April 1, 2010

Shell Chemicals, LP
Deer Park Annex B3
5900 Hwy. 225
Deer Park, Texas 77536

Attention: Ms. Barbara Bessette-Henderson

ARI Project No. HRVOC-504-329

Ms. Bessette-Henderson:

Enclosed are the analytical results from the sampling performed at the Shell-Deer Park facility.

This is a complete analytical report for sampling conducted on February 10, 2010.

If you have any questions regarding this report please feel free to contact me at (713) 946-6222 ext. 109.

Respectfully,

Jim Presley
Senior Chemist
ARI Environmental, Inc.
1710 Preston Road, Unit C
Pasadena, Texas 77503

EXCELLENCE in ANALYSIS **CCAS** SOIL GAS ANALYSIS

## METHANE & ATMOSPHERIC GAS ANALYSIS by EPA 3C/ASTM D-1945, TCD/FID

| | | | | |
|---|---|---|---|---|
| Date Sampled: | 2/10/2010 | Barbara Bessette-Henderson | CCAS Log No.: | 1002012-01 |
| Date Received: | 2/17/2010 | ARI Environmental | Client Sample ID: | 15:58 |
| Date Analyzed: | 2/17&19/2010 | 1710 Preston Rd. # C | Description: | Ambient |
| Date Reported: | 3/25/2010 | Pasadena, TX 77503 | Client Job ID: | Shell Refinery |
| Analyst: | Daniel Florida, BS | | Canister Number: | 4568 |
| | Mei Ma, MS | | | |

EPA 3C/ASTM D 1945/1946

| Analyte | CAS # | Quantitat'n Limit | | Results | |
|---|---|---|---|---|---|
| | | ppmv | Percent | ppmv | Percent |
| Carbon Dioxide | 124-38-9 | 200 | 0.02 | 520 | 0.052 |
| Oxygen | 7782-44-7 | 300 | 0.03 | 209000 | 20.9 |
| Nitrogen | 7727-37-9 | 300 | 0.03 | 791000 | 79.1 |
| Methane | 74-82-8 | 1.0 | 0.0001 | ND | ND |
| VOC to C12 | | 0.002 | 0.0000002 | 0.39 | 0.000039 |
| Carbon Monoxide | 630-08-0 | (MDL) 10 | 0.0010 | ND | ND |

N.D. = Not Detected
N.R.=Not Requested

Dry gas basis

Respectfully submitted,

FFIX 1002012-01
MM/SCH

Stephen C. Havlicek, Ph.D.

CCAS State Certifications:
TX/NELAP T104704250-09-TX

Shell HRVOC 504-329 BBH (Canister 4568 02102010)



2703 National Place, Garland, TX 75041
Phone (972) 840-8983/Toll Free (877) 506-0629/ Fax (972) 840-8993

EPA Method TO-15 for PAMS

# CCAS

Air Toxics Report

Date Sampled: 2/10/2010
Date Received: 2/17/2010
Date Analyzed: 2/17&19/2010
Date Reported: 3/25/2010
Analyst: Daniel Florida, BS
Mei Ma, MS
Attn: Greg Burch

Sampler: Barbara Bessette-Henderson
Client: ARI Environmental
Address: 1710 Preston Rd. # C
Pasadena, TX 77503

CCAS Log No.: 1002012-01
Client Sample ID: 15:58; Ambient Grab
Description: TOL-913 Pygas Tank
Client Job ID: Shell Deer Park
Canister Number: 4568

tot. DF= 1.0

| Compound | MW | CAS Number | PQL+ ppbv | PQL+ ug/M$^3$ | Results ppbv | Results ug/M$^3$ |
|---|---|---|---|---|---|---|
| Acetone | 58.1 | 67-64-1 | 0.2 | 0.5 | 20 | 52 |
| Acetylene | 26 | 74-86-2 | 0.2 | 0.2 | ND | ND |
| Benzene | 78.1 | 71-43-2 | 0.2 | 0.7 | 73 | 250 |
| Benzyl Chloride | 126.6 | 71-43-2 | 0.2 | 1.1 | ND | ND |
| Bromodichloromethane | 163.9 | 75-27-4 | 0.2 | 1.5 | ND | ND |
| 1,3-Butadiene | 54.1 | 106-99-0 | 0.2 | 0.5 | 7.5 | 18 |
| Butane | 58.1 | 106-97-8 | 0.2 | 0.5 | 7.8 | 20 |
| 1-Butene | 56.1 | 25167-67-3 | 0.2 | 0.5 | 5.4 | 14 |
| *c*-2-Butene | 56.1 | 590-18-1 | 0.2 | 0.5 | 5.3 | 13 |
| *t*-2-Butene | 56.1 | 624-64-6 | 0.2 | 0.5 | 4.4 | 11 |
| 2-Butanone (MEK) | 72.1 | 78-93-3 | 0.2 | 0.6 | 4.3 | 14 |
| Carbon Disulfide | 76.3 | 75-15-0 | 0.2 | 0.7 | ND | ND |
| Carbon Tetrachloride | 153.8 | 56-23-5 | 0.2 | 1.4 | ND | ND |
| Carbonyl Sulfide E | 60.2 | 463-58-1 | 0.2 | 0.5 | 0.46 | 1.2 |
| Chlorobenzene | 112.6 | 108-90-7 | 0.2 | 1.0 | ND | ND |
| Chloroethane | 64.5 | 75-00-3 | 0.2 | 0.6 | ND | ND |
| Chloroform | 119.4 | 67-66-3 | 0.2 | 1.1 | ND | ND |
| Chloromethane | 50.5 | 74-87-3 | 0.2 | 0.5 | 0.54 | 1.2 |
| 3-Chloropropene | 76.5 | 107-05-1 | 0.2 | 0.7 | ND | ND |
| Cyclohexane | 84.2 | 110-82-7 | 0.2 | 0.8 | 1.1 | 4.1 |
| Cyclopentane | 70.2 | 287-92-3 | 0.2 | 0.6 | 2.7 | 8.5 |
| Decane & isomers | 142.2 | 124-18-5 | 0.2 | 1.3 | ND | ND |
| Dibromochloromethane | 208.3 | 124-48-1 | 0.2 | 1.9 | ND | ND |
| 1,2-Dibromoethane (Ethylene Dibromide) | 187.9 | 106-93-4 | 0.2 | 1.7 | ND | ND |
| 1,2-Dichlorobenzene | 147.0 | 955-50-1 | 0.2 | 1.3 | ND | ND |
| 1,3-Dichlorobenzene | 147.0 | 541-73-1 | 0.2 | 1.3 | ND | ND |
| 1,4-Dichlorobenzene | 147.0 | 106-46-7 | 0.2 | 1.3 | ND | ND |
| 1,1-Dichloroethane (1,1-DCA) | 99.0 | 75-34-3 | 0.2 | 0.9 | ND | ND |
| 1,2-Dichloroethane(1,2-DCA) | 99.0 | 107-06-2 | 0.2 | 0.9 | ND | ND |
| 1,1-Dichloroethene(1,1-DCE) | 96.9 | 75-35-4 | 0.2 | 0.9 | ND | ND |
| *trans*- 1,2-Dichloroethene (*t*-1,2-DCE) | 96.9 | 156-60-5 | 0.2 | 0.9 | ND | ND |
| 1,2-Dichloropropane | 113.0 | 78-87-5 | 0.2 | 1.0 | ND | ND |
| *cis*- 1,3-Dichloropropene | 111.0 | 10061-01-5 | 0.2 | 1.0 | ND | ND |
| *trans*- 1,3-Dichloropropene | 111.0 | 10061-02-6 | 0.2 | 1.0 | ND | ND |
| 1,4-Diethylbenzene (p-Diethylbenzene) | 134.2 | 105-05-5 | 0.2 | 1.2 | ND | ND |
| m-Diethylbenzene | 134.2 | 141-93-5 | 0.2 | 1.2 | ND | ND |
| 2,2-Dimethylbutane | 86.2 | 75-83-2 | 0.2 | 0.8 | 1.1 | 4.2 |
| 2,3-Dimethylbutane | 86.2 | 79-29-8 | 0.2 | 0.8 | 1.1 | 4.2 |
| 2,3-Dimethylpentane | 100.2 | 565-59-3 | 0.2 | 0.9 | ND | ND |
| 3,3-Dimethylpentane | 100.2 | 562-49-2 | 0.2 | 0.9 | ND | ND |
| 2,4-Dimethylpentane | 100.2 | 108-08-7 | 0.2 | 0.9 | 0.35 | 1.6 |
| 1,4-Dioxane | 88.1 | 123-91-1 | 0.2 | 0.8 | ND | ND |
| Ethane | 30.1 | 74-84-0 | 0.2 | 0.3 | 13 | 17 |
| Ethyl Acetate | | 141-78-6 | 0.5 | 0.0 | ND | ND |
| Ethylbenzene | 106.1 | 100-41-4 | 0.5 | 2.4 | 1.5 | 7.1 |
| Ethylene | 28.0 | 74-85-1 | 0.2 | 0 | ND | ND |
| 1-Ethyl-4-methylcyclohexane & isomers | 126.2 | 3728-56-1 | 0.2 | 1.1 | ND | ND |

