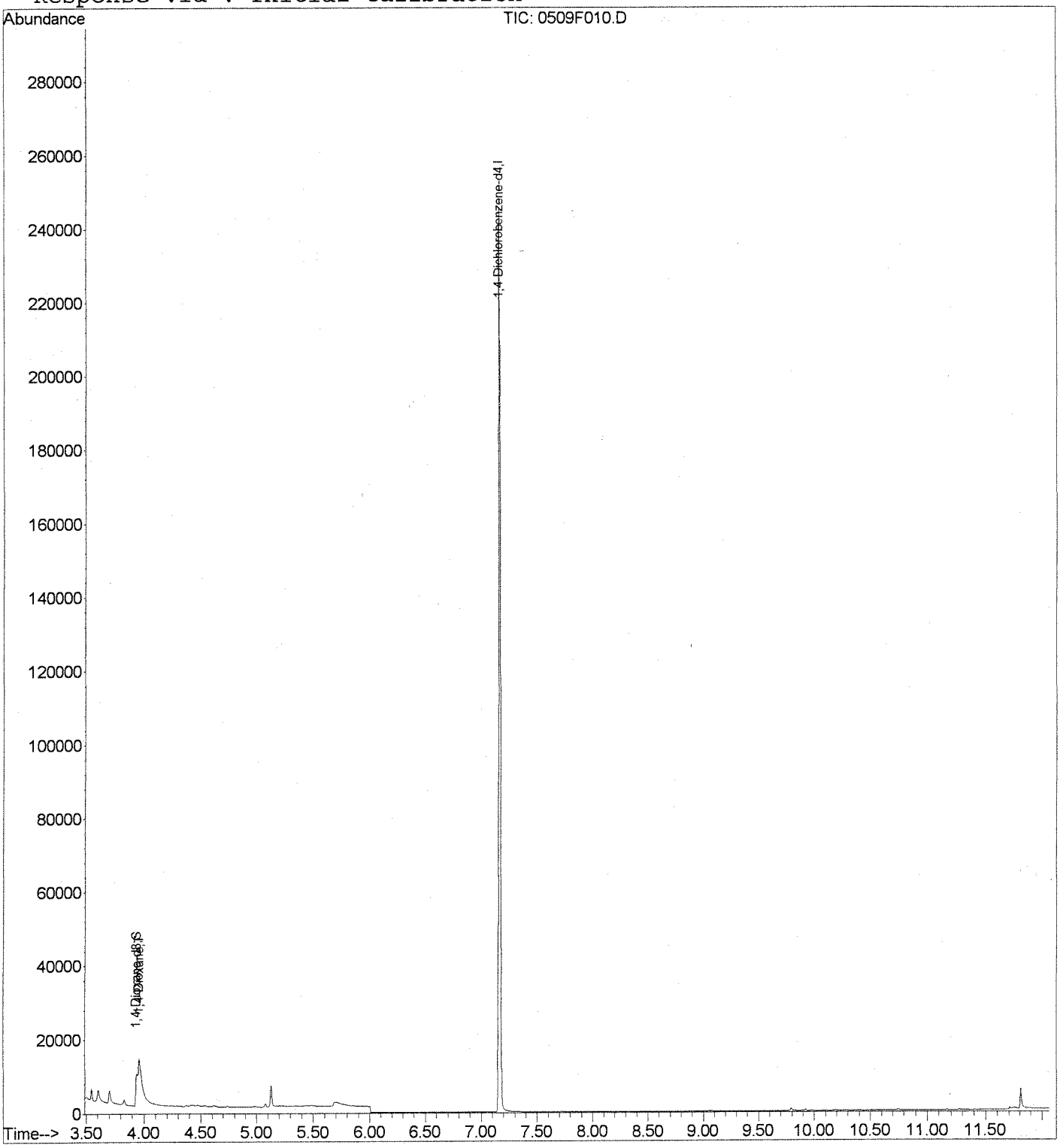
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	84266	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.94	96	13588	20.63	ng/ml	0.00
Spiked Amount 50.000			Recovery = 41.26%			
Target Compounds						Qvalue
3) 1,4-Dioxane	3.96	88	13696m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

(#) = qualifier out of range (m) = manual integration
0509F010.D 050911_DX.M Mon May 09 17:06:25 2011 Page 1

Quantitation Report (QT Reviewed)

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

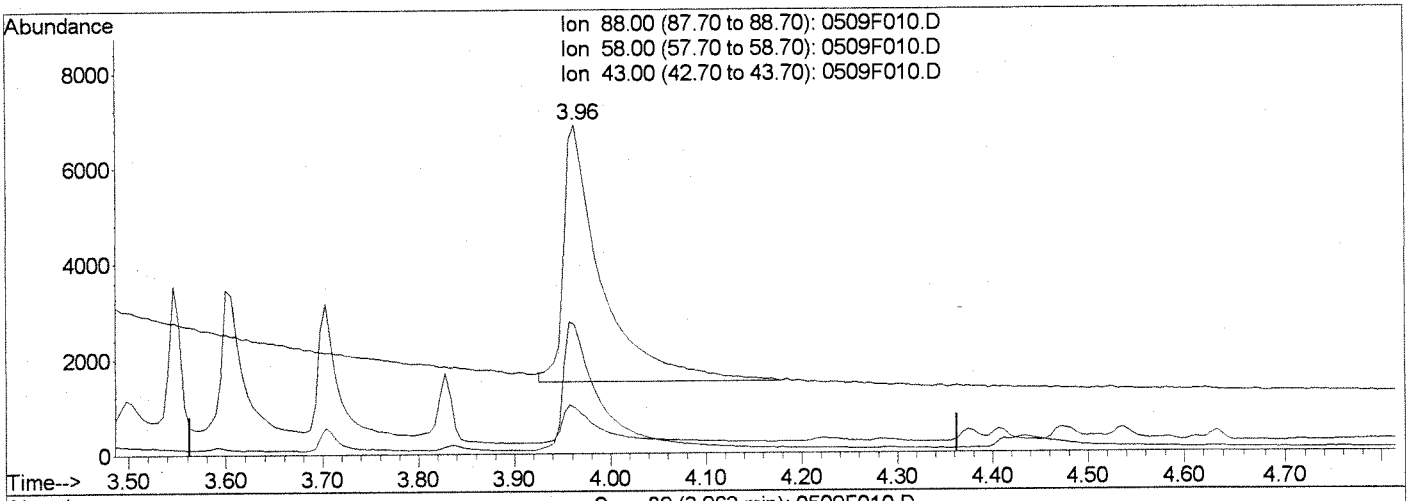


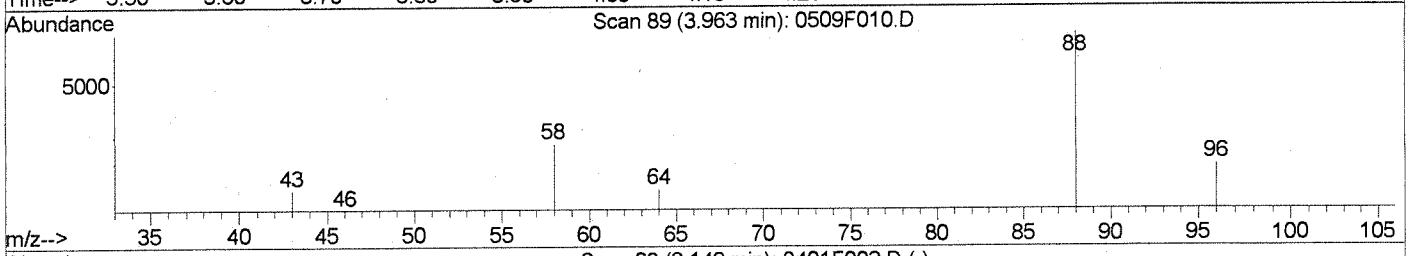
Data File : J:\MS26\DATA\050911A\0509F010.D
Acq On : 9 May 2011 1:02 pm
Sample : 20ng/mL ICAL 1,4-Dioxane | SVM34-56E
Misc :
MS Integration Params: RTEINT.P
Quant Time: May 9 17:05 2011

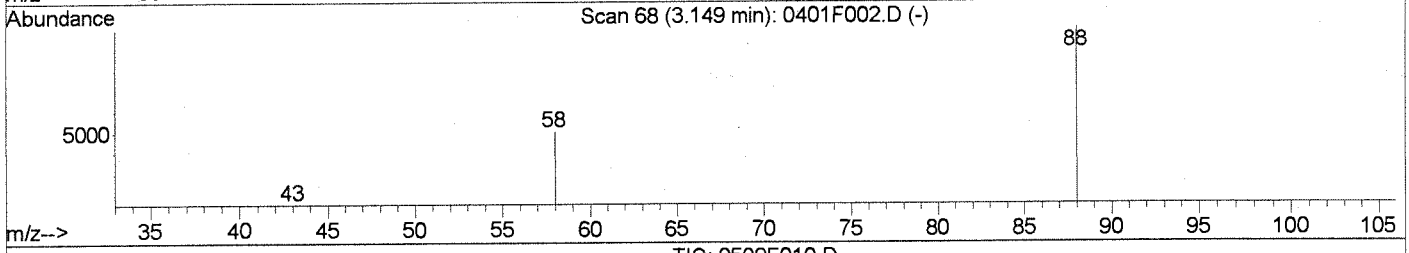
Vial: 6
Operator: KBailey
Inst : MS26
Multiplr: 1.00

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

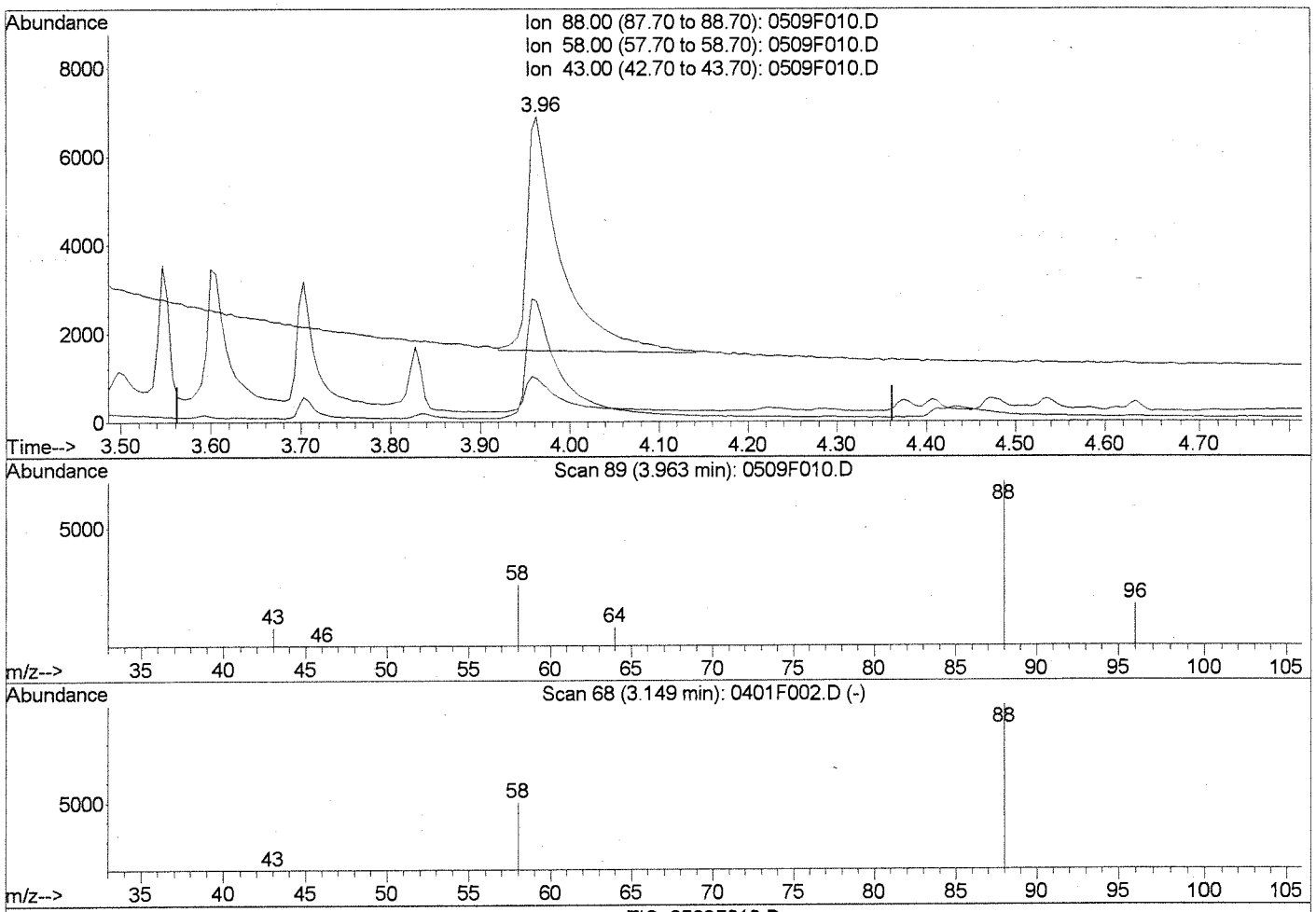
response 14729

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 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: 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

0509F010.D 050911_DX.M Mon May 09 17:06:03 2011

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: SVM34-5LA.

Started By: SJones Assisted By: —

Completed By: KKerriga Assisted By: —

Training: Yes / No

Yes / No

Reviewed By: JBaily Date: 5/9/11 Storage: SVM LAB / MS2L

Chain of Custody

Relinquished By: [signature] Date: 5/6/11

Received By: LB Date: 5/9/11

Extracts Examined: Yes / 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: 5-4-11

Started By: SJones Assisted By:

Completed By: Assisted By:

Additional Prep Information For 1,4 Dioxane by EPA 3510

Service Request P1101579, P1101605 & P1101607 Workgroup KWG1103961

Pre-Prep Information:

DCM Lot DD020

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

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

Sulfate Lot # BF1002 Salt Lot # G38343

Extract Storage: Pockleberry

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

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	NF	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
CAL 10487
LB 5/10/11

DH 05.10.11

LABORATORY REPORT

May 11, 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 27, 2011. For your reference, these analyses have been assigned our service request number P1101581.

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 12:13:17 -07'00'

Sue Anderson
Project Manager

Client: Battelle CAS Project No: P1101581
Project: JPL-GW-2Q11 / G005862 / JPL GWM

CASE NARRATIVE

The samples were received intact under chain of custody on April 27, 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
Service Request: P1101581
Project ID: JPL-GW-2Q11 / G005862 / JPL GWM

Date Received: 4/27/2011
Time Received: 15:50

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	7196A - Cr6
MW-6	P1101581-001	Water	4/27/2011	09:26	X
DUPE-7-2Q11	P1101581-002	Water	4/27/2011	09:30	X
MW-8	P1101581-003	Water	4/27/2011	11:51	X
DUPE-8-2Q11	P1101581-004	Water	4/27/2011	11:55	X
MW-15	P1101581-005	Water	4/27/2011	14:17	X

Acronyms

CA LUFT	California DHS LUFT Methoc
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 *tert* -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	*Standard Methods for the Examination of Water and Wastewater* , 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* , 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

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

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.: P1101551

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
Battelle 505 King Ave Columbus OH 43201	JPL-GW-2Q11
	Project Number: G005862/JPL GWM
Project Manager: David Conner	P.O. # / Billing Information: 214375/Battelle 505 King Ave Columbus OH 43201
Phone: 614 726-7311 / Fax: 614 458-6641	
Email Address for Result Reporting: connerd@battelle.org	Sampler (Print & Sign): David Loera / David Loera

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics 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)	0 Hexavalent Cr (7196)	Remarks
MW-6	1	4/27/11	0926	AQ	1P							X	
DUPE-7-2Q11	2	4/27/11	0930	AQ	1P							X	
MW-8	3	4/27/11	1151	AQ	1P							X	
DUPE-8-2Q11	4	4/27/11	1155	AQ	1P							X	
MW-15	5	4/27/11	1417	AQ	1P							X	

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge X
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
David Loera	4-27-11	1450	[illegible]	4/27/11	1508
[illegible]	4/27/11	1550	[illegible]	4/27/11	1550
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 2°C °C

Client: Battelle **Service Request:** P1101581
Project: JPL-GW-2Q11/G005862 / JPL GWM

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101581-001.01					
	7196A				
		4/27/11	1610	SMO / MZAMORA	
		4/27/11	1611	P-37 / MZAMORA	
		4/27/11	1616	In Lab / SANDERSON	
		4/27/11	1713	P-37 / SANDERSON	
P1101581-002.01					
	7196A				
		4/27/11	1610	SMO / MZAMORA	
		4/27/11	1611	P-37 / MZAMORA	
		4/27/11	1616	In Lab / SANDERSON	
		4/27/11	1713	P-37 / SANDERSON	
P1101581-003.01					
	7196A				
		4/27/11	1610	SMO / MZAMORA	
		4/27/11	1611	P-37 / MZAMORA	
		4/27/11	1616	In Lab / SANDERSON	
		4/27/11	1713	P-37 / SANDERSON	
P1101581-004.01					
	7196A				
		4/27/11	1610	SMO / MZAMORA	
		4/27/11	1611	P-37 / MZAMORA	
		4/27/11	1616	In Lab / SANDERSON	
		4/27/11	1713	P-37 / SANDERSON	
P1101581-005.01					
	7196A				
		4/27/11	1610	SMO / MZAMORA	
		4/27/11	1611	P-37 / MZAMORA	
		4/27/11	1616	In Lab / SANDERSON	
		4/27/11	1713	P-37 / SANDERSON	

Columbia Analytical Services | 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

Sample Acceptance Check Form

Client: Battelle Work order: P1101581

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

Sample(s) received on: 4/27/11 Date opened: 4/27/11 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?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 2 °C			
9	Was a **trip blank** received?	☐	☒	☐
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101581-001.01	125mL Plastic NP					
P1101581-002.01	125mL Plastic NP					
P1101581-003.01	125mL Plastic NP					
P1101581-004.01	125mL Plastic NP					
P1101581-005.01	125mL Plastic NP					

