

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Houston

6310 Rothway Street

Houston, TX 77040

Tel: (713)690-4444

TestAmerica Job ID: 600-153749-1

Client Project/Site: Falcon Refinery

For:

CH2M Hill Constructors, Inc.

14701 St. Mary's Lane

Suite 300

Houston, Texas 77079-2923

Attn: Mr. John Ynfante



Authorized for release by:

9/16/2017 5:04:55 PM

Cathy Upton, Project Manager I

(713)690-4444

cathy.upton@testamericainc.com

LINKS

Review your project
results through

TotalAccess

Have a Question?



Visit us at:

www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



Table of Contents

Cover Page	1
Table of Contents	2
Case Narrative	3
Method Summary	4
Sample Summary	5
Client Sample Results	6
Definitions/Glossary	15
Surrogate Summary	16
QC Sample Results	17
QC Association Summary	30
Lab Chronicle	32
Certification Summary	34
Chain of Custody	35
Receipt Checklists	37

Case Narrative

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Job ID: 600-153749-1

Laboratory: TestAmerica Houston

Narrative

Job Narrative 600-153749-1

Comments

No additional comments.

Receipt

The samples were received on 9/12/2017 3:56 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.6° C.

GC/MS VOA

Method(s) 8260B: The following compound was outside control limits in the continuing calibration verification (CCV) associated with batch 600-221194: Chloroethane (-42.9%). This compound is not classified as a Calibration Check Compound (CCC) in the reference method, and the laboratory defaults to in-house and/or project-specific criteria for evaluation. The drift% is more than 35% but below 50%.

Method(s) 8260B: The laboratory control sample (LCS) for analytical batch 600-221194 recovered outside control limits for the following analyte: trans-1,3-Dichloropropene. This analyte was biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method(s) 8260B: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch analytical batch 600-221194 recovered outside control limits for multiple Analytes.

Method(s) 8260B: The method blank for analytical batch 600-221194 contained 2-Hexanone above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA

Method(s) 8270C LL: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch preparation batch 600-221308 and analytical batch 600-221338 recovered outside control limits for the following analyte: Benzaldehyde.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL HOU
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL HOU
2540B	Percent Moisture	SM20	TAL HOU

Protocol References:

SM20 = "Standard Methods For The Examination Of Water And Wastewater", 20th Edition."

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

Sample Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
600-153749-1	FRS-SS-001	Solid	09/12/17 10:25	09/12/17 15:56
600-153749-2	FRS-SS-002	Solid	09/12/17 11:00	09/12/17 15:56
600-153749-3	FRS-SS-003	Solid	09/12/17 11:30	09/12/17 15:56

Client Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Client Sample ID: FRS-SS-001

Lab Sample ID: 600-153749-1

Date Collected: 09/12/17 10:25

Matrix: Solid

Date Received: 09/12/17 15:56

Percent Solids: 78.9

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.72	U	4.8	0.72	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,1,2,2-Tetrachloroethane	0.84	U	4.8	0.84	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.4	U	4.8	1.4	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,1,2-Trichloroethane	0.71	U	39	0.71	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,1-Dichloroethane	0.84	U	4.8	0.84	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,1-Dichloroethene	1.2	U	4.8	1.2	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,2,3-Trichlorobenzene	0.60	U *	4.8	0.60	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,2,4-Trichlorobenzene	1.9	U	4.8	1.9	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,2-Dibromo-3-Chloropropane	2.4	U *	4.8	2.4	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,2-Dibromoethane	0.99	U	4.8	0.99	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,2-Dichlorobenzene	0.77	U	4.8	0.77	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,2-Dichloroethane	0.87	U	4.8	0.87	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,2-Dichloroethene, Total	1.8	U	9.7	1.8	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,2-Dichloropropane	0.69	U	4.8	0.69	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,3-Dichlorobenzene	0.69	U	4.8	0.69	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,4-Dichlorobenzene	0.64	U	4.8	0.64	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
1,4-Dioxane	60	U *	480	60	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
2-Butanone (MEK)	1.8	U *	9.7	1.8	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
2-Hexanone	5.4	J B *	9.7	0.98	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
4-Methyl-2-pentanone (MIBK)	1.4	U *	9.7	1.4	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Acetone	1.6	U *	9.7	1.6	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Benzene	0.61	U	4.8	0.61	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Bromochloromethane	1.7	U	4.8	1.7	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Bromodichloromethane	0.64	U	4.8	0.64	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Bromoform	1.3	U	4.8	1.3	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Bromomethane	0.80	U	9.7	0.80	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Carbon disulfide	0.53	U	9.7	0.53	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Carbon tetrachloride	1.1	U	4.8	1.1	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Chlorobenzene	0.93	U	4.8	0.93	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Chloroethane	1.4	U	9.7	1.4	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Chloroform	0.64	U	9.7	0.64	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Chloromethane	1.6	U	9.7	1.6	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
cis-1,2-Dichloroethene	0.80	U	4.8	0.80	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
cis-1,3-Dichloropropene	0.52	U	4.8	0.52	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Cyclohexane	1.9	U	4.8	1.9	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Dibromochloromethane	0.91	U	4.8	0.91	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Dichlorodifluoromethane	1.5	U	4.8	1.5	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Ethylbenzene	0.99	U	4.8	0.99	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Isopropylbenzene	0.89	U	4.8	0.89	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Methyl acetate	2.8	U *	4.8	2.8	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Methyl tert-butyl ether	1.8	U	4.8	1.8	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Methylcyclohexane	1.4	U	4.8	1.4	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Methylene Chloride	2.1	U	9.7	2.1	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
m-Xylene & p-Xylene	1.5	U	4.8	1.5	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
o-Xylene	1.1	U	4.8	1.1	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Styrene	0.69	U	4.8	0.69	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Tetrachloroethene	0.69	U	4.8	0.69	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Toluene	1.3	U	4.8	1.3	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
trans-1,2-Dichloroethene	1.1	U	4.8	1.1	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1

TestAmerica Houston

Client Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Client Sample ID: FRS-SS-001

Lab Sample ID: 600-153749-1

Date Collected: 09/12/17 10:25

Matrix: Solid

Date Received: 09/12/17 15:56

Percent Solids: 78.9

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	0.56	U *	4.8	0.56	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Trichloroethene	1.4	U	4.8	1.4	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Trichlorofluoromethane	0.64	U	9.7	0.64	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Vinyl acetate	0.90	U	9.7	0.90	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Vinyl chloride	0.87	U	9.7	0.87	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1
Xylenes, Total	1.1	U	4.8	1.1	ug/Kg	☼	09/12/17 19:00	09/13/17 13:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	79		61 - 130	09/12/17 19:00	09/13/17 13:10	1
4-Bromofluorobenzene	108		57 - 140	09/12/17 19:00	09/13/17 13:10	1
Dibromofluoromethane	75		68 - 140	09/12/17 19:00	09/13/17 13:10	1
Toluene-d8 (Surr)	81		50 - 130	09/12/17 19:00	09/13/17 13:10	1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	5.1	U	42	5.1	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
1,2,4,5-Tetrachlorobenzene	8.6	U	42	8.6	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2,3,4,6-Tetrachlorophenol	21	U	42	21	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2,4,5-Trichlorophenol	13	U	42	13	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2,4,6-Trichlorophenol	3.4	U	42	3.4	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2,4-Dichlorophenol	4.9	U	42	4.9	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2,4-Dimethylphenol	11	U	42	11	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2,4-Dinitrophenol	6.0	U	130	6.0	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2,4-Dinitrotoluene	4.6	U	42	4.6	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2,6-Dinitrotoluene	3.7	U	42	3.7	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2-Chloronaphthalene	1.5	U	42	1.5	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2-Chlorophenol	2.5	U	42	2.5	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2-Methylnaphthalene	3.5	U	42	3.5	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2-Methylphenol	4.1	U	42	4.1	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2-Nitroaniline	6.2	U	42	6.2	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
2-Nitrophenol	4.9	U	42	4.9	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
3 & 4 Methylphenol	3.5	U	42	3.5	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
3,3'-Dichlorobenzidine	13	U	42	13	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
3-Nitroaniline	9.1	U	42	9.1	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
4,6-Dinitro-2-methylphenol	6.3	U	220	6.3	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
4-Bromophenyl phenyl ether	3.6	U	42	3.6	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
4-Chloro-3-methylphenol	20	U	42	20	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
4-Chloroaniline	7.4	U	42	7.4	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
4-Chlorophenyl phenyl ether	2.3	U	42	2.3	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
4-Nitroaniline	14	U	42	14	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
4-Nitrophenol	6.4	U	250	6.4	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Acenaphthene	7.9	J	42	1.8	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Acenaphthylene	1.3	U	42	1.3	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Acetophenone	6.0	J	42	4.2	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Anthracene	9.0	J	42	1.6	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Atrazine	6.4	U	42	6.4	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Benzaldehyde	21	U *	42	21	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Benzo[a]anthracene	11	J	42	1.7	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Benzo[a]pyrene	10	J	42	2.0	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Benzo[b]fluoranthene	11	J	42	2.2	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1

TestAmerica Houston

Client Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Client Sample ID: FRS-SS-001

Lab Sample ID: 600-153749-1

Date Collected: 09/12/17 10:25

Matrix: Solid

Date Received: 09/12/17 15:56

Percent Solids: 78.9

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[g,h,i]perylene	11	J	42	6.4	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Benzo[k]fluoranthene	9.6	J	42	1.9	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
bis (2-Chloroisopropyl) ether	11	U	42	11	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Bis(2-chloroethoxy)methane	1.8	U	42	1.8	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Bis(2-chloroethyl)ether	5.8	J	42	2.1	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Bis(2-ethylhexyl) phthalate	6.8	U	42	6.8	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Butyl benzyl phthalate	36	J	85	7.8	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Caprolactam	48		42	21	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Carbazole	12	J	42	4.0	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Chrysene	12	J	42	1.3	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Dibenz(a,h)anthracene	7.9	J	42	4.6	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Dibenzofuran	2.3	U	42	2.3	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Diethyl phthalate	29	J	85	11	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Dimethyl phthalate	6.2	U	85	6.2	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Di-n-butyl phthalate	40	J	85	3.3	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Di-n-octyl phthalate	12	J	85	2.4	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Fluoranthene	12	J	42	3.9	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Fluorene	8.4	J	42	3.0	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Hexachlorobenzene	1.9	U	42	1.9	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Hexachlorobutadiene	2.4	U	42	2.4	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Hexachlorocyclopentadiene	5.8	U	42	5.8	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Hexachloroethane	2.9	U	42	2.9	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Indeno[1,2,3-cd]pyrene	8.8	J	42	4.4	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Isophorone	1.3	U	42	1.3	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Naphthalene	1.7	U	42	1.7	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Nitrobenzene	3.8	U	42	3.8	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
N-Nitrosodi-n-propylamine	2.8	U	42	2.8	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
N-Nitrosodiphenylamine	2.4	U	42	2.4	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Pentachlorophenol	5.1	U	210	5.1	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Phenanthrene	11	J	42	6.3	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Phenol	6.9	J	42	5.4	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1
Pyrene	10	J	42	2.3	ug/Kg	☼	09/14/17 09:18	09/14/17 15:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	74		10 - 148	09/14/17 09:18	09/14/17 15:36	1
2-Fluorobiphenyl	60		38 - 130	09/14/17 09:18	09/14/17 15:36	1
2-Fluorophenol	67		25 - 132	09/14/17 09:18	09/14/17 15:36	1
Nitrobenzene-d5	58		10 - 155	09/14/17 09:18	09/14/17 15:36	1
Phenol-d5 (Surr)	58		27 - 130	09/14/17 09:18	09/14/17 15:36	1
Terphenyl-d14	74		53 - 134	09/14/17 09:18	09/14/17 15:36	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	21.1		1.0	1.0	%			09/13/17 16:19	1
Percent Solids	78.9		1.0	1.0	%			09/13/17 16:19	1