Phone: 972-840-8983
Fax: 972-840-8993

2703 National Place
Garland, TX 75041

EPA Method TO-15 for PAMS

# CCAS

Air Toxics Report

Date Sampled: 2/10/2010
Date Received: 2/17/2010
Date Analyzed: 2/17&19/2010
Date Reported: 3/25/2010
Analyst: Daniel Florida, BS
Mei Ma, MS

Sampler: Barbara Bessette-Henderson
Client: ARI Environmental
Address: 1710 Preston Rd. # C
Pasadena, TX 77503

CCAS Log No.: 1002012-01
Client Sample ID: 15:58; Ambient Grab
Description: TOL-913 Pygas Tank
Client Job ID: Shell Deer Park
Canister Number: 4568

Attn: Greg Burch

tot. DF= 1.0

| Compound | MW | CAS Number | PQL+ ppbv | PQL+ ug/M$^3$ | Results ppbv | Results ug/M$^3$ |
|---|---|---|---|---|---|---|
| m-Ethyltoluene | 120.1 | 620-14-4 | 0.2 | 1.1 | ND | ND |
| o-Ethyltoluene | 120.1 | 611-14-3 | 0.2 | 1.1 | ND | ND |
| p-Ethyltoluene | 120.1 | 622-96-8 | 0.2 | 1.1 | ND | ND |
| Freon 11 (Fluorotrichloromethane) | 137.4 | 75-69-4 | 0.2 | 1.2 | 0.36 | 2.2 |
| Freon 12 (Dichlorodifluoromethane) | 120.9 | 75-71-8 | 0.2 | 1.1 | 0.55 | 3.0 |
| Freon 113 (1,1,2-Trichlorotrifluoroethane) | 187.4 | 76-13-1 | 0.2 | 1.7 | ND | ND |
| Freon 114 (1,2-Dichlorotetrafluoroethane) | 170.9 | 76-14-2 | 0.2 | 1.5 | ND | ND |
| Heptane & isomers | 100.2 | 142-82-5 | 0.2 | 0.9 | 1.4 | 6.3 |
| Hexachloro-1,3-butadiene | 260.8 | 87-68-3 | 0.2 | 2.3 | ND | ND |
| Hexane | 86.2 | 110-54-3 | 0.2 | 0.8 | 8.3 | 32 |
| 2-Hexanone | 100.1 | 591-78-6 | 0.2 | 0.9 | ND | ND |
| 1-Hexene & isomers | 84.2 | 592-41-6 | 0.2 | 0.8 | 3.0 | 11 |
| *c*-2-Hexene | 84.2 | 7688-21-3 | 0.2 | 0.8 | ND | ND |
| Isobutane | 58.1 | 75-28-5 | 0.2 | 0.5 | 4.6 | 12 |
| Isopentane (2-Methylbutane) | 72.2 | 78-78-4 | 0.2 | 0.6 | 50 | 160 |
| Isoprene (2-Methyl-1,3-Butadiene) | 68.1 | 78-79-5 | 0.2 | 0.6 | 4.0 | 12 |
| Isopropylbenzene (Cumene) | 120.2 | 98-82-8 | 0.2 | 1.1 | 0.20 | 1.1 |
| 2-Methyl-2-Butene | 70.1 | 513-35-9 | 0.2 | 0.6 | 5.3 | 17 |
| 3-Methyl-1-Butene | 70.1 | 563-45-1 | 0.2 | 0.6 | ND | ND |
| Methylene Chloride (Dichloromethane) | 84.8 | 75-09-2 | 0.2 | 0.8 | ND | ND |
| Methylcyclohexane | 98.1 | 108-87-2 | 0.2 | 0.9 | 0.56 | 2.5 |
| Methylcyclopentane | 84.2 | 96-37-7 | 0.2 | 0.8 | 2.2 | 8.3 |
| 2-Methylheptane | 114.2 | 592-27-8 | 0.2 | 1.0 | ND | ND |
| 3-Methylheptane | 114.2 | 589-81-1 | 0.2 | 1.0 | ND | ND |
| 2-Methylhexane | 100.2 | 591-76-4 | 0.2 | 0.9 | 0.49 | 2.2 |
| 3-Methylhexane | 100.2 | 589-34-4 | 0.2 | 0.9 | 0.99 | 4.4 |
| Methyl Isobutyl Ketone (MIBK) | 100.2 | 108-10-1 | 0.2 | 0.9 | ND | ND |
| Methyl Methacrylate | 100.1 | 80-62-6 | 0.2 | 0.9 | ND | ND |
| 3-Methyl-1,3-pentadiene E | 82.1 | 2787-43-1 | 0.2 | 0.7 | ND | ND |
| 3-Methylpentanal E | 100.1 | 15877-57-3 | 0.2 | 0.9 | ND | ND |
| 2-Methylpentane | 86.2 | 107-83-5 | 0.2 | 0.8 | 7.8 | 30 |
| 3-Methylpentane | 86.2 | 96-14-0 | 0.2 | 0.8 | 4.1 | 16 |
| 2-Methyl-1-pentene & isomers | 84.2 | 763-24-1 | 0.2 | 0.8 | ND | ND |
| 4-Methyl-1-pentene/4-Methyl-2-pentene | 84.2 | 691-37-2 | 0.2 | 0.8 | ND | ND |
| MTBE | 88.2 | 1634-04-4 | 0.2 | 0.8 | ND | ND |
| Nonane & isomers | 128.2 | 111-84-2 | 0.2 | 1.1 | ND | ND |
| Octane & isomers | 114.2 | 111-65-9 | 0.2 | 1.0 | ND | ND |
| Pentane | 72.2 | 109-66-0 | 0.2 | 0.6 | 20 | 64 |
| 1-Pentene | 70.1 | 109-67-1 | 0.2 | 0.6 | 11 | 34 |
| *c*-2-Pentene | 70.1 | 627-20-3 | 0.2 | 0.6 | 8.4 | 26 |
| *t*-2-Pentene | 70.1 | 646-04-8 | 0.2 | 0.6 | 4.7 | 15 |
| Propane | 44.1 | 74-98-6 | 0.2 | 0.4 | 4.1 | 8.1 |
| Propylbenzene | 120.2 | 103-65-1 | 0.2 | 1.1 | ND | ND |