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

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Analytical Report

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

Service Request : P1101581
Date Collected : 04/27/11
Date Received : 04/27/11

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-6	P1101581-001	0.010	0.003	1	NA	04/27/11 16:45	ND	
DUPE-7-2Q11	P1101581-002	0.010	0.003	1	NA	04/27/11 16:45	ND	
MW-8	P1101581-003	0.010	0.003	1	NA	04/27/11 16:45	ND	
DUPE-8-2Q11	P1101581-004	0.010	0.003	1	NA	04/27/11 16:45	ND	
MW-15	P1101581-005	0.010	0.003	1	NA	04/27/11 16:45	ND	
Method Blank	P1101581-MB	0.010	0.003	1	NA	04/27/11 16:45	ND	

Approved By Karen Rya Date : 4/28/11

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Service Request: P1101581
Date Analyzed: 04/27/11

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: 4/28/11

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Service Request: P1101581
Date Analyzed: 04/27/11

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	0.0502	100	90-110
CCV1	0.0500	0.0511	102	90-110
CCV2	0.0500	0.0511	102	90-110

Approved By: Karen Rya Date: 4/28/11

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1101581
Project Name :	JPL-GW-2Q11	**Date Collected :**	NA
Project Number :	G005862 / JPL GWM	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	04/27/11

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1101581-LCS	Basis :	NA

Test Notes :

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0404	101	90-110	

Approved By Karen Ryan Date : 4/28/11

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P1101581
Project Name :	JPL-GW-2Q11	**Date Collected :**	04/27/11
Project Number :	G005862 / JPL GWM	**Date Received :**	04/27/11
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	04/27/11

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-6		Units :	mg/L (ppm)
Lab Code :	P1101581-001MS	P1101581-001DMS	Basis :	NA
Test Notes :				

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0458	0.0458	92	92	73-119	<1	

Approved By Karen Ryan Date : 4/28/11

Report By:SAnderson

Columbia Analytical Services

pH Run Log

Service Request #(s): P1101579, P1101581

Time: 0807

Sample	VWR lot #	Exp.
pH 2 Buffer	524-11041002	1/2012
pH 4 Buffer	524-11041003	8/31/12
pH 7 Buffer	524-11041004	9/30/12
pH 10 Buffer	524-0302/001	9/30/11

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	Sample	#	pH	Temp. °C
pH 2.000	5	2.002	23.0°	1581-2.01	5	2.052	10.0°
pH 4.000		4.002	23.0°	-3.01		2.088	10.1°
pH 7.000		7.009	23.0°	pH 2.000		1.990	21.8°
pH 10.000		9.997	23.3°	1581-4.01		1.976	9.9°
Ref#: 7.0-646 Exp. 1/2012 G19-1123090301		6.361	98% 23.4°	-5.01		2.057	11.0°
DI		2.041	21.0°	pH 2.000		2.015	21.3°
pH 2.000		1.979	22.7°				
TIME: 1608							
pH 2.000	5	1.983	21.9°				
1579-1.01		1.921	9.5°				
-2.01		1.845	9.2°	space not used			
-3.01		1.984	8.6°				
-4.01		2.058	9.6°				
-5.01		2.067	11.5°				
-6.01		2.112	8.9°				
-7.01		2.014	10.0°				
1581-1.01		2.032	10.6°				

pH Adjustments: ☒ **7196A**: Diluted/Conc H_2SO_4 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: 4/25/11

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

Analyst: [signature] Date: 4/27/11

Reviewer: KR Date: 4/28/11

pH.XLS

Hexavalent Chromium (Liquids)

Columbia Analytical Services™

Method EPA 7196A

page 1 of 2

Service Request#(s): 1101579, 1581 Run#: 243958

Stock#: 524-022S/103 T.V=10ppm EXP: 2/25/12 Prep Run#:

ICV/CCV#: 524-1015/001 T.V=100ppm EXP: 3/20/12 Conc. H_2SO_4 Lot#: EMD 49284 EXP 11/20/14

Coloring Reagent Ref#: 524-0415/102 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	0.9999445
Absorbance @ 540 nm	0.000	0.010	0.056	0.112	

	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	0.000473	<0.003
2	ICV 0.05PPM		—	✓	0.000	0.056	0.056	0.0502	100%
3	MB		—	✓	0.000	0.000	0.000	0.000473	<0.003
4	LCS 0.040PPM		—	✓	0.000	0.045	0.045	0.0404	101%
5	1579-1.01		—	✓	0.001	0.003	0.002	0.00225	<0.003
6	1.01 MS 0.05PPM		—	✓	0.001	0.054	0.053	0.0476	95% 0%
7	1.01 MSD 0.05PPM		—	✓	0.001	0.053	0.052	0.0467	93% 2% RPD
8	-2.01		—	✓	0.005	0.005	0.000	0.000473	<0.003
9	-2.01 LS 0.03PPM		—	✓	0.005	0.037	0.032	0.0289	96%
10	-3.01		—	✓	0.002	0.004	0.002	0.00225	<0.003
11	-4.01		—	✓	0.001	0.003	0.002	0.00225	↓
12	-5.01		—	✓	0.004	0.004	0.000	0.000473	↓
13	CCV1 0.05PPM		—	✓	0.000	0.057	0.057	0.0511	102%
14	CCB1		—	✓	0.000	0.000	0.000	0.000473	<0.003
15	1579-6.01		—	✓	0.002	0.004	0.002	0.00225	↓
16	-7.01		—	✓	0.000	0.000	0.000	0.000473	↓
17	1581-1.01	↓	—	✓	0.000	0.002	0.002	0.00225	↓

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

ICV/CCV spiked with 0.25 ml of 524-1015/001@1to ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of 524-022S/003 ↑ 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 ↓ @1to ↑ 10 ml of sample (T.V.= 0.03 ppm)

Comments:

Prepared By: Date/Time: 4/27/11 @1630

Analyzed By: Date/Time: 4/27/11 @1645

Reviewed By: KR Date: 4/28/11

Cr6LIQ.xls

Hexavalent Chromium (Liquids)

Columbia Analytical Services

Method EPA 7196A

72

page 2 of 2

Service Request#(s): P110179, 1581 Run#: 243958

Stock#: S24-0228/103 T.V=100ppm EXP: 2/28/12 Prep Run#:

ICV/CCV#: S24-1015/001 T.V=100ppm EXP: 3/26/12 Conc. H_2SO_4 Lot#: BMD49284 EXP: 11/20/14

Coloring Reagent Ref#: S24-0415/102 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					

	Sample #	Sample Vol.(mL)	Dilution	pH ✓	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD
1	1581-1.01 MS 0.05ppm	10ml	—	✓	0.000	0.057	0.057	0.0458	92%
2	-1.01 MSD	"	—	✓	0.000	0.051	0.051	0.0458	92% 0 RPD
3	-2.01		—	✓	0.000	0.002	0.002 (82.4%)	0.00225	<0.003
4	-2.01 MS 0.03ppm		—	✓	0.000	0.030	0.030	0.0271	90%
5	-3.01		—	✓	0.000	0.000	0.000	0.000473	<0.003
6	-4.01		—	✓	0.001	0.003	0.002	0.00225	"
7	-5.01		—	✓	0.000	0.000	0.000	0.000473	"
8	CCV2 0.050ppm		—	✓	0.000	0.057	0.057	0.0511	102%
9	CCB2	↓	—	✓	0.000	0.000	0.000	0.000473	<0.003
10									
11									
12									
13									
14									
15									
16									
17									

Space not used

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

ICV/CCV spiked with 0.25 ml of S24-1015/001 @1ppm ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of S24-0228/103 ↑ 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: Date/Time: 4/27/11 @1630

Analyzed By: Date/Time: 4/27/11 @1645

Reviewed By: PR Date: 4/28/11

Cr6LIQ.xls

HOU

11/23/09 SIG-1123090Z 1000 ppm SO3 (ICV/CCV)
Sr 0.1607g Na2SO3 (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/ DI
EXP: 5/23/10

11/23/09 SIG-1123090 3 A,B,C,D pH REFERENCE
Sr PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 SIG-1124090 1 1000 ppm SO4 Standard
Sr PURCHASED CAT # ICC-006
LOT # K007794
EXP: 9/30/13

Sr 11/25/09
11/25/09 SIG-~~H25~~ 1125090 1 0.1N H2SO4
Sr 5~~6~~ml conc H2SO4 (EMD 4705D EXP: 9/13/10)
EXP: ~~H25~~ 9/13/10
Sr 11/25/09

11/30/09 SIG-1130090 1 Cr6+ Coloring Reagent
Sr 0.2500g Diphenylcarbohydrazide (EMD) 47103ED; EXP: 1/30/13) ↑ 50ml w/ Acetone (EMD 4715D; EXP: 5/24/12)
EXP: 12/30/09

11/30/09 SIG-1130090 2 25133 ppb Stock for O3 in Air
Sr 0.05ml Pyridine-4-Carboxaldehyde (Alfa Aesar LOT 10140598; EXP 8/11/12)
↑ 500ml deionized H2O
EXP: 12/14/09

11/30/09 SIG-1130090 3 25133 ppb ICV/CCV FOR O3 in AIR
Sr 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: VL Date: 12/22/09

14

3/1/10 524-0301100I pH 4.000 Buffer
SV Purchased 500 ml CAT # 5657-01
JT BAKER LOT # H31526
EXP 8/31/11

3/1/10 524-0301100J pH 7.000 Buffer
SV Purchased 500ml CAT # 5656-01
JT BAKER LOT # H47531
EXP: 1/31/12

3/1/10 524-0301100K 1000 PPM Cl (LCS)
SV Purchased 120ml Cat # 1955-4
RICCA CHEM CO LOT # 1001395
EXP: 7/2011

3/1/10 524-0301100L NH3 Filling Sol'n
SV Purchased 60ml Ord # 951202
Thermo Scientific LOT # MT1
P/N 703613-A04
EXP: 3/1/11

3/2/10 524-0302100I pH 10.000 buffer
SV Purchased 500ml Cat # 5655-01
JT Baker LOT H34508
EXP: 9/30/11

40

10/6/10 SL 524-10061001 25/33 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 25/33 ppb ICV/CCV for O3

0.05 ml Pyridine-4-carboxaldehyde TCI
(IGJINC :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 546666K :Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 44284; EXP 11/20/

EXP: 10/7/10

10/15/10 SL 524-10151001 Cr6+ ICV/CCV Stock 100ppm Cr6+

Purchased
RICCA Chemical Co
500ml Plastic
LOT # 101077
EXP: 3/20/12

Cat No 2995-16

10/15/10 SL 524-10157002 500ppm NO_2 Stock

Purchased
RICCA Chemical Co
LOT# 101071
EXP: 4/2011

Cat No: 5444.54
120ml amber glass

10/28/10 S24-10281002 1000 ppm SO_3 ICV/CCV

0.1607 Na_2SO_3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.

EXP: 11/11/10

11/1/10 S24-11011001 ICV/CCV Cr^{6+} T.V = 0.579 ppm

0.5 ml SIG-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

0.2500g 1,5-Diphenylcarbohydrazide (EMD 47103721; EXP: 1/30/13) ↑ 50 ml w/ Acetone (EMD 47154D; EXP: 9/24/12).

EXP: 11/15/10

11/4/10 S24-11041001 A → E pH Filling Sol'n

PURCHASED (3M KCl)

Thermo Scientific

P/N 702613-A02

LOT Code: 0R1

EXP: 11/4/11

11/4/10 S24-11041002 pH 2.000 Buffer

Purchased

BDH CAT NO: 5010-500 ml

LOT # 10021991

EXP. 1/2012

11/4/10 524-110410003 pH 4.000 Buffer
Purchased
J.T. Baker Cat No: 5657-01 500 mL
LOT # J30507
EXP 8/31/12

11/4/10 524-110410004 pH 7.000 Buffer
Purchased
J.T. Baker Cat No: 5656-01 500 mL
LOT # J35515
EXP: 9/30/12

11/5/10 524-110510001 MBTH Std

0.5000 g MBTH (Aldrich 52666EK ;Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 49884 EXP: 11/20/14

EXP: 11/6/10

11/8/10 524-110810001 1000 ppm NH_3
0.3141g NH_4Cl (EMD 49R8931; EXP: 10/19/14) up to 100 ml
W/ 524-102210006 EXP: 10/22/11
EXP: 10/22/11

11/12/10 524-111210001 1000 ppm SO_3 STOCK

0.1591 Na_2SO_3 (JT Baker Lot #H10627; Exp: 8/31/14) up to 100 ml w/ DI Water.

EXP: 11/26/10

54

524-022111 01 1:1 H_2SO_4

2/21/11 SC
250 mL H_2SO_4 (EMD 49284; EXP: 11/20/14 ADDED SLOWLY TO 250 mL DI. COOL COMPLETELY
EXP: 2/21/12

2/21/11 SC
524-022111 02 Cr6+ Coloring Reagent
0.2500 g 1,5-diphenylcarbohydrazide (EMD LOT 47103721 EXP: 11/30/13) + 50 mL w/ Acetone (EMD LOT# 471540, EXP: 9/24/12).
EXP: 3/21/11

2/28/11 SC
524-022811 01 0.1 H_2SO_4
5.6 mL conc H_2SO_4 (EMD 49284 EXP: 11/20/14) + 2L w/ DI H_2O
EXP: 2/28/12

2/28/11 SC
524-022811 03 1001 mg/L Cr6+
Purchased
Inorganic Ventures CGCR(6)1-1
125 mL Clear Glass
LOT# D2-CR030KO
EXP: 3/1/2012

2/28/11 SR
524-022811 03 100ppm Cr6+ Std
1.0mL 524-022811 02 (~~lot~~ 100ppm Cr6+ Std 2/28/11; Exp: 3/1/12) ↑
100mL w/ DI H2O
Exp: 2/28/12

3/7/11 SR
524-030711 01 Cr6+ Coloring Reagent
0.2500g 1,5-Diphenylcarbohydrazide (EMD Lot 47103721, Exp: 1/30/13) ↑ 50mL w/ Acetone (EMD 47124, Exp: 9/24/12).
Exp: 4/7/11

3/7/11 SR
524-030711 02 500ppm NO2
Purchased
RICCA Chem Co Cat No 5444-5-4
Lot # 1162524
Exp: 8/2011

3/17/11 SR 3/17/11
524-031711 01 Alkaline Digestion Std
20.0g NaOH (EMD 47022713B; Exp: 10/11/12) + 30.0g Na2CO3 (EMD 46221715B; Exp: 10/11/12) ↑ 1L w/ DI H2O.
Exp: 4/17/11

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

7/14/11 SR
524-041411 01 IC02 Eluent
75mL 524-042911 02 (10X Conc Eluent, exp 4/29/11) ↑ 750mL w/ DI H2O. DEGAS
Exp: 4/28/11

56

524-04151101 ICO2 PCE

4/15/11

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

EXP: 4/30/11

[illegible] 524-[illegible] Cyclohexane Reagent

0.2500g 1,5-Diphenylcarbohydrazide (EMD [illegible] EXP 1/30/13) + 50 mL w/ Acetone (EMD #71540; EXP 9/24/12)

EXP: 5/15/11

4/12/11 524-04151102 0.5 N NaOH

100g NaOH (EMD #7708718 EXP 10/1/12) + 100 DI H2O

EXP 4/15/12

4/18/11 524-04181101 1000ppb Cr6+

0.1mL 524-02281102 (1000 ppm Cr6+; EXP 3/1/12) + 100 mL w/ pH ADJUSTED DI (9.39)

EXP: 3/1/12

4/18/11 524-04181102 ICN ICO2 25ppb

0.25 mL Ref 524-10151001 @ 0.1/10 exp: 3/2012 up to 100 mL with pH adjusted (pH= 9.39), degassed DI Water.

EXP. 5/2/11

LABORATORY REPORT

May 19, 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 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 P1101605.

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 1:52 pm, May 19, 2011

Sue Anderson
Project Manager

Client: Battelle CAS Project No: P1101605
Project: JPL GW Mon 2Q11 / G486090

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.