TestAmerica Houston

Client Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Client Sample ID: FRS-SS-002

Lab Sample ID: 600-153749-2

Date Collected: 09/12/17 11:00

Matrix: Solid

Date Received: 09/12/17 15:56

Percent Solids: 78.6

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.77	U	5.2	0.77	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,1,2,2-Tetrachloroethane	0.91	U	5.2	0.91	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.5	U	5.2	1.5	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,1,2-Trichloroethane	0.76	U	42	0.76	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,1-Dichloroethane	0.91	U	5.2	0.91	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,1-Dichloroethene	1.3	U	5.2	1.3	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,2,3-Trichlorobenzene	0.65	U *	5.2	0.65	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,2,4-Trichlorobenzene	2.0	U	5.2	2.0	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,2-Dibromo-3-Chloropropane	2.5	U *	5.2	2.5	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,2-Dibromoethane	1.1	U	5.2	1.1	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,2-Dichlorobenzene	0.83	U	5.2	0.83	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,2-Dichloroethane	0.94	U	5.2	0.94	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,2-Dichloroethene, Total	2.0	U	10	2.0	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,2-Dichloropropane	0.74	U	5.2	0.74	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,3-Dichlorobenzene	0.74	U	5.2	0.74	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,4-Dichlorobenzene	0.69	U	5.2	0.69	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
1,4-Dioxane	65	U *	520	65	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
2-Butanone (MEK)	2.0	U *	10	2.0	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
2-Hexanone	1.1	U *	10	1.1	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
4-Methyl-2-pentanone (MIBK)	1.5	U *	10	1.5	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Acetone	1.7	U *	10	1.7	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Benzene	0.66	U	5.2	0.66	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Bromochloromethane	1.9	U	5.2	1.9	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Bromodichloromethane	0.69	U	5.2	0.69	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Bromoform	1.4	U	5.2	1.4	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Bromomethane	0.86	U	10	0.86	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Carbon disulfide	0.57	U	10	0.57	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Carbon tetrachloride	1.2	U	5.2	1.2	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Chlorobenzene	1.0	U	5.2	1.0	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Chloroethane	1.5	U	10	1.5	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Chloroform	0.69	U	10	0.69	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Chloromethane	1.7	U	10	1.7	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
cis-1,2-Dichloroethene	0.86	U	5.2	0.86	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
cis-1,3-Dichloropropene	0.56	U	5.2	0.56	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Cyclohexane	2.0	U	5.2	2.0	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Dibromochloromethane	0.98	U	5.2	0.98	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Dichlorodifluoromethane	1.6	U	5.2	1.6	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Ethylbenzene	1.1	U	5.2	1.1	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Isopropylbenzene	0.96	U	5.2	0.96	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Methyl acetate	3.0	U *	5.2	3.0	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Methyl tert-butyl ether	1.9	U	5.2	1.9	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Methylcyclohexane	1.5	U	5.2	1.5	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Methylene Chloride	2.3	U	10	2.3	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
m-Xylene & p-Xylene	1.6	U	5.2	1.6	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
o-Xylene	1.2	U	5.2	1.2	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Styrene	0.74	U	5.2	0.74	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Tetrachloroethene	0.74	U	5.2	0.74	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Toluene	1.4	U	5.2	1.4	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
trans-1,2-Dichloroethene	1.2	U	5.2	1.2	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1

TestAmerica Houston

Client Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Client Sample ID: FRS-SS-002

Lab Sample ID: 600-153749-2

Date Collected: 09/12/17 11:00

Matrix: Solid

Date Received: 09/12/17 15:56

Percent Solids: 78.6

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	0.60	U *	5.2	0.60	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Trichloroethene	1.5	U	5.2	1.5	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Trichlorofluoromethane	0.69	U	10	0.69	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Vinyl acetate	0.97	U	10	0.97	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Vinyl chloride	0.94	U	10	0.94	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1
Xylenes, Total	1.2	U	5.2	1.2	ug/Kg	☼	09/12/17 19:00	09/13/17 13:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	76		61 - 130	09/12/17 19:00	09/13/17 13:35	1
4-Bromofluorobenzene	109		57 - 140	09/12/17 19:00	09/13/17 13:35	1
Dibromofluoromethane	72		68 - 140	09/12/17 19:00	09/13/17 13:35	1
Toluene-d8 (Surr)	82		50 - 130	09/12/17 19:00	09/13/17 13:35	1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	5.1	U	42	5.1	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
1,2,4,5-Tetrachlorobenzene	8.6	U	42	8.6	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2,3,4,6-Tetrachlorophenol	21	U	42	21	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2,4,5-Trichlorophenol	13	U	42	13	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2,4,6-Trichlorophenol	3.4	U	42	3.4	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2,4-Dichlorophenol	4.9	U	42	4.9	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2,4-Dimethylphenol	11	U	42	11	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2,4-Dinitrophenol	6.0	U	130	6.0	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2,4-Dinitrotoluene	4.6	U	42	4.6	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2,6-Dinitrotoluene	3.8	U	42	3.8	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2-Chloronaphthalene	1.5	U	42	1.5	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2-Chlorophenol	2.5	U	42	2.5	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2-Methylnaphthalene	42		42	3.5	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2-Methylphenol	4.1	U	42	4.1	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2-Nitroaniline	6.2	U	42	6.2	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
2-Nitrophenol	5.0	U	42	5.0	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
3 & 4 Methylphenol	3.6	U	42	3.6	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
3,3'-Dichlorobenzidine	13	U	42	13	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
3-Nitroaniline	9.1	U	42	9.1	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
4,6-Dinitro-2-methylphenol	6.3	U	220	6.3	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
4-Bromophenyl phenyl ether	3.6	U	42	3.6	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
4-Chloro-3-methylphenol	20	U	42	20	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
4-Chloroaniline	7.4	U	42	7.4	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
4-Chlorophenyl phenyl ether	2.3	U	42	2.3	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
4-Nitroaniline	14	U	42	14	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
4-Nitrophenol	6.5	U	250	6.5	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Acenaphthene	66		42	1.8	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Acenaphthylene	1.3	U	42	1.3	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Acetophenone	4.2	U	42	4.2	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Anthracene	120		42	1.6	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Atrazine	6.4	U	42	6.4	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Benzaldehyde	21	U	42	21	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Benzo[a]anthracene	37 J		42	1.8	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Benzo[a]pyrene	15 J		42	2.0	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Benzo[b]fluoranthene	30 J		42	2.2	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1

TestAmerica Houston

Client Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Client Sample ID: FRS-SS-002

Lab Sample ID: 600-153749-2

Date Collected: 09/12/17 11:00

Matrix: Solid

Date Received: 09/12/17 15:56

Percent Solids: 78.6

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[g,h,i]perylene	6.5	U	42	6.5	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Benzo[k]fluoranthene	10	J	42	1.9	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
bis (2-Chloroisopropyl) ether	11	U	42	11	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Bis(2-chloroethoxy)methane	1.8	U	42	1.8	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Bis(2-chloroethyl)ether	2.1	U	42	2.1	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Bis(2-ethylhexyl) phthalate	6.8	U	42	6.8	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Butyl benzyl phthalate	7.9	U	85	7.9	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Caprolactam	21	U	42	21	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Carbazole	33	J	42	4.0	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Chrysene	40	J	42	1.3	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Dibenz(a,h)anthracene	4.6	U	42	4.6	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Dibenzofuran	63		42	2.3	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Diethyl phthalate	11	U	85	11	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Dimethyl phthalate	6.2	U	85	6.2	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Di-n-butyl phthalate	3.3	U	85	3.3	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Di-n-octyl phthalate	2.4	U	85	2.4	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Fluoranthene	220		42	4.0	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Fluorene	100		42	3.0	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Hexachlorobenzene	1.9	U	42	1.9	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Hexachlorobutadiene	2.4	U	42	2.4	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Hexachlorocyclopentadiene	5.9	U	42	5.9	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Hexachloroethane	2.9	U	42	2.9	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Indeno[1,2,3-cd]pyrene	6.0	J	42	4.5	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Isophorone	1.3	U	42	1.3	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Naphthalene	79		42	1.7	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Nitrobenzene	3.8	U	42	3.8	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
N-Nitrosodi-n-propylamine	2.8	U	42	2.8	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
N-Nitrosodiphenylamine	2.4	U	42	2.4	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Pentachlorophenol	5.1	U	210	5.1	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Phenanthrene	380		42	6.3	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Phenol	5.4	U	42	5.4	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1
Pyrene	130		42	2.3	ug/Kg	☼	09/15/17 11:17	09/16/17 07:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	59		10 - 148	09/15/17 11:17	09/16/17 07:34	1
2-Fluorobiphenyl	50		38 - 130	09/15/17 11:17	09/16/17 07:34	1
2-Fluorophenol	53		25 - 132	09/15/17 11:17	09/16/17 07:34	1
Nitrobenzene-d5	46		10 - 155	09/15/17 11:17	09/16/17 07:34	1
Phenol-d5 (Surr)	45		27 - 130	09/15/17 11:17	09/16/17 07:34	1
Terphenyl-d14	59		53 - 134	09/15/17 11:17	09/16/17 07:34	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	21.4		1.0	1.0	%			09/13/17 16:19	1
Percent Solids	78.6		1.0	1.0	%			09/13/17 16:19	1

TestAmerica Houston

Client Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Client Sample ID: FRS-SS-003