Phone: 972-840-8983
Fax: 972-840-8993

2703 National Place
Garland, TX 75041

EPA Method TO-15 for PAMS

# CCAS

Air Toxics Report

| | | | | | |
|---|---|---|---|---|---|
| Date Sampled: | 2/10/2010 | Sampler: | Barbara Bessette-Henderson | CCAS Log No.: | 1002012-01 |
| Date Received: | 2/17/2010 | Client: | ARI Environmental | Client Sample ID: | 15:58; Ambient Grab |
| Date Analyzed: | 2/17&19/2010 | Address: | 1710 Preston Rd. # C | Description: | TOL-913 Pygas Tank |
| Date Reported: | 3/25/2010 | | Pasadena, TX 77503 | Client Job ID: | Shell Deer Park |
| Analyst: | Daniel Florida, BS | | | Canister Number: | 4568 |
| | Mei Ma, MS | | | | |

Attn: Greg Burch

tot. DF= 1.0

| Compound | MW | CAS Number | PQL+ ppbv | PQL+ ug/M$^3$ | Results ppbv | Results ug/M$^3$ |
|---|---|---|---|---|---|---|
| 2-Propanol | 60.1 | 67-63-0 | 0.2 | 0.5 | ND | ND |
| Propylene | 42.1 | 115-07-1 | 0.2 | 0.4 | 10 | 19 |
| Styrene | 104.2 | 100-42-5 | 0.2 | 0.9 | 2.8 | 13 |
| 1,1,2,2-Tetrachloroethane | 167.9 | 630-20-6 | 0.2 | 1.5 | ND | ND |
| Tetrachloroethylene (PCE) | 165.8 | 127-18-4 | 0.2 | 1.5 | ND | ND |
| Tetrahydrofuran | 72.1 | 109-99-9 | 0.2 | 0.6 | ND | ND |
| Toluene | 92.2 | 108-88-3 | 0.2 | 0.8 | 20 | 82 |
| 1,1,1-Trichloroethane (1,1,1-TCA) | 133.4 | 71-55-6 | 0.2 | 1.2 | ND | ND |
| 1,1,2-Trichloroethane (1,1,2-TCA) | 133.4 | 79-00-5 | 0.2 | 1.2 | ND | ND |
| Trichloroethylene (TCE) | 131.3 | 79-01-6 | 0.2 | 1.2 | ND | ND |
| 1,2,3-Trimethylbenzene | 120.1 | 526-73-8 | 0.2 | 1.1 | ND | ND |
| 1,2,4-Trimethylbenzene (Pseudocumene) | 120.2 | 95-63-6 | 0.2 | 1.1 | ND | ND |
| 1,3,5-Trimethylbenzene (Mesitylene) | 120.2 | 108-67-8 | 0.2 | 1.1 | ND | ND |
| 2,2,4-Trimethylpentane | 114.26 | 540-84-1 | 0.2 | 1.1 | ND | ND |
| 2,3,4-Trimethylpentane & isomers | 114.26 | 565-75-3 | 0.2 | 1.1 | ND | ND |
| Undecane & isomers | 156.2 | 1120-21-4 | 0.2 | 0.9 | ND | ND |
| Vinyl Acetate | 86.1 | 108-05-4 | 0.2 | 0.6 | ND | ND |
| Vinyl Bromide | 107.0 | 593-60-2 | 0.2 | 0.6 | ND | ND |
| Vinyl Chloride | 62.5 | 75-01-4 | 0.2 | 0.6 | ND | ND |
| m-Xylene* | 106.17 | 108-38-3 | 0.2 | 0.9 | 3.4 | 16 |
| p-Xylene* | 106.17 | 106-42-3 | 0.2 | 0.9 | * | * |
| o-Xylene | 106.17 | 95-47-6 | 0.2 | 0.9 | 1.3 | 6.2 |
| | | | | sum target VOC | 329 | 1045 |

* Coeluting compounds, reported as sum under m-Xylene.

| Sample-specific QA recoveries: | | % | OK? Y/N |
|---|---|---|---|
| IS | Bromochloromethane | 87% | Y |
| SS | 4-Bromofluorobenzene | 90% | Y |
| SS | Benzene-d6 | 93% | Y |
| IS | Chlorobenzene $D_5$ | 84% | Y |

SS acceptance criterion is 70-130%.

Acceptance ranges for Internal Standards (IS) are 60-140%.

IS acceptance criteria corresponds to EPA guidelines.

TO-14/15 1002012-01

CCAS State Certifications:
TX/NELAP T104704250-09-TX

Respectfully submitted,

Stephen Havlicek, Ph.D.

Phone: 972-840-8983
Fax: 972-840-8993

2703 National Place
Garland, TX 75041

EPA Method TO-14/15

# CCAS

Air Toxics Supplimentary Report

Date Sampled: 2/10/2010
Date Received: 2/17/2010
Date Analyzed: 2/17&19/2010
Date Reported: 3/25/2010
Analyst: Daniel Florida, BS
Mei Ma, MS
Attn: Greg Burch

Sampler: Barbara Bessette-Henderson
Client: ARI Environmental
Address: 1710 Preston Rd. # C
Pasadena, TX 77503

CCAS Log No.: 1002012-01
Client Sample ID: 15:58; Ambient Grab
Description: TOL-913 Pygas Tank
Client Job ID:Shell Deer Park
Canister Number: 4568

tot. DF= 1.0

| Compound | MW | CAS Number | PQL+ ppbv | PQL+ ug/M$^3$ | Results ppbv | Results ug/M$^3$ |
|---|---|---|---|---|---|---|
| 1,2-Butadiene | 54.1 | 590-19-2 | 0.5 | 1.2 | 0.55 | 1.3 |
| 1,4-Cyclohexadiene and isomers | 80.1 | 628-41-1 | 0.5 | 1.8 | 2.8 | 10 |
| 1,3-Cyclopentadiene E | 66.1 | 542-92-7 | 0.5 | 1.5 | 28 | 83 |
| Cyclopentene | 68.1 | 142-29-0 | 0.5 | 1.5 | 7.3 | 22 |
| 2-Ethylhexanol E | 130.2 | 104-76-7 | 0.5 | 2.9 | 1.5 | 8.7 |
| 2-Methyl-1-Butene | 66.1 | 563-46-1 | 0.5 | 1.5 | 4.2 | 12 |
| Methylcyclopentene isomers | 82.1 | 1120-62-3 | 0.5 | 1.8 | 2.6 | 9.5 |
| 1,3-Pentadiene & isomers | 68.1 | 2004-70-8 | 0.5 | 1.5 | 14 | 43 |
| Tetrahydro-4,7-methanoindene E | 132.1 | 77-73-6 | 0.5 | 2.9 | 0.85 | 5.0 |
| Other Hydrocarbons up to $C_{12}/C_{13}$ | 170.2 | 112-40-3 | 10 | 28 | 1.4 | 11 |
| | | | | | | |
| | | | | Sum Supplemental VOC | 63 | 205 |

| Sample-specific QA recoveries: | | % | OK? Y/N |
|---|---|---|---|
| IS | Bromochloromethane | 87% | Y |
| SS | 4-Bromofluorobenzene | 90% | Y |
| SS | Benzene-d6 | 93% | Y |
| IS | Chlorobenzene $D_5$ | 84% | Y |

SS acceptance criterion is 70-130%.
Acceptance ranges for Internal Standards (IS) are 60-140%.
IS acceptance criteria corresponds to EPA guidelines.
TO-14/15 1002012-01

CCAS State Certifications:
TX/NELAP T104704250-09-TX

Respectfully submitted,

Stephen Havlicek, Ph.D.