DETAIL SUMMARY REPORT

Client: Battelle
Project ID: JPL GW Mon 2Q11 / G486090
Service Request: P1101605

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-4-5	P1101605-001	Water	4/28/2011	07:38	X		
MW-4-4	P1101605-002	Water	4/28/2011	08:15	X		
MW-4-3	P1101605-003	Water	4/28/2011	09:15	X		
MW-4-2	P1101605-004	Water	4/28/2011	09:51	X		
MW-4-1	P1101605-005	Water	4/28/2011	12:41	X	X	X
EB-4-4/28/11	P1101605-006	Water	4/28/2011	12:27	X		

Acronyms

CA LUFT	California DHS LUFT Methoc
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 *tert* -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	*Standard Methods for the Examination of Water and Wastewater* , 19th Ed., 1995.
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* , 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

Page 1 of 1

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

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. P11D1605

CAS Contact:

Company Name & Address (Reporting Information)	Project Name	Project Number
BATTELLE 3990 OLD TOWN AVE. C-205 SAN DIEGO, CA 92110	JPL GW. MON. 2Q11	G486090

Project Manager	P.O. # / Billing Information
DAVID CONNELL	214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201

Phone	Fax
(619) 726-7311	(614) 458-6614

Email Address for Result Reporting

Sampler (Print & Sign) CHASE BROGDON

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics 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)	0	7	0	Remarks
													CAM III (7196)	NDMA (521)	DIOXANE (8270 SIM)	
MW-4-5	1	4/28/11	738	W	1							X			
MW-4-4	2		815		2							X			MS/MSD
MW-4-3	3		915		1							X			
MW-4-2	4		951		1							X			
MW-4-1	5		1241		4							X	X	X	
~~Equip~~ EB-4-4/28/11	6		1227		1							X			EQUIP BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

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)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	4/28/11	1505		4/28/11	1505
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	4/28/11	1545		04/28/11	1545
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 2°C °C

5 of 25

Client: Battelle **Service Request:** P1101605
Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1101605-001.01					
	7196A				
		4/28/11	1601	SMO / MZAMORA	
		4/28/11	1602	P-37 / MZAMORA	
		4/28/11	1610	In Lab / SANDERSON	
		4/28/11	1718	P-37 / SANDERSON	
P1101605-002.01					
	7196A				
		4/28/11	1601	SMO / MZAMORA	
		4/28/11	1602	P-37 / MZAMORA	
		4/28/11	1610	In Lab / SANDERSON	
		4/28/11	1718	P-37 / SANDERSON	
P1101605-002.02					
		4/28/11	1602	SMO / MZAMORA	
		4/28/11	1602	P-37 / MZAMORA	
		4/28/11	1610	In Lab / SANDERSON	
		4/28/11	1718	P-37 / SANDERSON	
P1101605-003.01					
	7196A				
		4/28/11	1601	SMO / MZAMORA	
		4/28/11	1602	P-37 / MZAMORA	
		4/28/11	1610	In Lab / SANDERSON	
		4/28/11	1718	P-37 / SANDERSON	
P1101605-004.01					
	7196A				
		4/28/11	1601	SMO / MZAMORA	
		4/28/11	1602	P-37 / MZAMORA	
		4/28/11	1610	In Lab / SANDERSON	
		4/28/11	1718	P-37 / SANDERSON	
P1101605-005.01					
		4/28/11	1601	SMO / MZAMORA	
		4/28/11	1603	SUBBED / MZAMORA	
		4/30/11	1157	K-Delilah-36 / FADAIR	
		5/4/11	1642	In Lab / SJONES	
P1101605-005.02					
	521				
		4/28/11	1601	SMO / MZAMORA	
		4/28/11	1603	SUBBED / MZAMORA	
		4/30/11	1157	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	
P1101605-005.03					

Client: Battelle **Service Request:** P1101605
Project: JPL GW Mon 2Q11/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
	7196A				
		4/28/11	1601	SMO / MZAMORA	
		4/28/11	1602	P-37 / MZAMORA	
		4/28/11	1610	In Lab / SANDERSON	
		4/28/11	1718	P-37 / SANDERSON	
P1101605-005.04					
	8270C SIM				
		4/28/11	1601	SMO / MZAMORA	
		4/28/11	1603	SUBBED / MZAMORA	
		4/30/11	1157	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	
P1101605-006.01					
	7196A				
		4/28/11	1601	SMO / MZAMORA	
		4/28/11	1602	P-37 / MZAMORA	
		4/28/11	1610	In Lab / SANDERSON	
		4/28/11	1718	P-37 / SANDERSON	

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Sample Acceptance Check Form

Client: Battelle Work order: P1101605

Project: JPL GW. Mon. 2Q11 / G486090

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

Note: This form is used forall 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?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 2 °C			
9	Was a **trip blank** received?	☐	☒	☐
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101605-001.01	125mL Plastic NP					
P1101605-002.01	125mL Plastic NP					
P1101605-002.02	125mL Plastic NP					
P1101605-003.01	125mL Plastic NP					
P1101605-004.01	125mL Plastic NP					
P1101605-005.01	1000ml AG NP					
P1101605-005.02	1000ml AG NP					
P1101605-005.03	125mL Plastic NP					

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

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

Columbia Analytical Services INC 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

Sample Acceptance Check Form

Client: Battelle Work order: P1101605

Project: JPL GW. Mon. 2Q11 / G486090

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101605-005.04	500mL AG NP					
P1101605-006.01	125mL Plastic NP					

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

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101605
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-4-5	P1101605-001	0.010	0.003	1	04/28/11 16:45	ND	
MW-4-4	P1101605-002	0.010	0.003	1	04/28/11 16:45	ND	
MW-4-3	P1101605-003	0.010	0.003	1	04/28/11 16:45	ND	
MW-4-2	P1101605-004	0.010	0.003	1	04/28/11 16:45	ND	
MW-4-1	P1101605-005	0.010	0.003	1	04/28/11 16:45	ND	
EB-4-4/28/11	P1101605-006	0.010	0.003	1	04/28/11 16:45	ND	
Method Blank	P1101605-MB	0.010	0.003	1	04/28/11 16:45	ND	

Approved By Karen Ryan Date : 4/29/11

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Service Request: P1101605
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: Kara Rya Date: 4/29/11

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Service Request: P1101605
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	**Service Request :**	P1101605
Project Name :	JPL GW Mon 2Q11	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	04/28/11

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P1101605-LCS	Basis :	NA
Test Notes :			

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 Karen Rya Date : 4/29/11

Report By:SAnderson

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL GW Mon 2Q11
Project Number : G486090
Sample Matrix : WATER

Service Request : P1101605
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-4-4
Lab Code : P1101605-002MS P1101605-002DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0422	0.0422	84	84	73-119	<1	

Approved By Karen Ryan Date : 4/29/11

Report By:SAnderson

Columbia Analytical Services

pH Run Log

Service Request #(s): P1101605, '607

Time: 0910

Sample	VWR lot #	Exp.
pH 2 Buffer	524-1104/002	1/2012
pH 4 Buffer	524-1104/003	5/31/11
pH 7 Buffer	524-1104/004	9/30/12
pH 10 Buffer	524-0302/001	9/30/11

Slope	Prep.Run #
98.3%	—
	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		6.991	22.5°
pH 10.000		9.990	22.5°
Ref#: T-6.46 EXP: 1/2012 SIG-1123046SD		6.357 98%	22.7°
DI		2.063	21.2°
pH 2.000	↓	2.014	22.6°
TIME: 1615			
pH 2.000	5	2.003	22.3°
1615-1.01	T	2.099	6.8°
-2.01		2.010	6.8°
-3.01		2.085	7.8°
-4.01		1.994	7.5°
-5.01		1.937	8.0°
-6.01		2.098	8.1°
1607-1.01		2.082	9.3°
T-2.01	↓	1.948	10.1°

Sample	#	pH	Temp. °C
1607-3.01	5	2.031	9.4°
pH 2.000	5	2.014	21.3°

pH Adjustments: ~~7196A~~: Diluted/Conc H_2SO_4 DWP 44284 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: 4/25/11

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

Analyst: _____ Date: 4/25/11

Reviewer: KR Date: 4/29/11

pH.XLS

Hexavalent Chromium (Liquids)

Columbia Analytical Services™

Method EPA 7196A

page 1 of 2

Service Request#(s): P1101605 1607 Run#: 244177

Stock#: S24-0228/103 T.V.=10ppm EXP: 2/28/12 Prep Run#: —

ICV/CCV#: S24-1015/001 T.V.=100ppm EXP: 3/2012 Conc. H_2SO_4 Lot#: EMD 49384 EXP: 11/20/14

Coloring Reagent Ref#: S24-0415/102 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	0.9999 4015
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	<0.003
2	ICV 0.05PPM		—	✓	0.000	0.058	0.058	0.0509	102%
3	MB		—	✓	0.000	0.000	0.000	0.000155	<0.003
4	LCS 0.04PPM		—	✓	0.000	0.047	0.047	0.0413	103%
5	1605-2.01		—	✓	0.001	~~0.0024~~ 0.002	0.001	0.00103	<0.003
6	-2.01 MS 0.05PPM		—	✓	0.001	0.049	0.048	0.0422	84%
7	-2.01 MSD		—	✓	0.001	0.049	0.048	0.0422	84%
8	-2.01		—	✓	0.000	0.001	0.001	0.00103	<0.003
9	-2.01 LS 0.03PPM		—	✓	0.000	0.035	0.035	0.0308	103%
10	-3.01		—	✓	0.000	0.000	0.000	0.000155	<0.003
11	-4.01		—	✓	0.000	0.003	0.003	0.00278	<0.003
12	-5.01		—	✓	0.000	0.000	0.000	0.000155	<0.003
13	CCV1 0.05PPM		—	✓	0.000	0.058	0.058	0.0509	102%
14	CCB1		—	✓	0.000	0.000	0.000	0.000155	<0.003
15	1605-6.01		—	✓	0.000	0.000	0.000	0.000155	<0.003
16	1607-1.01		—	✓	0.000	0.010	0.010	0.00891	"J"
17	-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 S24-1015/001 @ 100 ppm ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of S24-0228/103 ↑ 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 ↑ 10 ml of sample (T.V.= 0.03 ppm)

Comments: —

Prepared By: [signature] Date/Time: 4/28/11 @ 1650

Analyzed By: [signature] Date/Time: 4/28/11 @ 1645

Reviewed By: [signature] Date: 4/29/11

Cr6LIQ.xls

Hexavalent Chromium (Liquids)

Columbia Analytical Services™

Method EPA 7196A

Service Request#(s): 1101605 1607 Run#: 24477

Stock#: S24-0228110 3 T.V. 10 ppm Exp: 2/28/12 Prep Run#: —

ICV/CCV#: S24-1015001 T.V. = 100 ppm Exp: 3/2012 Conc. H_2SO_4 Lot#: EMD 49284

Coloring Reagent Ref#: S24-0415102 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*	0.999401
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	1607-1.01 MSD 0.05ppm		—	✓	0.000	0.060	0.060	0.0527	88% 0%
2	T-2.01		—	✓	0.002	0.002	0.000	0.00155	<0.005 RPD
3	T-2.01 MS 0.03ppm		—	✓	0.002	0.032	0.030	0.0264	88%
4	T-3.01		—	✓	0.002	0.002	0.000	0.00155	<0.005
5	CCV3 0.05ppm		—	✓	0.000	0.057	0.057	0.0507	100%
6	CCB3	↓	—	✓	0.000	0.000	0.000	0.00155	<0.005
7									
8									
9									
10									
11									
12					Space not used				
13									
14									
15									
16									
17									

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

ICV/CCV spiked with 0.25 ml of S24-1015001 @ 10 ↑ 50 ml of pH adjusted DI WATER (T.V.= 0.05 ppm)

MS/MSD spiked with 0.05 ml of S24-0228110 3 ↑ 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: 4/28/11 @ 1630

Analyzed By: [signature] Date/Time: 4/28/11 @ 1645

Reviewed By: [signature] Date: 4/29/11

Cr6LIQ.xls

IBU

11/23/09 SIG-1123090 2 1000 ppm SO_3 (ICV/CCV)
SR 0.1607g Na_2SO_3 (Mallinckrodt; H25469; EXP 8/11/14)
↑ 100ml w/ DI
EXP: 5/23/10

11/23/09 SIG-1123090 3 A, B, C, D pH REFERENCE
SR PURCHASED
ERA CAT # 977
LOT # 129934
EXP: 1/2012

11/24/09 SIG-1124090 1 1000 ppm SO_4 Standard
SR PURCHASED CAT # ICC-006
LOT # K007944
EXP: 9/30/13
SR 11/25/09

11/25/09 SIG-~~H25~~ 1125090 1 0.1N H_2SO_4
SR 5.6ml conc H_2SO_4 (EMD 47050 EXP: 9/13/10)
EXP: ~~H25~~ 9/13/10
SR 11/25/09

11/30/09 SIG-1130090 1 Cr^{6+} Coloring Reagent
SR 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 SIG-1130090 2 25133 ppb Stock for O_3 in Air
SR 0.05ml Pyridine-4-Carboxaldehyde (Alfa Aesar LOT 10140598; EXP 8/11/12)
↑ 500ml deionized H_2O
EXP: 12/14/09

11/30/09 SIG-1130090 3 25133 ppb ICV/CCV for O_3 in Air
SR 0.05ml Pyridine-4-carboxaldehyde (TCI LOT # IGINC; EXP: 5/10/12)
↑ 500ml w/ DI H_2O
EXP: 12/14/09

Reviewed And Approved By:
Initial: VL Date: 12/22/09

14

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

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

3/1/10 524-03011003 1000 PPM Cl (ICS)
SV Purchased 120 ml Cat # 1955-4
RICCA CHEM CO LOT # 1001395
EXP: 7/2011

3/1/10 524-03011004 NH3 Filling Sol'n
SV Purchased 60 ml Orion 951202
Thermo Scientific LOT # MT1
P/N 703613-A04
EXP: 3/1/11

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

40

10/6/10 SL — 524-10061001 — 25133 ppb Stock for O3

0.05 ml Pyridine-4-carboxaldehyde Aldrich Aesar
10146598 :Exp: 8/11/12) up to 500 ml w/ DI Water.

EXP: 10/20/10

10/6/10 SL — 524-10061002 — 25133 ppb ICV/CCV for O3

0.05 ml Pyridine-4-carboxaldehyde TCI
(IGI INC :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 54664KK :Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 49284; EXP 11/20/

EXP: 10/7/10

10/15/10 SL — 524-10151001 — Cr6+ ICV/CCV Stock 100ppm Cr6+

Purchased
RICCA Chemical Co
500ml plastic
LOT # 101077
EXP: 3/30/13
Cat No 2935-16

10/15/10 SL — 524-10157002 — 500ppm NO_2 Stock

Purchased
RICCA Chemical Co
LOT # 101071
EXP: 4/2011
Cat No: 5444.54
120 ml amber glass

10/28/10 S24-10281002 1000 ppm SO_3 ICV/CCV

0.1607 Na_2SO_3 (Mallinckrodt Lot #H25469; Exp: 8/11/14) up to 100 ml w/ DI Water.

Exp: 11/11/10

11/1/10 S24-11011001 ICV/CCV Cr^{6+} T.V = 0.579 ppm

0.5 ml SIG-04090604 (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

0.2500g 1,5-Diphenylcarbohydrazide (EMD 47703721; EXP. 1/30/13) ↑ 50 ml w/ Acetone (EMD 47154D; EXP. 9/24/12).
EXP: 11/15/10

11/4/10 S24-11041001 A→E pH Filling Soln

PURCHASED (3M KCl)
Thermo Scientific
LOT Code: OR1
EXP: 11/4/11

P/N 702613-A02

11/4/10 S24-11041002 pH 2.000 Buffer

Purchased
BDH CAT NO: 5010-500ml
LOT # 100219G
EXP: 1/2012

77

11/4/10 524-1104100 pH 4.000 Buffer
Purchased
J.T. Baker Cat No: 5657-01 500 ml
LOT # J30507
EXP 8/31/12

11/4/10 524-1104C04 pH 7.000 Buffer
Purchased
J.T. Baker Cat No: 5656-01 500 ml
LOT # J35515
EXP: 9/30/12

11/5/10 524-1105100 MBTH Soln

0.5000 g MBTH (Aldrich 54696EK ;Exp: 8/7/14) up to 100 ml w/ DI Water. Plus 0.5 ml Conc. H_2SO_4 EMD 49884 EXP: 11/20/14

EXP: 11/6/10

11/8/10 524-1108100 1000 ppm NH_3
0.3141 g NH_4Cl (EMD 4979931; EXP: 10/19/14) to 100 ml
W/ 524-0221006 EXP: 10/22/11
EXP: 10/22/11

11/12/10 524-1112100 1000 ppm SO_3 STOCK

0.1591 Na_2SO_3 (JT Baker Lot #H10627; Exp: 8/31/14) up to 100 ml w/ DI Water.

EXP: 11/26/10

54

2/21/11 SC

524-0221/1101 1:1 H_2SO_4

250mL H_2SO_4 (EMD 49284; EXP: 11/20/14) ADDED SLOWLY TO 250mL DI. COOL COMPLETELY
EXP: 2/21/13

2/21/11 SC

524-0221/1102 Cr6+ Coloring Reagent

0.2500g 1,5-diphenylcarbohydrazide (EMD LOT 47103721 EXP: 01/30/13) + 50mL w/ Acetone (EMD LOT# 47154D, EXP: 9/24/12).
EXP: 3/21/11

2/28/11 SC

524-0228/1101 0.1 H_2SO_4

5.6mL Conc H_2SO_4 (EMD 49284 EXP: 11/20/14) + 2L w/ DI H_2O
EXP: 2/28/12

2/28/11 SC

524-0228/1102 1001 mg/L Cr6+

Purchased Inorganic Ventures CGCR(6)1-1
125mL Clear Glass
LOT# D2-CR03040
EXP: 3/1/2012

2/28/11 SL

524-022811 03 10ppm Cr6+ Std/Soln
1.0mL 524-022811 02 (~~1ppm Cr6+~~ 1000 ppm Cr6+ 3751 ppm Cr6+, Exp: 3/1/12) ↑
100mL w/ DI H2O
Exp: 2/28/12

3/7/11 SL

524-030711 01 Cr6+ Colony Reagent
0.2500g 1,5-Diphenylcarbohydrazide (EMD Lot 47103721, Exp: 1/30/13) ↑ 50mL w/ Acetone (EMD 47154, Exp: 9/24/12).
Exp: 4/7/11

3/7/11 SL

524-030711 02 500ppm NO2
Purchased
RICCA CHEM Co Cat No 5444.5-4
LOT # 1162524
Exp: 8/2011

3/17/11 SL

524-031711 01 Alkaline Digestion Soln
20.0g NaOH (EMD 47022713B; Exp: 10/11/12) + 30.0g Na2CO3 (EMD 46221715B; Exp: 10/11/12) ↑ to 1L w/ DI H2O.
Exp: 4/17/11

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

4/14/11 SL

524-041411 01 IC02 Eluent
75mL 524-042911 02 (10x Conc Eluent, Exp 4/29/11) ↑ 750mL w/ DI H2O DEGAS
Exp: 4/28/11

56

524-041511101 ICO3 PCE

4/15/11 SC

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

EXP: 4/30/11

4/19/11 SC

524-041911103 Cyto Staining Reagent

0.25g 1,5-diphenylcarbohydrazide (EMD 1.10372, EXP 1/30/13) + 50mL MeOH (EMD 471540; EXP 5/24/12)

EXP: 5/15/11

4/12/11 SC

524-041511102 0.5N NaOH

100g NaOH (EMD 1.06498 EXP 10/1/12) + 100L DI DI H2O

EXP 4/15/12

4/18/11 SC

524-041811101 1000ppb Cr6+

0.1mL 524-02281102 (1000 ppm Cr6+; EXP 3/1/12) + 100mL w/ pH ADJUSTED DI (9.39)

EXP: 3/1/12

4/18/11 SC

524-041811102 ICV ICO2 2.5ppb

0.25 mL Ref 524-101511001 @ 0.1/10 exp: 3/2012 up to 100 mL with pH adjusted (pH= 9.391). degassed DI Water.

EXP. 5/2/11

Columbia Analytical Services, Inc.
1317 S. 13th Avenue, Kelso, WA 98626 360.577.7222 360.636.1068 (fax) www.caslab.com

May 16, 2011 Analytical Report for Service Request No: P1101605

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 April 28, 2011. For your reference, these analyses have been assigned our service request number P1101605.

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

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	**Service Request No.:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Received:**	4/28/11
Sample Matrix:	Water		

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.