Lab Sample ID: 600-153749-3

Date Collected: 09/12/17 11:30

Matrix: Solid

Date Received: 09/12/17 15:56

Percent Solids: 78.8

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.76	U	5.1	0.76	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,1,2,2-Tetrachloroethane	0.89	U	5.1	0.89	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.5	U	5.1	1.5	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,1,2-Trichloroethane	0.75	U	41	0.75	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,1-Dichloroethane	0.89	U	5.1	0.89	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,1-Dichloroethene	1.2	U	5.1	1.2	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,2,3-Trichlorobenzene	0.63	U *	5.1	0.63	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,2,4-Trichlorobenzene	2.0	U	5.1	2.0	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,2-Dibromo-3-Chloropropane	2.5	U *	5.1	2.5	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,2-Dibromoethane	1.0	U	5.1	1.0	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,2-Dichlorobenzene	0.82	U	5.1	0.82	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,2-Dichloroethane	0.92	U	5.1	0.92	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,2-Dichloroethene, Total	1.9	U	10	1.9	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,2-Dichloropropane	0.73	U	5.1	0.73	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,3-Dichlorobenzene	0.73	U	5.1	0.73	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,4-Dichlorobenzene	0.68	U	5.1	0.68	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
1,4-Dioxane	64	U *	510	64	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
2-Butanone (MEK)	1.9	U *	10	1.9	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
2-Hexanone	1.0	U *	10	1.0	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
4-Methyl-2-pentanone (MIBK)	1.5	U *	10	1.5	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Acetone	1.7	U *	10	1.7	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Benzene	0.65	U	5.1	0.65	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Bromochloromethane	1.8	U	5.1	1.8	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Bromodichloromethane	0.68	U	5.1	0.68	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Bromoform	1.4	U	5.1	1.4	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Bromomethane	0.85	U	10	0.85	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Carbon disulfide	0.56	U	10	0.56	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Carbon tetrachloride	1.2	U	5.1	1.2	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Chlorobenzene	0.98	U	5.1	0.98	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Chloroethane	1.4	U	10	1.4	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Chloroform	0.68	U	10	0.68	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Chloromethane	1.7	U	10	1.7	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
cis-1,2-Dichloroethene	0.85	U	5.1	0.85	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
cis-1,3-Dichloropropene	0.55	U	5.1	0.55	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Cyclohexane	2.0	U	5.1	2.0	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Dibromochloromethane	0.96	U	5.1	0.96	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Dichlorodifluoromethane	1.6	U	5.1	1.6	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Ethylbenzene	1.0	U	5.1	1.0	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Isopropylbenzene	0.94	U	5.1	0.94	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Methyl acetate	3.0	U *	5.1	3.0	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Methyl tert-butyl ether	1.9	U	5.1	1.9	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Methylcyclohexane	1.5	U	5.1	1.5	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Methylene Chloride	2.2	U	10	2.2	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
m-Xylene & p-Xylene	1.6	U	5.1	1.6	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
o-Xylene	1.2	U	5.1	1.2	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Styrene	0.73	U	5.1	0.73	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Tetrachloroethene	0.73	U	5.1	0.73	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Toluene	1.4	U	5.1	1.4	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
trans-1,2-Dichloroethene	1.2	U	5.1	1.2	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1

TestAmerica Houston

Client Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Client Sample ID: FRS-SS-003

Lab Sample ID: 600-153749-3

Date Collected: 09/12/17 11:30

Matrix: Solid

Date Received: 09/12/17 15:56

Percent Solids: 78.8

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	0.59	U *	5.1	0.59	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Trichloroethene	1.4	U	5.1	1.4	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Trichlorofluoromethane	0.68	U	10	0.68	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Vinyl acetate	0.95	U	10	0.95	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Vinyl chloride	0.92	U	10	0.92	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1
Xylenes, Total	1.2	U	5.1	1.2	ug/Kg	☼	09/12/17 19:00	09/13/17 13:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	77		61 - 130	09/12/17 19:00	09/13/17 13:59	1
4-Bromofluorobenzene	108		57 - 140	09/12/17 19:00	09/13/17 13:59	1
Dibromofluoromethane	73		68 - 140	09/12/17 19:00	09/13/17 13:59	1
Toluene-d8 (Surr)	82		50 - 130	09/12/17 19:00	09/13/17 13:59	1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	5.1	U	42	5.1	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
1,2,4,5-Tetrachlorobenzene	8.5	U	42	8.5	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2,3,4,6-Tetrachlorophenol	21	U	42	21	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2,4,5-Trichlorophenol	13	U	42	13	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2,4,6-Trichlorophenol	3.4	U	42	3.4	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2,4-Dichlorophenol	4.9	U	42	4.9	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2,4-Dimethylphenol	11	U	42	11	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2,4-Dinitrophenol	6.0	U	130	6.0	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2,4-Dinitrotoluene	4.6	U	42	4.6	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2,6-Dinitrotoluene	3.7	U	42	3.7	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2-Chloronaphthalene	1.5	U	42	1.5	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2-Chlorophenol	2.5	U	42	2.5	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2-Methylnaphthalene	3.5	U	42	3.5	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2-Methylphenol	4.1	U	42	4.1	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2-Nitroaniline	6.2	U	42	6.2	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
2-Nitrophenol	4.9	U	42	4.9	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
3 & 4 Methylphenol	3.5	U	42	3.5	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
3,3'-Dichlorobenzidine	13	U	42	13	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
3-Nitroaniline	9.1	U	42	9.1	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
4,6-Dinitro-2-methylphenol	6.3	U	220	6.3	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
4-Bromophenyl phenyl ether	3.6	U	42	3.6	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
4-Chloro-3-methylphenol	20	U	42	20	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
4-Chloroaniline	7.4	U	42	7.4	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
4-Chlorophenyl phenyl ether	2.3	U	42	2.3	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
4-Nitroaniline	14	U	42	14	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
4-Nitrophenol	6.4	U	250	6.4	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Acenaphthene	1.8	U	42	1.8	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Acenaphthylene	1.3	U	42	1.3	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Acetophenone	4.2	U	42	4.2	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Anthracene	1.6	U	42	1.6	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Atrazine	6.4	U	42	6.4	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Benzaldehyde	21	U *	42	21	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Benzo[a]anthracene	1.7	U	42	1.7	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Benzo[a]pyrene	2.0	U	42	2.0	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Benzo[b]fluoranthene	2.2	U	42	2.2	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1

TestAmerica Houston

Client Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Client Sample ID: FRS-SS-003

Lab Sample ID: 600-153749-3

Date Collected: 09/12/17 11:30

Matrix: Solid

Date Received: 09/12/17 15:56

Percent Solids: 78.8

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[g,h,i]perylene	6.4	U	42	6.4	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Benzo[k]fluoranthene	1.9	U	42	1.9	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
bis (2-Chloroisopropyl) ether	11	U	42	11	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Bis(2-chloroethoxy)methane	1.8	U	42	1.8	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Bis(2-chloroethyl)ether	2.1	U	42	2.1	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Bis(2-ethylhexyl) phthalate	6.8	U	42	6.8	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Butyl benzyl phthalate	34	J	84	7.8	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Caprolactam	21	U	42	21	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Carbazole	4.0	U	42	4.0	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Chrysene	1.3	U	42	1.3	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Dibenz(a,h)anthracene	4.6	U	42	4.6	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Dibenzofuran	2.3	U	42	2.3	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Diethyl phthalate	21	J	84	11	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Dimethyl phthalate	6.2	U	84	6.2	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Di-n-butyl phthalate	50	J	84	3.3	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Di-n-octyl phthalate	28	J	84	2.4	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Fluoranthene	3.9	U	42	3.9	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Fluorene	3.0	U	42	3.0	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Hexachlorobenzene	1.9	U	42	1.9	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Hexachlorobutadiene	2.4	U	42	2.4	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Hexachlorocyclopentadiene	5.8	U	42	5.8	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Hexachloroethane	2.9	U	42	2.9	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Indeno[1,2,3-cd]pyrene	4.4	U	42	4.4	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Isophorone	1.3	U	42	1.3	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Naphthalene	1.7	U	42	1.7	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Nitrobenzene	3.7	U	42	3.7	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
N-Nitrosodi-n-propylamine	2.8	U	42	2.8	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
N-Nitrosodiphenylamine	2.4	U	42	2.4	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Pentachlorophenol	5.1	U	210	5.1	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Phenanthrene	6.3	U	42	6.3	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Phenol	5.4	U	42	5.4	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1
Pyrene	2.3	U	42	2.3	ug/Kg	☼	09/14/17 09:18	09/14/17 16:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	54		10 - 148	09/14/17 09:18	09/14/17 16:24	1
2-Fluorobiphenyl	54		38 - 130	09/14/17 09:18	09/14/17 16:24	1
2-Fluorophenol	61		25 - 132	09/14/17 09:18	09/14/17 16:24	1
Nitrobenzene-d5	48		10 - 155	09/14/17 09:18	09/14/17 16:24	1
Phenol-d5 (Surr)	51		27 - 130	09/14/17 09:18	09/14/17 16:24	1
Terphenyl-d14	55		53 - 134	09/14/17 09:18	09/14/17 16:24	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	21.2		1.0	1.0	%			09/13/17 16:19	1
Percent Solids	78.8		1.0	1.0	%			09/13/17 16:19	1

TestAmerica Houston

Definitions/Glossary

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
*	RPD of the LCS and LCSD exceeds the control limits
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
*	LCS or LCSD is outside acceptance limits.

GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
*	RPD of the LCS and LCSD exceeds the control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Surrogate Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		12DCE (61-130)	BFB (57-140)	DBFM (68-140)	TOL (50-130)
600-153749-1	FRS-SS-001	79	108	75	81
600-153749-2	FRS-SS-002	76	109	72	82
600-153749-3	FRS-SS-003	77	108	73	82
LCS 600-221194/3	Lab Control Sample	94	134	89	97
LCSD 600-221194/4	Lab Control Sample Dup	78	131	82	95
MB 600-221194/6	Method Blank	85	110	74	83

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)

BFB = 4-Bromofluorobenzene

DBFM = Dibromofluoromethane

TOL = Toluene-d8 (Surr)

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		TBP (10-148)	FBP (38-130)	2FP (25-132)	NBZ (10-155)	PHL (27-130)	TPH (53-134)
600-153749-1	FRS-SS-001	74	60	67	58	58	74
600-153749-2	FRS-SS-002	59	50	53	46	45	59
600-153749-3	FRS-SS-003	54	54	61	48	51	55
LCS 600-221308/2-A	Lab Control Sample	82	77	75	72	73	85
LCS 600-221420/2-A	Lab Control Sample	83	77	78	71	73	86
LCSD 600-221308/3-A	Lab Control Sample Dup	82	74	75	68	71	84
MB 600-221308/1-A	Method Blank	67	65	71	68	67	78
MB 600-221420/1-A	Method Blank	64	77	70	69	64	80

Surrogate Legend

TBP = 2,4,6-Tribromophenol

FBP = 2-Fluorobiphenyl

2FP = 2-Fluorophenol

NBZ = Nitrobenzene-d5

PHL = Phenol-d5 (Surr)

TPH = Terphenyl-d14

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 600-221194/6

Matrix: Solid

Analysis Batch: 221194

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.74	U	5.0	0.74	ug/Kg			09/13/17 10:41	1
1,1,2,2-Tetrachloroethane	0.87	U	5.0	0.87	ug/Kg			09/13/17 10:41	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.4	U	5.0	1.4	ug/Kg			09/13/17 10:41	1
1,1,2-Trichloroethane	0.73	U	40	0.73	ug/Kg			09/13/17 10:41	1
1,1-Dichloroethane	0.87	U	5.0	0.87	ug/Kg			09/13/17 10:41	1
1,1-Dichloroethene	1.2	U	5.0	1.2	ug/Kg			09/13/17 10:41	1
1,2,3-Trichlorobenzene	0.62	U	5.0	0.62	ug/Kg			09/13/17 10:41	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	ug/Kg			09/13/17 10:41	1
1,2-Dibromo-3-Chloropropane	2.4	U	5.0	2.4	ug/Kg			09/13/17 10:41	1
1,2-Dibromoethane	1.0	U	5.0	1.0	ug/Kg			09/13/17 10:41	1
1,2-Dichlorobenzene	0.80	U	5.0	0.80	ug/Kg			09/13/17 10:41	1
1,2-Dichloroethane	0.90	U	5.0	0.90	ug/Kg			09/13/17 10:41	1
1,2-Dichloroethene, Total	1.9	U	10	1.9	ug/Kg			09/13/17 10:41	1
1,2-Dichloropropane	0.71	U	5.0	0.71	ug/Kg			09/13/17 10:41	1
1,3-Dichlorobenzene	0.71	U	5.0	0.71	ug/Kg			09/13/17 10:41	1
1,4-Dichlorobenzene	0.66	U	5.0	0.66	ug/Kg			09/13/17 10:41	1
1,4-Dioxane	62	U	500	62	ug/Kg			09/13/17 10:41	1
2-Butanone (MEK)	1.9	U	10	1.9	ug/Kg			09/13/17 10:41	1
2-Hexanone	3.59	J	10	1.0	ug/Kg			09/13/17 10:41	1
4-Methyl-2-pentanone (MIBK)	1.5	U	10	1.5	ug/Kg			09/13/17 10:41	1
Acetone	1.7	U	10	1.7	ug/Kg			09/13/17 10:41	1
Benzene	0.63	U	5.0	0.63	ug/Kg			09/13/17 10:41	1
Bromochloromethane	1.8	U	5.0	1.8	ug/Kg			09/13/17 10:41	1
Bromodichloromethane	0.66	U	5.0	0.66	ug/Kg			09/13/17 10:41	1
Bromoform	1.4	U	5.0	1.4	ug/Kg			09/13/17 10:41	1
Bromomethane	0.83	U	10	0.83	ug/Kg			09/13/17 10:41	1
Carbon disulfide	0.55	U	10	0.55	ug/Kg			09/13/17 10:41	1
Carbon tetrachloride	1.1	U	5.0	1.1	ug/Kg			09/13/17 10:41	1
Chlorobenzene	0.96	U	5.0	0.96	ug/Kg			09/13/17 10:41	1
Chloroethane	1.4	U	10	1.4	ug/Kg			09/13/17 10:41	1
Chloroform	0.66	U	10	0.66	ug/Kg			09/13/17 10:41	1
Chloromethane	1.7	U	10	1.7	ug/Kg			09/13/17 10:41	1
cis-1,2-Dichloroethene	0.83	U	5.0	0.83	ug/Kg			09/13/17 10:41	1
cis-1,3-Dichloropropene	0.54	U	5.0	0.54	ug/Kg			09/13/17 10:41	1
Cyclohexane	1.9	U	5.0	1.9	ug/Kg			09/13/17 10:41	1
Dibromochloromethane	0.94	U	5.0	0.94	ug/Kg			09/13/17 10:41	1
Dichlorodifluoromethane	1.5	U	5.0	1.5	ug/Kg			09/13/17 10:41	1
Ethylbenzene	1.0	U	5.0	1.0	ug/Kg			09/13/17 10:41	1
Isopropylbenzene	0.92	U	5.0	0.92	ug/Kg			09/13/17 10:41	1
Methyl acetate	2.9	U	5.0	2.9	ug/Kg			09/13/17 10:41	1
Methyl tert-butyl ether	1.8	U	5.0	1.8	ug/Kg			09/13/17 10:41	1
Methylcyclohexane	1.5	U	5.0	1.5	ug/Kg			09/13/17 10:41	1
Methylene Chloride	2.2	U	10	2.2	ug/Kg			09/13/17 10:41	1
m-Xylene & p-Xylene	1.5	U	5.0	1.5	ug/Kg			09/13/17 10:41	1
o-Xylene	1.1	U	5.0	1.1	ug/Kg			09/13/17 10:41	1
Styrene	0.71	U	5.0	0.71	ug/Kg			09/13/17 10:41	1
Tetrachloroethene	0.71	U	5.0	0.71	ug/Kg			09/13/17 10:41	1
Toluene	1.4	U	5.0	1.4	ug/Kg			09/13/17 10:41	1

TestAmerica Houston

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 600-221194/6

Matrix: Solid

Analysis Batch: 221194

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	1.1	U	5.0	1.1	ug/Kg			09/13/17 10:41	1
trans-1,3-Dichloropropene	0.58	U	5.0	0.58	ug/Kg			09/13/17 10:41	1
Trichloroethene	1.4	U	5.0	1.4	ug/Kg			09/13/17 10:41	1
Trichlorofluoromethane	0.66	U	10	0.66	ug/Kg			09/13/17 10:41	1
Vinyl acetate	0.93	U	10	0.93	ug/Kg			09/13/17 10:41	1
Vinyl chloride	0.90	U	10	0.90	ug/Kg			09/13/17 10:41	1
Xylenes, Total	1.1	U	5.0	1.1	ug/Kg			09/13/17 10:41	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	85		61 - 130					09/13/17 10:41	1
4-Bromofluorobenzene	110		57 - 140					09/13/17 10:41	1
Dibromofluoromethane	74		68 - 140					09/13/17 10:41	1
Toluene-d8 (Surr)	83		50 - 130					09/13/17 10:41	1

Lab Sample ID: LCS 600-221194/3

Matrix: Solid

Analysis Batch: 221194

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	50.0	42.8		ug/Kg		86	59 - 130
1,1,2,2-Tetrachloroethane	50.0	54.0		ug/Kg		108	61 - 138
1,1,2-Trichloro-1,2,2-trifluoroethane	50.0	46.2		ug/Kg		92	48 - 150
1,1,2-Trichloroethane	50.0	59.3		ug/Kg		119	67 - 134
1,1-Dichloroethane	50.0	44.1		ug/Kg		88	63 - 140
1,1-Dichloroethene	50.0	44.6		ug/Kg		89	62 - 142
1,2,3-Trichlorobenzene	50.0	41.5		ug/Kg		83	52 - 135
1,2,4-Trichlorobenzene	50.0	40.8		ug/Kg		82	53 - 136
1,2-Dibromo-3-Chloropropane	50.0	47.0		ug/Kg		94	29 - 150
1,2-Dibromoethane	50.0	64.3		ug/Kg		129	65 - 136
1,2-Dichlorobenzene	50.0	44.2		ug/Kg		88	61 - 131
1,2-Dichloroethane	50.0	57.5		ug/Kg		115	58 - 137
1,2-Dichloroethene, Total	100	96.2		ug/Kg		96	70 - 130
1,2-Dichloropropane	50.0	56.1		ug/Kg		112	70 - 130
1,3-Dichlorobenzene	50.0	48.0		ug/Kg		96	63 - 132
1,4-Dichlorobenzene	50.0	48.3		ug/Kg		97	65 - 131
1,4-Dioxane	1000	1390		ug/Kg		139	31 - 150
2-Butanone (MEK)	100	142		ug/Kg		142	33 - 150
2-Hexanone	100	109		ug/Kg		109	35 - 150
4-Methyl-2-pentanone (MIBK)	100	128		ug/Kg		128	21 - 150
Acetone	100	149		ug/Kg		149	13 - 150
Benzene	50.0	49.9		ug/Kg		100	70 - 131
Bromochloromethane	50.0	55.3		ug/Kg		111	70 - 132
Bromodichloromethane	50.0	56.5		ug/Kg		113	67 - 138
Bromoform	50.0	61.7		ug/Kg		123	43 - 150
Bromomethane	50.0	32.0		ug/Kg		64	37 - 147
Carbon disulfide	50.0	37.5		ug/Kg		75	51 - 141
Carbon tetrachloride	50.0	44.0		ug/Kg		88	58 - 130

TestAmerica Houston

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 600-221194/3

Matrix: Solid

Analysis Batch: 221194

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chlorobenzene	50.0	52.6		ug/Kg		105	63 - 131
Chloroethane	50.0	29.1		ug/Kg		58	40 - 150
Chloroform	50.0	46.5		ug/Kg		93	69 - 130
Chloromethane	50.0	38.1		ug/Kg		76	44 - 141
cis-1,2-Dichloroethene	50.0	46.8		ug/Kg		94	70 - 130
cis-1,3-Dichloropropene	50.0	54.8		ug/Kg		110	65 - 130
Cyclohexane	50.0	45.5		ug/Kg		91	54 - 130
Dibromochloromethane	50.0	56.9		ug/Kg		114	65 - 134
Dichlorodifluoromethane	50.0	35.4		ug/Kg		71	24 - 147
Ethylbenzene	50.0	48.1		ug/Kg		96	66 - 130
Isopropylbenzene	50.0	42.6		ug/Kg		85	64 - 131
Methyl acetate	250	320		ug/Kg		128	10 - 150
Methyl tert-butyl ether	50.0	49.6		ug/Kg		99	63 - 132
Methylcyclohexane	50.0	46.8		ug/Kg		94	51 - 137
Methylene Chloride	50.0	45.7		ug/Kg		91	61 - 150
m-Xylene & p-Xylene	50.0	46.7		ug/Kg		93	64 - 130
o-Xylene	50.0	42.5		ug/Kg		85	62 - 130
Styrene	50.0	51.9		ug/Kg		104	65 - 133
Tetrachloroethene	50.0	47.7		ug/Kg		95	43 - 143
Toluene	50.0	47.7		ug/Kg		95	67 - 130
trans-1,2-Dichloroethene	50.0	49.4		ug/Kg		99	69 - 130
trans-1,3-Dichloropropene	50.0	65.5	*	ug/Kg		131	70 - 130
Trichloroethene	50.0	53.1		ug/Kg		106	63 - 135
Trichlorofluoromethane	50.0	37.3		ug/Kg		75	53 - 134
Vinyl acetate	100	125		ug/Kg		125	40 - 150
Vinyl chloride	50.0	44.0		ug/Kg		88	40 - 148
Xylenes, Total	100	89.2		ug/Kg		89	63 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	94		61 - 130
4-Bromofluorobenzene	134		57 - 140
Dibromofluoromethane	89		68 - 140
Toluene-d8 (Surr)	97		50 - 130

Lab Sample ID: LCSD 600-221194/4

Matrix: Solid

Analysis Batch: 221194

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	50.0	43.0		ug/Kg		86	59 - 130	1	30
1,1,2,2-Tetrachloroethane	50.0	39.7		ug/Kg		79	61 - 138	30	30
1,1,2-Trichloro-1,2,2-trifluoroethane	50.0	46.5		ug/Kg		93	48 - 150	1	30
1,1,2-Trichloroethane	50.0	49.5		ug/Kg		99	67 - 134	18	30
1,1-Dichloroethane	50.0	43.2		ug/Kg		86	63 - 140	2	30
1,1-Dichloroethene	50.0	43.9		ug/Kg		88	62 - 142	1	30
1,2,3-Trichlorobenzene	50.0	29.9	*	ug/Kg		60	52 - 135	33	30
1,2,4-Trichlorobenzene	50.0	30.9		ug/Kg		62	53 - 136	28	30

TestAmerica Houston

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 600-221194/4

Matrix: Solid

Analysis Batch: 221194

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromo-3-Chloropropane	50.0	29.7	*	ug/Kg		59	29 - 150	45	30
1,2-Dibromoethane	50.0	52.0		ug/Kg		104	65 - 136	21	30
1,2-Dichlorobenzene	50.0	40.3		ug/Kg		81	61 - 131	9	30
1,2-Dichloroethane	50.0	47.9		ug/Kg		96	58 - 137	18	30
1,2-Dichloroethene, Total	100	91.3		ug/Kg		91	70 - 130	5	30
1,2-Dichloropropane	50.0	51.6		ug/Kg		103	70 - 130	8	30
1,3-Dichlorobenzene	50.0	45.3		ug/Kg		91	63 - 132	6	30
1,4-Dichlorobenzene	50.0	46.1		ug/Kg		92	65 - 131	5	30
1,4-Dioxane	1000	668	*	ug/Kg		67	31 - 150	70	30
2-Butanone (MEK)	100	76.1	*	ug/Kg		76	33 - 150	60	30
2-Hexanone	100	75.5	*	ug/Kg		75	35 - 150	36	30
4-Methyl-2-pentanone (MIBK)	100	83.5	*	ug/Kg		83	21 - 150	42	30
Acetone	100	36.9	*	ug/Kg		37	13 - 150	120	30
Benzene	50.0	48.1		ug/Kg		96	70 - 131	4	30
Bromochloromethane	50.0	47.3		ug/Kg		95	70 - 132	16	30
Bromodichloromethane	50.0	50.8		ug/Kg		102	67 - 138	11	30
Bromoform	50.0	49.2		ug/Kg		98	43 - 150	23	30
Bromomethane	50.0	38.3		ug/Kg		77	37 - 147	18	30
Carbon disulfide	50.0	37.9		ug/Kg		76	51 - 141	1	30
Carbon tetrachloride	50.0	42.6		ug/Kg		85	58 - 130	3	30
Chlorobenzene	50.0	49.7		ug/Kg		99	63 - 131	6	30
Chloroethane	50.0	31.3		ug/Kg		63	40 - 150	7	30
Chloroform	50.0	44.5		ug/Kg		89	69 - 130	4	30
Chloromethane	50.0	40.9		ug/Kg		82	44 - 141	7	30
cis-1,2-Dichloroethene	50.0	44.7		ug/Kg		89	70 - 130	5	30
cis-1,3-Dichloropropene	50.0	49.9		ug/Kg		100	65 - 130	9	30
Cyclohexane	50.0	45.1		ug/Kg		90	54 - 130	1	30
Dibromochloromethane	50.0	49.3		ug/Kg		99	65 - 134	14	30
Dichlorodifluoromethane	50.0	37.2		ug/Kg		74	24 - 147	5	30
Ethylbenzene	50.0	45.3		ug/Kg		91	66 - 130	6	30
Isopropylbenzene	50.0	40.3		ug/Kg		81	64 - 131	6	30
Methyl acetate	250	186	*	ug/Kg		74	10 - 150	53	30
Methyl tert-butyl ether	50.0	40.4		ug/Kg		81	63 - 132	21	30
Methylcyclohexane	50.0	44.4		ug/Kg		89	51 - 137	5	30
Methylene Chloride	50.0	42.5		ug/Kg		85	61 - 150	7	30
m-Xylene & p-Xylene	50.0	44.3		ug/Kg		89	64 - 130	5	30
o-Xylene	50.0	40.2		ug/Kg		80	62 - 130	5	30
Styrene	50.0	49.4		ug/Kg		99	65 - 133	5	30
Tetrachloroethene	50.0	45.5		ug/Kg		91	43 - 143	5	30
Toluene	50.0	46.0		ug/Kg		92	67 - 130	4	30
trans-1,2-Dichloroethene	50.0	46.6		ug/Kg		93	69 - 130	6	30
trans-1,3-Dichloropropene	50.0	56.6		ug/Kg		113	70 - 130	15	30
Trichloroethene	50.0	49.8		ug/Kg		100	63 - 135	6	30
Trichlorofluoromethane	50.0	39.7		ug/Kg		79	53 - 134	6	30
Vinyl acetate	100	92.0		ug/Kg		92	40 - 150	30	30
Vinyl chloride	50.0	47.7		ug/Kg		95	40 - 148	8	30
Xylenes, Total	100	84.5		ug/Kg		85	63 - 130	5	30

TestAmerica Houston

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 600-221194/4

Matrix: Solid

Analysis Batch: 221194

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	78		61 - 130
4-Bromofluorobenzene	131		57 - 140
Dibromofluoromethane	82		68 - 140
Toluene-d8 (Surr)	95		50 - 130

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 600-221308/1-A

Matrix: Solid

Analysis Batch: 221338

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 221308

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	4.0	U	33	4.0	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
1,2,4,5-Tetrachlorobenzene	6.8	U	33	6.8	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2,3,4,6-Tetrachlorophenol	17	U	33	17	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2,4,5-Trichlorophenol	10	U	33	10	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2,4,6-Trichlorophenol	2.7	U	33	2.7	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2,4-Dichlorophenol	3.9	U	33	3.9	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2,4-Dimethylphenol	8.6	U	33	8.6	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2,4-Dinitrophenol	4.7	U	100	4.7	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2,4-Dinitrotoluene	3.6	U	33	3.6	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2,6-Dinitrotoluene	3.0	U	33	3.0	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2-Chloronaphthalene	1.2	U	33	1.2	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2-Chlorophenol	2.0	U	33	2.0	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2-Methylnaphthalene	2.7	U	33	2.7	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2-Methylphenol	3.2	U	33	3.2	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2-Nitroaniline	4.9	U	33	4.9	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
2-Nitrophenol	3.9	U	33	3.9	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
3 & 4 Methylphenol	2.8	U	33	2.8	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
3,3'-Dichlorobenzidine	10	U	33	10	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
3-Nitroaniline	7.2	U	33	7.2	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
4,6-Dinitro-2-methylphenol	5.0	U	170	5.0	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
4-Bromophenyl phenyl ether	2.8	U	33	2.8	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
4-Chloro-3-methylphenol	16	U	33	16	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
4-Chloroaniline	5.8	U	33	5.8	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
4-Chlorophenyl phenyl ether	1.8	U	33	1.8	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
4-Nitroaniline	11	U	33	11	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
4-Nitrophenol	5.1	U	200	5.1	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Acenaphthene	1.4	U	33	1.4	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Acenaphthylene	1.0	U	33	1.0	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Acetophenone	3.3	U	33	3.3	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Anthracene	1.3	U	33	1.3	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Atrazine	5.0	U	33	5.0	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Benzaldehyde	17	U	33	17	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Benzo[a]anthracene	1.4	U	33	1.4	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Benzo[a]pyrene	1.6	U	33	1.6	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Benzo[b]fluoranthene	1.7	U	33	1.7	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Benzo[g,h,i]perylene	5.1	U	33	5.1	ug/Kg		09/14/17 09:18	09/14/17 14:23	1

TestAmerica Houston

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: MB 600-221308/1-A

Matrix: Solid

Analysis Batch: 221338

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 221308

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[k]fluoranthene	1.5	U	33	1.5	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
bis (2-Chloroisopropyl) ether	8.8	U	33	8.8	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Bis(2-chloroethoxy)methane	1.4	U	33	1.4	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Bis(2-chloroethyl)ether	1.7	U	33	1.7	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Bis(2-ethylhexyl) phthalate	5.4	U	33	5.4	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Butyl benzyl phthalate	6.2	U	67	6.2	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Caprolactam	17	U	33	17	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Carbazole	3.1	U	33	3.1	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Chrysene	1.0	U	33	1.0	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Dibenz(a,h)anthracene	3.6	U	33	3.6	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Dibenzofuran	1.8	U	33	1.8	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Diethyl phthalate	8.4	U	67	8.4	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Dimethyl phthalate	4.9	U	67	4.9	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Di-n-butyl phthalate	2.6	U	67	2.6	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Di-n-octyl phthalate	1.9	U	67	1.9	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Fluoranthene	3.1	U	33	3.1	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Fluorene	2.4	U	33	2.4	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Hexachlorobenzene	1.5	U	33	1.5	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Hexachlorobutadiene	1.9	U	33	1.9	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Hexachlorocyclopentadiene	4.6	U	33	4.6	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Hexachloroethane	2.3	U	33	2.3	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Indeno[1,2,3-cd]pyrene	3.5	U	33	3.5	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Isophorone	1.0	U	33	1.0	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Naphthalene	1.4	U	33	1.4	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Nitrobenzene	3.0	U	33	3.0	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
N-Nitrosodi-n-propylamine	2.2	U	33	2.2	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
N-Nitrosodiphenylamine	1.9	U	33	1.9	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Pentachlorophenol	4.0	U	170	4.0	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Phenanthrene	5.0	U	33	5.0	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Phenol	4.2	U	33	4.2	ug/Kg		09/14/17 09:18	09/14/17 14:23	1
Pyrene	1.8	U	33	1.8	ug/Kg		09/14/17 09:18	09/14/17 14:23	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	67		10 - 148	09/14/17 09:18	09/14/17 14:23	1
2-Fluorobiphenyl	65		38 - 130	09/14/17 09:18	09/14/17 14:23	1
2-Fluorophenol	71		25 - 132	09/14/17 09:18	09/14/17 14:23	1
Nitrobenzene-d5	68		10 - 155	09/14/17 09:18	09/14/17 14:23	1
Phenol-d5 (Surr)	67		27 - 130	09/14/17 09:18	09/14/17 14:23	1
Terphenyl-d14	78		53 - 134	09/14/17 09:18	09/14/17 14:23	1

Lab Sample ID: LCS 600-221308/2-A

Matrix: Solid

Analysis Batch: 221338

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 221308

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1'-Biphenyl	667	469		ug/Kg		70	40 - 130
1,2,4,5-Tetrachlorobenzene	667	523		ug/Kg		78	37 - 130
2,3,4,6-Tetrachlorophenol	667	491		ug/Kg		74	44 - 130

TestAmerica Houston

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCS 600-221308/2-A

Matrix: Solid

Analysis Batch: 221338

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 221308

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4,5-Trichlorophenol	667	539		ug/Kg		81	41 - 130
2,4,6-Trichlorophenol	667	488		ug/Kg		73	39 - 130
2,4-Dichlorophenol	667	481		ug/Kg		72	38 - 130
2,4-Dimethylphenol	667	420		ug/Kg		63	32 - 139
2,4-Dinitrophenol	1330	953		ug/Kg		71	15 - 130
2,4-Dinitrotoluene	667	520		ug/Kg		78	45 - 130
2,6-Dinitrotoluene	667	523		ug/Kg		78	44 - 130
2-Chloronaphthalene	667	482		ug/Kg		72	41 - 130
2-Chlorophenol	667	501		ug/Kg		75	37 - 130
2-Methylnaphthalene	667	466		ug/Kg		70	43 - 130
2-Methylphenol	667	514		ug/Kg		77	30 - 130
2-Nitroaniline	667	387		ug/Kg		58	42 - 130
2-Nitrophenol	667	531		ug/Kg		80	38 - 130
3 & 4 Methylphenol	667	470		ug/Kg		70	28 - 133
3,3'-Dichlorobenzidine	667	549		ug/Kg		82	13 - 146
3-Nitroaniline	667	610		ug/Kg		92	41 - 130
4,6-Dinitro-2-methylphenol	1330	999		ug/Kg		75	38 - 130
4-Bromophenyl phenyl ether	667	554		ug/Kg		83	46 - 130
4-Chloro-3-methylphenol	667	499		ug/Kg		75	43 - 130
4-Chloroaniline	667	548		ug/Kg		82	32 - 130
4-Chlorophenyl phenyl ether	667	556		ug/Kg		83	44 - 130
4-Nitroaniline	667	703		ug/Kg		106	46 - 130
4-Nitrophenol	1330	588		ug/Kg		44	42 - 130
Acenaphthene	667	508		ug/Kg		76	42 - 130
Acenaphthylene	667	490		ug/Kg		73	39 - 130
Acetophenone	667	384		ug/Kg		58	36 - 130
Anthracene	667	514		ug/Kg		77	51 - 130
Atrazine	667	191		ug/Kg		29	10 - 140
Benzaldehyde	667	221		ug/Kg		33	10 - 130
Benzo[a]anthracene	667	534		ug/Kg		80	54 - 130
Benzo[a]pyrene	667	609		ug/Kg		91	44 - 131
Benzo[b]fluoranthene	667	597		ug/Kg		90	41 - 139
Benzo[g,h,i]perylene	667	587		ug/Kg		88	38 - 142
Benzo[k]fluoranthene	667	532		ug/Kg		80	42 - 134
bis (2-Chloroisopropyl) ether	667	381		ug/Kg		57	38 - 130
Bis(2-chloroethoxy)methane	667	459		ug/Kg		69	39 - 130
Bis(2-chloroethyl)ether	667	445		ug/Kg		67	40 - 130
Bis(2-ethylhexyl) phthalate	667	452		ug/Kg		68	41 - 145
Butyl benzyl phthalate	667	463		ug/Kg		70	48 - 141
Caprolactam	667	399		ug/Kg		60	41 - 130
Carbazole	667	700		ug/Kg		105	49 - 131
Chrysene	667	519		ug/Kg		78	52 - 130
Dibenz(a,h)anthracene	667	557		ug/Kg		84	40 - 137
Dibenzofuran	667	515		ug/Kg		77	43 - 130
Diethyl phthalate	667	505		ug/Kg		76	50 - 130
Dimethyl phthalate	667	528		ug/Kg		79	40 - 130
Di-n-butyl phthalate	667	488		ug/Kg		73	51 - 135
Di-n-octyl phthalate	667	471		ug/Kg		71	38 - 153

TestAmerica Houston

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCS 600-221308/2-A

Matrix: Solid

Analysis Batch: 221338

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 221308

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoranthene	667	553		ug/Kg		83	53 - 130
Fluorene	667	511		ug/Kg		77	46 - 130
Hexachlorobenzene	667	550		ug/Kg		83	44 - 130
Hexachlorobutadiene	667	548		ug/Kg		82	36 - 130
Hexachlorocyclopentadiene	667	112		ug/Kg		17	10 - 130
Hexachloroethane	667	472		ug/Kg		71	37 - 130
Indeno[1,2,3-cd]pyrene	667	567		ug/Kg		85	35 - 146
Isophorone	667	373		ug/Kg		56	39 - 130
Naphthalene	667	504		ug/Kg		76	40 - 130
Nitrobenzene	667	438		ug/Kg		66	42 - 130
N-Nitrosodi-n-propylamine	667	429		ug/Kg		64	36 - 130
N-Nitrosodiphenylamine	667	517		ug/Kg		78	48 - 130
Pentachlorophenol	1330	841		ug/Kg		63	40 - 130
Phenanthrene	667	524		ug/Kg		79	51 - 130
Phenol	667	471		ug/Kg		71	30 - 130
Pyrene	667	526		ug/Kg		79	53 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4,6-Tribromophenol	82		10 - 148
2-Fluorobiphenyl	77		38 - 130
2-Fluorophenol	75		25 - 132
Nitrobenzene-d5	72		10 - 155
Phenol-d5 (Surr)	73		27 - 130
Terphenyl-d14	85		53 - 134

Lab Sample ID: LCSD 600-221308/3-A

Matrix: Solid

Analysis Batch: 221338

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 221308

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
1,1'-Biphenyl	667	479		ug/Kg		72	40 - 130	2	30
1,2,4,5-Tetrachlorobenzene	667	538		ug/Kg		81	37 - 130	3	30
2,3,4,6-Tetrachlorophenol	667	528		ug/Kg		79	44 - 130	7	30
2,4,5-Trichlorophenol	667	555		ug/Kg		83	41 - 130	3	30
2,4,6-Trichlorophenol	667	498		ug/Kg		75	39 - 130	2	30
2,4-Dichlorophenol	667	477		ug/Kg		72	38 - 130	1	30
2,4-Dimethylphenol	667	452		ug/Kg		68	32 - 139	7	30
2,4-Dinitrophenol	1330	917		ug/Kg		69	15 - 130	4	30
2,4-Dinitrotoluene	667	546		ug/Kg		82	45 - 130	5	30
2,6-Dinitrotoluene	667	532		ug/Kg		80	44 - 130	2	30
2-Chloronaphthalene	667	487		ug/Kg		73	41 - 130	1	30
2-Chlorophenol	667	517		ug/Kg		78	37 - 130	3	30
2-Methylnaphthalene	667	489		ug/Kg		73	43 - 130	5	30
2-Methylphenol	667	473		ug/Kg		71	30 - 130	8	30
2-Nitroaniline	667	397		ug/Kg		60	42 - 130	3	30
2-Nitrophenol	667	534		ug/Kg		80	38 - 130	1	30
3 & 4 Methylphenol	667	478		ug/Kg		72	28 - 133	2	30
3,3'-Dichlorobenzidine	667	579		ug/Kg		87	13 - 146	5	30

TestAmerica Houston

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 600-221308/3-A

Matrix: Solid

Analysis Batch: 221338

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 221308

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
3-Nitroaniline	667	626		ug/Kg		94	41 - 130	3	30
4,6-Dinitro-2-methylphenol	1330	1020		ug/Kg		77	38 - 130	2	30
4-Bromophenyl phenyl ether	667	599		ug/Kg		90	46 - 130	8	30
4-Chloro-3-methylphenol	667	491		ug/Kg		74	43 - 130	2	30
4-Chloroaniline	667	530		ug/Kg		79	32 - 130	3	30
4-Chlorophenyl phenyl ether	667	573		ug/Kg		86	44 - 130	3	30
4-Nitroaniline	667	771		ug/Kg		116	46 - 130	9	30
4-Nitrophenol	1330	746		ug/Kg		56	42 - 130	24	30
Acenaphthene	667	515		ug/Kg		77	42 - 130	1	30
Acenaphthylene	667	503		ug/Kg		75	39 - 130	3	30
Acetophenone	667	378		ug/Kg		57	36 - 130	2	30
Anthracene	667	538		ug/Kg		81	51 - 130	4	30
Atrazine	667	197		ug/Kg		30	10 - 140	3	30
Benzaldehyde	667	142 *		ug/Kg		21	10 - 130	44	30
Benzo[a]anthracene	667	559		ug/Kg		84	54 - 130	4	30
Benzo[a]pyrene	667	636		ug/Kg		95	44 - 131	4	30
Benzo[b]fluoranthene	667	616		ug/Kg		92	41 - 139	3	30
Benzo[g,h,i]perylene	667	617		ug/Kg		93	38 - 142	5	30
Benzo[k]fluoranthene	667	565		ug/Kg		85	42 - 134	6	30
bis (2-Chloroisopropyl) ether	667	390		ug/Kg		59	38 - 130	2	30
Bis(2-chloroethoxy)methane	667	468		ug/Kg		70	39 - 130	2	30
Bis(2-chloroethyl)ether	667	463		ug/Kg		70	40 - 130	4	30
Bis(2-ethylhexyl) phthalate	667	470		ug/Kg		71	41 - 145	4	30
Butyl benzyl phthalate	667	479		ug/Kg		72	48 - 141	3	30
Caprolactam	667	430		ug/Kg		65	41 - 130	7	30
Carbazole	667	738		ug/Kg		111	49 - 131	5	30
Chrysene	667	534		ug/Kg		80	52 - 130	3	30
Dibenz(a,h)anthracene	667	590		ug/Kg		88	40 - 137	6	30
Dibenzofuran	667	527		ug/Kg		79	43 - 130	2	30
Diethyl phthalate	667	534		ug/Kg		80	50 - 130	6	30
Dimethyl phthalate	667	535		ug/Kg		80	40 - 130	1	30
Di-n-butyl phthalate	667	515		ug/Kg		77	51 - 135	5	30
Di-n-octyl phthalate	667	491		ug/Kg		74	38 - 153	4	30
Fluoranthene	667	579		ug/Kg		87	53 - 130	5	30
Fluorene	667	538		ug/Kg		81	46 - 130	5	30
Hexachlorobenzene	667	575		ug/Kg		86	44 - 130	5	30
Hexachlorobutadiene	667	554		ug/Kg		83	36 - 130	1	30
Hexachlorocyclopentadiene	667	123		ug/Kg		18	10 - 130	9	30
Hexachloroethane	667	476		ug/Kg		71	37 - 130	1	30
Indeno[1,2,3-cd]pyrene	667	592		ug/Kg		89	35 - 146	4	30
Isophorone	667	374		ug/Kg		56	39 - 130	0	30
Naphthalene	667	513		ug/Kg		77	40 - 130	2	30
Nitrobenzene	667	439		ug/Kg		66	42 - 130	0	30
N-Nitrosodi-n-propylamine	667	443		ug/Kg		66	36 - 130	3	30
N-Nitrosodiphenylamine	667	542		ug/Kg		81	48 - 130	5	30
Pentachlorophenol	1330	863		ug/Kg		65	40 - 130	3	30
Phenanthrene	667	548		ug/Kg		82	51 - 130	4	30
Phenol	667	486		ug/Kg		73	30 - 130	3	30

TestAmerica Houston

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 600-221308/3-A

Matrix: Solid

Analysis Batch: 221338

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 221308

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pyrene	667	543		ug/Kg		81	53 - 130	3	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
2,4,6-Tribromophenol	82		10 - 148
2-Fluorobiphenyl	74		38 - 130
2-Fluorophenol	75		25 - 132
Nitrobenzene-d5	68		10 - 155
Phenol-d5 (Surr)	71		27 - 130
Terphenyl-d14	84		53 - 134

Lab Sample ID: MB 600-221420/1-A

Matrix: Solid

Analysis Batch: 221418

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 221420

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	4.0	U	33	4.0	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
1,2,4,5-Tetrachlorobenzene	6.8	U	33	6.8	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2,3,4,6-Tetrachlorophenol	17	U	33	17	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2,4,5-Trichlorophenol	10	U	33	10	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2,4,6-Trichlorophenol	2.7	U	33	2.7	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2,4-Dichlorophenol	3.9	U	33	3.9	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2,4-Dimethylphenol	8.6	U	33	8.6	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2,4-Dinitrophenol	4.7	U	100	4.7	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2,4-Dinitrotoluene	3.6	U	33	3.6	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2,6-Dinitrotoluene	3.0	U	33	3.0	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2-Chloronaphthalene	1.2	U	33	1.2	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2-Chlorophenol	2.0	U	33	2.0	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2-Methylnaphthalene	2.7	U	33	2.7	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2-Methylphenol	3.2	U	33	3.2	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2-Nitroaniline	4.9	U	33	4.9	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
2-Nitrophenol	3.9	U	33	3.9	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
3 & 4 Methylphenol	2.8	U	33	2.8	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
3,3'-Dichlorobenzidine	10	U	33	10	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
3-Nitroaniline	7.2	U	33	7.2	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
4,6-Dinitro-2-methylphenol	5.0	U	170	5.0	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
4-Bromophenyl phenyl ether	2.8	U	33	2.8	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
4-Chloro-3-methylphenol	16	U	33	16	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
4-Chloroaniline	5.8	U	33	5.8	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
4-Chlorophenyl phenyl ether	1.8	U	33	1.8	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
4-Nitroaniline	11	U	33	11	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
4-Nitrophenol	5.1	U	200	5.1	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Acenaphthene	1.4	U	33	1.4	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Acenaphthylene	1.0	U	33	1.0	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Acetophenone	3.3	U	33	3.3	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Anthracene	1.3	U	33	1.3	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Atrazine	5.0	U	33	5.0	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Benzaldehyde	17	U	33	17	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Benzo[a]anthracene	1.4	U	33	1.4	ug/Kg		09/15/17 11:17	09/15/17 12:57	1

TestAmerica Houston

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: MB 600-221420/1-A

Matrix: Solid

Analysis Batch: 221418

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 221420

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]pyrene	1.6	U	33	1.6	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Benzo[b]fluoranthene	1.7	U	33	1.7	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Benzo[g,h,i]perylene	5.1	U	33	5.1	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Benzo[k]fluoranthene	1.5	U	33	1.5	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
bis (2-Chloroisopropyl) ether	8.8	U	33	8.8	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Bis(2-chloroethoxy)methane	1.4	U	33	1.4	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Bis(2-chloroethyl)ether	1.7	U	33	1.7	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Bis(2-ethylhexyl) phthalate	5.4	U	33	5.4	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Butyl benzyl phthalate	6.2	U	67	6.2	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Caprolactam	17	U	33	17	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Carbazole	3.1	U	33	3.1	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Chrysene	1.0	U	33	1.0	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Dibenz(a,h)anthracene	3.6	U	33	3.6	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Dibenzofuran	1.8	U	33	1.8	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Diethyl phthalate	8.4	U	67	8.4	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Dimethyl phthalate	4.9	U	67	4.9	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Di-n-butyl phthalate	2.6	U	67	2.6	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Di-n-octyl phthalate	1.9	U	67	1.9	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Fluoranthene	3.1	U	33	3.1	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Fluorene	2.4	U	33	2.4	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Hexachlorobenzene	1.5	U	33	1.5	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Hexachlorobutadiene	1.9	U	33	1.9	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Hexachlorocyclopentadiene	4.6	U	33	4.6	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Hexachloroethane	2.3	U	33	2.3	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Indeno[1,2,3-cd]pyrene	3.5	U	33	3.5	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Isophorone	1.0	U	33	1.0	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Naphthalene	1.4	U	33	1.4	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Nitrobenzene	3.0	U	33	3.0	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
N-Nitrosodi-n-propylamine	2.2	U	33	2.2	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
N-Nitrosodiphenylamine	1.9	U	33	1.9	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Pentachlorophenol	4.0	U	170	4.0	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Phenanthrene	5.0	U	33	5.0	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Phenol	4.2	U	33	4.2	ug/Kg		09/15/17 11:17	09/15/17 12:57	1
Pyrene	1.8	U	33	1.8	ug/Kg		09/15/17 11:17	09/15/17 12:57	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	64		10 - 148	09/15/17 11:17	09/15/17 12:57	1
2-Fluorobiphenyl	77		38 - 130	09/15/17 11:17	09/15/17 12:57	1
2-Fluorophenol	70		25 - 132	09/15/17 11:17	09/15/17 12:57	1
Nitrobenzene-d5	69		10 - 155	09/15/17 11:17	09/15/17 12:57	1
Phenol-d5 (Surr)	64		27 - 130	09/15/17 11:17	09/15/17 12:57	1
Terphenyl-d14	80		53 - 134	09/15/17 11:17	09/15/17 12:57	1

TestAmerica Houston

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCS 600-221420/2-A

Matrix: Solid

Analysis Batch: 221418

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 221420

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1'-Biphenyl	667	471		ug/Kg		71	40 - 130
1,2,4,5-Tetrachlorobenzene	667	534		ug/Kg		80	37 - 130
2,3,4,6-Tetrachlorophenol	667	496		ug/Kg		74	44 - 130
2,4,5-Trichlorophenol	667	493		ug/Kg		74	41 - 130
2,4,6-Trichlorophenol	667	485		ug/Kg		73	39 - 130
2,4-Dichlorophenol	667	495		ug/Kg		74	38 - 130
2,4-Dimethylphenol	667	424		ug/Kg		64	32 - 139
2,4-Dinitrophenol	1330	946		ug/Kg		71	15 - 130
2,4-Dinitrotoluene	667	515		ug/Kg		77	45 - 130
2,6-Dinitrotoluene	667	511		ug/Kg		77	44 - 130
2-Chloronaphthalene	667	482		ug/Kg		72	41 - 130
2-Chlorophenol	667	503		ug/Kg		75	37 - 130
2-Methylnaphthalene	667	475		ug/Kg		71	43 - 130
2-Methylphenol	667	516		ug/Kg		77	30 - 130
2-Nitroaniline	667	389		ug/Kg		58	42 - 130
2-Nitrophenol	667	525		ug/Kg		79	38 - 130
3 & 4 Methylphenol	667	479		ug/Kg		72	28 - 133
3,3'-Dichlorobenzidine	667	559		ug/Kg		84	13 - 146
3-Nitroaniline	667	596		ug/Kg		89	41 - 130
4,6-Dinitro-2-methylphenol	1330	1030		ug/Kg		77	38 - 130
4-Bromophenyl phenyl ether	667	552		ug/Kg		83	46 - 130
4-Chloro-3-methylphenol	667	492		ug/Kg		74	43 - 130
4-Chloroaniline	667	506		ug/Kg		76	32 - 130
4-Chlorophenyl phenyl ether	667	544		ug/Kg		82	44 - 130
4-Nitroaniline	667	737		ug/Kg		111	46 - 130
4-Nitrophenol	1330	702		ug/Kg		53	42 - 130
Acenaphthene	667	506		ug/Kg		76	42 - 130
Acenaphthylene	667	495		ug/Kg		74	39 - 130
Acetophenone	667	386		ug/Kg		58	36 - 130
Anthracene	667	520		ug/Kg		78	51 - 130
Atrazine	667	194		ug/Kg		29	10 - 140
Benzaldehyde	667	231		ug/Kg		35	10 - 130
Benzo[a]anthracene	667	534		ug/Kg		80	54 - 130
Benzo[a]pyrene	667	605		ug/Kg		91	44 - 131
Benzo[b]fluoranthene	667	619		ug/Kg		93	41 - 139
Benzo[g,h,i]perylene	667	728		ug/Kg		109	38 - 142
Benzo[k]fluoranthene	667	569		ug/Kg		85	42 - 134
bis (2-Chloroisopropyl) ether	667	387		ug/Kg		58	38 - 130
Bis(2-chloroethoxy)methane	667	451		ug/Kg		68	39 - 130
Bis(2-chloroethyl)ether	667	444		ug/Kg		67	40 - 130
Bis(2-ethylhexyl) phthalate	667	462		ug/Kg		69	41 - 145
Butyl benzyl phthalate	667	464		ug/Kg		70	48 - 141
Caprolactam	667	383		ug/Kg		57	41 - 130
Carbazole	667	708		ug/Kg		106	49 - 131
Chrysene	667	520		ug/Kg		78	52 - 130
Dibenz(a,h)anthracene	667	652		ug/Kg		98	40 - 137
Dibenzofuran	667	511		ug/Kg		77	43 - 130
Diethyl phthalate	667	503		ug/Kg		75	50 - 130

TestAmerica Houston

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCS 600-221420/2-A

Matrix: Solid

Analysis Batch: 221418

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 221420

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dimethyl phthalate	667	514		ug/Kg		77	40 - 130
Di-n-butyl phthalate	667	498		ug/Kg		75	51 - 135
Di-n-octyl phthalate	667	490		ug/Kg		74	38 - 153
Fluoranthene	667	563		ug/Kg		85	53 - 130
Fluorene	667	516		ug/Kg		77	46 - 130
Hexachlorobenzene	667	564		ug/Kg		85	44 - 130
Hexachlorobutadiene	667	564		ug/Kg		85	36 - 130
Hexachlorocyclopentadiene	667	100		ug/Kg		15	10 - 130
Hexachloroethane	667	473		ug/Kg		71	37 - 130
Indeno[1,2,3-cd]pyrene	667	657		ug/Kg		98	35 - 146
Isophorone	667	370		ug/Kg		55	39 - 130
Naphthalene	667	497		ug/Kg		75	40 - 130
Nitrobenzene	667	426		ug/Kg		64	42 - 130
N-Nitrosodi-n-propylamine	667	439		ug/Kg		66	36 - 130
N-Nitrosodiphenylamine	667	524		ug/Kg		79	48 - 130
Pentachlorophenol	1330	797		ug/Kg		60	40 - 130
Phenanthrene	667	529		ug/Kg		79	51 - 130
Phenol	667	476		ug/Kg		71	30 - 130
Pyrene	667	525		ug/Kg		79	53 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4,6-Tribromophenol	83		10 - 148
2-Fluorobiphenyl	77		38 - 130
2-Fluorophenol	78		25 - 132
Nitrobenzene-d5	71		10 - 155
Phenol-d5 (Surr)	73		27 - 130
Terphenyl-d14	86		53 - 134

Method: 2540B - Percent Moisture

Lab Sample ID: 600-153749-3 DU

Matrix: Solid

Analysis Batch: 221266

Client Sample ID: FRS-SS-003

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	19.2		21.7		%			20
Percent Solids	80.8		78.3		%			20

TestAmerica Houston

QC Association Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

GC/MS VOA

Analysis Batch: 221194

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-153749-1	FRS-SS-001	Total/NA	Solid	8260B	221235
600-153749-2	FRS-SS-002	Total/NA	Solid	8260B	221235
600-153749-3	FRS-SS-003	Total/NA	Solid	8260B	221235
MB 600-221194/6	Method Blank	Total/NA	Solid	8260B	
LCS 600-221194/3	Lab Control Sample	Total/NA	Solid	8260B	
LCSD 600-221194/4	Lab Control Sample Dup	Total/NA	Solid	8260B	

Prep Batch: 221235

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-153749-1	FRS-SS-001	Total/NA	Solid	5035	
600-153749-2	FRS-SS-002	Total/NA	Solid	5035	
600-153749-3	FRS-SS-003	Total/NA	Solid	5035	

GC/MS Semi VOA

Prep Batch: 221308

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-153749-1	FRS-SS-001	Total/NA	Solid	3546	
600-153749-3	FRS-SS-003	Total/NA	Solid	3546	
MB 600-221308/1-A	Method Blank	Total/NA	Solid	3546	
LCS 600-221308/2-A	Lab Control Sample	Total/NA	Solid	3546	
LCSD 600-221308/3-A	Lab Control Sample Dup	Total/NA	Solid	3546	

Analysis Batch: 221338

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-153749-1	FRS-SS-001	Total/NA	Solid	8270C LL	221308
600-153749-3	FRS-SS-003	Total/NA	Solid	8270C LL	221308
MB 600-221308/1-A	Method Blank	Total/NA	Solid	8270C LL	221308
LCS 600-221308/2-A	Lab Control Sample	Total/NA	Solid	8270C LL	221308
LCSD 600-221308/3-A	Lab Control Sample Dup	Total/NA	Solid	8270C LL	221308

Analysis Batch: 221418

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 600-221420/1-A	Method Blank	Total/NA	Solid	8270C LL	221420
LCS 600-221420/2-A	Lab Control Sample	Total/NA	Solid	8270C LL	221420

Prep Batch: 221420

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-153749-2	FRS-SS-002	Total/NA	Solid	3546	
MB 600-221420/1-A	Method Blank	Total/NA	Solid	3546	
LCS 600-221420/2-A	Lab Control Sample	Total/NA	Solid	3546	

Analysis Batch: 221476

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-153749-2	FRS-SS-002	Total/NA	Solid	8270C LL	221420

TestAmerica Houston

QC Association Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

General Chemistry

Analysis Batch: 221266

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-153749-1	FRS-SS-001	Total/NA	Solid	2540B	
600-153749-2	FRS-SS-002	Total/NA	Solid	2540B	
600-153749-3	FRS-SS-003	Total/NA	Solid	2540B	
600-153749-3 DU	FRS-SS-003	Total/NA	Solid	2540B	

Lab Chronicle

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Client Sample ID: FRS-SS-001

Date Collected: 09/12/17 10:25

Date Received: 09/12/17 15:56

Lab Sample ID: 600-153749-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540B		1			221266	09/13/17 16:19	B1K	TAL HOU

Client Sample ID: FRS-SS-001

Date Collected: 09/12/17 10:25

Date Received: 09/12/17 15:56

Lab Sample ID: 600-153749-1

Matrix: Solid

Percent Solids: 78.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			6.556 g	5 mL	221235	09/12/17 19:00	WS1	TAL HOU
Total/NA	Analysis	8260B		1	5 g	5 g	221194	09/13/17 13:10	WS1	TAL HOU
Total/NA	Prep	3546			15.00 g	1.0 mL	221308	09/14/17 09:18	EAT	TAL HOU
Total/NA	Analysis	8270C LL		1			221338	09/14/17 15:36	TTD	TAL HOU

Client Sample ID: FRS-SS-002

Date Collected: 09/12/17 11:00

Date Received: 09/12/17 15:56

Lab Sample ID: 600-153749-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540B		1			221266	09/13/17 16:19	B1K	TAL HOU

Client Sample ID: FRS-SS-002

Date Collected: 09/12/17 11:00

Date Received: 09/12/17 15:56

Lab Sample ID: 600-153749-2

Matrix: Solid

Percent Solids: 78.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			6.116 g	5 mL	221235	09/12/17 19:00	WS1	TAL HOU
Total/NA	Analysis	8260B		1	5 g	5 g	221194	09/13/17 13:35	WS1	TAL HOU
Total/NA	Prep	3546			15.00 g	1.0 mL	221420	09/15/17 11:17	EAT	TAL HOU
Total/NA	Analysis	8270C LL		1	1 mL	1.0 mL	221476	09/16/17 07:34	TTD	TAL HOU

Client Sample ID: FRS-SS-003

Date Collected: 09/12/17 11:30

Date Received: 09/12/17 15:56

Lab Sample ID: 600-153749-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540B		1			221266	09/13/17 16:19	B1K	TAL HOU

Client Sample ID: FRS-SS-003

Date Collected: 09/12/17 11:30

Date Received: 09/12/17 15:56

Lab Sample ID: 600-153749-3

Matrix: Solid

Percent Solids: 78.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			6.192 g	5 mL	221235	09/12/17 19:00	WS1	TAL HOU

TestAmerica Houston

Lab Chronicle

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Client Sample ID: FRS-SS-003

Lab Sample ID: 600-153749-3

Date Collected: 09/12/17 11:30

Matrix: Solid

Date Received: 09/12/17 15:56

Percent Solids: 78.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 g	5 g	221194	09/13/17 13:59	WS1	TAL HOU
Total/NA	Prep	3546			15.02 g	1.0 mL	221308	09/14/17 09:18	EAT	TAL HOU
Total/NA	Analysis	8270C LL		1			221338	09/14/17 16:24	TTD	TAL HOU

Laboratory References:

TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

Accreditation/Certification Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Falcon Refinery

TestAmerica Job ID: 600-153749-1

Laboratory: TestAmerica Houston

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Texas	NELAP	6	T104704223-17-21	10-31-17

The following analytes are included in this report, but are not accredited/certified under this accreditation/certification:

Analysis Method	Prep Method	Matrix	Analyte
8260B	5035	Solid	Methyl acetate

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
2540B		Solid	Percent Moisture
2540B		Solid	Percent Solids
8260B	5035	Solid	1,2-Dichloroethene, Total
8260B	5035	Solid	Cyclohexane
8270C LL	3546	Solid	Atrazine
8270C LL	3546	Solid	Benzaldehyde

Chain of Custody Record

Client Information Client Contact: Mr. John Ynfante Company: CH2M Hill Constructors, Inc. Address: 14701 St. Mary's Lane Suite 300 City: Houston State/Zip: TX, 77079-2923 Phone: 281-721-8546(Tel) Email: john.ynfante@ch2m.com Project Name: Hurricane Harvey Environmental Response Site:		Lab PM: Upton, Cathy L E-Mail: cathy.upton@testamericainc.com Phone: 505 918 1800		Carrier Tracking No(s): 600-54931-16099-12 Page: Page 12 of 32 Job #:	
Due Date Requested: TAT Requested (days): PO #: Purchase Order not required WO #:		Analysis Requested			
Sample Identification FPS-SS-001 FPS-SS-002 FPS-SS-003		Sample Date 9/12/17 1 1	Sample Time 1025 1100 1130	Sample Type (C=Comp, G=grab) G/G G/G G/G	Matrix (W=Water, S=Solid, O=Other/Misc) Solid Solid Solid
Perform MS/MSD (Yes or No)		Field Filtered Sample (Yes or No)		Total Number of Containers	
6020, 7471A 8260B - TCL Volatiles TX - default 8270C - TCL 4.2 Default List 8082 - PCBs 300_ORGFM_28D, 9045C 6020, 7470A 8260B - TCL Volatiles TX - default 9040B - pH 300_ORGFM_28D, SM2310B		6020, 7471A 8260B - TCL Volatiles TX - default 8270C - TCL 4.2 Default List 8082 - PCBs 300_ORGFM_28D, 9045C 6020, 7470A 8260B - TCL Volatiles TX - default 9040B - pH 300_ORGFM_28D, SM2310B		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO4 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify) Other:	
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Special Instructions/QC Requirements:					
Empty Kit Relinquished by:					
Relinquished by: [Signature] Date/Time: 9/12/17 1530 Company: CH2M					
Relinquished by: [Signature] Date/Time: 9/12/17 1530 Company: CH2M					
Relinquished by: [Signature] Date/Time: 9/12/17 1530 Company: CH2M					
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
Cooler Temperature(s) °C and Other Remarks: 1.0°C 10.5°C					

Sample Receipt

JOB NUMBER: _____

UNPACKED BY: _____

Date/Time Received: _____

CLIENT: _____

CARRIER/DRIVER: _____

Custody Seal Present:

☐ YES☒ NO

Number of Coolers Received: _____

Cooler ID	Temp Blank	Trip Blank	Observed Temp (°C)	Therm ID	Therm CF	Corrected Temp (°C)
BLU	Y / N	Y / N	1.9	SEP	-3	1.6
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				

CF = correction factor

Samples received on ice?

☒ YES☐ NO

LABORATORY PRESERVATION OF SAMPLES REQUIRED:

☒ NO☐ YES

Base samples are > pH 12:

☐ YES☐ NO

Acid preserved are < pH 2:

☐ YES☐ NO

pH paper Lot # _____

VOA headspace acceptable (5-6mm):

☐ YES☐ NO☒ NA

YES NO

Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?

COMMENTS:

Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 600-153749-1

Login Number: 153749

List Source: TestAmerica Houston

List Number: 1

Creator: Crafton, Tommie S

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		