Phone: 972-840-8983
Fax: 972-840-8993

2703 National Place
Garland, TX 75041

**EPA Method TO-14/15** **CCAS** **Air Toxics Report**

| | | | | | |
|---|---|---|---|---|---|
| **Date Sampled:** | 2/19/2010 | **Sampled by:** | CCAS | **SPIKE:** | 021910 |
| **Date Received:** | 2/19/2010 | **Client:** | CCAS | **Client Sample ID:** | N/A |
| **Date Analyzed:** | 2/19/2010 | **Address:** | 2703 National Place | **Description:** | CCV |
| **Date Reported:** | 2/22/2010 | | Garland, TX 75041 | **Matrix:** | Air |
| **Analyst:** | Daniel Florida | | | **Test Code:** | TO-14/15 |

**tot. DF= 1.0** page 1 of 2

| Compound | MW | CAS Number | PQL+ ppbv | PQL+ ug/M$^3$ | Results ppbv | Results % Recov. |
|---|---|---|---|---|---|---|
| Benzene | 78.1 | 71-43-2 | 1.0 | 3.5 | 53 | 98 |
| Carbon Tetrachloride | 153.8 | 56-23-5 | 0.5 | 3.4 | 26 | 95 |
| Chlorobenzene | 112.6 | 108-90-7 | 1.0 | 5.0 | 26 | 97 |
| Chloroform | 119.4 | 67-66-3 | 0.5 | 2.7 | 26 | 94 |
| 1,2-Dibromoethane (Ethylene Dibromide) | 187.9 | 106-93-4 | 1.0 | 8.4 | 26 | 98 |
| 1,2-Dichlorobenzene | 147.0 | 955-50-1 | 1.0 | 6.6 | 26 | 97 |
| 1,3-Dichlorobenzene | 147.0 | 541-73-1 | 1.0 | 6.6 | 26 | 97 |
| 1,4-Dichlorobenzene | 147.0 | 106-46-7 | 1.0 | 6.6 | 26 | 97 |
| 1,1-Dichloroethane (1,1-DCA) | 99.0 | 75-34-3 | 0.5 | 2.2 | 25 | 94 |
| 1,2-Dichloroethane(1,2-DCA) | 99.0 | 107-06-2 | 1.0 | 4.4 | 26 | 96 |
| 1,1-Dichloroethylene(1,1-DCE) | 96.9 | 75-35-4 | 1.0 | 4.3 | 26 | 97 |
| *cis*- 1,2-Dichloroethylene (*c* -1,2-DCE) | 96.9 | 156-59-2 | 0.5 | 2.2 | 26 | 94 |
| 1,2-Dichloropropane | 96.9 | 156-60-5 | 1.0 | 4.3 | 26 | 97 |
| *cis*- 1,3-Dichloropropene | 111.0 | 10061-01-5 | 0.5 | 2.5 | 26 | 96 |
| *trans*- 1,3-Dichloropropene | 111.0 | 10061-02-6 | 1.0 | 5.0 | 26 | 97 |
| Ethylbenzene | 106.1 | 100-41-4 | 1.0 | 4.7 | 53 | 98 |
| Ethyl Chloride (Chloroethane) | 64.5 | 75-00-3 | 1.0 | 2.9 | 25 | 94 |
| Freon 11 (Trichlorofluoromethane) | 137.4 | 75-69-4 | 1.0 | 6.1 | 26 | 96 |
| Freon 12 (Dichlorodifluoromethane) | 120.9 | 75-71-8 | 2.0 | 11 | 25 | 93 |
| Freon 113 (1,1,2-Trichlorotrifluoroethane) | 187.4 | 76-13-1 | 1.0 | 8.4 | 26 | 95 |
| Freon 114 (1,2-Dichlorotetrafluoroethane) | 170.9 | 76-14-2 | 2.0 | 15 | 26 | 95 |
| Isopropylbenzene (Cumene) | 120.1 | 98-82-8 | 1.0 | 5.4 | 53 | 97 |
| Methyl Bromide (Bromomethane) | 94.9 | 74-83-9 | 1.0 | 4.2 | 26 | 95 |
| 2-Methyl-1-Pentene | 84.2 | 763-24-1 | 1.0 | 3.8 | 26 | 96 |
| Methyl Chloride (Chloromethane) | 50.5 | 74-87-3 | 1.0 | 2.3 | 25 | 91 |
| Methylene Chloride (Dichloromethane) | 84.8 | 75-09-2 | 5.0 | 19 | 23 | 86 |
| Perchloroethylene (PCE) | 165.8 | 127-18-4 | 0.5 | 3.7 | 27 | 101 |
| Propylbenzene | 120.1 | 103-65-1 | 1.0 | 5.4 | 26 | 98 |
| Styrene | 104.2 | 100-42-5 | 1.0 | 4.7 | 53 | 98 |
| 1,1,2,2-Tetrachloroethane | 167.9 | 79-34-5 | 1.0 | 7.5 | 26 | 95 |

**EPA Method TO-14/15** **CCAS** **Air Toxics Report**

| | | | | | |
|---|---|---|---|---|---|
| **Date Sampled:** | **2/19/2010** | **Sampled by:** | **CCAS** | **SPIKE:** | **021910** |
| **Date Received:** | **2/19/2010** | **Client:** | **CCAS** | **Client Sample ID:** | **N/A** |
| **Date Analyzed:** | **2/19/2010** | **Address:** | **2703 National Place** | **Description:** | **CCV** |
| **Date Reported:** | **2/22/2010** | | **Garland, TX 75041** | **Matrix:** | **Air** |
| **Analyst:** | **Daniel Florida** | | | **Test Code:** | **TO-14/15** |

**tot. DF= 1.0** page 2 of 2

| Compound | MW | CAS Number | PQL+ ppbv | PQL+ ug/M$^3$ | Results ppbv | Results % Recov. |
|---|---|---|---|---|---|---|
| Toluene | 92.1 | 108-88-3 | 1.0 | 4.1 | 53 | 98 |
| 1,1,1-Trichloroethane (1,1,1-TCA) | 133.4 | 71-55-6 | 0.5 | 3.0 | 26 | 96 |
| 1,1,2-Trichloroethane (1,1,2-TCA) | 133.4 | 79-00-5 | 0.5 | 3.0 | 26 | 97 |
| Trichloroethylene (TCE) | 131.3 | 79-01-6 | 0.5 | 2.9 | 26 | 98 |
| 1,2,4-Trimethylbenzene (Pseudocumene) | 120.1 | 95-63-6 | 1.0 | 5.4 | 53 | 97 |
| 1,3,5-Trimethylbenzene (Mesitylene) | 120.1 | 108-67-8 | 1.0 | 5.4 | 53 | 98 |
| m-Xylene* | 106.1 | 108-38-3 | 1.0 | 4.7 | 106 | 98 |
| p-Xylene* | 106.1 | 106-42-3 | 1.0 | 4.7 | * | * |
| o-Xylene | 106.1 | 95-47-6 | 1.0 | 4.7 | 52 | 97 |
| Vinyl Chloride | 62.5 | 75-01-4 | 2.0 | 5.6 | 25 | 93 |