Nitosamines 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 Howard Holmes **Date** 5-17-11

Chain of Custody

Intra-Network Chain of Custody

2655 Park Center Drive, Suite A • Simi Valley, CA 93065 • 805-526-7161 • FAX 805-526-7270

CAS Contact: Sue Anderson

Project Name: JPL GW Mon 2Q11
Project Number: G486090
Project Manager: David Conner
Company: Battelle

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	14_DIOXANE 8270C SIM	Nitrosamines 521
P1101605-005	MW-4-1	3	Water	4/28/11	1241	4/28/11	KELSO	IV	IV

Test Comments

Nitrosamines - 521 P1101605-005 NDMA

8

Special Instructions/Comments

Turnaround Requirements

____**RUSH** (Surcharges Apply)

PLEASE CIRCLE WORK DAYS

1 2 3 4 5

X **STANDARD**

Requested FAX Date: _____

Requested Report Date: 05/15/11

Report Requirements

____ I. Results Only

____ II. Results + QC Summaries

____ III. Results + QC and Calibration Summaries

X IV. Data Validation Report with Raw Data

PQL/MDL/J Y

EDD Y

Invoice Information

PO# P1101605

Bill to

Relinquished By: [signature] 4/29/11 1510

Received By: [signature] 4/30/11 0900

Airbill Number: _____

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC HH

Client / Project: CAS Simi Service Request ~~K11~~ P1101605

Received: 4/30/11 Opened: 4/30/11 By: IA Unloaded: 4/30/11 By: IA

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		1Z 78905X4442 7147 15	

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 Mon 2Q11/G486090
Service Request: P1101605

Cover Page - Organic Analysis Data Package
Nitrosamines by EPA 521

Sample Name	Lab Code	Date Collected	Date Received
MW-4-1	P1101605-005	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: Lorn E Pentwood
Name: Lorn Pentwood
Date: 5/15/11
Title: Scientist

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	04/28/2011
Sample Matrix:	Water	**Date Received:**	04/28/2011

Nitrosamines by EPA 521

Sample Name:	MW-4-1	**Units:**	ng/L
Lab Code:	P1101605-005	**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	**0.80**	J	2.0	0.32	1	05/02/11	05/13/11	KWG1103886	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	97	70-130	05/13/11	Acceptable

Comments:

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Drinking water	**Date Received:**	NA

Nitrosamines by EPA 521

Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KWG1103886-4	**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	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 Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101605

Surrogate Recovery Summary
Nitrosamines by EPA 521

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Level: Low

Sample Name	Lab Code	Sur1
MW-4-1	P1101605-005	97
Batch QC	P1101607-001	98
Method Blank	KWG1103886-4	92
Batch QCMS	KWG1103886-1	99
Batch QCDMS	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.

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/02/2011
Sample Matrix:	Water	**Date Analyzed:**	05/13/2011

Matrix Spike/Duplicate Matrix Spike Summary
Nitrosamines by EPA 521

Sample Name:	Batch QC	**Units:**	ng/L
Lab Code:	P1101607-001	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521	**Extraction Lot:**	KWG1103886

Analyte Name	Sample Result	Batch QCMS KWG1103886-1 Matrix Spike			Batch QCDMS 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	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/02/2011
Sample Matrix:	Drinking water	**Date Analyzed:**	05/13/2011

Lab Control Spike Summary
Nitrosamines by EPA 521

Extraction Method:	METHOD	**Units:**	ng/L
Analysis Method:	521	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1103886

	Lab Control Sample KWG1103886-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
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.

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/02/2011
Sample Matrix:	Drinking water	**Date Analyzed:**	05/13/2011
		Time Analyzed:	01:28

Method Blank Summary
Nitrosamines by EPA 521

Sample Name:	Method Blank	**File ID:**	J:\MS16\DATA\051211-521\0512025.D
Lab Code:	KWG1103886-4	**Instrument ID:**	MS16
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521	**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-4-1	P1101605-005	J:\MS16\DATA\051211-521\0512030.D	05/13/11	04:43
Batch QC	P1101607-001	J:\MS16\DATA\051211-521\0512031.D	05/13/11	05:22
Batch QCMS	KWG1103886-1	J:\MS16\DATA\051211-521\0512032.D	05/13/11	06:01
Batch QCDMS	KWG1103886-2	J:\MS16\DATA\051211-521\0512033.D	05/13/11	06:40

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/02/2011
Sample Matrix:	Drinking water	**Date Analyzed:**	05/13/2011
		Time Analyzed:	03:25

Lab Control Sample Summary
Nitrosamines by EPA 521

Sample Name:	Lab Control Sample	**File ID:**	J:\MS16\DATA\051211-521\0512028.D
Lab Code:	KWG1103886-3	**Instrument ID:**	MS16
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521	**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-4-1	P1101605-005	J:\MS16\DATA\051211-521\0512030.D	05/13/11	04:43
Batch QC	P1101607-001	J:\MS16\DATA\051211-521\0512031.D	05/13/11	05:22
Batch QCMS	KWG1103886-1	J:\MS16\DATA\051211-521\0512032.D	05/13/11	06:01
Batch QCDMS	KWG1103886-2	J:\MS16\DATA\051211-521\0512033.D	05/13/11	06:40

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

Service Request: P1101605
Calibration Date: 05/12/2011

Initial Calibration Summary
Nitrosamines by EPA 521

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

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

Analyte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level 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**

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

Service Request: P1101605
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**

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

Service Request: P1101605
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**

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

Service Request: P1101605
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**

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

Service Request: P1101605
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**

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

Service Request: P1101605

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	MW-4-1	P1101605-005	5/13/2011	04:43		5/13/2011	05:12
\0512031.D	Batch QC	P1101607-001	5/13/2011	05:22		5/13/2011	05:51
\0512032.D	Batch QCMS	KWG1103886-1	5/13/2011	06:01		5/13/2011	06:30
\0512033.D	Batch QCDMS	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

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

Service Request: P1101605
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-4-1	P1101605-005	04/28/11	04/28/11	500ml	1ml	NA	
Method Blank	KWG1103886-4	NA	NA	500ml	1ml	NA	
Batch QCMS	KWG1103886-1	NA	NA	500ml	1ml	NA	
Batch QCDMS	KWG1103886-2	NA	NA	500ml	1ml	NA	
Batch QC	P1101607-001	NA	NA	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 Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101605

Surrogate Recovery Summary
Nitrosamines by EPA 521

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Level: Low

Sample Name	Lab Code	Sur1
MW-4-1	P1101605-005	97
Batch QC	P1101607-001	98
Method Blank	KWG1103886-4	92
Batch QCMS	KWG1103886-1	99
Batch QCDMS	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.

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

Service Request: P1101605
Date Extracted: 05/02/2011
Date Analyzed: 05/13/2011

Matrix Spike/Duplicate Matrix Spike Summary
Nitrosamines by EPA 521

Sample Name: Batch QC
Lab Code: P1101607-001

Extraction Method: METHOD
Analysis Method: 521

Units: ng/L
Basis: NA

Level: Low
Extraction Lot: KWG1103886

Analyte Name	Sample Result	Batch QCMS KWG1103886-1 Matrix Spike			Batch QCDMS 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	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/02/2011
Sample Matrix:	Drinking water	**Date Analyzed:**	05/13/2011

Lab Control Spike Summary
Nitrosamines by EPA 521

Extraction Method:	METHOD	**Units:**	ng/L
Analysis Method:	521	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1103886

	Lab Control Sample KWG1103886-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
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.

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/02/2011
Sample Matrix:	Drinking water	**Date Analyzed:**	05/13/2011
		Time Analyzed:	01:28

Method Blank Summary
Nitrosamines by EPA 521

Sample Name:	Method Blank	**File ID:**	J:\MS16\DATA\051211-521\0512025.D
Lab Code:	KWG1103886-4	**Instrument ID:**	MS16
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521	**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-4-1	P1101605-005	J:\MS16\DATA\051211-521\0512030.D	05/13/11	04:43
Batch QC	P1101607-001	J:\MS16\DATA\051211-521\0512031.D	05/13/11	05:22
Batch QCMS	KWG1103886-1	J:\MS16\DATA\051211-521\0512032.D	05/13/11	06:01
Batch QCDMS	KWG1103886-2	J:\MS16\DATA\051211-521\0512033.D	05/13/11	06:40

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/02/2011
Sample Matrix:	Drinking water	**Date Analyzed:**	05/13/2011
		Time Analyzed:	03:25

Lab Control Sample Summary
Nitrosamines by EPA 521

Sample Name:	Lab Control Sample	**File ID:**	J:\MS16\DATA\051211-521\0512028.D
Lab Code:	KWG1103886-3	**Instrument ID:**	MS16
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	521	**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-4-1	P1101605-005	J:\MS16\DATA\051211-521\0512030.D	05/13/11	04:43
Batch QC	P1101607-001	J:\MS16\DATA\051211-521\0512031.D	05/13/11	05:22
Batch QCMS	KWG1103886-1	J:\MS16\DATA\051211-521\0512032.D	05/13/11	06:01
Batch QCDMS	KWG1103886-2	J:\MS16\DATA\051211-521\0512033.D	05/13/11	06:40

Organic Analysis:
Nitrosamines by EPA 521

Validation Package

Raw Data

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	04/28/2011
Sample Matrix:	Water	**Date Received:**	04/28/2011

Nitrosamines by EPA 521

Sample Name:	MW-4-1	**Units:**	ng/L
Lab Code:	P1101605-005	**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	**0.80**	J	2.0	0.32	1	05/02/11	05/13/11	KWG1103886	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
N-Nitrosodimethylamine-d6	97	70-130	05/13/11	Acceptable

Comments:

Exception Report

Data File: J:\MS16\DATA\051211-521\0512030.D
Lab ID: P1101605-005
RunType: SMPL
Matrix: WATER

Date Acquired: 05/13/2011 04:43
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	
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: 5/13/11

Secondary Review: _____

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:**	P1101605
Analysis Method:	521	**Prep Method:**	METHOD		
Prep Ref:	1015267	**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\0512030.D			**Instrument:**	MS16
Acqu Date:	05/13/2011 04:43	**Quant Date:**	05/13/2011 12:51	**Vial:**	11
Run Type:	SMPL			**Dilution:**	1.0
Lab ID:	P1101605-005			**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	28610	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	-0.01	0.00	50	24774	9.67	97	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	361	0.4000	0.80	J	

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

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512030.D Vial: 11
Acq On : 13 May 2011 04:43 Operator: SVO-DW
Sample : P1101605-005 Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:27 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

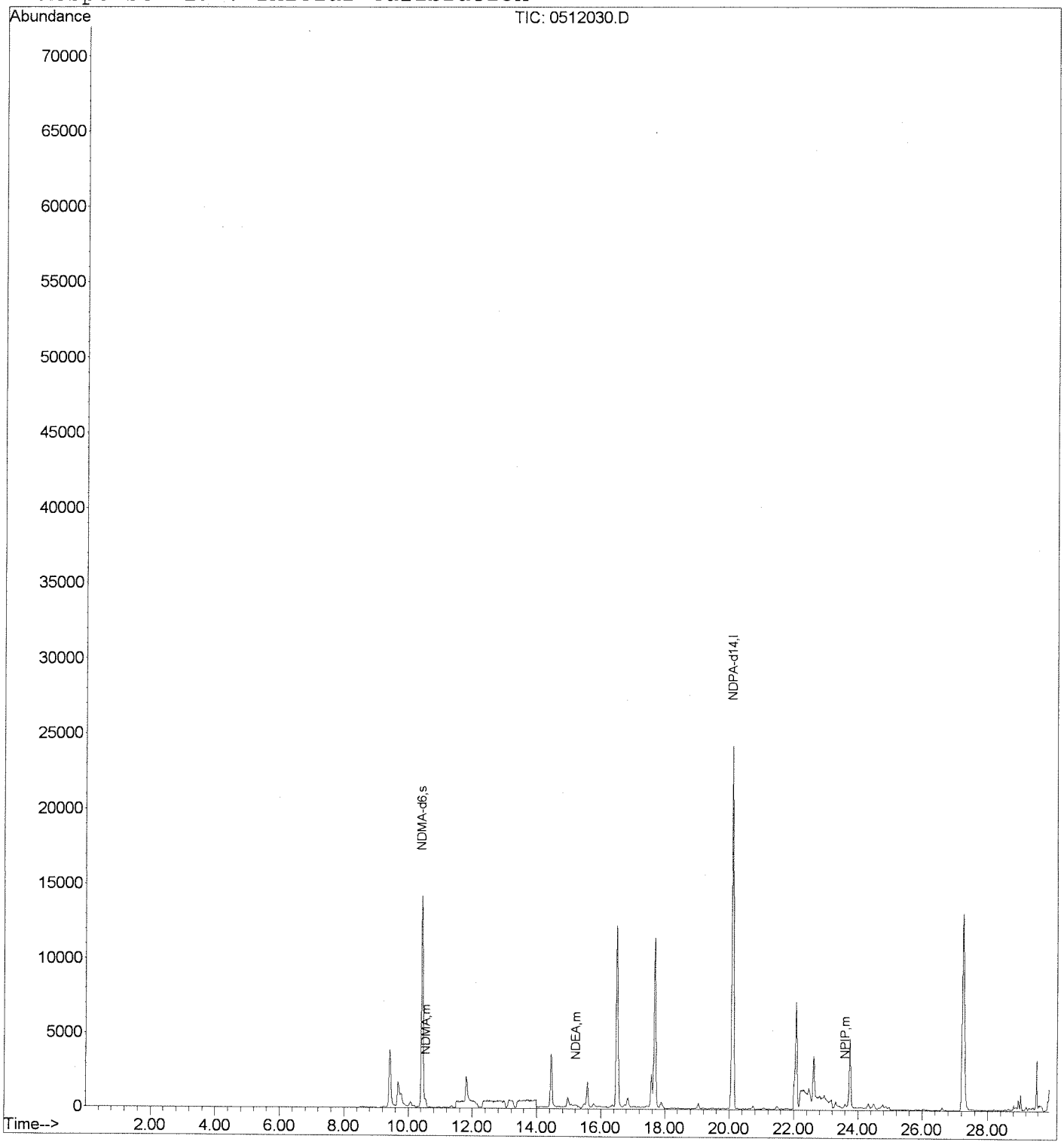
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.10	97	28610	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.42	50	24774	9.67	ug/L	-0.01
Target Compounds						Qvalue
4) NDMA	10.55	47	361	0.40	ug/L #	1
6) NDEA	15.21	75	293	0.91	ug/L #	60
9) NPIP	23.60	69	374	0.63	ug/L	69

(#) = qualifier out of range (m) = manual integration
0512030.D 051211_D14.M Fri May 13 12:55:36 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512030.D Vial: 11
Acq On : 13 May 2011 04:43 Operator: SVO-DW
Sample : P1101605-005 Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 12:51 2011 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	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Drinking water	**Date Received:**	NA

Nitrosamines by EPA 521

Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KWG1103886-4	**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	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: _____

Secondary Review: _____

Quantitation Report

Bottle ID:		**Tier:**		**Matrix:**	DRINKING WATE
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:	1015271	**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:		**Quant based on Method**	

Data File:	J:\MS16\DATA\051211-521\0512025.D			**Instrument:**	MS16
Acqu Date:	05/13/2011 01:28	**Quant Date:**	05/13/2011 12:49	**Vial:**	8
Run Type:	MB			**Dilution:**	1.0
Lab ID:	KWG1103886-4			**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

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	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 Vial: 8
Acq On : 13 May 2011 01:28 Operator: SVO-DW
Sample : 050211-MB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:26 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

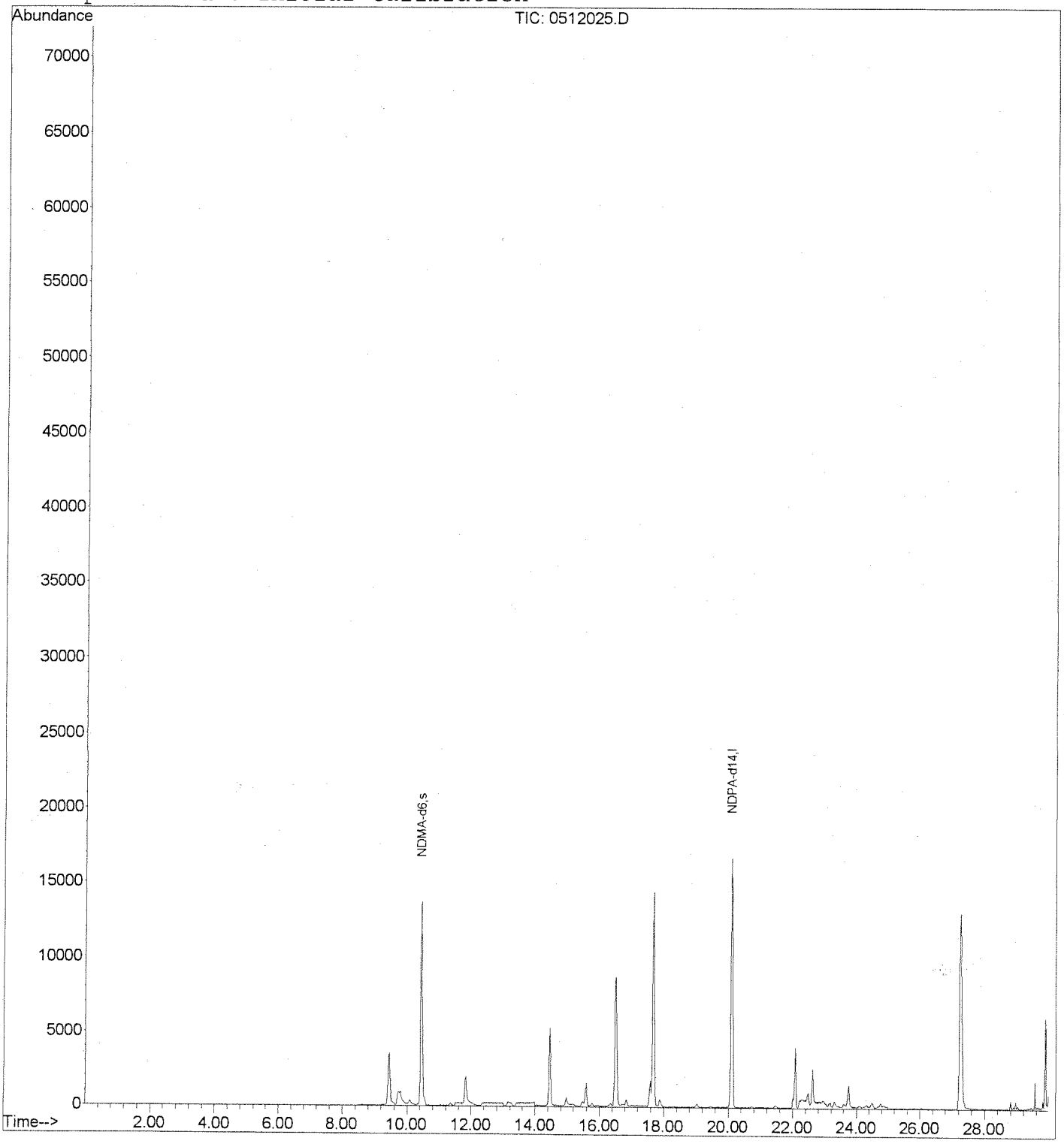
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	31460	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.44	50	25627	9.17	ug/L	0.00
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration
0512025.D 051211_D14.M Fri May 13 12:55:34 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512025.D Vial: 8
Acq On : 13 May 2011 01:28 Operator: SVO-DW
Sample : 050211-MB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 12:49 2011 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



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

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

Nitrosamines by EPA 521

Sample Name: Batch QCMS
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: 5/13/11

Secondary Review: _____

Printed: 05/13/2011 14:53:04
u:\Stealth\Crystal.rpt\except2.rpt

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:			
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\0512032.D			**Instrument:**	MS16
Acqu Date:	05/13/2011 06:01	**Quant Date:**	05/13/2011 12:51	**Vial:**	13
Run Type:	MS			**Dilution:**	1.0
Lab ID:	KWG1103886-1 -- P1101607-001MS			**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 Vial: 13
Acq On : 13 May 2011 06:01 Operator: SVO-DW
Sample : P1101607-001 MS Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:27 2011 Quant Results File: 051211_D14.RES

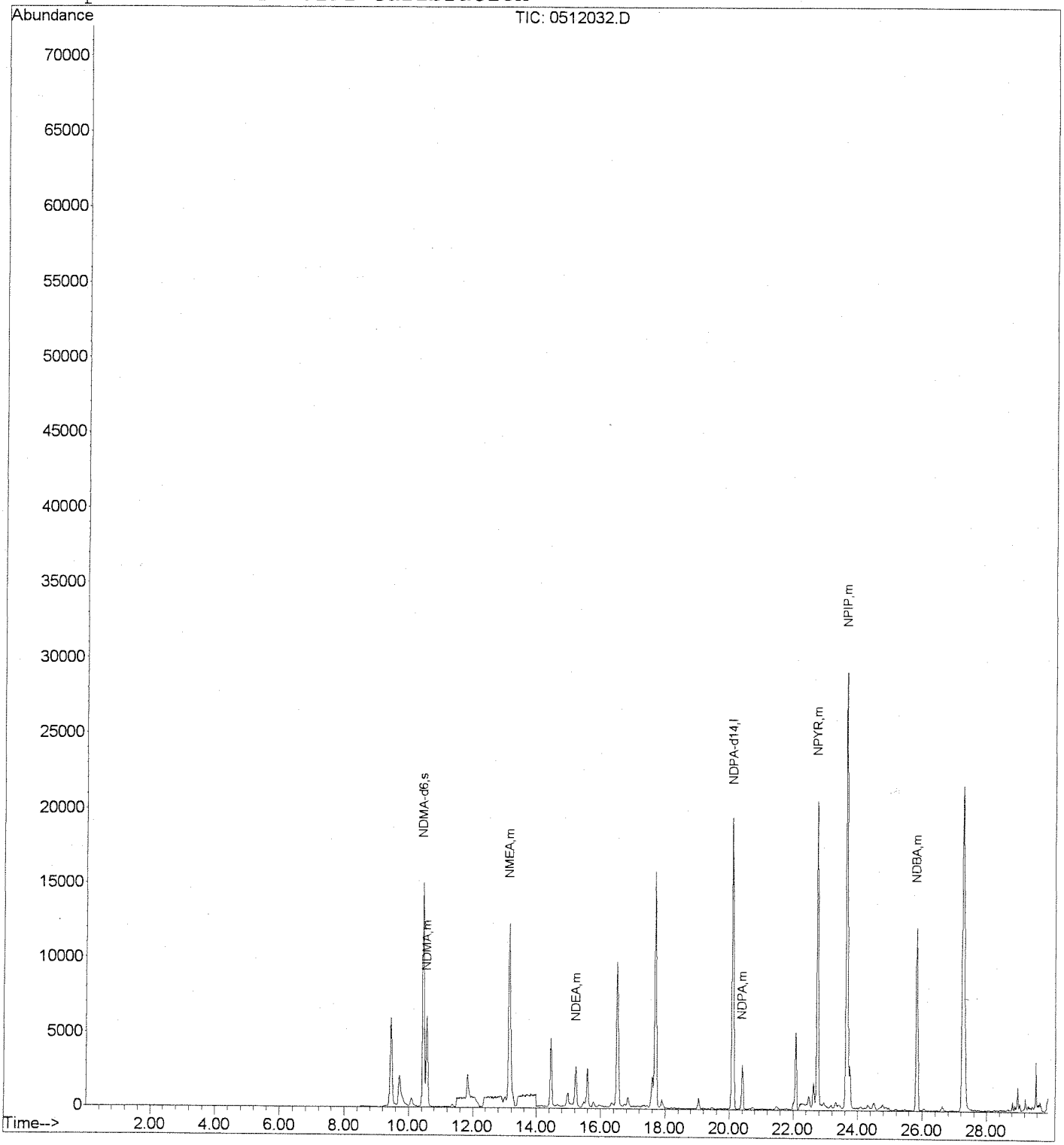
Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration
DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) NDPA-d14	20.11	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

(#) = qualifier out of range (m) = manual integration
0512032.D 051211_D14.M Fri May 13 12:55:38 2011 Page 1

Data File : J:\MS16\DATA\051211-521\0512032.D Vial: 13
Acq On : 13 May 2011 06:01 Operator: SVO-DW
Sample : P1101607-001 MS Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 12:51 2011 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	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Nitrosamines by EPA 521

Sample Name:	Batch QCDMS	**Units:**	ng/L
Lab Code:	KWG1103886-2	**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	**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:**	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:	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	**Vial:**	14
Run Type:	DMS			**Dilution:**	1.0
Lab ID:	KWG1103886-2 -- P1101607-001DMS			**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	20.10	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 Vial: 14
Acq On : 13 May 2011 06:40 Operator: SVO-DW
Sample : P1101607-001 DMS Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:28 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	20.10	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

(#) = qualifier out of range (m) = manual integration
0512033.D 051211_D14.M Fri May 13 12:55:38 2011 Page 1

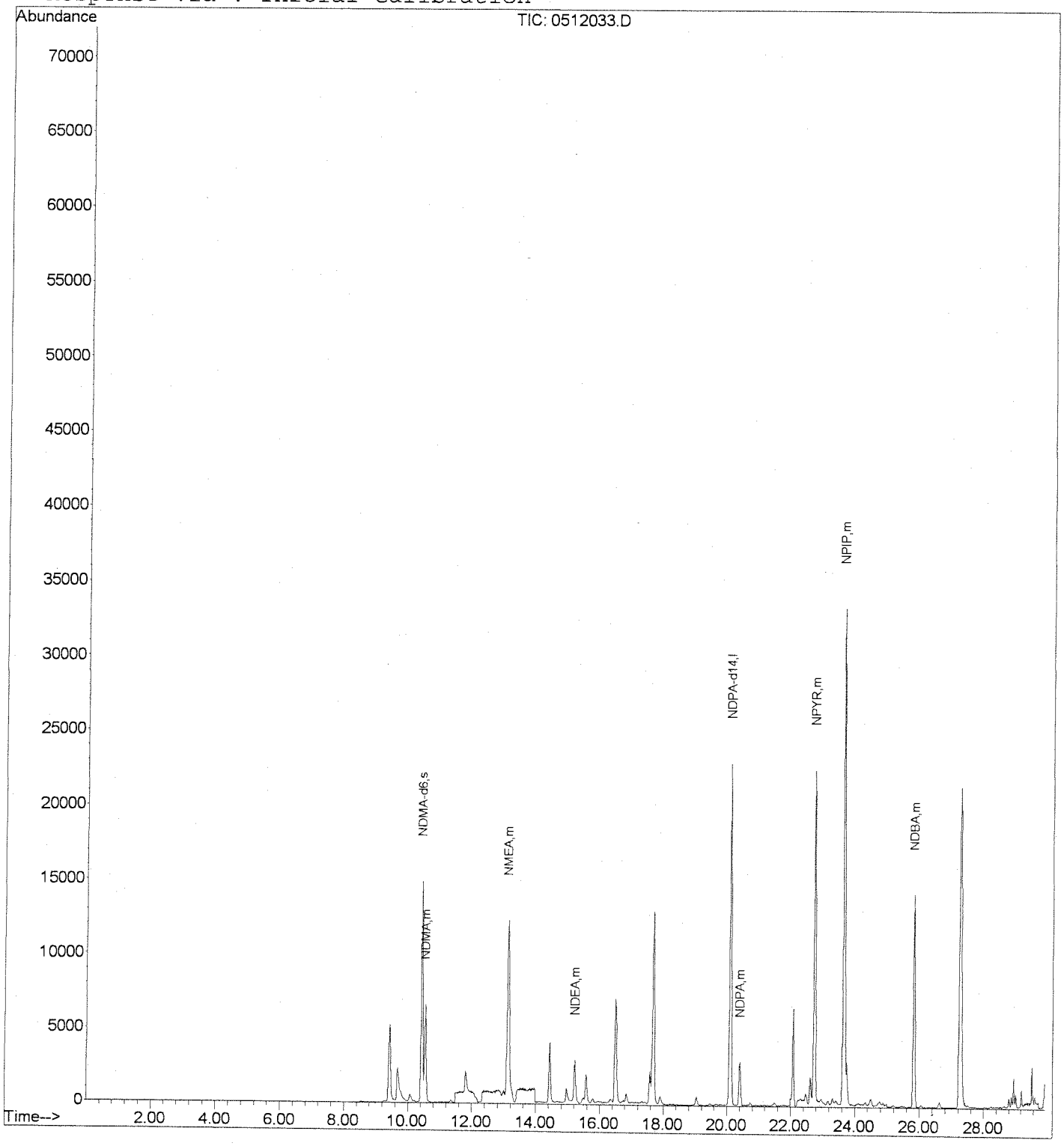
Quantitation Report (QT Reviewed)

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	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Nitrosamines by EPA 521

Sample Name:	Batch QC	**Units:**	ng/L
Lab Code:	P1101607-001	**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	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: _____

Secondary Review: _____

Printed: 05/13/2011 14:53:01
u:\Stealth\Crystal.rpt\except2.rpt

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	**Vial:**	12
Run Type:	SMPL			**Dilution:**	1.0
Lab ID:	P1101607-001			**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 Vial: 12
Acq On : 13 May 2011 05:22 Operator: SVO-DW
Sample : P1101607-001 Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:27 2011 Quant Results File: 051211_D14.RES

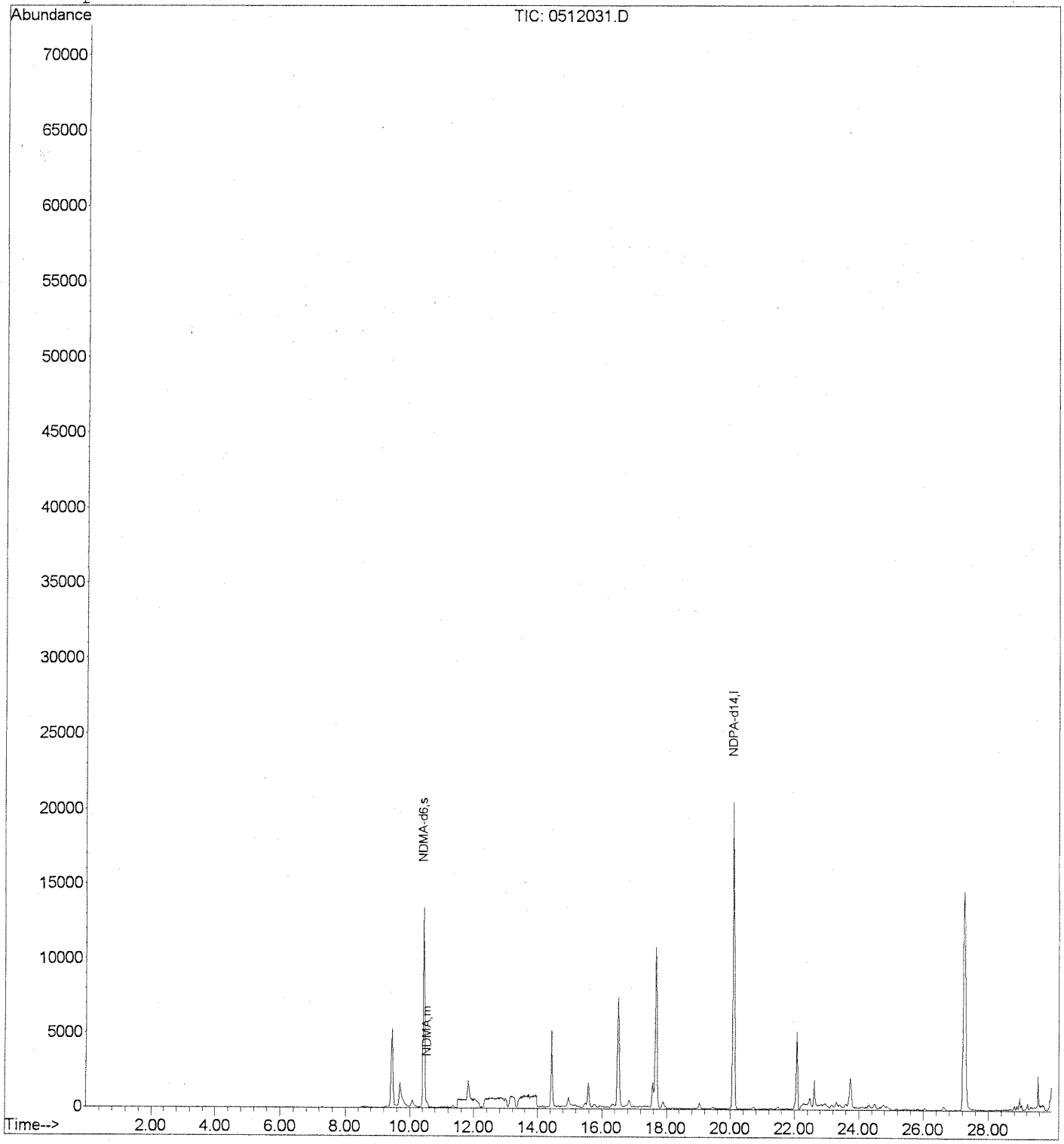
Quant Method : J:\MS16\METHODS\051211_D14.M (RTE Integrator)
Title : 051211_D14.m MJ808 CAL 10502
Last Update : Fri May 13 10:05:05 2011
Response via : Initial Calibration
DataAcq Meth : 521.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.10	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						Qvalue
4) NDMA	10.54	47	188	0.12	ug/L	# 22

(#) = qualifier out of range (m) = manual integration
0512031.D 051211_D14.M Fri May 13 12:55:37 2011 Page 1

Data File : J:\MS16\DATA\051211-521\0512031.D Vial: 12
Acq On : 13 May 2011 05:22 Operator: SVO-DW
Sample : P1101607-001 Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 12:51 2011 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	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Drinking water	**Date Received:**	NA

Nitrosamines by EPA 521

Sample Name:	Lab Control Sample	**Units:**	ng/L
Lab Code:	KWG1103886-3	**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	**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: 5/13/11

Secondary Review: _____

Printed: 05/13/2011 14:52:52
u:\Stealth\Crystal.rpt\except2.rpt

Quantitation Report

Bottle ID:		**Tier:**		**Matrix:**	DRINKING WATE
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:	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	**Vial:**	9
Run Type:	LCS			**Dilution:**	1.0
Lab ID:	KWG1103886-3			**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

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	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
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\0512028.D Vial: 9
Acq On : 13 May 2011 03:25 Operator: SVO-DW
Sample : 050211-LCS Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:26 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	20.10	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							Qvalue
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

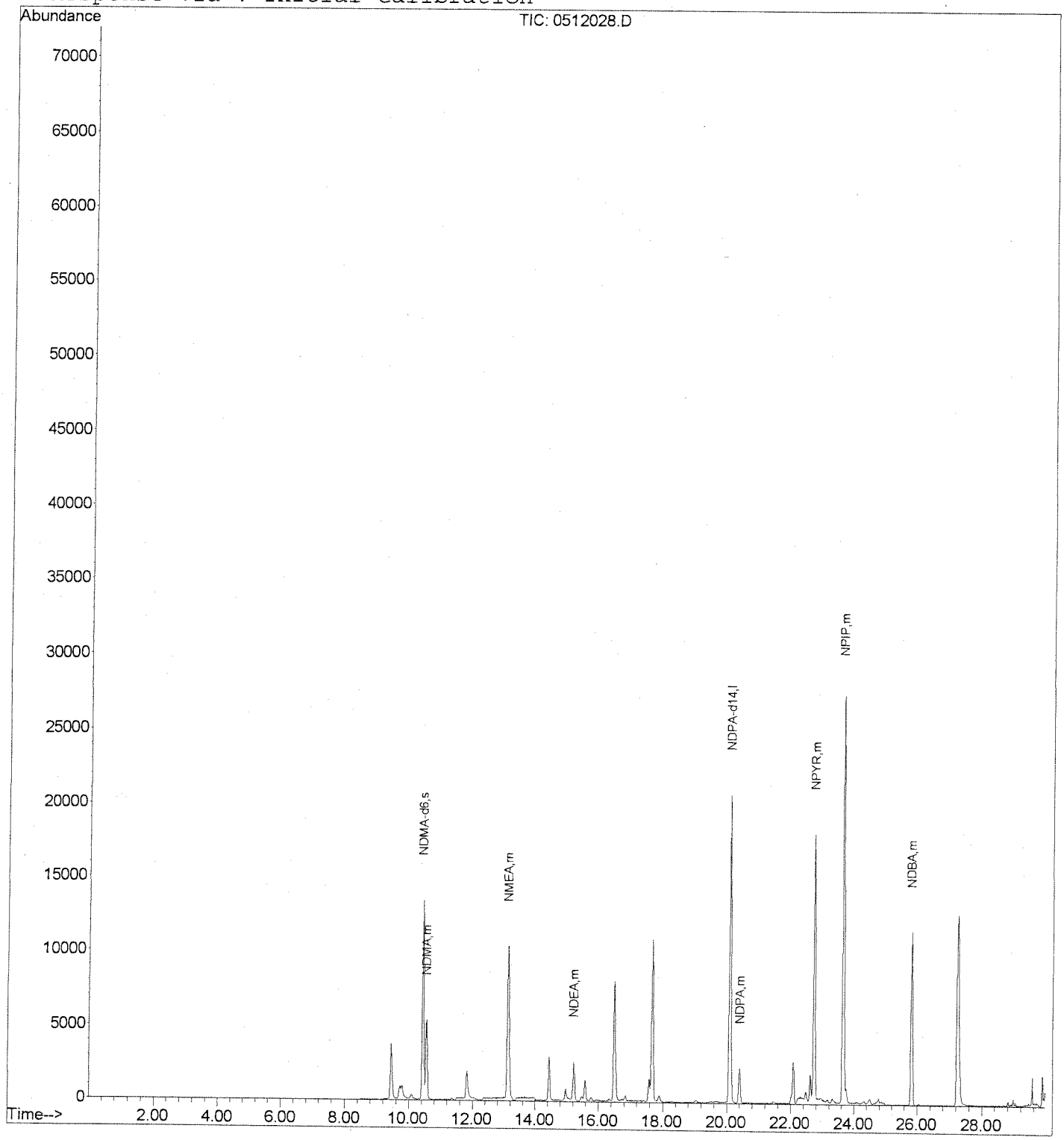
(#) = qualifier out of range (m) = manual integration
0512028.D 051211_D14.M Fri May 13 12:55:35 2011 Page 1