*** Coeluting compounds, reported as sum under m-Xylene**

| Sample-specific QA recoveries: | | % | OK Y/N |
|---|---|---|---|
| IS | Bromochloromethane | 100 | Y |
| SS | Bromofluorobenzene | 105 | Y |
| IS | Chlorobenzene d5 | 100 | Y |
| IS | 1,4-Difluorobenzene | 100 | Y |

+ Practical Quantitation Limit, a 2-4X multiple of the experimentally established Method Detection Limit.
Acceptance criteria 70-130% for SS, 60-140% for IS.
IS acceptance criteria corresponds to EPA guidelines.

**TO-14/15 SPIKE 021910**

**Respectfully submitted,**

**Stephen Havlicek, Ph.D.**

EXCELLENCE in ANALYSIS **CCAS** FLARE/SOIL GAS ANALYSIS

## METHANE/ATMOSPHERIC GAS ANALYSIS: ASTM D-1945, TCD/FID

| | | | | | |
|---|---|---|---|---|---|
| Date Sampled: | 2/17/2010 | Sampled by: | CCAS | CCAS Log No. | Spike 021710 |
| Date Received: | 2/17/2010 | Client: | | Client Sample ID: | N/A |
| Date Analyzed: | 2/17/2010 | Address: | | Description: N/A | |
| Date Reported: | 2/17/2010 | | | Client Job ID: N/A | |
| Analyst: | Mei Ma | | | Sample Prep: Mei Ma | |

CERTIFIED REFERENCE SPIKE

| COMPOUND | (CAS RN) | DETECTION LIMIT % | TRUE VALUE PERCENT | FOUND PERCENT | PERCENT RECOVERY | QC LIMIT PERCENT |
|---|---|---|---|---|---|---|
| Hydrogen | 1333-74-0 | 0.02 | 4.0 | 4.0 | 99 | 70 - 130 |
| Oxygen | 7782-44-7 | 0.02 | 5.0 | 5.0 | 100 | 70 - 130 |
| Nitrogen | 7727-37-9 | 0.05 | 78.1 | 79.5 | 102 | 70 - 130 |
| Methane | 74-82-8 | 0.0002 | 4.0 | 3.9 | 99 | 70 - 130 |
| Carbon Dioxide | 124-38-9 | 0.01 | 5.0 | 5.0 | 99 | 70 - 130 |
| Carbon Monoxide | 630-08-0 | 0.01 | 5.0 | 5.0 | 100 | 70 - 130 |

PERCENT RECOVERY 0 COMPOUNDS OUT OF 6 OUTSIDE QC LIMITS

CCAS State Certifications:
TX/NELAP T104704250-09-TX

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SPECIALISTS

Stephen C. Havlicek, Ph.D.

N.S.= Not Spiked
N/A = Not Applicable
FIX Spike 021710
MM/SCH

2703 National Place, Garland, TX 75041
Phone (972) 840-8983/Toll Free (877) 506-0629/ Fax (972) 840-8993

EXCELLENCE in ANALYSIS

# CCAS

HYDROCARBON GAS ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Date Sampled: | 2/17/2010 | Sampled by:CCAS | | CCAS Log No. | BLK 021710 |
| Date Received: | 2/17/2010 | Client: | | Client Sample ID: | N/A |
| Date Analyzed: | 2/17/2010 | Address: | | PO: | N/A |
| Date Reported: | 2/17/2010 | | | Client Job ID: | N/A |
| Analysts: | Mei Ma | ASTM D1945 REPORT | | Description: Full Method Blank | |

| Compound | MW | CAS No. | Time | PQL* | Concentration |
|---|---|---|---|---|---|
| | | | min. | PPMV | PPMV |
| Methane | 16.1 | 74-82-8 | | 2.0 | N.D. |
| Ethane | 30.1 | 74-84-0 | | 0.4 | N.D. |
| Ethylene | 28.1 | 74-85-1 | | 0.3 | N.D. |
| Propane | 44.0 | 74-98-6 | | 0.4 | N.D. |
| Propylene | 42.0 | 115-07-1 | | 0.3 | N.D. |
| Butane | 58.1 | 106-97-8 | | 0.4 | N.D. |
| 1-Butene | 56.1 | 106-98-9 | | 0.4 | N.D. |
| Pentane | 72.1 | 109-66-0 | | 0.2 | N.D. |
| 1-Pentene | 70.1 | 109-67-1 | | 0.4 | N.D. |
| Hexane | 86.1 | 110-54-3 | | 0.3 | N.D. |
| 1-Hexene | 84.1 | 592-41-6 | | 0.2 | N.D. |
| Isobutane | 58.1 | 75-28-5 | | 0.1 | N.D. |
| Neopentane | 72.1 | 463-82-1 | | 0.1 | N.D. |
| Isopentane | 72.1 | 78-78-4 | | 0.2 | N.D. |
| 2,2-Dimethylbutane | 86.1 | 75-83-2 | | 0.3 | N.D. |
| 2-Methylpentane | 86.1 | 107-83-5 | | 0.1 | N.D. |
| 3-Methylpentane | 86.1 | 96-14-0 | | 0.2 | N.D. |

1. PQL * = Practical Quantitation Limit. All are based on a recent, statistically established MDL study.

Respectfully Submitted,
COAST-TO-COAST ANALYTICAL SPECIALISTS

CCAS State Certifications:
TX/NELAP T104704250-09-TX

Stephen C. Havlicek, Ph.D.

HC BLK 021710

2703 National Place, Garland, TX 75041
Phone (972) 840-8983/Toll Free (877) 506-0629/ Fax (972) 840-8993



Shell HRVOC 504-329 BBH (Canister 4568 02102010)

EXCELLENCE in ANALYSIS **CCAS** AIR TOXICS REPORT

## HYDROCARBON GAS ANALYSIS: METHOD ASTM D1945 RECOVERY STUDY, FID

| | | | | | |
|---|---|---|---|---|---|
| Date Spiked: | 2/17/2010 | Sampled by: | CCAS | CCAS Log No. | HC Spike 021710 |
| Date Received: | 2/17/2010 | Client: | | Client Sample ID: | N/A |
| Date Analyzed: | 2/17/2010 | Address: | | Description: | Certified Standards |
| Date Reported: | 2/17/2010 | | | Sample Prep: | Mei Ma |
| Analyst: | Mei Ma | | | | |

### Representative Hydrocarbon Spike
### ASTM D1945 REPORT

| COMPOUND | CAS R | DETECTION LIMIT PPMV | TRUE VALUE PPMV | FOUND PPMV | PERCENT RECOVERY | QC LIMIT PERCENT |
|---|---|---|---|---|---|---|
| Methane | 74-82-8 | 2.0 | 50 | 49 | 98 | 70 - 130 |
| Ethane | 74-84-0 | 0.4 | 50 | 53 | 106 | 70 - 130 |
| Ethylene | 74-85-1 | 0.3 | 50 | 53 | 106 | 70 - 130 |
| Propane | 74-98-6 | 0.4 | 50 | 53 | 105 | 70 - 130 |
| Propylene | 115-07-1 | 0.3 | 50 | 52 | 104 | 70 - 130 |
| Butane | 106-97-8 | 0.4 | 50 | 52 | 104 | 70 - 130 |
| 1-Butene | 106-98-9 | 0.4 | 50 | 51 | 103 | 70 - 130 |
| Pentane | 109-66-0 | 0.2 | 50 | 51 | 102 | 70 - 130 |
| 1-Pentene | 109-67-1 | 0.4 | 50 | 51 | 102 | 70 - 130 |
| Hexane | 110-54-3 | 0.3 | 50 | 50 | 101 | 70 - 130 |
| 1-Hexene | 592-41-6 | 0.2 | 50 | 50 | 100 | 70 - 130 |
| | | | | | | |
| Isobutane | 75-28-5 | 0.1 | 50 | 52 | 105 | 70 - 130 |
| Neopentane | 463-82-1 | 0.1 | 50 | 53 | 105 | 70 - 130 |
| Isopentane | 78-78-4 | 0.2 | 50 | 51 | 103 | 70 - 130 |
| 2,2-Dimethylbutane | 75-83-2 | 0.3 | 50 | 52 | 103 | 70 - 130 |
| 2-Methylpentane | 107-83-5 | 0.1 | 50 | 51 | 101 | 70 - 130 |
| 3-Methylpentane | 96-14-0 | 0.2 | 50 | 50 | 101 | 70 - 130 |

PERCENT RECOVERY 0 COMPOUNDS OUT OF17 OUTSIDE QC LIMITS

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SPECIALISTS

**CCAS State Certifications:**
**TX/NELAP T104704250-09-TX**

SAT HC SPIKE HC Spike 021710
MM/SCH

Stephen C. Havlicek, Ph.D.

2703 National Place, Garland, TX 75041
Phone (972) 840-8983/Toll Free (877) 506-0629/ Fax (972) 840-8993

Shell HRVOC 504-329 BBH (Canister 4568 02102010)

**EPA Method TO-14/15** **CCAS** **Air Toxics Report**

| | | | | | |
|---|---|---|---|---|---|
| **Date Sampled:** | 2/19/2010 | **Sampled by:** | CCAS | **LCS SPIKE:** | 021910 |
| **Date Received:** | 2/19/2010 | **Client:** | CCAS | **Client Sample ID:** | N/A |
| **Date Analyzed:** | 2/19/2010 | **Address:** | 2703 National Place | **Description:** | LCS |
| **Date Reported:** | 2/22/2010 | | Garland, TX 75041 | **Matrix:** | Air |
| **Analyst:** | Daniel Florida | | | **Test Code:** | TO-14/15 |

**tot. DF= 1.0** page 1 of 2

| Compound | MW | CAS Number | PQL+ ppbv | PQL+ ug/M$^3$ | Results ppbv | Results % Recov. |
|---|---|---|---|---|---|---|
| Benzene | 78.1 | 71-43-2 | 1.0 | 3.5 | 17 | 94 |
| Carbon Tetrachloride | 153.8 | 56-23-5 | 0.5 | 3.4 | 8.3 | 92 |
| Chlorobenzene | 112.6 | 108-90-7 | 1.0 | 5.0 | 8.4 | 93 |
| Chloroform | 119.4 | 67-66-3 | 0.5 | 2.7 | 9.8 | 109 |
| 1,2-Dibromoethane (Ethylene Dibromide) | 187.9 | 106-93-4 | 1.0 | 8.4 | 8.3 | 93 |
| 1,2-Dichlorobenzene | 147.0 | 955-50-1 | 1.0 | 6.6 | 7.4 | 82 |
| 1,3-Dichlorobenzene | 147.0 | 541-73-1 | 1.0 | 6.6 | 8.0 | 89 |
| 1,4-Dichlorobenzene | 147.0 | 106-46-7 | 1.0 | 6.6 | 8.2 | 91 |
| 1,1-Dichloroethane (1,1-DCA) | 99.0 | 75-34-3 | 0.5 | 2.2 | 9.9 | 110 |
| 1,2-Dichloroethane(1,2-DCA) | 99.0 | 107-06-2 | 1.0 | 4.4 | 8.9 | 99 |
| 1,1-Dichloroethylene(1,1-DCE) | 96.9 | 75-35-4 | 1.0 | 4.3 | 7.6 | 84 |
| *cis*- 1,2-Dichloroethylene (*c*-1,2-DCE) | 96.9 | 156-59-2 | 0.5 | 2.2 | 9.6 | 106 |
| 1,2-Dichloropropane | 96.9 | 156-60-5 | 1.0 | 4.3 | 8.8 | 97 |
| *cis*- 1,3-Dichloropropene | 111.0 | 10061-01-5 | 0.5 | 2.5 | 9.2 | 103 |
| *trans*- 1,3-Dichloropropene | 111.0 | 10061-02-6 | 1.0 | 5.0 | 9.2 | 102 |
| Ethylbenzene | 106.1 | 100-41-4 | 1.0 | 4.7 | 17 | 92 |
| Ethyl Chloride (Chloroethane) | 64.5 | 75-00-3 | 1.0 | 2.9 | 9.9 | 110 |
| Freon 11 (Trichlorofluoromethane) | 137.4 | 75-69-4 | 1.0 | 6.1 | 7.6 | 85 |
| Freon 12 (Dichlorodifluoromethane) | 120.9 | 75-71-8 | 2.0 | 11 | 7.7 | 86 |
| Freon 113 (1,1,2-Trichlorotrifluoroethane) | 187.4 | 76-13-1 | 1.0 | 8.4 | 7.7 | 85 |
| Freon 114 (1,2-Dichlorotetrafluoroethane) | 170.9 | 76-14-2 | 2.0 | 15 | 7.8 | 86 |
| Isopropylbenzene (Cumene) | 120.1 | 98-82-8 | 1.0 | 5.4 | 17 | 94 |
| Methyl Bromide (Bromomethane) | 94.9 | 74-83-9 | 1.0 | 4.2 | 7.7 | 85 |
| 2-Methyl-1-Pentene | 84.2 | 763-24-1 | 1.0 | 3.8 | 7.3 | 81 |
| Methyl Chloride (Chloromethane) | 50.5 | 74-87-3 | 1.0 | 2.3 | 7.9 | 87 |
| Methylene Chloride (Dichloromethane) | 84.8 | 75-09-2 | 5.0 | 19 | 8.5 | 95 |
| Perchloroethylene (PCE) | 165.8 | 127-18-4 | 0.5 | 3.7 | 8.1 | 90 |
| Propylbenzene | 120.1 | 103-65-1 | 1.0 | 5.4 | 8.1 | 90 |
| Styrene | 104.2 | 100-42-5 | 1.0 | 4.7 | 17 | 93 |
| 1,1,2,2-Tetrachloroethane | 167.9 | 79-34-5 | 1.0 | 7.5 | 7.7 | 85 |

**EPA Method TO-14/15** **CCAS** **Air Toxics Report**

| | | | | | |
|---|---|---|---|---|---|
| **Date Sampled:** | 2/19/2010 | **Sampled by:** | CCAS | **LCS SPIKE:** | 021910 |
| **Date Received:** | 2/19/2010 | **Client:** | CCAS | **Client Sample ID:** | N/A |
| **Date Analyzed:** | 2/19/2010 | **Address:** | 2703 National Place | **Description:** | LCS |
| **Date Reported:** | 2/22/2010 | | Garland, TX 75041 | **Matrix:** | Air |
| **Analyst:** | Daniel Florida | | | **Test Code:** | TO-14/15 |

**tot. DF= 1.0** page 2 of 2

| Compound | MW | CAS Number | PQL+ ppbv | PQL+ ug/M$^3$ | Results ppbv | Results % Recov. |
|---|---|---|---|---|---|---|
| Toluene | 92.1 | 108-88-3 | 1.0 | 4.1 | 16 | 92 |
| 1,1,1-Trichloroethane (1,1,1-TCA) | 133.4 | 71-55-6 | 0.5 | 3.0 | 8.2 | 91 |
| 1,1,2-Trichloroethane (1,1,2-TCA) | 133.4 | 79-00-5 | 0.5 | 3.0 | 8.5 | 94 |
| Trichloroethylene (TCE) | 131.3 | 79-01-6 | 0.5 | 2.9 | 7.8 | 87 |
| 1,2,4-Trimethylbenzene (Pseudocumene) | 120.1 | 95-63-6 | 1.0 | 5.4 | 17 | 92 |
| 1,3,5-Trimethylbenzene (Mesitylene) | 120.1 | 108-67-8 | 1.0 | 5.4 | 17 | 94 |
| m-Xylene* | 106.1 | 108-38-3 | 1.0 | 4.7 | 33 | 92 |
| p-Xylene* | 106.1 | 106-42-3 | 1.0 | 4.7 | * | * |
| o-Xylene | 106.1 | 95-47-6 | 1.0 | 4.7 | 17 | 93 |
| Vinyl Chloride | 62.5 | 75-01-4 | 2.0 | 5.6 | 7.7 | 85 |

*** Coeluting compounds, reported as sum under m-Xylene**

| Sample-specific QA recoveries: | | % | OK Y/N |
|---|---|---|---|
| IS | Bromochloromethane | 86 | Y |
| SS | Bromofluorobenzene | 102 | Y |
| IS | Chlorobenzene d5 | 76 | Y |
| IS | 1,4-Difluorobenzene | 78 | Y |

+ Practical Quantitation Limit, a 2-4X multiple of the experimentally established Method Detection Limit.
Acceptance criteria 70-130% for SS, 60-140% for IS.
IS acceptance criteria corresponds to EPA guidelines.

**TO-14/15 LCS 021910**

**Respectfully submitted,**

**Stephen Havlicek, Ph.D.**

**EPA Method TO 14/15** **CCAS** **Air Toxics Report**

| | | | | | |
|---|---|---|---|---|---|
| **Date Sampled:** | 2/19/2010 | **Sampled by:** | CCAS | **BLANK:** | 021910 |
| **Date Received:** | 2/19/2010 | **Client:** | CCAS | **Client Sample ID:** | N/A |
| **Date Analyzed:** | 2/19/2010 | **Address:** | 2703 National Place | **Description:** | Method Blank |
| **Date Reported:** | 2/19/2010 | | Garland. TX 75041 | **Matrix:** | Air |
| **Analyst:** | Daniel Florida | | | **Test Code:** | TO-14/15 |

**tot. DF= 1.0** page 1 of 2

| Compound | MW | CAS Number | PQL+ ppbv | PQL+ ug/M$^3$ | Results ppbv | Results ug/M$^3$ |
|---|---|---|---|---|---|---|
| Benzene | 78.1 | 71-43-2 | 1.0 | 3.5 | ND | ND |
| Carbon Tetrachloride | 153.8 | 56-23-5 | 0.5 | 3.4 | ND | ND |
| Chlorobenzene | 112.6 | 108-90-7 | 1.0 | 5.0 | ND | ND |
| Chloroform | 119.4 | 67-66-3 | 0.5 | 2.7 | ND | ND |
| 1,2-Dibromoethane (Ethylene Dibromide) | 187.9 | 106-93-4 | 1.0 | 8.4 | ND | ND |
| 1,2-Dichlorobenzene | 147.0 | 955-50-1 | 1.0 | 6.6 | ND | ND |
| 1,3-Dichlorobenzene | 147.0 | 541-73-1 | 1.0 | 6.6 | ND | ND |
| 1,4-Dichlorobenzene | 147.0 | 106-46-7 | 1.0 | 6.6 | ND | ND |
| 1,1-Dichloroethane (1,1-DCA) | 99.0 | 75-34-3 | 1.0 | 4.4 | ND | ND |
| 1,2-Dichloroethane(1,2-DCA) | 99.0 | 107-06-2 | 1.0 | 4.4 | ND | ND |
| 1,1-Dichloroethylene(1,1-DCE) | 96.9 | 75-35-4 | 0.5 | 2.2 | ND | ND |
| *cis*- 1,2-Dichloroethylene (*c* -1,2-DCE) | 96.9 | 156-59-2 | 0.5 | 2.2 | ND | ND |
| 1,2-Dichloropropane | 113.0 | 78-87-5 | 1.0 | 5.0 | ND | ND |
| *cis*- 1,3-Dichloropropene | 111.0 | 10061-01-5 | 0.5 | 2.5 | ND | ND |
| *trans*- 1,3-Dichloropropene | 111.0 | 10061-02-6 | 1.0 | 5.0 | ND | ND |
| Ethylbenzene | 106.1 | 100-41-4 | 1.0 | 4.7 | ND | ND |
| Ethyl Chloride (Chloroethane) | 64.5 | 75-00-3 | 1.0 | 2.9 | ND | ND |
| Freon 11 (Trichlorofluoromethane) | 137.4 | 75-69-4 | 1.0 | 6.1 | ND | ND |
| Freon 12 (Dichlorodifluoromethane) | 120.9 | 75-71-8 | 2.0 | 11 | ND | ND |
| Freon 113 (1,1,2-Trichlorotrifluoroethane) | 187.4 | 76-13-1 | 1.0 | 8.4 | ND | ND |
| Freon 114 (1,2-Dichlorotetrafluoroethane) | 170.9 | 76-14-2 | 2.0 | 15 | ND | ND |
| Isopropylbenzene (Cumene) | 120.1 | 98-82-8 | 1.0 | 5.4 | ND | ND |
| Methyl Bromide (Bromomethane) | 94.9 | 74-83-9 | 1.0 | 4.2 | ND | ND |
| 2-Methyl-1-Pentene | 84.2 | 763-24-1 | 1.0 | 3.8 | ND | ND |
| Methyl Chloride (Chloromethane) | 50.5 | 74-87-3 | 1.0 | 2.3 | ND | ND |
| Methylene Chloride (Dichloromethane) | 84.8 | 75-09-2 | 5.0 | 19 | ND | ND |
| Perchloroethylene (PCE) | 165.8 | 127-18-4 | 0.5 | 3.7 | ND | ND |
| Propylbenzene | 120.1 | 103-65-1 | 1.0 | 5.4 | ND | ND |
| Styrene | 104.2 | 100-42-5 | 1.0 | 4.7 | ND | ND |
| 1,1,2,2-Tetrachloroethane | 167.9 | 79-34-5 | 1.0 | 7.5 | ND | ND |

**EPA Method TO 14/15** **CCAS** **Air Toxics Report**

| | | | | | |
|---|---|---|---|---|---|
| **Date Sampled:** | **2/19/2010** | **Sampled by:** | **CCAS** | **BLANK:** | **021910** |
| **Date Received:** | **2/19/2010** | **Client:** | **CCAS** | **Client Sample ID:** | **N/A** |
| **Date Analyzed:** | **2/19/2010** | **Address:** | **2703 National Place** | **Description:** | **Method Blank** |
| **Date Reported:** | **2/19/2010** | | **Garland. TX 75041** | **Matrix:** | **Air** |
| **Analyst:** | **Daniel Florida** | | | **Test Code:** | **TO-14/15** |

**tot. DF= 1.0** page 2 of 2

| Compound | MW | CAS Number | PQL+ ppbv | PQL+ ug/M$^3$ | Results ppbv | Results ug/M$^3$ |
|---|---|---|---|---|---|---|
| Toluene | 92.1 | 108-88-3 | 1.0 | 4.1 | ND | ND |
| 1,1,1-Trichloroethane (1,1,1-TCA) | 133.4 | 71-55-6 | 0.5 | 3.0 | ND | ND |
| 1,1,2-Trichloroethane (1,1,2-TCA) | 133.4 | 79-00-5 | 0.5 | 3.0 | ND | ND |
| Trichloroethylene (TCE) | 131.3 | 79-01-6 | 0.5 | 2.9 | ND | ND |
| 1,2,4-Trimethylbenzene (Pseudocumene) | 120.1 | 95-63-6 | 1.0 | 5.4 | ND | ND |
| 1,3,5-Trimethylbenzene (Mesitylene) | 120.1 | 108-67-8 | 1.0 | 5.4 | ND | ND |
| m-Xylene* | 106.1 | 108-38-3 | 1.0 | 4.7 | ND | ND |
| p-Xylene* | 106.1 | 106-42-3 | 1.0 | 4.7 | * | * |
| o-Xylene | 106.1 | 95-47-6 | 1.0 | 4.7 | ND | ND |
| Vinyl Chloride | 62.5 | 75-01-4 | 1.0 | 2.8 | ND | ND |

*** Coeluting compounds, reported as sum under m-Xylene**

| Sample-specific QA recoveries: | | % | OK Y/N |
|---|---|---|---|
| IS | Bromochloromethane | 91 | Y |
| SS | Bromofluorobenzene | 91 | Y |
| IS | Chlorobenzene d5 | 74 | Y |
| IS | 1,4-Difluorobenzene | 79 | Y |

+ Practical Quantitation Limit, a 2-4X multiple of the experimentally established Method Detection Limit.
Acceptance criteria 70-130% for SS, 60-140% for IS.
IS acceptance criteria corresponds to EPA guidelines.

**TO-14/15 Blank 021910**

**Respectfully submitted,**

**CCAS State Certifications:**
**TX/NELAP T104704250-09-TX**

**Stephen Havlicek, Ph.D.**

**2703 National Place**
**Garland, TX 75041**

3:43 PM3/26/2010

# City of Houston

## Bureau of Air Quality Control 100201z

### Canister Sampling Data Sheet and Chain-of-Custody

| Sample ID: [redacted]68 Grab | Canister #: 4568 |
|---|---|

| Canister Cleaning Information (Laboratory Personnel Only) | | |
|---|---|---|
| Canister Cleaning Operation | Pressure | Initials / Date |
| Canister Cleaned and Evacuated | in Hg | |
| Media Blank Evacuation | in Hg | |

| Sampling and Analysis Request Information (BAQC Investigator Only) | | |
|---|---|---|
| Canister Received: (Initials / Date) CS 2-10-10 | Canister Pressure (Upon Receipt): -30 in Hg | |
| Pre-Sampling Pressure: -30 in Hg (* If the difference is greater than ±2 in Hg, do not use the canister for sampling) | Pre-Sampling Leak Test (Circle) Pass / Fail | |
| Start Time: 15:58 | End Time: 16:58 | Elapsed Time: 60 sec |
| Post-Sampling Pressure: -6 in Hg | | |
| Potential Source (s) (Company's Name): Shell Deer Park | Potential Source (s) (Company's) Address (es): TOL-913 Pygas tank | |
| Sample Collection Address: Co-located w/ sample # 1350 | Alleged Chemical (s) (If Known) aromatic hydrocarbons | |
| GPS Coordinates: | Weather Conditions: Sky c[redacted] overcast Light rain. | |
| Sample Collected By: Cary Secrest | Sample Date: 2-10-2[redacted] | |
| Phone Number: 202 3400 9527 | E-mail: secrest.cary@epa.gov | |
| **Site Description and Field Comments:** [redacted] | | |

**Analysis Method Requested** (Circle) VOC's by TO-15 / Other Describe:

| Canister Leak Test Information (BAQC Mobile Lab Personnel Only) | | | | | |
|---|---|---|---|---|---|
| Canister Leak Test | Field Pressure (in Hg) | Lab Pressure (in Hg) | Difference in Pressure | Test Results (Circle) | Initials / Date |
| Final | | | | Pass / Fail / NA | |

| Canister Preparation Information (BAQC Mobile Lab Personnel Only) | | | |
|---|---|---|---|
| Canister Preparation | Dilution 1 | Dilution 2 | Initials / Date: |
| Pre-Dilution Pressure | in Hg | in Hg | |
| Post-Dilution Pressure | psi | psi | |
| Dilution Factors | #1 | #2 | |
| **Laboratory Comments:** | | | |

| Chain of Custody | |
|---|---|
| Relinquished by: (Signature/Date) | Received by: (Signature/Date) |
| Cary Secrest 16:55 on 2-10-10 | Bessett Henderson at 16:58 on 2/10/10 |
| | |
| | |
| | |
| | |

Effective Date: 01/23/08

Robert Foner 2-17-10 9:00 A.M. CC AS

[redacted]

Shell HRVOC 504-329 BBH (Canister 4568 02102010)

**TESTAMERICA - AUSTIN**
**14050 SUMMIT DR. SUITE A-100**
**AUSTIN, TX 78728**

Duplicate for Shell

Canister # 4568
Field ID 4568 8 Grab
Site 59 m ~~to~~ NNW (340°) of center of TOL-913
Project Shell Deer Park DIAL
Sampler Initials CS
Date 02 / 10 / 2010 Time 15:58
Comments PID readings 700-1200 ppb as isobutadiene, near source ambient

DF = 1.63

Sample Matrix: ☑ Ambient ☑ Source
☐ Routine ☐ Duplicate ☐ Blank ☐ Other ☐ Void

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Tests Austin Lab 1002012-01

Shell HRVOC 504-329 BBH (Canister 4568 02102010)

4568 (2/10/2010)

| | Initial Pressure | Final Pressure | Date | Initials | Dilution Factor |
|---|---|---|---|---|---|
| FIELD | | | | | |
| LAB | | | | | |
| | | | | | |
| | | | | | |
| | Cleaned | 3-25-10 | | | |
| | | | | | |

13.9 psia @ lab
DF = 1.83

Canister Blanked _____

Lab Pressure 29.2

020309

Return canister to City of Houston BAQ