Quantitation Report (QT Reviewed)

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

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

Service Request: P1101605
Calibration Date: 05/12/2011

Initial Calibration Summary
Nitrosamines by EPA 521

Calibration ID: CAL10502
Instrument ID: MS16

Column: MS

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

Analyte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level 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**

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

Service Request: P1101605
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**

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

Service Request: P1101605
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

5/19/11

5/13/11

13 May 2011 09:48

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

051211_D14.m MJ808 CAL 10502
Calibration Last Updated: Fri May 13 09:55:14 2011

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
1)	I	NDPA-d14	ISTD								
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

(#) = Out of Range

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512015.D Vial: 1
Acq On : 12 May 11 18:58 Operator: SVO-DW
Sample : 5-11B 521 1 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 08:15:12 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 17:17:45 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

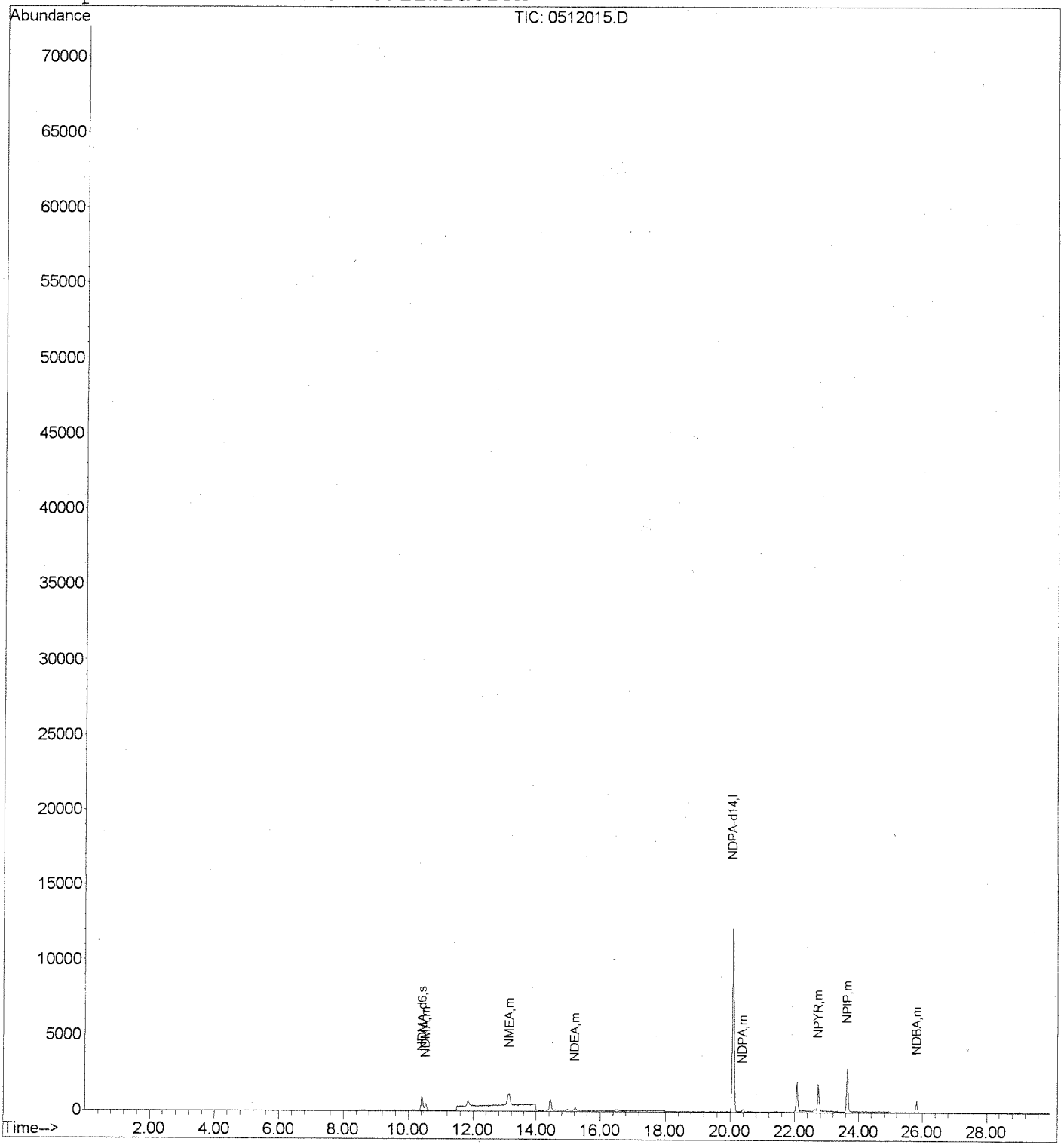
5/13/11

(#) = qualifier out of range (m) = manual integration
0512015.D 051211_D14.M Fri May 13 09:48:58 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512015.D Vial: 1
Acq On : 12 May 11 18:58 Operator: SVO-DW
Sample : 5-11B 521 1 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011 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



Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512016.D Vial: 2
Acq On : 12 May 11 19:37 Operator: SVO-DW
Sample : 5-11C 521 2 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 08:15:12 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

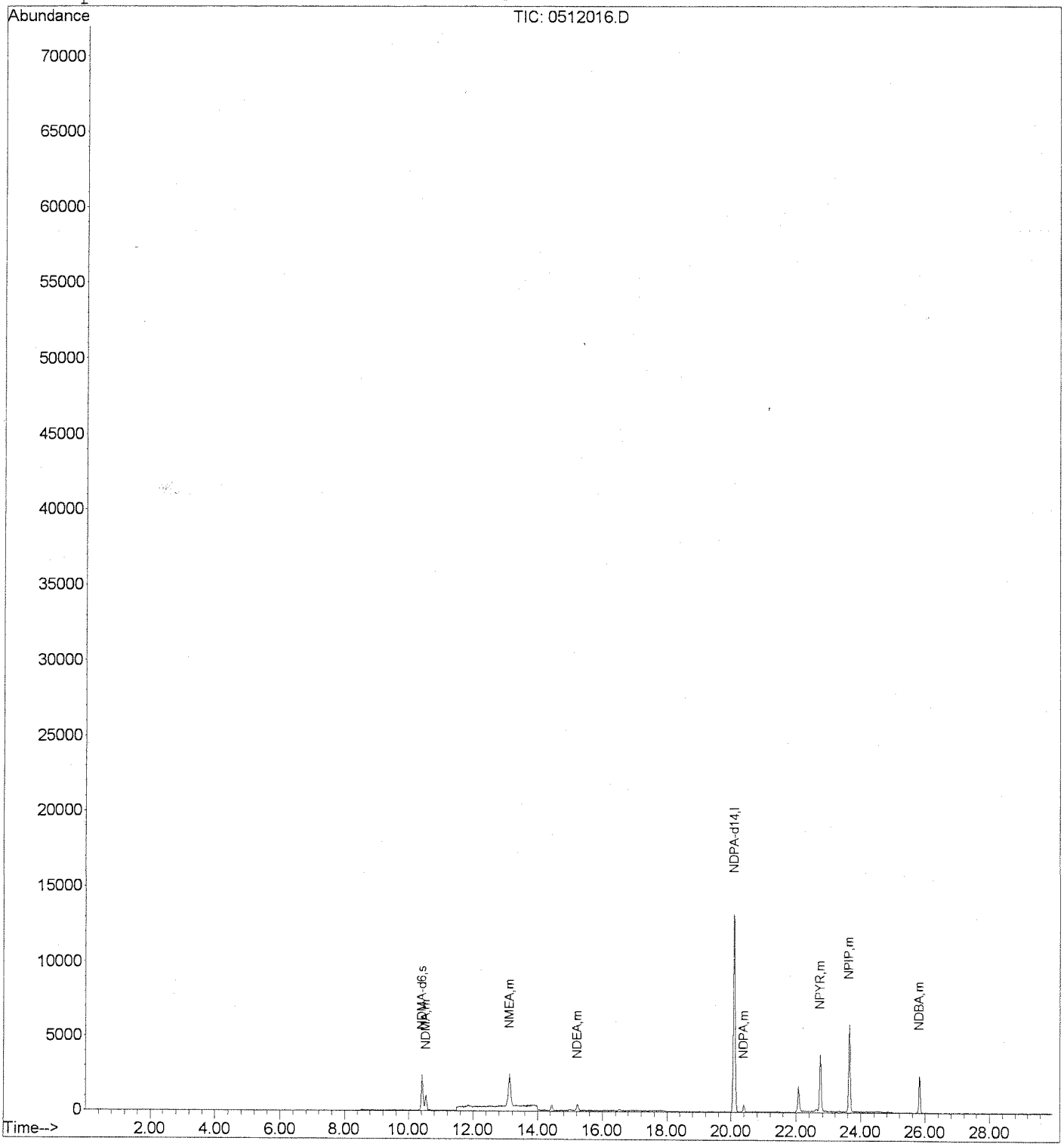
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.11	97	32642	50.00	ug/L	0.00
System Monitoring Compounds						
3) NDMA-d6	10.41	50	4501	1.93	ug/L	-0.02
Target Compounds						Qvalue
4) NDMA	10.54	47	1325	1.30	ug/L	86
5) NMEA	13.12	61	9214	1.88	ug/L	90
6) NDEA	15.22	75	1201	1.64	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

(#) = qualifier out of range (m) = manual integration
0512016.D 051211_D14.M Fri May 13 09:48:59 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512016.D Vial: 2
Acq On : 12 May 11 19:37 Operator: SVO-DW
Sample : 5-11C 521 2 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011 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



Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512017.D Vial: 3
Acq On : 12 May 11 20:16 Operator: SVO-DW
Sample : 5-11D 521 5 PPB Inst : MS16
Misc : 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

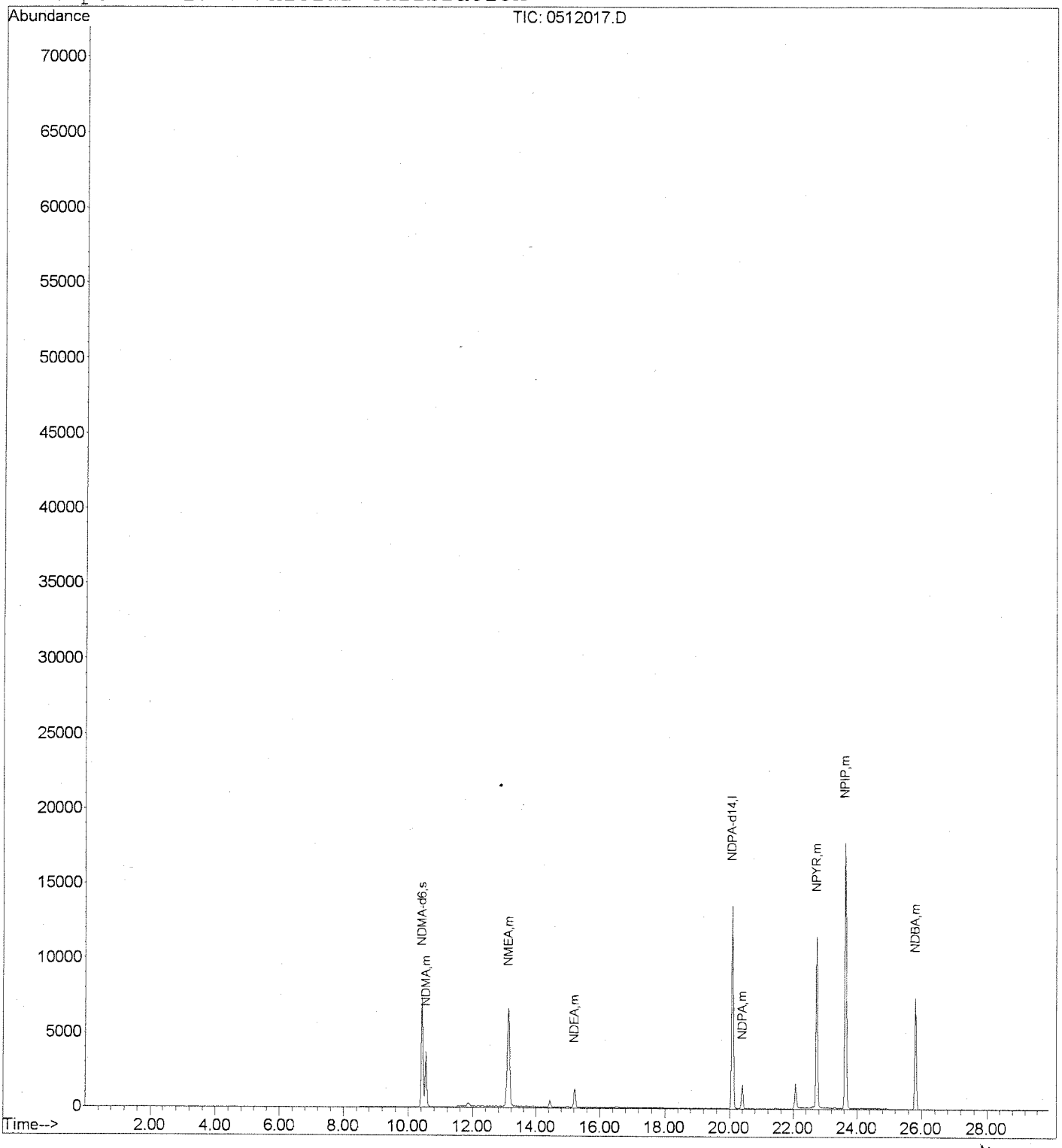
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	33027	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	14037	4.91	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.54	47	4463	4.38	ug/L	68
5) NMEA	13.12	61	29471	5.09	ug/L	93
6) NDEA	15.22	75	3824	5.15	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

(#) = qualifier out of range (m) = manual integration
0512017.D 051211_D14.M Fri May 13 09:49:01 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512017.D Vial: 3
Acq On : 12 May 11 20:16 Operator: SVO-DW
Sample : 5-11D 521 5 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011 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



Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512018.D Vial: 4
Acq On : 12 May 11 20:55 Operator: SVO-DW
Sample : 5-11E 521 10 PPB Inst : MS16
Misc : 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

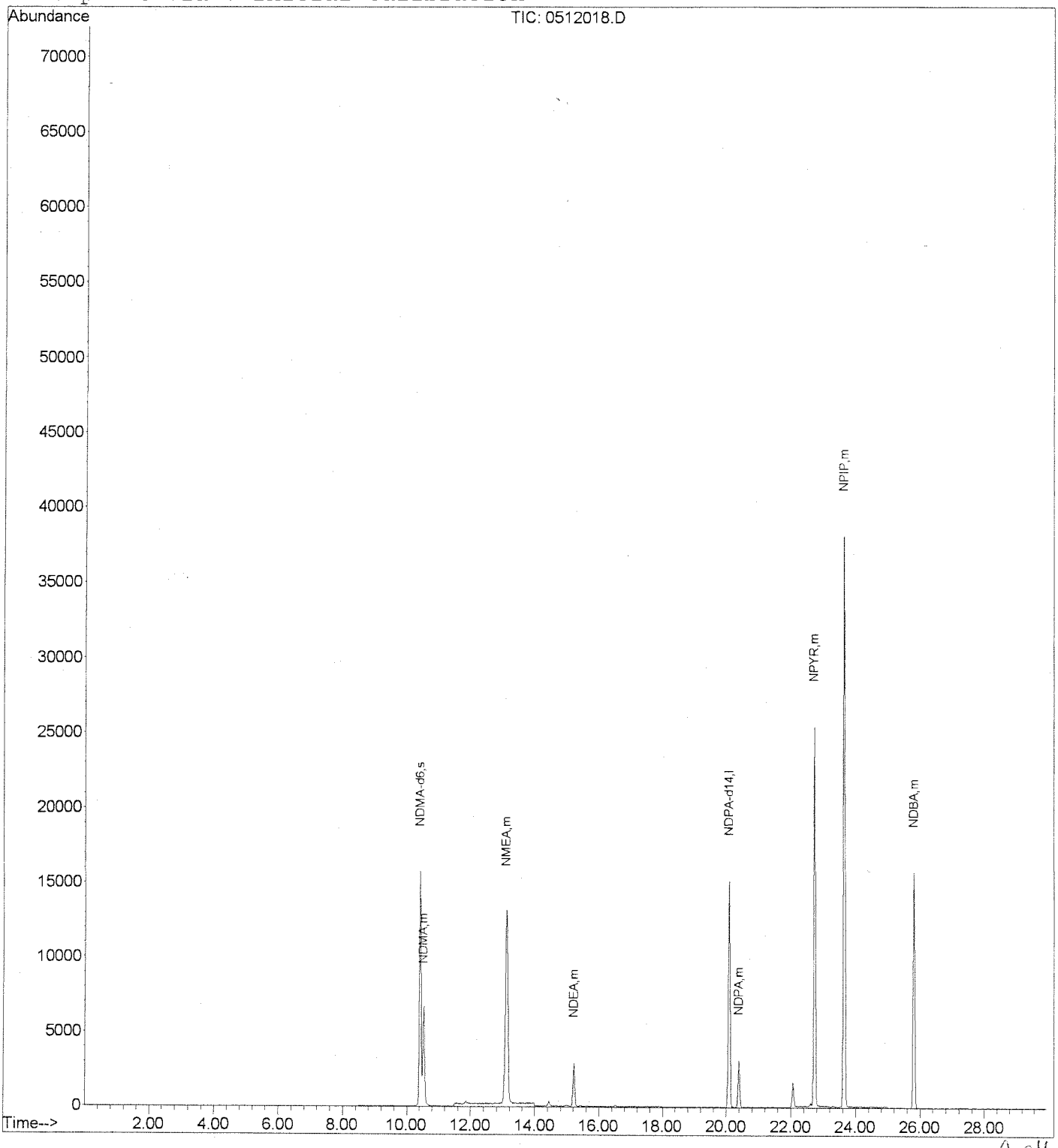
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	34066	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	30941	10.05	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.53	47	8429	8.17	ug/L	67
5) NMEA	13.11	61	60836	9.78	ug/L	87
6) NDEA	15.21	75	7990	10.43	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

(#) = qualifier out of range (m) = manual integration
0512018.D 051211_D14.M Fri May 13 09:49:04 2011 5/16/14

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512018.D Vial: 4
Acq On : 12 May 11 20:55 Operator: SVO-DW
Sample : 5-11E 521 10 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 8:15 2011 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



0512018.D 051211_D14.M Fri May 13 09:49:04 2011 Page 2

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512019.D Vial: 5
Acq On : 12 May 11 21:34 Operator: SVO-DW
Sample : 5-11F 521 20 PPB Inst : MS16
Misc : 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

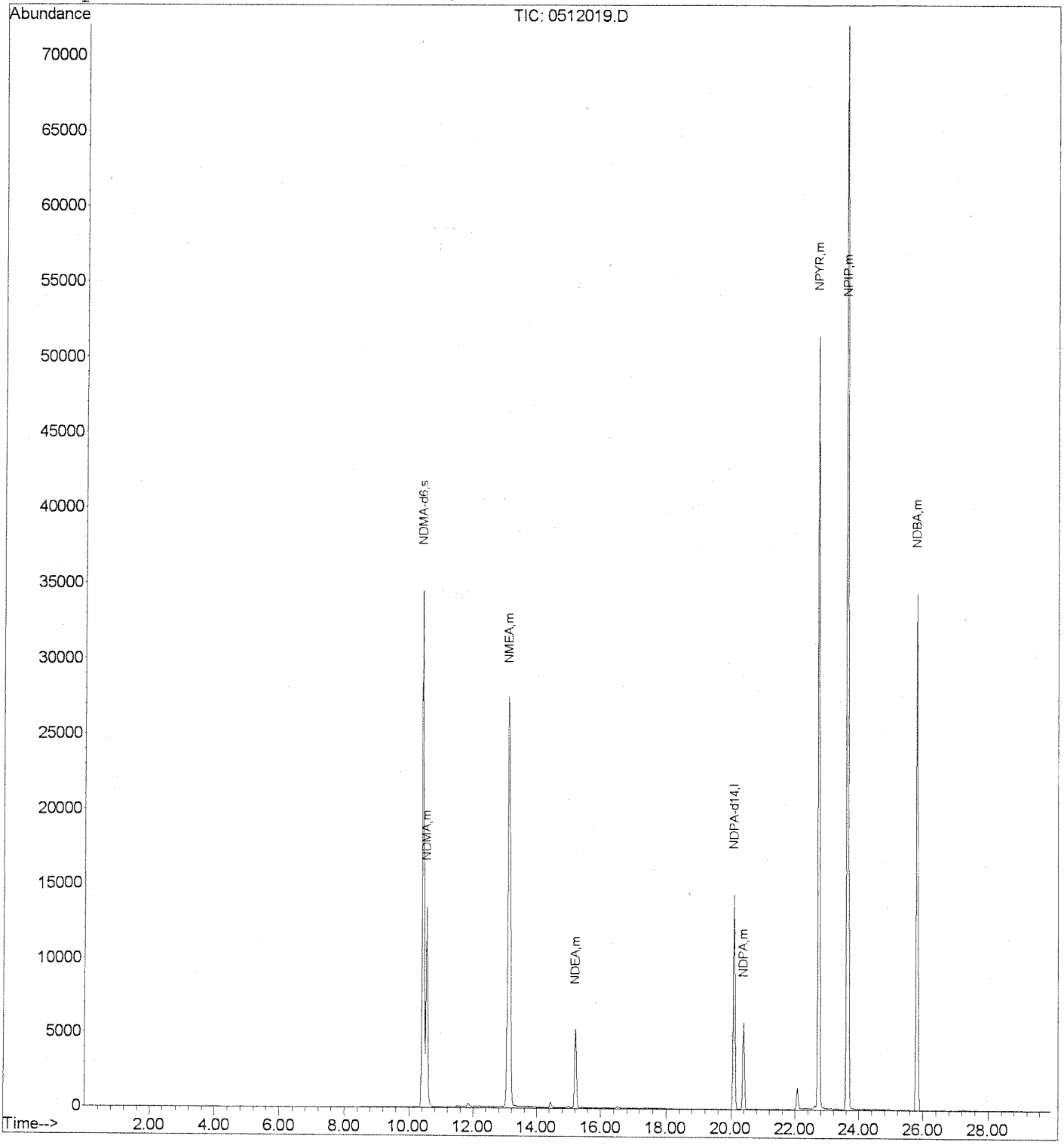
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.09	97	30941	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.43	50	64495	23.27	ug/L	0.00
Target Compounds						Qvalue
4) NDMA	10.55	47	17071	19.26	ug/L	# 22
5) NMEA	13.13	61	126903	21.89	ug/L	88
6) NDEA	15.21	75	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

(#) = qualifier out of range (m) = manual integration
0512019.D 051211_D14.M Fri May 13 09:49:06 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512019.D Vial: 5
Acq On : 12 May 11 21:34 Operator: SVO-DW
Sample : 5-11F 521 20 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 8:18 2011 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



Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512020.D Vial: 6
Acq On : 12 May 11 22:13 Operator: SVO-DW
Sample : 5-11G 521 50 PPB Inst : MS16
Misc : 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

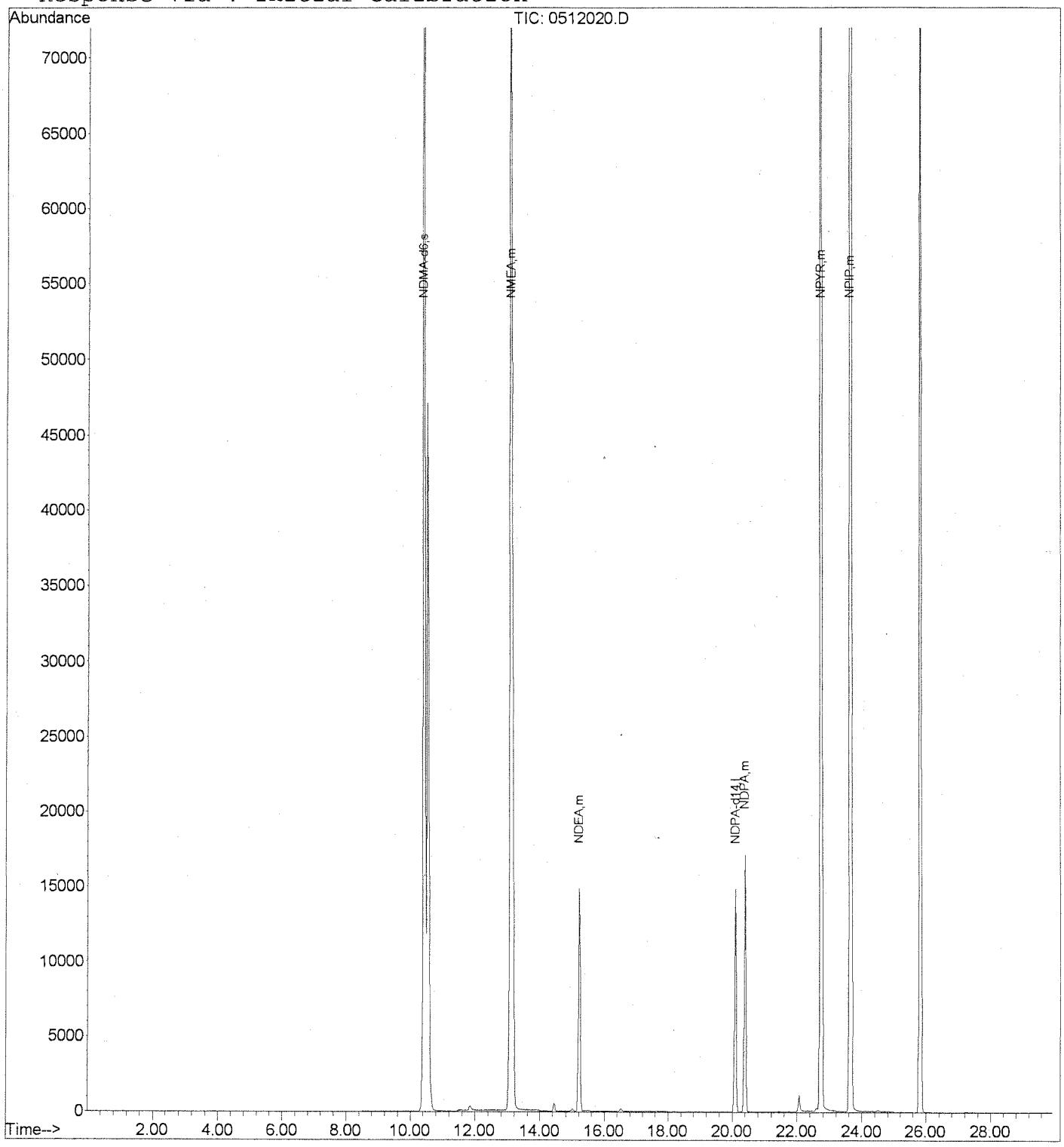
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) NDPA-d14	20.10	97	30878	50.00	ug/L	-0.02
System Monitoring Compounds						
3) NDMA-d6	10.42	50	226827	109.62	ug/L	-0.01
Target Compounds						Qvalue
4) NDMA	10.54	47	69326	Below Cal		59
5) NMEA	13.11	61	353142	59.78	ug/L	80
6) NDEA	15.21	75	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

(#) = qualifier out of range (m) = manual integration
0512020.D 051211_D14.M Fri May 13 09:49:07 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512020.D Vial: 6
Acq On : 12 May 11 22:13 Operator: SVO-DW
Sample : 5-11G 521 50 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 8:18 2011 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



Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512021.D Vial: 7
Acq On : 12 May 11 22:52 Operator: SVO-DW
Sample : 5-11H 521 ICV10 PPB Inst : MS16
Misc : 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

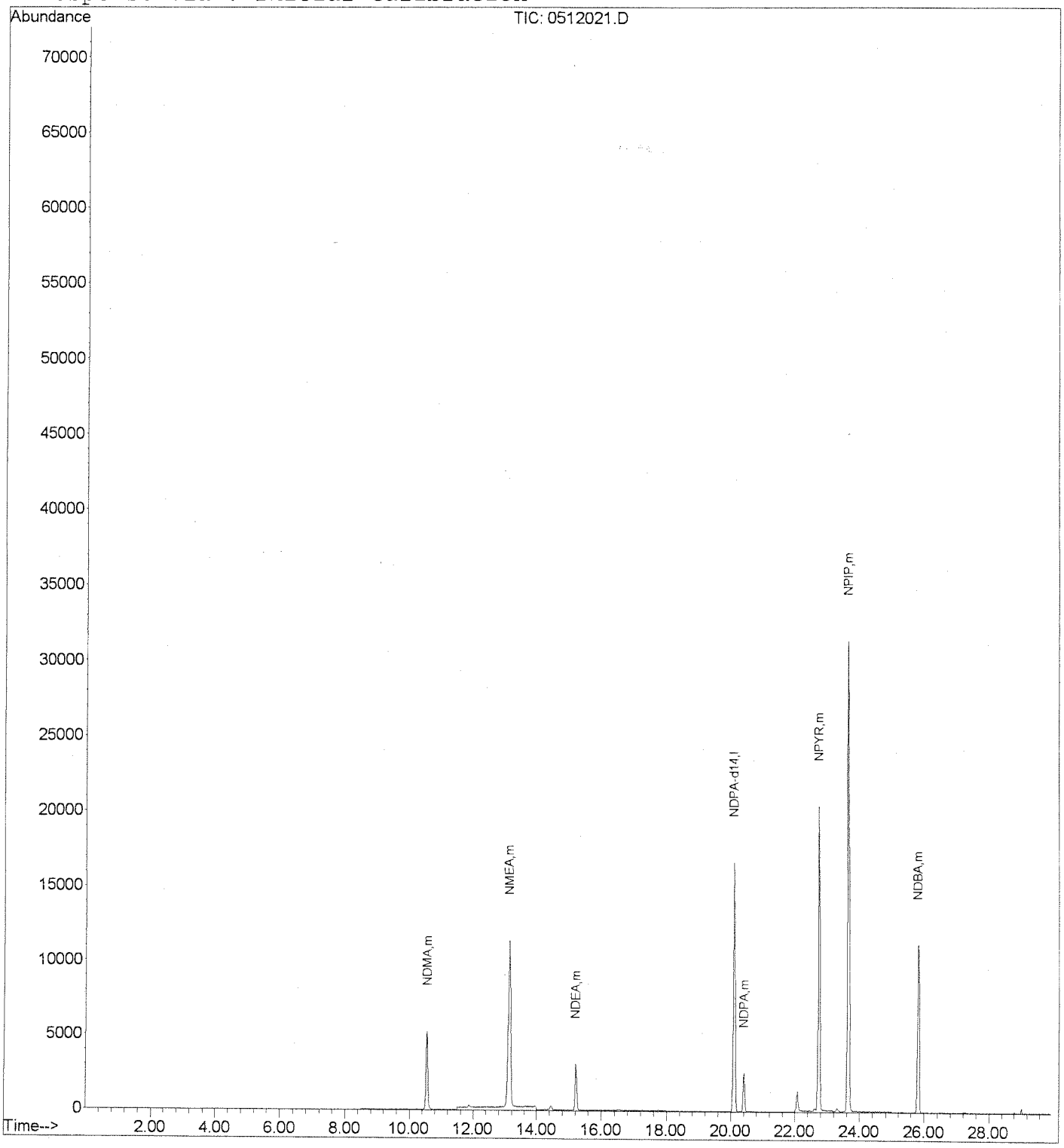
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) NDPA-d14	20.09	97	31927	50.00	ug/L		-0.02
System Monitoring Compounds							
3) NDMA-d6	0.00	50	0	0.00	ug/L		
Target Compounds							Qvalue
4) NDMA	10.56	47	5601	7.57	ug/L	#	1
5) NMEA	13.12	61	47068	7.97	ug/L		65
6) NDEA	15.21	75	6866	8.91	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

(#) = qualifier out of range (m) = manual integration
0512021.D 051211_D14.M Fri May 13 09:55:51 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512021.D Vial: 7
Acq On : 12 May 11 22:52 Operator: SVO-DW
Sample : 5-11H 521 ICV10 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 9:55 2011 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



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

Service Request: P1101605
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: 5/13/11

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	**Vial:**	3
Run Type:	CCV			**Dilution:**	1.0
Lab ID:	KWG1104312-2			**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

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	10.52			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 Vial: 3
Acq On : 13 May 2011 00:49 Operator: SVO-DW
Sample : 5-11D 521 5 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:25 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

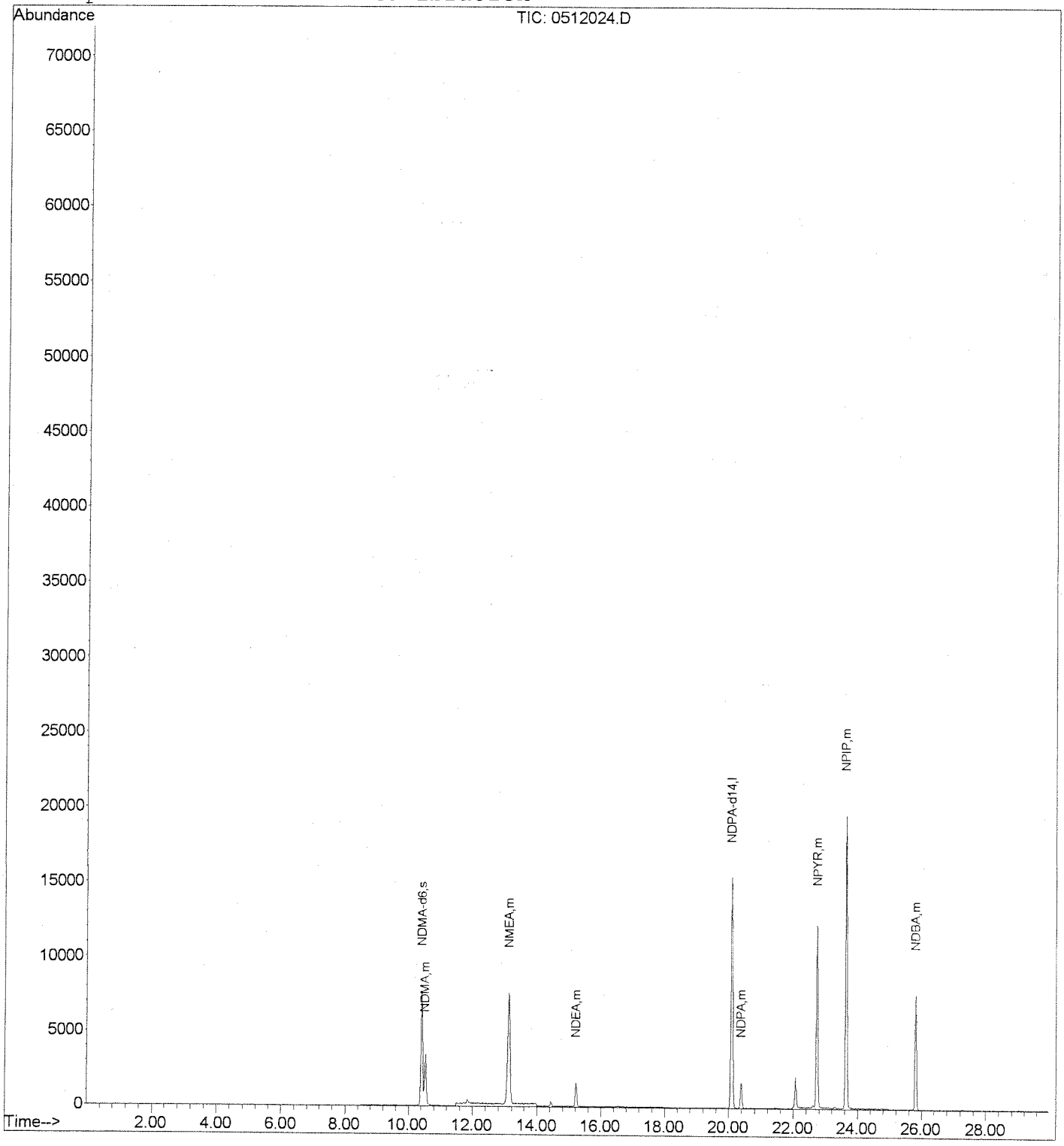
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) NDPA-d14	20.10	97	33516	50.00	ug/L		-0.01
System Monitoring Compounds							
3) NDMA-d6	10.43	50	15183	5.47	ug/L		0.00
Target Compounds							Qvalue
4) NDMA	10.52	47	3365	4.55	ug/L		70
5) NMEA	13.12	61	29595	5.03	ug/L		75
6) NDEA	15.21	75	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

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512024.D Vial: 3
Acq On : 13 May 2011 00:49 Operator: SVO-DW
Sample : 5-11D 521 5 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24 2011 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



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

Service Request: P1101605
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: 5/13/11

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\0512035.D			**Instrument:**	MS16
Acqu Date:	05/13/2011 07:58	**Quant Date:**	05/13/2011 11:24	**Vial:**	4
Run Type:	CCV			**Dilution:**	1.0
Lab ID:	KWG1104312-3			**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

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	10.56			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
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 Vial: 4
Acq On : 13 May 2011 07:58 Operator: SVO-DW
Sample : 5-11E 521 10 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24:28 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

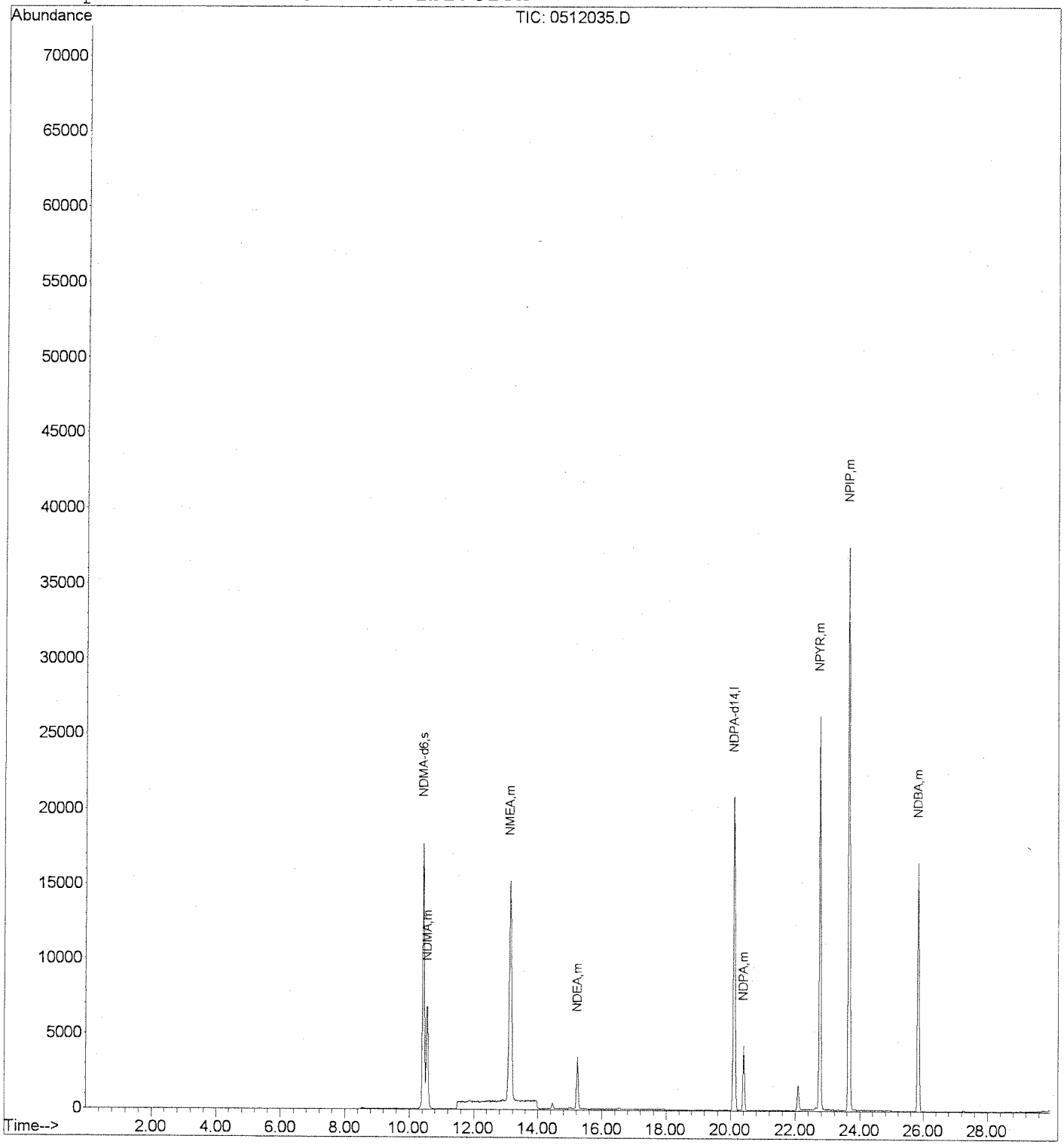
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) NDPA-d14	20.09	97	32248	50.00	ug/L		-0.02
System Monitoring Compounds							
3) NDMA-d6	10.44	50	32011	10.86	ug/L		0.00
Target Compounds							Qvalue
4) NDMA	10.56	47	7370	9.50	ug/L	#	42
5) NMEA	13.12	61	60530	9.93	ug/L		77
6) NDEA	15.23	75	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

(#) = qualifier out of range (m) = manual integration
0512035.D 051211_D14.M Fri May 13 12:55:39 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS16\DATA\051211-521\0512035.D Vial: 4
Acq On : 13 May 2011 07:58 Operator: SVO-DW
Sample : 5-11E 521 10 PPB Inst : MS16
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 13 11:24 2011 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 WATER	500ml	1ml
KWG1103886-4	Method Blank	521 Nitrosamines	DRINKING WATER	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	DWSTD04-94O	10uL	DWSTD05-8I	100uL	
KWG1103886-2	1015269	DWSTD04-94O	10uL	DWSTD05-8I	100uL	
KWG1103886-3	1015270	DWSTD04-94O	10uL	DWSTD05-8I	100uL	
KWG1103886-4	1015271	DWSTD04-94O	10uL			
P1101579-005	1015266	DWSTD04-94O	10uL			
P1101605-005	1015267	DWSTD04-94O	10uL			
P1101607-001	1015265	DWSTD04-94O	10uL			

Comments:

Started By: RHayes Assisted By:

Completed By: RHayes Assisted By:

Training: Yes / No

Yes / No

Reviewed By: Date: 5/13/11 Storage: 20A-F-06

Chain of Custody

Relinquished By: Date: 5/2/11

Received By: Date: 5/2/11

~~Extracts~~ Examined: Yes / No

COLUMBIA ANALYTICAL SERVICES, INC.

Service Request No.: As Listed

Date Extracted: 5-2-11

Analyst: Rob Hayes

Method: EPA 521

StarLims Run :

Nitrosoamines in Water

Lab ID	Client ID	Sample Volume	Surr	MS	Residual Chlorine	Final Volume
	ISTD					
P1101579-005	10 uL	500 mL	10 uL		< 0.1	1 mL
P1101605-005						
P1101607-001						
MB						
LCS				100 uL		
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 5 ppm xp: 8/7/11

Spike ID : DWSTD05-8I 100 ppb xp 10/18/11

Vial: Amber Extract Storage: Z15A-F-06 Extracts Received: 5/2/11

Reviewed By:	Date:

Preparation Information Benchsheet

Prep Run#: 133014
Team: Semivoa GC
Number of Copies to make: 3

Prep WorkFlow: OrgExtDW(14/28)
Prep Method: Method

Status: Draft
Prep Date/Time: 5/2/11 10:08 AM

#	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 Mon 2Q11/G486090

Service Request: P1101605

Cover Page - Organic Analysis Data Package
1,4-Dioxane by GC/MS

Sample Name	Lab Code	Date Collected	Date Received
MW-4-1	P1101605-005	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 Dagren

Date: 5/12/11 Title: Group Supervisor

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	04/28/2011
Sample Matrix:	Water	**Date Received:**	04/28/2011

1,4-Dioxane by GC/MS

Sample Name:	MW-4-1	**Units:**	ug/L
Lab Code:	P1101605-005	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM		

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	94	42-112	05/09/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

1,4-Dioxane by GC/MS

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1103961-4	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM		

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 Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101605

Surrogate Recovery Summary
1,4-Dioxane by GC/MS

Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Batch QC	P1101579-005	87
MW-4-1	P1101605-005	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 Mon 2Q11/G486090

Service Request: P1101605
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-4-1	P1101605-005	82,019	7.17

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011

Matrix Spike/Duplicate Matrix Spike Summary
1,4-Dioxane by GC/MS

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	P1101579-005	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM	**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	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011

Lab Control Spike Summary
1,4-Dioxane by GC/MS

Extraction Method:	EPA 3510C	**Units:**	ug/L
Analysis Method:	8270C SIM	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1103961

	Lab Control Sample KWG1103961-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
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	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011
		Time Analyzed:	14:42

Method Blank Summary
1,4-Dioxane by GC/MS

Sample Name:	Method Blank	**File ID:**	J:\MS26\DATA\050911\0509F015.D
Lab Code:	KWG1103961-4	**Instrument ID:**	MS26
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM	**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-4-1	P1101605-005	J:\MS26\DATA\050911\0509F020.D	05/09/11	16:21

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011
		Time Analyzed:	15:02

Lab Control Sample Summary
1,4-Dioxane by GC/MS

Sample Name:	Lab Control Sample	**File ID:**	J:\MS26\DATA\050911\0509F016.D
Lab Code:	KWG1103961-3	**Instrument ID:**	MS26
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM	**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-4-1	P1101605-005	J:\MS26\DATA\050911\0509F020.D	05/09/11	16:21

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

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 ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level 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**

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

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**

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

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

Service Request: P1101605

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	MW-4-1	P1101605-005	5/9/2011	16:21		5/9/2011	16:33
0509F021.D	ZZZZZZ	ZZZZZZ	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 Mon 2Q11/G486090
Sample Matrix: Water

Service Request: P1101605
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-4-1	P1101605-005	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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Service Request: P1101605

Surrogate Recovery Summary
1,4-Dioxane by GC/MS

Extraction Method: EPA 3510C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Batch QC	P1101579-005	87
MW-4-1	P1101605-005	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	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**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	**Lab Code:**	KWG1104145-2
Instrument ID:	MS26	**Analysis Lot:**	KWG1104145
Analysis Method:	8270C SIM		

		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-4-1	P1101605-005	82,019	7.17

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011

Matrix Spike/Duplicate Matrix Spike Summary
1,4-Dioxane by GC/MS

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	P1101579-005	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM	**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	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011

Lab Control Spike Summary
1,4-Dioxane by GC/MS

Extraction Method:	EPA 3510C	**Units:**	ug/L
Analysis Method:	8270C SIM	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1103961

	Lab Control Sample KWG1103961-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
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	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011
		Time Analyzed:	14:42

Method Blank Summary
1,4-Dioxane by GC/MS

Sample Name:	Method Blank	**File ID:**	J:\MS26\DATA\050911\0509F015.D
Lab Code:	KWG1103961-4	**Instrument ID:**	MS26
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM	**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-4-1	P1101605-005	J:\MS26\DATA\050911\0509F020.D	05/09/11	16:21

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Extracted:**	05/04/2011
Sample Matrix:	Water	**Date Analyzed:**	05/09/2011
		Time Analyzed:	15:02

Lab Control Sample Summary
1,4-Dioxane by GC/MS

Sample Name:	Lab Control Sample	**File ID:**	J:\MS26\DATA\050911\0509F016.D
Lab Code:	KWG1103961-3	**Instrument ID:**	MS26
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM	**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-4-1	P1101605-005	J:\MS26\DATA\050911\0509F020.D	05/09/11	16:21

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

Validation Package

Raw Data

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	04/28/2011
Sample Matrix:	Water	**Date Received:**	04/28/2011

1,4-Dioxane by GC/MS

Sample Name:	MW-4-1	**Units:**	ug/L
Lab Code:	P1101605-005	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM		

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	94	42-112	05/09/11	Acceptable

Comments:

Exception Report

Data File: J:\MS26\DATA\050911\0509F020.D
Lab ID: P1101605-005
RunType: SMPL
Matrix: WATER

Date Acquired: 05/09/2011 16:21
Date Quantitated: 05/09/2011 16:51
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: LB 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:**	P1101605
Analysis Method:	8270C SIM	**Prep Method:**	EPA 3510C		
Prep Ref:	1015913	**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\0509F020.D			**Instrument:**	MS26
Acqu Date:	05/09/2011 16:21	**Quant Date:**	05/09/2011 16:51	**Vial:**	16
Run Type:	SMPL			**Dilution:**	1.0
Lab ID:	P1101605-005			**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	82019	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	30115	46.98	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				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

Quantitation Report (QT Reviewed)

Data File : J:\MS26\DATA\050911\0509F020.D Vial: 16
Acq On : 9 May 2011 4:21 pm Operator: KBailey
Sample : P1101605-005 Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 09 16:51:14 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

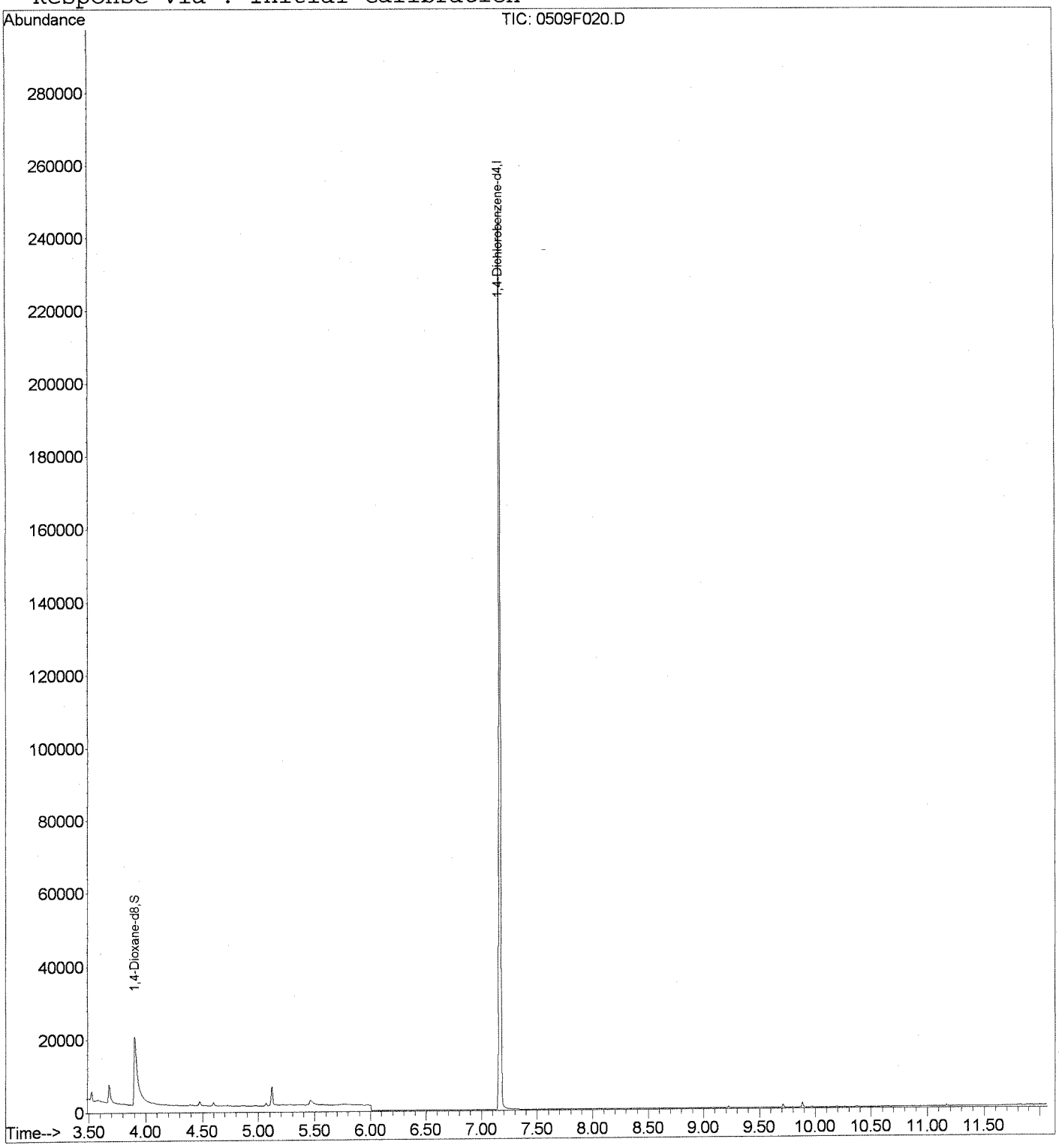
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	7.17	152	82019	50.00	ng/ml	0.00
System Monitoring Compounds						
2) 1,4-Dioxane-d8	3.90	96	30115	46.98	ng/ml	-0.03
Spiked Amount 50.000			Recovery = 93.96%			
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration
0509F020.D 050911_DX.M Mon May 09 17:04:28 2011 Page 1

Quantitation Report (QT Reviewed)

Data File : J:\MS26\DATA\050911\0509F020.D Vial: 16
Acq On : 9 May 2011 4:21 pm Operator: KBailey
Sample : P1101605-005 Inst : MS26
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 9 16:51 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



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Battelle	**Service Request:**	P1101605
Project:	JPL GW Mon 2Q11/G486090	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

1,4-Dioxane by GC/MS

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1103961-4	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	8270C SIM		

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: