3R – 317

2013 AGWMR

03 / 11 / 2014

COMPLIANCE / ENGINEERING / REMEDIATION

LT Environmental, Inc.
2243 Main Avenue, Suite 3
Durango, Colorado 81301
T 970.385.1096 / F 970.385.1873

March 11, 2014

Glenn Von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Online Submission of 2013 Annual Groundwater Reports

Dear Mr. Von Gonten

LT Environmental (LTE), Inc., on behalf of Williams Field Services, LLC (Williams), is electronically submitting the attached 2013 annual groundwater monitoring reports for the following sites:

- Davis #1
- Dogie Compressor Station East Pit
- Florance #40
- Florance #47
- Ice Canyon Drip
- Jicarilla Contract #147-6
- Pritchard #2A.

If you have any questions regarding these reports please contact Ashley Ager with LTE at 970-385-1096 or aager@ltenv.com or Danny Ruetlinger with Williams at danny.reutlinger@williams.com.

Sincerely,

LT ENVIRONMENTAL, INC.

Ashley Ager
Senior Geologist/Office Manager

Brooke Herb
Staff Geologist

cc: Danny Ruetlinger
Attachments (7)

2013 ANNUAL GROUNDWATER REPORT

FLORANCE #47X
ADMINISTRATIVE/ENVIRONMENTAL ORDER NUMBER 3RP-317-0

FEBRUARY 2014

Prepared for:

WILLIAMS FIELD SERVICES, LLC
Tulsa, Oklahoma

2013 ANNUAL GROUNDWATER REPORT

FLORANCE #47X
ADMINISTRATIVE/ENVIRONMENTAL ORDER NUMBER
3RP-317-0

FEBRUARY 2014

Prepared for:

WILLIAMS FIELD SERVICES, LLC
PO Box 3483, MD 48-6
Tulsa, Oklahoma 74101

Prepared by:

LT ENVIRONMENTAL, INC.
2243 Main Avenue, Suite 3
Durango, Colorado 81301
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TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

EXECUTIVE SUMMARY

Groundwater at the Florance #47X (Administrative/Environmental Order Number 3RP-317-0) natural gas production well (Site) is impacted by petroleum hydrocarbons due to a release from a former dehydrator pit. In January 2013, LT Environmental Inc., (LTE) was retained by Williams Field Services, LLC (Williams) to visit the Site and evaluate the status of groundwater monitoring wells, complete annual sampling requirements, and recommend improvements to the groundwater remediation program.

Between January 2013 and December 2013, four groundwater monitoring events were conducted (March 2013, June 2013, September 2013, and December 2013). Monitoring well top-of-casing elevations were re-surveyed on June 20, 2013. Depth to groundwater data for the monitoring events conducted in 2013 indicated the groundwater flow is to the southeast.

Groundwater monitoring wells MW-3 and MW-5 have historically contained phase-separated hydrocarbons (PSH). Measurable PSH was observed in monitoring well MW-3 during the four quarterly monitoring events in 2013. LTE recovered PSH from MW-3 during 2013 using oil absorbent socks and manual recovery and conducted fingerprinting analysis on the PSH. Measurable PSH was observed in monitoring well MW-5 during March 2013, but the well is damaged, preventing recovery of PSH. Laboratory analytical results indicate the samples collected from monitoring well MW-5 during the June, September, and December 2013 groundwater monitoring events contained concentrations of benzene and total xylenes exceeding the New Mexico Water Quality Control Commission (NMWQCC) groundwater standards.

Laboratory analytical results for groundwater samples collected in groundwater monitoring wells MW-1 and MW-4 indicated benzene, toluene, ethylbenzene, and total xylenes (BTEX) concentrations were compliant with the New Mexico Water Quality Control Commission (NMWQCC) standards for more than eight consecutive quarters and sampling of these wells ceased after the March 2013 monitoring event. Monitoring well MW-2 contained groundwater samples with BTEX concentrations exceeding NMWQCC standards during March, June, and December 2013. During the September 2013 monitoring event, groundwater monitoring well MW-2 was observed to be obstructed and was not sampled.

Williams will continue to monitor groundwater elevations and presence of PSH in MW-1, MW-2, MW-3, and MW-4. Additionally, Williams will manually recover PSH from groundwater monitoring well MW-3 and install oil absorbent socks for passive PSH recovery between site visits. Williams intends to replace monitoring wells MW-2 and MW-5 and install a new monitoring well (MW-6) downgradient to delineate impacted groundwater. New wells will be immediately developed, sampled, and placed on a monitoring schedule based on the initial sampling results.

1.0 INTRODUCTION

LT Environmental, Inc. (LTE), on behalf of Williams Field Services, LLC (Williams), has prepared this report detailing quarterly groundwater monitoring activities completed from January 2013 through December 2013 at the Florance #47X natural gas well (Administrative/Environmental Order Number 3RP-317-0) (Site). The scope of work for this project includes quarterly monitoring of petroleum hydrocarbon impacts to groundwater resulting from the operation of a former earthen dehydrator pit, including groundwater sampling and recovery of phase-separated hydrocarbons (PSH).

1.1 LOCATION

The Site is located at latitude 36.843316 and longitude -108.800667 in Unit G, Section 5, Township 30 North, Range 9 West as depicted on Figure 1. The Site is in Crow Canyon, a tributary of Pump Canyon, in the San Juan Basin in San Juan County, New Mexico.

1.2 HISTORY

In June 1996, approximately 399 cubic yards of impacted soil were excavated from what was believed to be the former dehydrator pit. Hand-written notes indicated the dimensions of the pit were 27 feet by 21 feet by 19 feet deep. A composite soil sample from the pit excavation contained 97 milligrams per kilogram (mg/kg) benzene, toluene, ethylbenzene, and total xylenes (BTEX) and 277 mg/kg of total petroleum hydrocarbons (TPH)-diesel range organics (DRO). A test hole was drilled in the location of the excavation to a depth of 115 feet below ground surface (bgs); groundwater was encountered at 96.95 feet in this test hole. A soil sample from this test hole at 56 feet bgs contained 6,318 mg/kg of TPH-gasoline range organics (GRO) and 88.2 mg/kg of TPH-DRO. A groundwater sample from this test hole, renamed groundwater monitoring well MW-2, contained 18,650 micrograms per liter (µg/L) of BTEX.

Between September 1999 and December 2012, Williams monitored groundwater in five monitoring wells at the Site (Figure 2). Groundwater monitoring wells MW-2, MW-3, and MW-5 contained PSH at some time between 1999 and 2013. Records regarding these activities can be found in previous groundwater reports submitted to the New Mexico Oil Conservation Division (NMOCD).

2.0 METHODOLOGY

During 2013, LTE conducted quarterly groundwater monitoring activities at the Site. These activities included measuring depth to groundwater and investigating presence of PSH in monitoring wells MW-1, MW-2, MW-3, MW-4, and MW-5. Groundwater samples were collected from MW-1, MW-2 MW-4, and MW-5. Monitoring wells MW-3 contains PSH, which LTE passively recovered and analyzed for fingerprinting to evaluate potential sources. PSH was detected in MW-5 during part of 2013; however, the well is damaged and PSH recovery is impossible. Monitoring well MW-2 is partially obstructed and groundwater cannot always be accessed with a pump or bailer.

2.1 WATER AND PRODUCT LEVEL MEASUREMENTS

Groundwater level monitoring activities included recording depth to groundwater measurements with a Keck oil/water interface probe. The presence of any PSH was investigated using the interface probe. The interface probe was decontaminated with Alconox™ soap and rinsed with de-ionized water prior to each measurement. These data are summarized in Table 1.

2.2 GROUNDWATER SAMPLING

Prior to sampling groundwater, depth to groundwater and total depth of monitoring wells were measured with a Keck oil/water interface probe. Groundwater monitoring wells containing measurable PSH were not sampled. The volume of water in each monitoring well was calculated, and a minimum of three well casing volumes of water was purged from each well using a dedicated polyvinyl chloride (PVC) bailer. As water was removed from the monitoring well, pH, electric conductivity, and temperature were monitored. Monitoring wells were purged until these properties stabilized, indicating the purge water was representative of aquifer conditions, or until the well was purged dry. Stabilization was defined as three consecutive stable readings for each water property (±0.4 units for pH, ±10 percent for electric conductivity, and ±2º Celsius for temperature). All purge water was contained and disposed of at a facility designated by Williams. A copy of the 2013 quarterly field notes are presented in Appendix A.

Once each monitoring well was properly purged, groundwater samples were collected by filling three 40-milliliter (ml) glass vials. The laboratory-supplied vials were filled and capped with no air inside to prevent degradation of the sample. Samples were labeled with the date and time of collection, monitoring well designation, project name, collector's name, and parameters to be analyzed. Samples were immediately sealed, packed on ice, and transferred to Hall Environmental Analysis Laboratory (HEAL) for analysis. HEAL analyzed the samples for BTEX using United States Environmental Protection Agency Method 8021.

2.3 GROUNDWATER CONTOUR MAPS

LTE used existing top-of-casing well elevations and groundwater elevations obtained from monitoring wells during the March 2013 site visit to draft a first quarter groundwater contour map (Figure 2). LTE returned to the Site to re-survey top-of-casing well elevations on June 20, 2013. The updated top-of-casing elevations were used for drafting groundwater contours and determining groundwater flow direction for the June, September, and December 2013 quarterly monitoring events (Figures 3 through 5). Contours were inferred based on groundwater elevations obtained and observations of physical characteristics at the Site (topography, proximity to irrigation ditches, etc.).

2.4 PASSIVE PSH RECOVERY

Oil absorbent socks were used to passively recover PSH in monitoring well MW-3. Oil absorbent socks were removed from the well at least seven days prior to sampling to allow groundwater to equilibrate. After sampling, new oil absorbent socks were installed. LTE estimated the volume of recovered PSH based on percent saturation observed in the socks.

2.5 FINGER PRINTING PSH

On September 12, 2013, LTE collected a sample of PSH from groundwater monitoring well MW-3 for paraffins, isoparaffins, aromatics, naphthenes, and olefins (PIANO) analysis to determine the chemical composition of the PSH and identify the potential source at the Site. The sample of PSH was collected using a disposable PVC bailer to fill three 40-milliliter (ml) glass vials. Samples were labeled with the date and time of collection, monitoring well designation, project name, collector's name, and parameters to be analyzed. They were immediately sealed and packed on ice. The samples were transferred to SPL, Inc. (SPL) in Houston, Texas for analysis under chain-of-custody (COC) procedures.

2.6 PRODUCT BAIL DOWN TEST

On November 5, 2013, LTE performed a product bail down test at groundwater monitoring well MW-3 to assess potential product recovery options. Depth to PSH and depth to groundwater were measured with a Keck oil/water interface probe to determine the initial product thickness. LTE used a disposable PVC bailer to remove as much PSH from the groundwater table as possible and recorded the time it took to purge the well of PSH. To monitor recovery, the thickness of PSH was measured every two minutes for the first ten minutes. After the first ten minutes, PSH recovery was measured every ten minutes for an hour. LTE returned to the site on November 6 and November 12, 2013, to measure full PSH recovery.

3.0 RESULTS

Depth to groundwater data collected during the 2013 quarterly monitoring events are summarized on Table 1. Groundwater flow direction was determined to be to the southeast (Figures 2 through 5).

Laboratory analytical results for groundwater samples collected in groundwater monitoring wells MW-1 and MW-4 indicate BTEX concentrations are compliant with the New Mexico Water Quality Control Commission (NMWQCC) groundwater standards or below laboratory analytical detection limits. During the 2013 quarterly monitoring events, BTEX concentrations exceeded the NMWQCC groundwater standards in groundwater monitoring wells MW-2 and MW-5. Laboratory analytical results for groundwater are summarized in Table 2. Copies of the laboratory analytical results are presented in Appendix B.

Groundwater was not sampled from MW-3 during 2013 due to the presence of PSH. Monitoring well MW-3 contained measurable PSH ranging in thickness from 0.40 feet to 0.97 feet during 2013. A total of approximately 81.48 ounces of PSH was removed from MW-3 during 2013 through passive product recovery socks and manual bailing. The PSH sample collected for PIANO analysis from MW-3 indicated a natural gas condensate source as shown on the laboratory analytical results included in Appendix B. The total volume of PSH removed during the bail down test in MW-3 did not fully recover. A graph illustrating PSH recovery over time is included as Figure 6. PSH recovery was slow, requiring at least 7 days to equilibrate. Only 65 percent of the original PSH thickness recovered within 7 days.

4.0 CONCLUSIONS

In 2013, PSH was measured in monitoring wells MW-3 and MW-5 downgradient of the original source area. Additionally, elevated concentrations of BTEX exceeding NMWQCC standards were detected in groundwater sampled from monitoring wells MW-2 and MW-5 located within and downgradient of the source area. Groundwater sampling activities ceased in MW-1 and MW-4 during 2013 due to BTEX concentrations being compliant with the NMWQCC standards for at least eight consecutive quarters. Monitoring wells MW-2 and MW-5 are damaged, restricting data gathering and remediation options in those locations.

Fingerprinting analysis of the PSH sample collected from MW-3 indicated a natural gas condensate source. The total thickness of PSH originally measured in MW-3 did not fully recover during the product bail down test, suggesting the aging well was acting as a preferential pathway for PSH accumulation over time. The volume of PSH actually recovered did so slowly, indicating the use of active product recovery techniques is not viable at the Site.

5.0 RECOMMENDATIONS

Williams will continue to monitor groundwater elevations and presence of PSH from MW-1, MW-2, MW-3, MW-4, and MW-5. Based on the product bail down test results, LTE recommends manual PSH recovery from monitoring wells MW-3 and MW-5 during each quarterly site visit when PSH is present and use of oil absorbent socks in the time periods between quarterly site visits. Williams intends to replace obstructed monitoring well MW-2 and damaged monitoring well MW-5 and install a new monitoring well, MW-6, downgradient for delineation of impacted groundwater. The new wells will be immediately developed, sampled, and placed on a PSH recovery schedule based on the initial sampling results.

FIGURES

IMAGE COURTESY OF ESRI/BING MAPS

LEGEND

SITE LOCATION

0 2,000 4,000

Feet

N

FIGURE 1
SITE LOCATION MAP
FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO

WILLIAMS FIELD SERVICES, LLC

P:\Williams Four Corners\GIS\MXD\034013001_FLORANCE47X\034013001_FLORANCE_47X_FIG01_SL.mxd

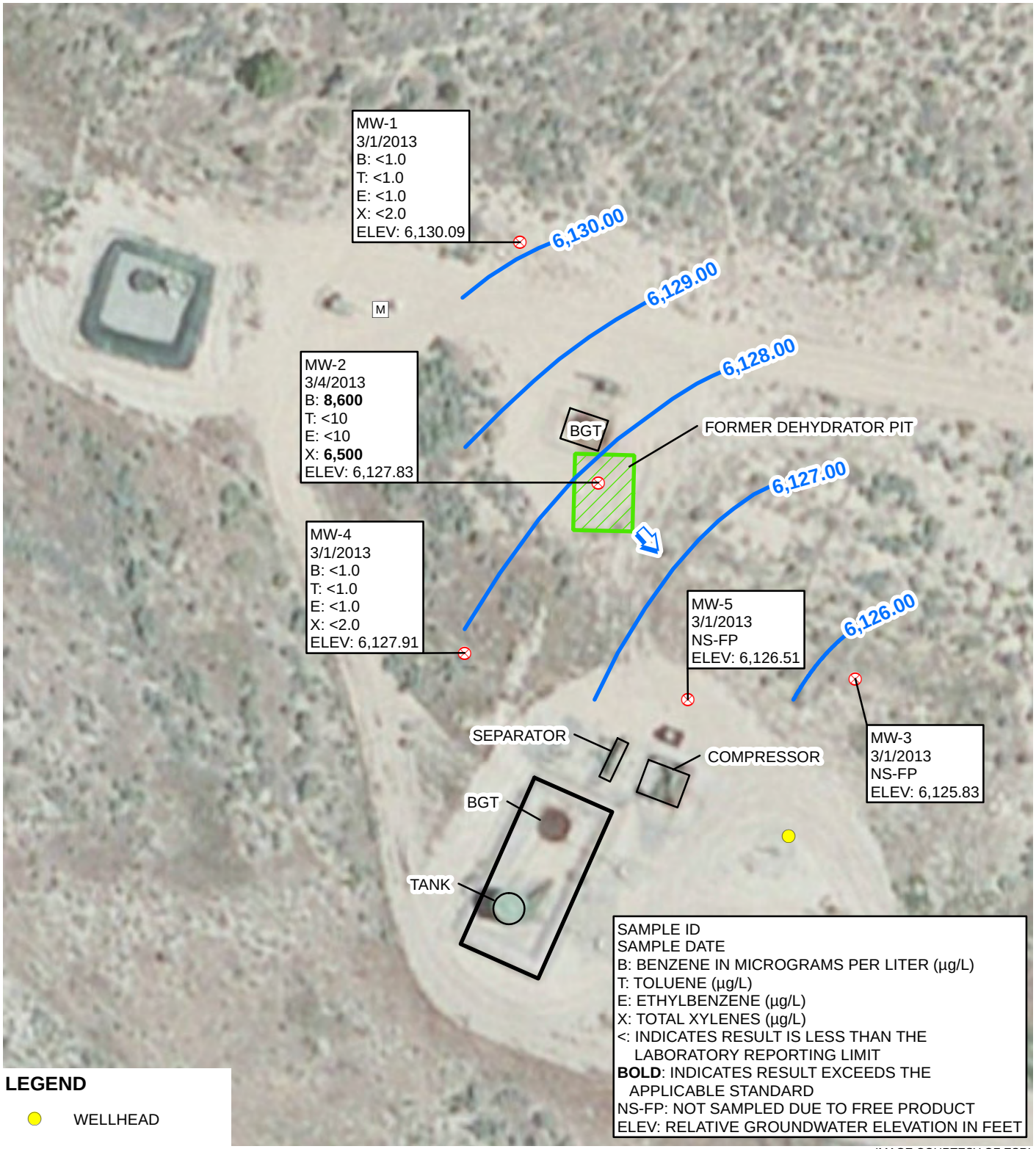


IMAGE COURTESY OF ESRI

LEGEND

- WELLHEAD
- MONITORING WELL
- M — METER HOUSE
- ESTIMATED GROUNDWATER FLOW DIRECTION
- RELATIVE GROUNDWATER ELEVATION CONTOUR
- CONTOUR INTERVAL = 1 FOOT
- BERM

BGT: BELOW GRADE TANK

0 50 100
Feet

N

FIGURE 2
GROUNDWATER ELEVATION & ANALYTICAL RESULTS (MARCH 2013)
FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO
WILLIAMS FIELD SERVICES, LLC

P:\Williams Field Services\GIS\MXD\034013010_FLORANC#47\034013010_FLORANCE_47X_FIG02_GWELEV_GWANALY_2013_Q1.mxd

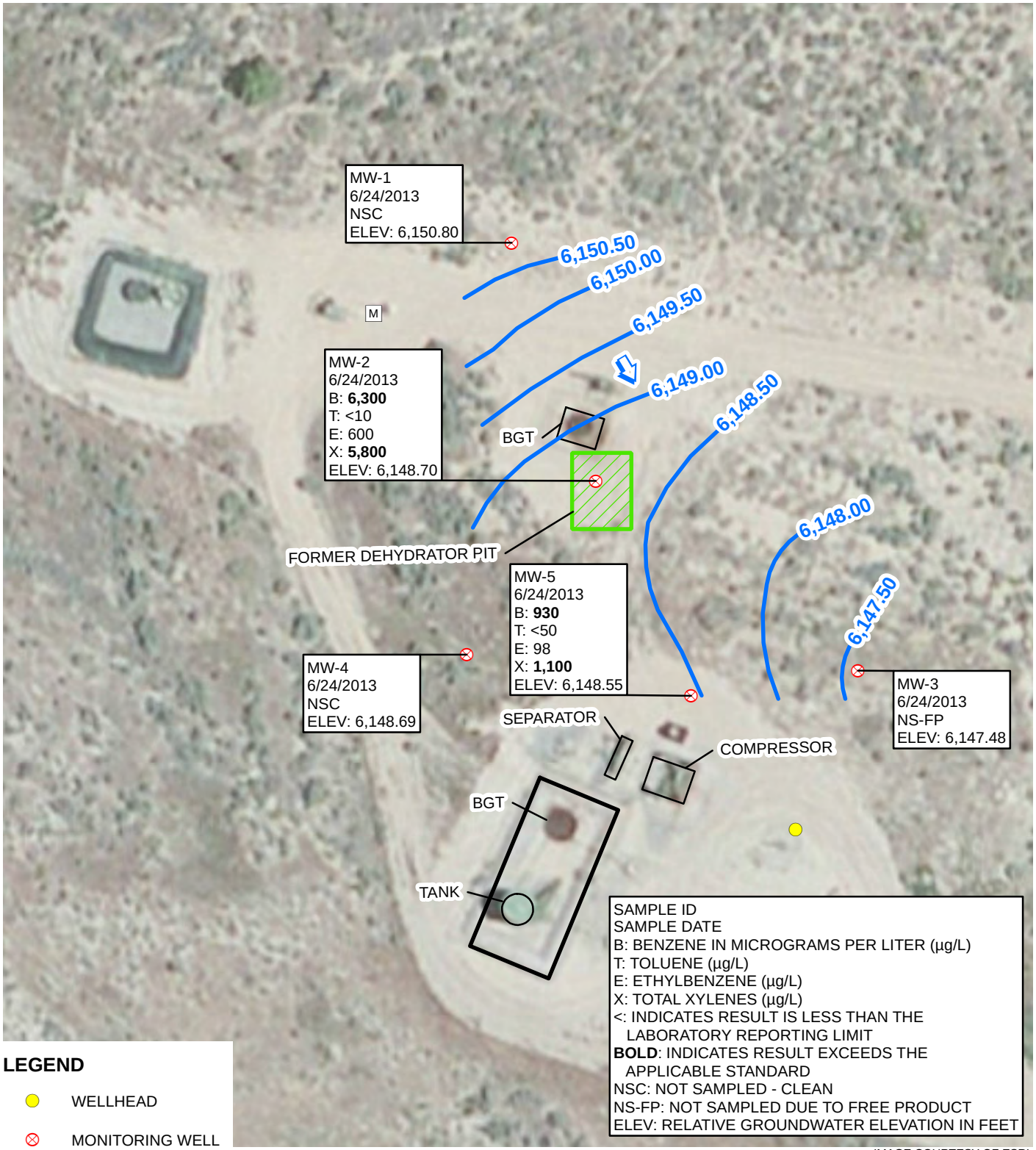


IMAGE COURTESY OF ESRI

LEGEND

- WELLHEAD
- MONITORING WELL
- METER HOUSE
- ESTIMATED GROUNDWATER FLOW DIRECTION
- RELATIVE GROUNDWATER ELEVATION CONTOUR
- CONTOUR INTERVAL = 0.50 FEET
- BERM

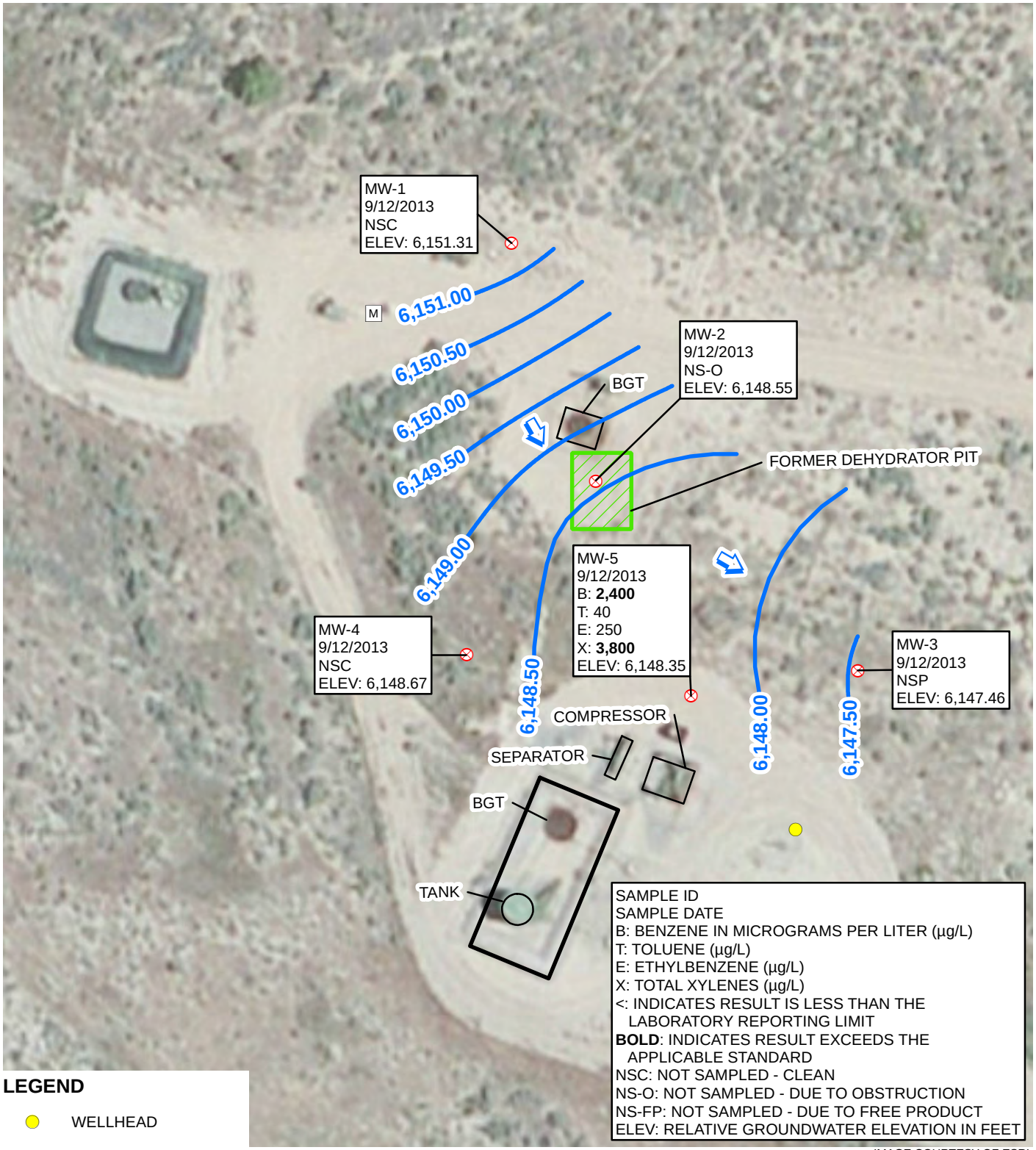
BGT: BELOW GRADE TANK

0 50 100
Feet

N

FIGURE 3
GROUNDWATER ELEVATION & ANALYTICAL RESULTS (JUNE 2013)
FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO
WILLIAMS FIELD SERVICES, LLC

P:\Williams Field Services\GIS\MXD\034013010_FLORANC#47\034013010_FLORANCE_47X_FIG02_GWELEV_GWANALY_2013_Q2.mxd



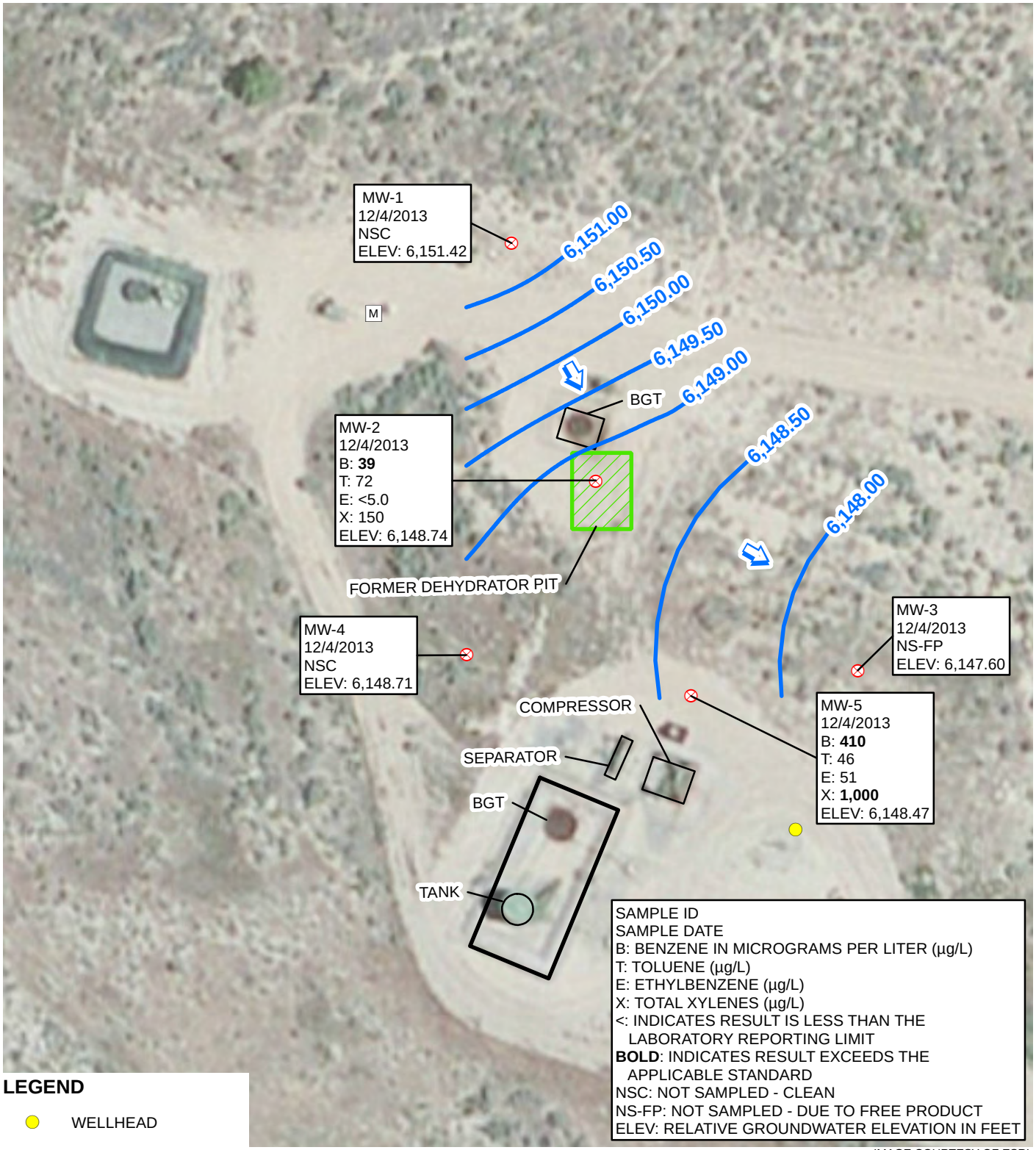
LEGEND

- WELLHEAD
- MONITORING WELL
- M METER HOUSE
- ESTIMATED GROUNDWATER FLOW DIRECTION
- RELATIVE GROUNDWATER ELEVATION CONTOUR
  CONTOUR INTERVAL = 0.50 FEET
- BERM

BGT: BELOW GRADE TANK

FIGURE 4
GROUNDWATER ELEVATION & ANALYTICAL RESULTS (SEPTEMBER 2013)
FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO
WILLIAMS FIELD SERVICES, LLC

P:\Williams Field Services\GIS\MXD\034013010_FLORANC#47\034013010_FLORANCE_47X_FIG02_GWELEV_GWANALY_2013_Q3.mxd



LEGEND

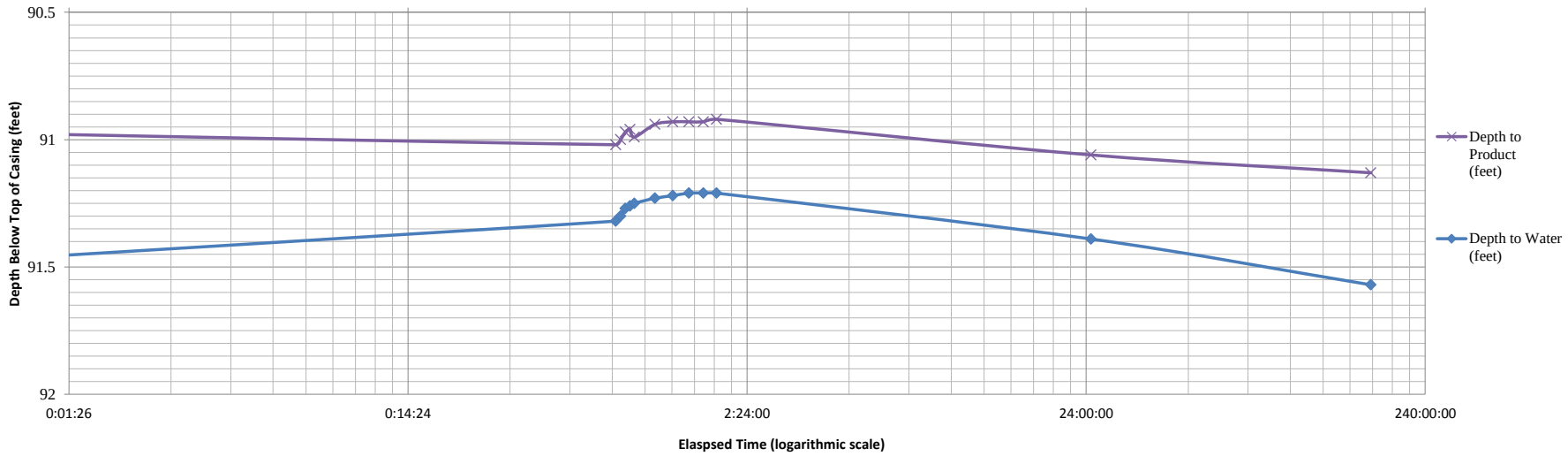
- WELLHEAD
- MONITORING WELL
- METER HOUSE
- ESTIMATED GROUNDWATER FLOW DIRECTION
- RELATIVE GROUNDWATER ELEVATION CONTOUR
  CONTOUR INTERVAL = 0.50 FEET
- BERM

BGT: BELOW GRADE TANK

FIGURE 5
GROUNDWATER ELEVATION & ANALYTICAL RESULTS (DECEMBER 2013)
FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO
WILLIAMS FIELD SERVICES, LLC

P:\Williams Field Services\GIS\MXD\034013010_FLORANC#47\034013010_FLORANCE_47X_FIG02_GWELEV_GWANALY_2013_Q4.mxd

FIGURE 6
PRODUCT BAIL DOWN TEST
FLORANCE #47X MONITORING WELL MW-3



TABLES

TABLE 1

GROUNDWATER ELEVATIONS SUMMARY
FLORANCE #47X
WILLIAMS FIELD SERVICES, LLC

Well Name	Date	Top of Casing Elevation (feet AMSL)	Depth to Product (feet BTOC)	Product Thickness (feet)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet AMSL)
MW-1	4/2/2012	6,229.61	UNK	UNK	UNK	UNK
MW-1	6/13/2012	6,229.61	UNK	UNK	UNK	UNK
MW-1	10/2/2012	6,229.61	UNK	UNK	UNK	UNK
MW-1	12/6/2012	6,229.61	UNK	UNK	UNK	UNK
MW-1	3/1/2013	6,229.61	NP	NP	99.52	6,130.09
MW-1	6/24/2013**	6,250.21	NP	NP	99.41	6,150.80
MW-1	9/12/2013	6,250.21	NP	NP	98.90	6,151.31
MW-1	12/4/2013	6,250.21	NP	NP	98.79	6,151.42
MW-2	4/2/2012	6,226.30	UNK	UNK	UNK	UNK
MW-2	6/13/2012	6,226.30	UNK	UNK	UNK	UNK
MW-2	10/2/2012	6,226.30	UNK	UNK	UNK	UNK
MW-2	12/6/2012	6,226.30	UNK	UNK	UNK	UNK
MW-2	3/1/2013	6,226.30	NP	NP	98.47	6,127.83
MW-2	6/24/2013**	6,247.15	NP	NP	98.45	6,148.70
MW-2	9/12/2013	6,247.15	NP	NP	98.60	6,148.55
MW-2	12/4/2013	6,247.15	NP	NP	98.41	6,148.74
MW-3	4/2/2012	6,217.53	UNK	UNK	UNK	UNK
MW-3	6/13/2012	6,217.53	UNK	UNK	UNK	UNK
MW-3	10/2/2012	6,217.53	UNK	UNK	UNK	UNK
MW-3	12/6/2012	6,217.53	UNK	UNK	UNK	UNK
MW-3*	3/1/2013	6,217.53	91.51	0.97	92.48	6,125.83
MW-3*	6/24/2013**	6,238.51	90.86	0.85	91.71	6,147.48
MW-3	9/12/2013	6,238.51	90.89	0.80	91.69	6,147.46
MW-3	12/4/2013	6,238.51	90.83	0.40	91.23	6,147.60
MW-4	4/2/2012	6,219.93	UNK	UNK	UNK	UNK
MW-4	6/13/2012	6,219.93	UNK	UNK	UNK	UNK
MW-4	10/2/2012	6,219.93	UNK	UNK	UNK	UNK
MW-4	12/6/2012	6,219.93	UNK	UNK	UNK	UNK
MW-4	3/1/2013	6,219.93	NP	NP	92.02	6,127.91
MW-4	6/24/2013**	6,240.67	NP	NP	91.98	6,148.69
MW-4	9/12/2013	6,240.67	NP	NP	92.00	6,148.67
MW-4	12/4/2013	6,240.67	NP	NP	91.96	6,148.71
MW-5	4/2/2012	6,216.97	UNK	UNK	UNK	UNK
MW-5	6/13/2012	6,216.97	UNK	UNK	UNK	UNK
MW-5	10/2/2012	6,216.97	UNK	UNK	UNK	UNK
MW-5	12/6/2012	6,216.97	UNK	UNK	UNK	UNK
MW-5	3/1/2013	6,216.97	90.46	0.02	90.48	6,126.51
MW-5	6/24/2013**	6,238.33	NP	NP	89.78	6,148.55
MW-5	9/12/2013	6,238.33	NP	NP	89.98	6,148.35
MW-5	12/4/2013	6,238.33	NP	NP	89.86	6,148.47

Notes:

* Due to presence of product recovery device, this is not a static water level

** Top of casing elevation was resurveyed on 6/20/13

Groundwater elevation calculation in wells with product: (Top of Casing Elevation - Depth to Water) + (Product Thickness * 0.8)

AMSL - Above Mean Sea Level

BTOC - Below Top of Casing

NP - no free phase hydrocarbons are present the the well

UNK - data is not known

TABLE 2

GROUNDWATER LABORATORY ANALYTICAL RESULTS
FLORANCE #47X
WILLIAMS FIELD SERVICES, LLC

Well Name	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard (µg/L)		**10**	**750**	**750**	**620**
MW-1	1/8/1997	**3,380**	**7,150**	**917**	**7,200**
MW-1	7/13/1997	**367**	241	35	191
MW-1	10/1/1997	**171**	54	27	65
MW-1	1/6/1998	**147**	70	20	73.6
MW-1	3/9/1998	**140**	1.4	17	36
MW-1	6/11/1998	**94**	19	11	16.3
MW-1	8/12/1998	**49**	4.7	8.8	5.7
MW-1	12/15/1998	**46**	11	5.8	4.7
MW-1	2/9/1999	**33**	6.6	5.6	4.7
MW-1	4/21/1999	**40**	15	6.4	10.4
MW-1	7/28/1999	**34**	7.8	3	3.0
MW-1	11/3/1933	2.9	<0.5	<0.5	<1.5
MW-1	3/23/2000	**10**	1.1	<0.5	<1.5
MW-1	6/14/2000	4.1	1.4	0.6	<1.5
MW-1	11/17/2000	4.64	<1.0	<1.0	<1.0
MW-1	1/31/2001	3.67	1.44	<1.0	<1.0
MW-1	4/30/2001	5.44	1.90	<1.0	1.78
MW-1	10/10/2001	1.1	<2.0	<2.0	<2.0
MW-1	12/2/2003	<2.0	<2.0	<2.0	<5.0
MW-1	9/20/2004	3.4	<2.0	<2.0	<5.0
MW-1	12/3/2004	<2.0	<2.0	<2.0	<5.0
MW-1	3/10/2005	<2.0	<2.0	<2.0	<5.0
MW-1	6/18/2005	<2.0	<2.0	<2.0	<5.0
MW-1	7/13/2006	2.2	<1.0	<1.0	<3.0
MW-1	9/21/2006	4.9	<1.0	<1.0	<3.0
MW-1	3/29/2010	<1.0	<1.0	<1.0	<3.0
MW-1	6/18/2010	<1.0	<1.0	<1.0	<3.0
MW-1	9/10/2010	1.2	<1.0	<1.0	<3.0
MW-1	12/4/2010	<1.0	<1.0	<1.0	<3.0
MW-1	3/2/2011	<1.0	<1.0	<1.0	<3.0
MW-1	6/14/2011	3.6	<1.0	<1.0	<3.0
MW-1	9/12/2011	<1.0	<1.0	<1.0	<3.0
MW-1	1/3/2012	<1.0	<1.0	<1.0	<3.0
MW-1	4/2/2012	<1.0	<1.0	<1.0	<3.0
MW-1	6/13/2012	<1.0	<1.0	<1.0	<3.0
MW-1	10/2/2012	1.1	<1.0	<1.0	<3.0
MW-1	12/6/2012	<1.0	<1.0	<1.0	<3.0

TABLE 2

GROUNDWATER LABORATORY ANALYTICAL RESULTS
FLORANCE #47X
WILLIAMS FIELD SERVICES, LLC

Well Name	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard (µg/L)		**10**	**750**	**750**	**620**
MW-1	3/1/2013	<1.0	<1.0	<1.0	<2.0
MW-2	8/12/1998	**9,800**	**14,000**	**920**	**9,200**
MW-2	12/15/1998	**12,000**	**17,000**	**870**	**8,700**
MW-2	2/9/1999	**11,000**	**16,000**	720	**7,300**
MW-2	4/21/1999	**14,000**	**20,000**	**850**	**8,500**
MW-2	7/28/1999	**11,000**	**15,000**	740	**6,800**
MW-2	11/3/1999	**11,000**	**14,000**	**770**	**8,100**
MW-2	3/23/2000	**12,000**	**15,000**	**810**	**8,200**
MW-2	6/14/2000	**6,400**	**7,000**	570	**5,800**
MW-2	11/17/2000	**5,980**	**3,240**	600	**4,780**
MW-2	1/31/2001	**6,300**	**2,790**	458	**5,490**
MW-2	4/30/2001	**7,160**	**2,200**	404	**7,060**
MW-2	10/10/2001	**4,500**	**1,000**	390	**3,800**
MW-2	12/2/2003	**11,000**	<100	540	**6,400**
MW-2	9/20/2004	**11,000**	<200	600	**5,800**
MW-2	12/3/2004	**11,000**	<200	630	**6,300**
MW-2	3/10/2005	**10,000**	38	490	**5,700**
MW-2	6/18/2005	**9,700**	<100	640	**6,000**
MW-2	9/16/2005	**8,900**	31	370	**4,800**
MW-2	11/30/2005	<2.0	2.9	<2.0	12.2
MW-2	7/18/2006	**16,900**	<10.0	**753**	**4,370**
MW-2	3/29/2010	**9,460**	67	521	**6,210**
MW-2	6/18/2010	**3,270**	<1.0	260	**3,530**
MW-2	12/4/2010	**1,470**	26.3	599	**2,720**
MW-2	3/2/2011	**2,530**	1.4	**764**	**3,700**
MW-2	6/14/2011	**8,500**	<20.0	537	**4,490**
MW-2	1/3/2012	**9,400**	<50.0	710	**6,340**
MW-2	4/2/2012	**10,000**	710	<100	**6,390**
MW-2	6/13/2012	**11,200**	716	<50.0	**6,790**
MW-2	10/2/2012	**10,200**	**765**	<100	**7,260**
MW-2	12/6/2012	**8,280**	722	<50.0	**5,610**
MW-2	3/4/2013	**8,600**	<10	<10	**6,500**
MW-2	6/24/2013	**6,300**	<10	600	**5,800**
MW-2	9/12/2013	NSO	NSO	NSO	NSO
MW-2	12/4/2013	**39**	72	<5.0	150

TABLE 2

GROUNDWATER LABORATORY ANALYTICAL RESULTS
FLORANCE #47X
WILLIAMS FIELD SERVICES, LLC

Well Name	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard (µg/L)		**10**	**750**	**750**	**620**
MW-3	4/2/2012	NS	NS	NS	NS
MW-3	6/13/2012	NS	NS	NS	NS
MW-3	10/2/2012	NS	NS	NS	NS
MW-3	12/6/2012	NS	NS	NS	NS
MW-3	3/1/2013	NS-FP	NS-FP	NS-FP	NS-FP
MW-3	6/24/2013	NS-FP	NS-FP	NS-FP	NS-FP
MW-3	9/12/2013	NS-FP	NS-FP	NS-FP	NS-FP
MW-3	12/4/2013	NS-FP	NS-FP	NS-FP	NS-FP
MW-4	12/15/1998	**44**	11	5.8	4.8
MW-4	2/9/1999	**11,000**	**16,000**	730	**7,300**
MW-4	4/21/1999	**68**	25	9.3	13
MW-4	7/2/1999	**11,000**	**14,000**	700	**6,700**
MW-4	3/23/2000	**11,000**	**13,000**	**770**	**7,800**
MW-4	6/14/2000	**28**	42	7	135
MW-4	11/17/2000	**59.9**	104	2.94	98.3
MW-4	1/31/2001	**30.3**	81.0	5.20	156
MW-4	4/30/2001	**36.1**	56.1	1.32	73
MW-4	10/10/2001	**24**	28	<2.0	47
MW-4	12/2/2003	2.3	2.7	<2.0	6.5
MW-4	9/20/2004	3.6	3.2	<2.0	9.8
MW-4	12/3/2004	2.5	2.3	<2.0	8
MW-4	3/10/2005	3.0	3.5	<2.0	11
MW-4	6/18/2005	<2.0	3	<2.0	8.6
MW-4	9/16/2005	<2.0	2.3	<2.0	9.4
MW-4	11/30/2005	<2.0	<2.0	<2.0	10.4
MW-4	7/13/2006	2.9	<1.0	1.0	9.9
MW-4	9/21/2006	1.2	<1.0	<1.0	9.6
MW-4	3/29/2010	1.3	<1.0	<1.0	8.7
MW-4	6/18/2010	<1.0	<1.0	<1.0	6.8
MW-4	9/10/2010	<1.0	<1.0	<1.0	3.9
MW-4	12/4/2010	<1.0	<1.0	<1.0	5.6
MW-4	3/2/2011	<1.0	<1.0	<1.0	3
MW-4	6/14/2011	<1.0	<1.0	<1.0	6
MW-4	9/12/2011	<1.0	<1.0	<1.0	4.7
MW-4	1/3/2012	<1.0	<1.0	<1.0	5.4
MW-4	4/2/2012	<1.0	<1.0	<1.0	6.1

TABLE 2

GROUNDWATER LABORATORY ANALYTICAL RESULTS
FLORANCE #47X
WILLIAMS FIELD SERVICES, LLC

Well Name	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard (µg/L)		**10**	**750**	**750**	**620**
MW-4	6/13/2012	<1.0	<1.0	<1.0	3.7
MW-4	10/2/2012	<1.0	<1.0	<1.0	4.5
MW-4	12/6/2012	<1.0	<1.0	<1.0	6
MW-4	3/1/2013	<1.0	<1.0	<1.0	<2.0
MW-5	6/14/2000	**1,100**	710	100	**1,100**
MW-5	6/14/2000	**890**	570	80	**900**
MW-5	11/17/2000	**161**	110	8.09	60.8
MW-5	4/30/2001	**15.7**	21.6	2.01	17.9
MW-5	10/10/2001	**380**	120	19	220
MW-5	12/2/2003	**41**	7.9	3.1	10
MW-5	9/20/2004	**17**	3.7	<2.0	9.9
MW-5	12/9/2004	**13**	3.3	<2.0	14
MW-5	3/10/2005	5.5	<2.0	<2.0	6.3
MW-5	7/13/2006	**920**	74	34.7	**1,980**
MW-5	9/21/2006	**135**	19.2	17.0	**409**
MW-5	4/2/2012	NS	NS	NS	NS
MW-5	6/13/2012	NS	NS	NS	NS
MW-5	10/2/2012	NS	NS	NS	NS
MW-5	12/6/2012	NS	NS	NS	NS
MW-5	3/1/2013	NS-FP	NS-FP	NS-FP	NS-FP
MW-5	6/24/2013	**930**	<50	98	**1,100**
MW-5	9/12/2013	**2,400**	40	250	**3,800**
MW-5	12/4/2013	**410**	46	51	**1,000**

Notes:
Bold - indicates sample exceeds NMWQCC standard
NMWQCC - New Mexico Water Quality Control Commission
NS - not sampled
NSC - not sampled due to eight quarters below NMWQCC standards
NSO - not sampled due to obstruction
NS -FP - not sampled due to the presence of free phase hydrocarbons in the well
µg/L - micrograms per liter
< - indicates result is less than laboratory reporting detection limit

APPENDIX A

2013 QUARTERLY FIELD NOTES

Water Sample Collection Form

Sample Location	Florance #47X	Client	Williams Field Services, LLC
Sample Date	3/1/2013	Project Name	Historical Groundwater
Sample Time	11:53	Project #	034013001
Sample ID	MW-1	Sampler	Brooke Herb
Analyses	BTEX 8021		
Matrix	Groundwater	Laboratory	Hall Environmental
Turn Around Time	Standard	Shipping Method	Hand delivery
Depth to Water	99.52	TD of Well	107.50
Time	10:55	Depth to Product	NA

Vol. of H2O to purge 7.98* 0.16 = 1.27 * 3 = 3.83

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging PVC Bailer

Method of Sampling PVC Bailer

Time	Vol. Removed (gallons)	Total Vol H2O removed (gallons)	pH (standard units)	Temp. (°C)	Conductivity (ms)	Comments
11:20	0.25	0.25	6.72	16.0	2.87	Dark gray, cloudy, no odor, no sheen
	0.25	0.50	6.44	15.2	2.82	No change
	0.25	0.75	6.51	15.5	2.82	No change
	0.25	1.00	6.45	15.6	2.82	No change
	1.00	2.00	6.52	15.6	2.83	No change
	1.00	3.00	6.50	15.6	2.88	No change
	0.25	3.25	6.50	15.8	2.83	No change
	0.25	3.50	6.49	15.9	2.82	No change
	0.25	3.75	6.50	16.0	2.85	No change
11:50	0.25	4.00	6.49	16.0	2.83	No change

Comments:

Describe Deviations from SOP: None

Signature: Brooke Herb **Date:** 3/1/2013

Water Sample Collection Form

Sample Location	Florance #47X	Client	Williams Field Services, LLC
Sample Date	3/1/2013	Project Name	Historical Groundwater
Sample Time	13:20	Project #	034013001
Sample ID	MW-2	Sampler	Brooke Herb
Analyses	BTEX 8021		
Matrix	Groundwater	Laboratory	Hall Environmental
Turn Around Time	Standard	Shipping Method	Hand delivery
Depth to Water	98.47	TD of Well	101.81
Time	12:00	Depth to Product	NA

Vol. of H2O to purge 3.34* 0.16 = 0.53 * 3 = 1.60

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging PVC Bailer

Method of Sampling PVC Bailer

Time	Vol. Removed (gallons)	Total Vol H2O removed (gallons)	pH (standard units)	Temp. (°C)	Conductivity (µs)	Comments
12:18	0.25	0.25	7.22	16.8	1,436	Strong HC odor, minor sheen, clearish gray with black particles and debris
	0.25	0.50	7.23	17.0	1,433	No change
	0.25	0.75	7.31	17.0	1,463	Black, heavier sheen
	0.25	1.00	7.37	17.0	1,525	No change
12:30	0.25	1.25	7.43	17.1	1,538	No change
						Bailed Dry at 12:35

Comments: Well bailed dry at 12:35. Return to MW-2 at 13:45, no water in bailer. Return to well after dumping purge water at 15:25, well still dry. Return March 4, 2013 for grab sample. It feels like there is an obstruction at ~98.00 feet preventing the bailer from going any deeper. Was able to collect grab sample at 13:20.

Describe Deviations from SOP: See Above

Signature: Brooke Herb **Date:** 3/1/2013

Water Sample Collection Form

Sample Location	Florance #47X	Client	Williams Field Services, LLC
Sample Date	3/1/2013	Project Name	Historical Groundwater
Sample Time	NA	Project #	034013001
Sample ID	MW-3	Sampler	Brooke Herb
Analyses	NA		
Matrix	NA	Laboratory	NA
Turn Around Time	NA	Shipping Method	NA
Depth to Water	92.48	TD of Well	NM
Time	13:40	Depth to Product	91.51

Vol. of H2O to purge

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging NA

Method of Sampling NA

Time	Vol. Removed (gallons)	Total Vol H2O removed (gallons)	pH (standard units)	Temp. (°C)	Conductivity (ms)	Comments

Comments No sample was collected due to the presence of product.
Product recovery device in well; returned to well after DTW and DTP measurements were complete.

Describe Deviations from SOP:

Signature: Brooke Herb **Date:** 3/1/2013

Water Sample Collection Form

Sample Location	Florance #47X	Client	Williams Field Services, LLC
Sample Date	3/1/2013	Project Name	Historical Groundwater
Sample Time	10:45	Project #	034013001
Sample ID	MW-4	Sampler	Brooke Herb
Analyses	BTEX 8021		
Matrix	Groundwater	Laboratory	Hall Environmental
Turn Around Time	Standard	Shipping Method	Hand delivery
Depth to Water	92.02	TD of Well	102.55
Time	9:40	Depth to Product	NA
Vol. of H2O to purge	10.53* 0.16 = 1.68 * 3 = 5.05		
	*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*		
Method of Purging	PVC Bailer		
Method of Sampling	PVC Bailer		

Time	Vol. Removed (gallons)	Total Vol H2O removed (gallons)	pH (standard units)	Temp. (°C)	Conductivity (ms)	Comments
9:51	0.25	0.25	5.45	14.8	2.68	Brown, silty
	0.25	0.50	5.65	14.4	2.55	No change
	0.25	0.75	5.70	14.0	2.66	No change
	0.25	1.00	5.62	14.4	2.57	No change
	1.00	2.00	5.74	14.7	2.63	Bailing down - bailers only 1/2 full
	1.00	3.00	5.68	14.9	2.62	less silt
	1.00	4.00	5.65	15.0	2.65	No change
	0.25	4.25	5.56	14.5	2.61	No change
	0.25	4.50	5.39	14.9	2.68	No change
	0.25	4.75	5.43	14.8	2.71	No change
	0.25	5.00	5.44	14.9	2.68	No change
10:45	0.25	5.25	5.43	14.8	2.66	No change

Comments:

Describe Deviations from SOP:

Signature: Brooke Herb **Date:** 3/1/2013

Water Sample Collection Form

Sample Location	Florance #47X	Client	Williams Field Services, LLC
Sample Date	3/1/2013	Project Name	Historical Groundwater
Sample Time	NA	Project #	034013001
Sample ID	MW-5	Sampler	Brooke Herb
Analyses	NA		
Matrix	NA	Laboratory	NA
Turn Around Time	NA	Shipping Method	NA
Depth to Water	90.48	TD of Well	NM
Time	12:40	Depth to Product	90.46

Vol. of H2O to purge

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging NA

Method of Sampling NA

Time	Vol. Removed (gallons)	Total Vol H2O removed (gallons)	pH (standard units)	Temp. (°C)	Conductivity (ms)	Comments

Comments: No sample was collected due to the presence of product.
Probe had gray sludge on it.
Tubing was present in the well all the way to the bottom; product was on the bottom 5 feet of tubing.
The tubing was removed from well and discarded.

Describe Deviations from SOP:

Signature: Brooke Herb **Date:** 3/1/2013

Water Sample Collection Form

Sample Location	Florance #47X	Client	Williams
Sample Date	6/24/13	Project Name	Historical GW
Sample Time	11:55	Project #	
Sample ID	MW-2	Sampler	BH 9 DN
Analyses	BTEX 8021		
Matrix	Groundwater	Laboratory	Hall
Turn Around Time	Standard	Shipping Method	Christine
Trip Blank	Yes	Other QA/QC	NA
Depth to Water	98.45	TD of Well	101.81
Time	11:05	Depth to Product	NA
Vol. of H2O to purge	3.36 x .1631 = 0.55 x 3 = 1.65		1.65

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging: Bottom Valve Bailer

Method of Sampling: Bottom Valve Bailer

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std. units)	Temp. (C) °F	Conductivity (us or ms)	Comments
1110	.20	.20	7.02	66.0	1330	Dark Gray Strong HC odor minor sheen, Blk particles
	.25	.45	7.06	65.7	1324	Darker Gray/Black HC odor
	.25	.70	7.12	65.8	1370	no change
	.25	.95	7.14	65.3	1344	"
	.25	1.20	7.22	65.1	1403	Black, more silt
	.25	1.45	7.26	65.5	1438	no change.
	.25	1.70	7.24	65.4	1436	"
1150	.25	1.95	7.24	65.3	1439	"

Comments: Filled 3 HCl VOA's for BTEX 8021

Describe Deviations from SOP:

Signature: [signature] **Date:** 6/24/13

Water Sample Collection Form

Sample Location	Florance #47X	Client	Williams
Sample Date	6/24/13	Project Name	Historical GW
Sample Time	1325	Project #	
Sample ID	MW-5	Sampler	BH & DN
Analyses	BTEX 8021		
Matrix	Groundwater	Laboratory	HALL
Turn Around Time	Standard	Shipping Method	Christine | Fedex
Trip Blank	Yes	Other QA/QC	NA
Depth to Water	89.78	TD of Well	99.79
Time	12:15	Depth to Product	NA

Vol. of H2O to purge: 10.01 x .1631 = 1.63 x 3 = 4.89

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging: Bottom Valve Bailer

Method of Sampling: " " "

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std. units)	Temp. (c) F	Conductivity (us or ms)	Comments
12:15	0.25	0.25	6.74	68.5	815	Black HC odor minor Sheen
	0.25	0.50	6.86	65.3	980	more Silt, Black
	0.25	0.75	6.89	65.5	1014	NO change
	0.15	0.90	6.89	67.5	1017	NO change
	0.15	1.05	6.92	66.9	1250	No change
	0.20	1.25	6.95	65.5	1276	No change
	0.15	1.40	6.96	66.2	1253	No change
	0.15	1.55	6.97	67.6	1235	NO change
	0.25	1.80	6.96	66.2	1416	NO change
DN	0.20	2.00	6.98	65.8	1226	NO change
1/2	0.15	2.15	6.98	67.7	1373	Bailing Down
1325						Bail Dry

Comments: PVC Casing Bent. ~~Hard to use small Bailer~~ BH Was able to Wiggle Bailer down using a rock

Describe Deviations from SOP: Bail Dry Before 3 casing volumes removed

Signature: [signature] **Date:** 6/24/13

LTE

APPENDIX B

LABORATORY ANALYTICAL REPORTS

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

March 07, 2013

Julie Linn

LTE
2243 Main Ave Suite 3
Durango, CO 81301
TEL: (970) 385-1096
FAX:

RE: Florance 47X OrderNo.: 1303037

Dear Julie Linn:

Hall Environmental Analysis Laboratory received 2 sample(s) on 3/2/2013 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order: **1303037**
Date Reported: **3/7/2013**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Project: Florance 47X
Lab Order: 1303037

Lab ID: 1303037-001
Collection Date: 3/1/2013 10:45:00 AM
Client Sample ID: MW-4
Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	3/5/2013 3:39:53 AM
Toluene	ND	1.0		µg/L	1	3/5/2013 3:39:53 AM
Ethylbenzene	ND	1.0		µg/L	1	3/5/2013 3:39:53 AM
Xylenes, Total	ND	2.0		µg/L	1	3/5/2013 3:39:53 AM
Surr: 4-Bromofluorobenzene	96.7	69.7-152		%REC	1	3/5/2013 3:39:53 AM

Lab ID: 1303037-002
Collection Date: 3/1/2013 11:53:00 AM
Client Sample ID: MW-1
Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	3/5/2013 4:10:02 AM
Toluene	ND	1.0		µg/L	1	3/5/2013 4:10:02 AM
Ethylbenzene	ND	1.0		µg/L	1	3/5/2013 4:10:02 AM
Xylenes, Total	ND	2.0		µg/L	1	3/5/2013 4:10:02 AM
Surr: 4-Bromofluorobenzene	104	69.7-152		%REC	1	3/5/2013 4:10:02 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1303037**

07-Mar-13

Client: LTE

Project: Florance 47X

Sample ID: **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBW**	Batch ID: **R8955**	RunNo: **8955**
Prep Date:	Analysis Date: **3/4/2013**	SeqNo: **255896** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	19		20.00		93.9	69.7	152			

Sample ID: **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSW**	Batch ID: **R8955**	RunNo: **8955**
Prep Date:	Analysis Date: **3/4/2013**	SeqNo: **255897** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	101	80	120			
Toluene	20	1.0	20.00	0	102	80	120			
Ethylbenzene	21	1.0	20.00	0	103	80	120			
Xylenes, Total	63	2.0	60.00	0	105	80	120			
Surr: 4-Bromofluorobenzene	21		20.00		103	69.7	152			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: LTE Work Order Number: 1303037

Received by/date: AF 03/02/13

Logged By: **Lindsay Mangin** 3/2/2013 12:00:00 PM

Completed By: **Lindsay Mangin** 3/4/2013 9:05:50 AM

Reviewed By: IO 03/04/2013

Chain of Custody

1. Were seals intact? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Courier

Log In

4. Coolers are present? (see 19. for cooler specific information) Yes ☑ No ☐ NA ☐
5. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
6. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
7. Sample(s) in proper container(s)? Yes ☑ No ☐
8. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
9. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
10. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
11. VOA vials have zero headspace? Yes ☑ No ☐ No VOA Vials ☐
12. Were any sample containers received broken? Yes ☐ No ☑
13. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
14. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
15. Is it clear what analyses were requested? Yes ☑ No ☐
16. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

18. Additional remarks:

-002A - ONE VOA HAS SOME HEAD SPACE.

19. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.9	Good	Yes			

Chain-of-Custody Record

Client: LT Environmental

Mailing Address: 2243 Main Ave S.3
Durango CO 81301

Phone #: 970-385-1096

email or Fax#: jlinn@ltenv.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: Florance 47X

Project #:

Project Manager: Julie Linn

Sampler: Brooke Herb

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.9

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1303037	BTEX + ~~MTBE + TMB's~~ (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
1/1/13	1045	GW	MW-4	VOA/3	cool	-001	X															
1/1/13	1153	GW	MW-1	VOA/3	cool	-002	X															

Analysis Request

Date:	Time:	Relinquished by:	Received by:	Date	Time
1/1/13	1610			3/1/13	1610
1/1/13	1715	Christine Walters		3/2/13	12:00

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

March 18, 2013

Julie Linn

LTE
2243 Main Ave Suite 3
Durango, CO 81301
TEL: (970) 385-1096
FAX

RE: Florance #47X OrderNo.: 1303403

Dear Julie Linn:

Hall Environmental Analysis Laboratory received 1 sample(s) on 3/8/2013 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-2
Project: Florance #47X
Collection Date: 3/4/2013 1:20:00 PM
Lab ID: 1303403-001
Matrix: AQUEOUS
Received Date: 3/8/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**
Benzene	8600	100		µg/L	100	3/12/2013 3:21:49 PM
Toluene	ND	10		µg/L	10	3/12/2013 5:22:37 AM
Ethylbenzene	ND	10		µg/L	10	3/12/2013 5:22:37 AM
Xylenes, Total	6500	200		µg/L	100	3/12/2013 3:21:49 PM
Surr: 1,2-Dichloroethane-d4	89.5	70-130		%REC	10	3/12/2013 5:22:37 AM
Surr: 4-Bromofluorobenzene	112	69.5-130		%REC	10	3/12/2013 5:22:37 AM
Surr: Dibromofluoromethane	93.8	70-130		%REC	10	3/12/2013 5:22:37 AM
Surr: Toluene-d8	90.5	70-130		%REC	10	3/12/2013 5:22:37 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1303403**

18-Mar-13

Client: LTE

Project: Florance #47X

Sample ID **5ml rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **R9117**	RunNo: **9117**
Prep Date:	Analysis Date: **3/11/2013**	SeqNo: **259724** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Surr: 1,2-Dichloroethane-d4	8.6		10.00		86.2	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.6	69.5	130			
Surr: Dibromofluoromethane	9.1		10.00		91.0	70	130			
Surr: Toluene-d8	9.5		10.00		94.7	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R9117**	RunNo: **9117**
Prep Date:	Analysis Date: **3/11/2013**	SeqNo: **259725** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	21	1.0	20.00	0	103	80	120			
Surr: 1,2-Dichloroethane-d4	8.7		10.00		87.1	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		98.7	69.5	130			
Surr: Dibromofluoromethane	9.1		10.00		90.6	70	130			
Surr: Toluene-d8	9.2		10.00		91.9	70	130			

Sample ID **5ml-rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **R9145**	RunNo: **9145**
Prep Date:	Analysis Date: **3/12/2013**	SeqNo: **260276** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 1,2-Dichloroethane-d4	8.6		10.00		86.4	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		103	69.5	130			
Surr: Dibromofluoromethane	9.3		10.00		93.1	70	130			
Surr: Toluene-d8	9.4		10.00		94.0	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R9145**	RunNo: **9145**
Prep Date:	Analysis Date: **3/12/2013**	SeqNo: **260277** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	104	70	130			
Surr: 1,2-Dichloroethane-d4	8.9		10.00		88.9	70	130			
Surr: 4-Bromofluorobenzene	9.2		10.00		92.2	69.5	130			
Surr: Dibromofluoromethane	9.3		10.00		93.2	70	130			
Surr: Toluene-d8	9.1		10.00		91.1	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: LTE Work Order Number: 1303403

Received by/date: MG 03/08/13

Logged By: **Anne Thorne** 3/8/2013 10:00:00 AM Anne Thorne

Completed By: **Anne Thorne** 3/8/2013 Anne Thorne

Reviewed By: AT 03/08/13

Chain of Custody

1. Were seals intact? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Courier

Log In

4. Coolers are present? (see 19. for cooler specific information) Yes ☑ No ☐ NA ☐
5. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
6. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
7. Sample(s) in proper container(s)? Yes ☑ No ☐
8. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
9. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
10. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
11. VOA vials have zero headspace? Yes ☑ No ☐ No VOA Vials ☐
12. Were any sample containers received broken? Yes ☐ No ☑
13. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
14. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
15. Is it clear what analyses were requested? Yes ☑ No ☐
16. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

18. Additional remarks:

19. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Not Present			

Chain-of-Custody Record

Client: LT Environmental

Mailing Address: 2243 Main Ave #3 Durango CO 81301

Phone #:

email or Fax#: jlinn@ltenv.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: Florance #47x

Project #:

Project Manager: Julie Linn

Sampler: Devin Hencmann

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1303403	BTEX + ~~MTBE + TMB's~~ (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
1/4/13	1320	GW	MW-2	VOA/3	cool	-001	X															

Date:	Time:	Relinquished by:	Received by:	Date	Time
1/7/13	1451		Martin Walker	3/7/13	1451
3/7/13	1750		Michelle Garcia	03/08/13	10:00

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

June 28, 2013

Ashley Ager
LTE
2243 Main Ave Suite 3
Durango, CO 81301
TEL: (970) 946-1093
FAX

RE: Florance #47X OrderNo.: 1306A98

Dear Ashley Ager:

Hall Environmental Analysis Laboratory received 2 sample(s) on 6/26/2013 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1306A98**
Date Reported: **6/28/2013**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-5
Project: Florance #47X
Collection Date: 6/24/2013 1:25:00 PM
Lab ID: 1306A98-001
Matrix: AQUEOUS
Received Date: 6/26/2013 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	930	50		µg/L	50	6/27/2013 2:40:30 AM	R11589
Toluene	ND	50		µg/L	50	6/27/2013 2:40:30 AM	R11589
Ethylbenzene	98	50		µg/L	50	6/27/2013 2:40:30 AM	R11589
Xylenes, Total	1100	100		µg/L	50	6/27/2013 2:40:30 AM	R11589
Surr: 4-Bromofluorobenzene	96.1	69.4-129		%REC	50	6/27/2013 2:40:30 AM	R11589

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-2
Project: Florance #47X
Collection Date: 6/24/2013 11:55:00 AM
Lab ID: 1306A98-002
Matrix: AQUEOUS
Received Date: 6/26/2013 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	6300	100		µg/L	100	6/27/2013 3:09:04 AM	R11589
Toluene	ND	10		µg/L	10	6/27/2013 3:37:37 AM	R11589
Ethylbenzene	600	10		µg/L	10	6/27/2013 3:37:37 AM	R11589
Xylenes, Total	5800	200		µg/L	100	6/27/2013 3:09:04 AM	R11589
Surr: 4-Bromofluorobenzene	118	69.4-129		%REC	10	6/27/2013 3:37:37 AM	R11589

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1306A98**

28-Jun-13

Client: LTE

Project: Florance #47X

Sample ID	**5ML RB**	SampType:	**MBLK**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**PBW**	Batch ID:	**R11589**	RunNo:	**11589**					
Prep Date:		Analysis Date:	**6/26/2013**	SeqNo:	**328383**	Units:	**µg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	19		20.00		96.1	69.4	129			

Sample ID	**100NG BTEX LCS**	SampType:	**LCS**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**LCSW**	Batch ID:	**R11589**	RunNo:	**11589**					
Prep Date:		Analysis Date:	**6/26/2013**	SeqNo:	**328384**	Units:	**µg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	111	80	120			
Toluene	22	1.0	20.00	0	111	80	120			
Ethylbenzene	22	1.0	20.00	0	109	80	120			
Xylenes, Total	66	2.0	60.00	0	110	80	120			
Surr: 4-Bromofluorobenzene	21		20.00		105	69.4	129			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: LTE | Work Order Number: 1306A98 | RcptNo: 1

Received by/date: 06/26/13

Logged By: Lindsay Mangin 6/26/2013 9:40:00 AM

Completed By: Lindsay Mangin 6/26/2013 10:38:41 AM

Reviewed By: 06/26/13

Chain of Custody

1. Custody seals intact on sample bottles?	Yes	No	Not Present ✔
2. Is Chain of Custody complete?	Yes ✔	No	Not Present
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ✔	No	NA
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ✔	No	NA
6. Sample(s) in proper container(s)?	Yes ✔	No	
7. Sufficient sample volume for indicated test(s)?	Yes ✔	No	
8. Are samples (except VOA and ONG) properly preserved?	Yes ✔	No	
9. Was preservative added to bottles?	Yes	No ✔	NA
10. VOA vials have zero headspace?	Yes ✔	No	No VOA Vials
11. Were any sample containers received broken?	Yes	No ✔	# of preserved bottles checked for pH: (<2 or >12 unless noted)
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ✔	No	Adjusted?
13. Are matrices correctly identified on Chain of Custody?	Yes ✔	No	
14. Is it clear what analyses were requested?	Yes ✔	No	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ✔	No	Checked by:

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes No NA ✔

Person Notified: Date:

By Whom: Via: eMail Phone Fax In Person

Regarding:

Client Instructions:

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.5	Good	Yes			

Chain-of-Custody Record

Client: LT Environmental

Mailing Address: 2243 Main Ave suite 3
Durango, Co. 81301

Phone #: ~~36~~ 970-385-1096

email or Fax#: dager@HenV.com

QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: FLORANCE #47X

Project #: 03H013001

Project Manager:

Sampler: Brooke Herb

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.5

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1306A18	BTEX + ~~MTBE + TMBs~~ (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Air Bubbles (Y or N)
~~6/24~~	~~1155~~	~~GW~~	MW															
6/24	1325	GW	MW-5	VOA/3	HCl	-001	X											
6/24	1155	GW	MW-2	VOA/3	HCl	-002	X											

Remarks:

Date	Time	Relinquished by:	Received by:	Date	Time
6/24/13	1825		Christa Waller	6/24/13	1825
Date:	Time:	Relinquished by:	Received by:	Date	Time
6/25/13	1800			06/26/13	0940

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

September 20, 2013

Ashley Ager
LTE
2243 Main Ave Suite 3
Durango, CO 81301
TEL: (970) 946-1093
FAX:

RE: Florance 47X OrderNo.: 1309571

Dear Ashley Ager:

Hall Environmental Analysis Laboratory received 2 sample(s) on 9/16/2013 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order: **1309571**
Date Reported: **9/20/2013**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Project: Florance 47X
Lab Order: 1309571

Lab ID: 1309571-001
Collection Date: 9/12/2013 3:55:00 PM
Client Sample ID: MW-5
Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	2400	100		µg/L	100	9/18/2013 1:19:47 PM	R13468
Toluene	40	10		µg/L	10	9/18/2013 1:51:43 PM	R13468
Ethylbenzene	250	10		µg/L	10	9/18/2013 1:51:43 PM	R13468
Xylenes, Total	3800	200		µg/L	100	9/18/2013 1:19:47 PM	R13468
Surr: 1,2-Dichloroethane-d4	92.7	70-130		%REC	10	9/18/2013 1:51:43 PM	R13468
Surr: 4-Bromofluorobenzene	136	70-130	S	%REC	10	9/18/2013 1:51:43 PM	R13468
Surr: Dibromofluoromethane	92.3	70-130		%REC	10	9/18/2013 1:51:43 PM	R13468
Surr: Toluene-d8	102	70-130		%REC	10	9/18/2013 1:51:43 PM	R13468

Lab ID: 1309571-002
Collection Date:
Client Sample ID: Trip Blank
Matrix: TRIP BLANK

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	1.0		µg/L	1	9/17/2013 6:20:29 PM	R13433
Toluene	ND	1.0		µg/L	1	9/17/2013 6:20:29 PM	R13433
Ethylbenzene	ND	1.0		µg/L	1	9/17/2013 6:20:29 PM	R13433
Xylenes, Total	ND	2.0		µg/L	1	9/17/2013 6:20:29 PM	R13433
Surr: 1,2-Dichloroethane-d4	89.7	70-130		%REC	1	9/17/2013 6:20:29 PM	R13433
Surr: 4-Bromofluorobenzene	86.0	70-130		%REC	1	9/17/2013 6:20:29 PM	R13433
Surr: Dibromofluoromethane	89.9	70-130		%REC	1	9/17/2013 6:20:29 PM	R13433
Surr: Toluene-d8	90.6	70-130		%REC	1	9/17/2013 6:20:29 PM	R13433

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
E	Value above quantitation range
J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2 for VOA and TOC only.
RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309571**

20-Sep-13

Client: LTE

Project: Florance 47X

Sample ID: **5ml rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **R13433**	RunNo: **13433**
Prep Date:	Analysis Date: **9/17/2013**	SeqNo: **382232** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 1,2-Dichloroethane-d4	9.5		10.00		95.2	70	130			
Surr: 4-Bromofluorobenzene	9.6		10.00		95.7	70	130			
Surr: Dibromofluoromethane	9.6		10.00		96.0	70	130			
Surr: Toluene-d8	9.2		10.00		91.9	70	130			

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R13433**	RunNo: **13433**
Prep Date:	Analysis Date: **9/17/2013**	SeqNo: **382235** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	98.0	70	130			
Toluene	20	1.0	20.00	0	97.7	82.2	124			
Surr: 1,2-Dichloroethane-d4	9.2		10.00		91.5	70	130			
Surr: 4-Bromofluorobenzene	8.9		10.00		89.1	70	130			
Surr: Dibromofluoromethane	9.0		10.00		89.9	70	130			
Surr: Toluene-d8	9.3		10.00		92.8	70	130			

Sample ID: **1309571-001ams**	SampType: **MS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **MW-5**	Batch ID: **R13433**	RunNo: **13433**
Prep Date:	Analysis Date: **9/17/2013**	SeqNo: **382239** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	23	1.0	20.00	9.104	70.5	77	127			S
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130			
Surr: 4-Bromofluorobenzene	31		10.00		307	70	130			S
Surr: Dibromofluoromethane	9.0		10.00		90.4	70	130			
Surr: Toluene-d8	8.4		10.00		84.5	70	130			

Sample ID: **1309571-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **MW-5**	Batch ID: **R13433**	RunNo: **13433**
Prep Date:	Analysis Date: **9/17/2013**	SeqNo: **382240** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	25	1.0	20.00	9.104	81.9	77	127	9.41	20	
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130	0	0	
Surr: 4-Bromofluorobenzene	38		10.00		383	70	130	0	0	S

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309571**

20-Sep-13

Client: LTE

Project: Florance 47X

Sample ID: **1309571-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **MW-5**	Batch ID: **R13433**	RunNo: **13433**
Prep Date:	Analysis Date: **9/17/2013**	SeqNo: **382240** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Dibromofluoromethane	9.2		10.00		91.8	70	130	0	0	
Surr: Toluene-d8	9.0		10.00		89.8	70	130	0	0	

Sample ID: **b4**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **R13468**	RunNo: **13468**
Prep Date:	Analysis Date: **9/18/2013**	SeqNo: **383115** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 1,2-Dichloroethane-d4	9.9		10.00		98.6	70	130			
Surr: 4-Bromofluorobenzene	9.2		10.00		92.3	70	130			
Surr: Dibromofluoromethane	9.4		10.00		93.6	70	130			
Surr: Toluene-d8	9.8		10.00		97.5	70	130			

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R13468**	RunNo: **13468**
Prep Date:	Analysis Date: **9/18/2013**	SeqNo: **383116** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	106	70	130			
Toluene	21	1.0	20.00	0	106	82.2	124			
Surr: 1,2-Dichloroethane-d4	9.5		10.00		95.4	70	130			
Surr: 4-Bromofluorobenzene	8.9		10.00		88.9	70	130			
Surr: Dibromofluoromethane	8.9		10.00		89.3	70	130			
Surr: Toluene-d8	9.9		10.00		99.5	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: LTE | Work Order Number: 1309571 | RcptNo: 1

Received by/date: AG 09/16/13

Logged By: Michelle Garcia 9/16/2013 10:12:00 AM Michelle Garcia

Completed By: Michelle Garcia 9/16/2013 2:06:55 PM Michelle Garcia

Reviewed By: 09/16/13

Chain of Custody

1. Custody seals intact on sample bottles?	Yes	No	Not Present ✔
2. Is Chain of Custody complete?	Yes ✔	No	Not Present
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ✔	No	NA
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ✔	No	NA
6. Sample(s) in proper container(s)?	Yes ✔	No	
7. Sufficient sample volume for indicated test(s)?	Yes ✔	No	
8. Are samples (except VOA and ONG) properly preserved?	Yes ✔	No	
9. Was preservative added to bottles?	Yes	No ✔	NA
10. VOA vials have zero headspace?	Yes ✔	No	No VOA Vials
11. Were any sample containers received broken?	Yes	No ✔	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ✔	No	# of preserved bottles checked for pH: (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ✔	No	Adjusted?
14. Is it clear what analyses were requested?	Yes ✔	No	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ✔	No	Checked by:

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes | No | NA ✔

Person Notified: _____ Date: _____

By Whom: _____ Via: eMail Phone Fax In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.6	Good	Yes			

Chain-of-Custody Record

Client: LT Environmental
Ashley Ager
Mailing Address: 2243 Main Ave #3
Durango CO 81301
Phone #: 970.385.1096
email or Fax#: aager@ltenv.com
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other _____
☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____
Project Name: Florance 47X
Project #: 034013010
Project Manager: Ashley Ager
Sampler:
On Ice: ☒ Yes ☐ No
Sample Temperature: 3.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 130957	BTEX + MTBE + TMBs (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Air Bubbles (Y or N)
9-12-13	1555	GW	MW-5	3/VOA	HCl	-001	X											
			Trip Blank	2/VOA	HCl	-002	X											

Remarks:

Date:	Time:	Relinquished by:	Received by:	Date	Time
9/13/13	1441	Morgan Wagoner	Christine Walters	9/13/13	1441
9/14/13	640	Christine Walters		09/14/13	10:12

HOUSTON LABORATORIES
8820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Analysis Summary

Client	LT Environmental		Contact(s):	Brooke Herb	
Address	2243 Main Ave.				
Suite / Department	Suite 3				
City	Durango	State	Colorado	Zip	81301
Phone	970-385-1096		e-mail	bherb@ltenv.com	
Fax					

Location	Williams Remediation
Project	San Juan Basin

13090743

Compound	Sample ID 001A Pritchard MW4	002A Pritchard MW2	003A Flor.47 MW3	004A Dogie MW6	0.000
Paraffin, wt%	16.151	12.517	16.457	21.607	
Isoparaffin, wt%	31.714	34.807	35.766	33.392	
Naphthenics, wt%	36.186	38.209	35.634	32.006	
Aromatics, wt%	15.949	14.468	12.143	12.996	
Olefins, wt%	N/D	N/D	N/D	N/D	
Unknowns, wt%	N/D	N/D	N/D	N/D	
2,2,4-Trimethylpentane, wt%	0.015	0.017	0.018	0.014	
Calculated Research Octane	N/A	N/A	N/A	N/A	
Lead/Manganese	N/A	N/A	N/A	N/A	
Oxygenates	N/D	N/D	N/D	N/D	
N-Hexane, wt%	2.248	1.914	0.410	2.188	
Benzene, wt%	0.393	0.334	0.081	0.177	
Ethyl Benzene, wt%	0.485	0.431	0.271	0.388	
Toluene, wt%	3.735	2.740	0.067	0.878	
Meta-Xylene, wt%	3.808	3.009	3.174	2.636	
Para-Xylene, wt%	1.344	1.288	1.113	0.919	
Ortho-Xylene, wt%	1.148	1.095	0.977	0.807	
Total Xylenes, wt%	6.300	5.392	5.264	4.362	
EDB	N/A	N/A	N/A	N/A	
EDC	N	N/A	N/A	N/A	
Ethanol	N/D	N/D	N/D	N/D	
Specific Gravity @ 60°F.	0.7558	0.7591	0.7754	0.7600	
API Gravity @ 60°F.	55.71	54.91	50.99	54.67	
Color	Straw	Straw	Dark Straw	Med. Straw	
Odor	Aromatic	Aromatic	Aromatic	Aromatic	
Carbon Range	C5-C24	C5-C18	C5-C28	C1-C28	
Major Range	C6-C10	C6-C10	C6-C11	C6-C11	
Naphthalene, wt%	0.035	0.049	0.090	0.130	
2-Methyl Naphthalene, wt%	0.011	0.020	0.075	0.110	
1-Methyl Naphthalene, wt%	0.015	0.021	0.057	0.132	

Remarks: See Individual Certificate of Analysis
N/A Not Applicable N/D None Detected

Chris Staley
Hydrocarbon Laboratory Manager

Certificate of Analysis

HOUSTON LABORATORIES
8820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Analysis Number: 13090743- 001A

Sample ID:	Pritchard MW4	**Date of Sample:**	09/12/13
Location:	San Juan Basin	**Time Sampled:**	11:45
Project Name:	Williams Remediation	**Date Sample Analyzed:**	10/03/13
Client	LT Environmental	**Contact(s):**	Brooke Herb
Address	2243 Main Ave.		
Suite / Department	Suite 3		
City	Durango	**State**	Colorado **Zip** 81301
Phone	970-385-1096	e-mail	bherb@ltenv.com
Fax			
Color:	Straw	**Odor:**	Aromatic
Specific Gravity @ 60° F.	0.7558	**API @ 60° F.**	55.71
Carbon Range	C5-C24	**Major Range**	C6-C10

Paraffin	16.151	wt%	**N-Hexane**	2.248	wt%
Isoparaffins	31.714	wt%	**Benzene**	0.393	wt%
Naphthenics	36.186	wt%	**Ethyl Benzene**	0.485	wt%
Aromatics	15.949	wt%	**Toluene**	3.735	wt%
Olefins	N/D	wt%	**Meta-Xylene**	3.808	wt%
Unknowns	N/D	wt%	**Para-Xylene**	1.344	wt%
2,2,4-Tri Methylpentane	0.015	wt%	**Ortho-Xylene**	1.148	wt%
			Xylenes	6.300	wt%
Calculated Research Octane	N/A		**EDB**	N/A	wt%
Lead/Manganese	N/A		**EDC**	N	wt%
Oxygnates	N/D	wt%	**Ethanol**	N/D	wt%
C_{17}	N/D	wt%	**C_{18}**	N/D	wt%
Pristane	N/D	wt%	**Phytane**	N/D	wt%
Naphthalene	0.035	wt%	**2-Methyl Naphthalene**	0.011	wt%
1-Methyl Naphthalene	0.015	wt%			

Gasoline Range:	C_4-C_{13}	Indicators:	2,2,4-TMP, Olefins
Diesel Range:	C_7-C_{22}	Indicators:	Pristane, Phytane
Condensate Range:	C_2-C_{25}+	Indicators:	No Olefins, Light & Heavies
Heavy Oil:	C_{20}+		

Comments: **N/A Not Applicable N/D None Detected**

Chris Staley
Hydrocarbon Laboratory Manager

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:19.09 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf
Sample: 13090743-001A JD
Processed 274 Peaks
Reference File: H:\DHA Application Software\References\DHA REF1309 JL_09092013.DHA
Comments:

Acquired: 09/27/13 16:43:34
Analyzed: 10/2/2013 1:16:47 PM

Normalized to 100.0000%

Oxygenates

Compound	Mass%	Mass% Oxygen	Vol%
No Oxy Compounds Found	0.00	0.00	0.00

Molecular Weight and Relative Density Data

Group	Avg Mw.	Avg Rel. Density
C1	0.000	0.000
C2	0.000	0.000
C3	0.000	0.000
C4	0.000	0.000
C5	71.710	0.647
C6	84.823	0.716
C7	98.258	0.738
C8	115.396	0.737
C9	126.658	0.748
C10	140.196	0.763
C11	153.843	0.770
C12	160.738	0.835
C13	169.390	0.823
C14	198.390	0.763
C15	0.000	0.000
C16	0.000	0.000
C17	198.390	0.763
C18	0.000	0.000
C19	198.390	0.763
C20	0.000	0.000
C21	268.530	0.777
C22	296.590	0.792
C23	0.000	0.000
C24	296.590	0.792
C25	0.000	0.000
C26	0.000	0.000
C27	0.000	0.000
C28	0.000	0.000

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:19:09 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf
Sample: 13090743-001A JD
Processed 274 Peaks
Reference File: H:\DHA Application Software\References\DHA REF1309 JL_09092013.DHA
Comments:

Acquired: 09/27/13 16:43:34
Analyzed: 10/2/2013 1:16:47 PM

Normalized to 100.0000%

C29	0.000	0.000
Total Sample:	110.00	0.74

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:19:09 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf
Acquired: 09/27/13 16:43:34
Sample: 13090743-001A JD
Analyzed: 10/2/2013 1:16:47 PM
Processed 274 Peaks
Reference File: H:\DHA Application Software\References\DHA REF1309 JL_09092013.DHA
Normalized to 100.0000%
Comments:

Totals by Group Type & Carbon Number (in Mass Percent)

	Paraffins	I-Paraffins	Olefins	Napthenes	Aromatics	Unknowns	Total
C1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C5	0.17526	0.07980	0.00000	0.06950	0.00000	0.00000	0.32456
C6	2.24766	2.28723	0.00000	4.77298	0.39322	0.00000	9.70109
C7	5.07783	8.16129	0.00000	13.25581	3.73457	0.00000	30.22930
C8	4.46958	4.63795	0.00000	13.39261	7.25964	0.00000	29.75978
C9	2.62516	10.23952	0.00000	3.96004	2.73685	0.00000	19.56158
C10	1.04192	4.65806	0.00000	0.73540	1.38125	0.00000	7.81663
C11	0.36574	1.30697	0.00000	0.00000	0.27230	0.00000	1.94501
C12	0.11214	0.21278	0.00000	0.00000	0.17095	0.00000	0.49588
C13	0.02978	0.05149	0.00000	0.00000	0.00000	0.00000	0.08127
C14	0.00604	0.00000	0.00000	0.00000	0.00000	0.00000	0.00604
C15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C16	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C17	0.00000	0.02268	0.00000	0.00000	0.00000	0.00000	0.02268
C18	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C19	0.00000	0.01024	0.00000	0.00000	0.00000	0.00000	0.01024
C20	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C21	0.00000	0.02228	0.00000	0.00000	0.00000	0.00000	0.02228
C22	0.00000	0.01924	0.00000	0.00000	0.00000	0.00000	0.01924
C23	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C24	0.00000	0.00442	0.00000	0.00000	0.00000	0.00000	0.00442
C25	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C26	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C27	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C28	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total:	16.15112	31.71397	0.00000	36.18614	15.94877	0.00000	100.00000

Oxygenates	0.00000	Total C30+:	0.00000
Total Unknowns:	0.00000	Grand Total:	100.00000

Totals by Group Type & Carbon Number (in Volume Percent)

	Paraffins	I-Paraffins	Olefins	Napthenes	Aromatics	Unknowns	Total
C1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C5	0.20712	0.09532	0.00000	0.06900	0.00000	0.00000	0.37144
C6	2.52260	2.57220	0.00000	4.60520	0.33110	0.00000	10.03110
C7	5.49641	8.60848	0.00000	12.81208	3.18777	0.00000	30.30474
C8	4.70855	4.80142	0.00000	12.85424	7.52791	0.00000	29.89211

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:19:09 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf
Acquired: 09/27/13 16:43:34
Sample: 13090743-001A JD
Analyzed: 10/2/2013 1:16:47 PM
Processed 274 Peaks
Reference File: H:\DHA Application Software\References\DHA REF1309 JL_09092013.DHA
Normalized to 100.0000%
Comments:

C9	2.70732	10.57413	0.00000	3.74584	2.32510	0.00000	19.35239
C10	1.05628	4.68353	0.00000	0.68086	1.16502	0.00000	7.58569
C11	0.36381	1.28072	0.00000	0.00000	0.22420	0.00000	1.86872
C12	0.11022	0.16722	0.00000	0.00000	0.14216	0.00000	0.43959
C13	0.02914	0.04393	0.00000	0.00000	0.00000	0.00000	0.07307
C14	0.00586	0.00000	0.00000	0.00000	0.00000	0.00000	0.00586
C15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C16	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C17	0.00000	0.02201	0.00000	0.00000	0.00000	0.00000	0.02201
C18	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C19	0.00000	0.00993	0.00000	0.00000	0.00000	0.00000	0.00993
C20	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C21	0.00000	0.02121	0.00000	0.00000	0.00000	0.00000	0.02121
C22	0.00000	0.01799	0.00000	0.00000	0.00000	0.00000	0.01799
C23	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C24	0.00000	0.00413	0.00000	0.00000	0.00000	0.00000	0.00413
C25	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C26	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C27	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C28	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total:	17.20730	33.12222	0.00000	34.76722	14.90326	0.00000	100.00000

Oxygenates	0.00000	Total C30+:	0.00000
Total Unknowns:	0.00000	Grand Total:	100.00000

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:19:09 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf
Sample: 13090743-001A JD
Processed 274 Peaks
Reference File: H:\DHA Application Software\References\DHA REF1309 JL_09092013.DHA
Comments:

Acquired: 09/27/13 16:43:34
Analyzed: 10/2/2013 1:16:47 PM

Normalized to 100.0000%

Totals by Group Type & Carbon Number (in Mol Percent)

	Paraffins	I-Paraffins	Olefins	Napthenes	Aromatics	Unknowns	Total
C1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C5	0.26658	0.12139	0.00000	0.10875	0.00000	0.00000	0.49671
C6	2.86232	2.91272	0.00000	6.22383	0.55245	0.00000	12.55131
C7	5.56126	8.93828	0.00000	14.81567	4.44797	0.00000	33.76317
C8	4.29401	4.45773	0.00000	13.09769	6.45304	0.00000	28.30247
C9	2.24622	8.76176	0.00000	3.44252	2.49890	0.00000	16.94941
C10	0.80363	3.60454	0.00000	0.57536	1.13528	0.00000	6.11881
C11	0.25678	0.92845	0.00000	0.00000	0.20225	0.00000	1.38748
C12	0.07225	0.15070	0.00000	0.00000	0.11561	0.00000	0.33856
C13	0.01773	0.03493	0.00000	0.00000	0.00000	0.00000	0.05266
C14	0.00334	0.00000	0.00000	0.00000	0.00000	0.00000	0.00334
C15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C16	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C17	0.00000	0.01255	0.00000	0.00000	0.00000	0.00000	0.01255
C18	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C19	0.00000	0.00566	0.00000	0.00000	0.00000	0.00000	0.00566
C20	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C21	0.00000	0.00911	0.00000	0.00000	0.00000	0.00000	0.00911
C22	0.00000	0.00712	0.00000	0.00000	0.00000	0.00000	0.00712
C23	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C24	0.00000	0.00164	0.00000	0.00000	0.00000	0.00000	0.00164
C25	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C26	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C27	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C28	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total:	16.38412	29.94656	0.00000	38.26382	15.40550	0.00000	100.00000

Oxygenates	0.00000	Total C30+:	0.00000
Total Unknowns:	0.00000	Grand Total:	100.00000

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:19:09 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf
Sample: 13090743-001A JD
Processed 274 Peaks
Reference File: H:\DHA Application Software\References\DHA REF1309 JL_09092013.DHA
Comments:

Acquired: 09/27/13 16:43:34
Analyzed: 10/2/2013 1:16:47 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
9.507	475.050	I5	i-pentane	0.080	0.095	0.121
10.180	500.000	P5	n-pentane	0.175	0.207	0.267
11.463	536.220	I6	2,2-dimethylbutane	0.047	0.054	0.060
12.817	564.270	N5	cyclopentane	0.069	0.069	0.109
12.890	565.600	I6	2,3-dimethylbutane	0.208	0.233	0.265
13.107	569.410	I6	2-methylpentane	1.149	1.302	1.463
13.980	583.490	I6	3-methylpentane	0.883	0.984	1.124
15.167	600.000	P6	n-hexane	2.248	2.523	2.862
17.147	626.470	I7	2,2-dimethylpentane	0.229	0.251	0.251
17.360	629.010	N6	methylcyclopentane	1.788	1.768	2.332
17.697	632.900	I7	2,4-dimethylpentane	0.389	0.428	0.426
18.200	638.490	I7	2,2,3-trimethylbutane	0.068	0.073	0.074
19.593	652.750	A6	benzene	0.393	0.331	0.552
20.160	658.100	I7	3,3-dimethylpentane	0.148	0.158	0.162
20.533	661.490	N6	cyclohexane	2.985	2.837	3.892
21.530	670.120	I7	2-methylhexane	2.643	2.883	2.895
21.713	671.640	I7	2,3-dimethylpentane	0.714	0.760	0.782
22.017	674.120	N7	1,1-dimethylcyclopentane	0.532	0.522	0.595
22.513	678.070	I7	3-methylhexane	2.745	2.957	3.006
23.237	683.590	N7	1c,3-dimethylcyclopentane	0.834	0.828	0.932
23.563	686.010	N7	1t,3-dimethylcyclopentane	0.795	0.785	0.888
23.720	687.150	N7	1t,2-dimethylcyclopentane	0.188	0.186	0.211
23.887	688.350	I7	3-ethylpentane	1.225	1.298	1.341
24.083	689.750	I8	2,2,4-trimethylpentane	0.015	0.016	0.014
25.477	699.250	P7	n-heptane	5.078	5.496	5.561
27.990	721.140	N7	methylcyclohexane	10.907	10.491	12.190
28.400	724.510	N8	1,1,3-trimethylcyclopentane	0.740	0.732	0.724
29.553	733.650	I8	2,2,3-trimethylpentane	0.443	0.457	0.425
29.747	735.140	N8	1c,2t,4-trimethylcyclopentane	0.582	0.564	0.569
29.870	736.080	I8	C8-Iso-Paraffin	0.028	0.027	0.027
30.003	737.090	I8	3,3-dimethylhexane	0.717	0.747	0.689
30.753	742.670	N8	1t,2c,3-trimethylcyclopentane	0.516	0.495	0.504
30.950	744.110	I8	2,3,4-trimethylpentane	0.213	0.219	0.205
31.763	749.920	I8	I1	0.421	0.433	0.404
32.163	752.700	I8	2,3,3-trimethylpentane	0.034	0.034	0.032
32.690	756.310	A7	toluene	3.735	3.188	4.448
33.743	763.300	N8	1,1,2-trimethylcyclopentane	0.604	0.579	0.591
33.907	764.350	I8	2-methyl-3-ethylpentane	0.057	0.059	0.055

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:19:09 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf
Sample: 13090743-001A JD
Processed 274 Peaks
Reference File: H:\DHA Application Software\References\DHA REF1309 JL_09092013.DHA
Comments:

Acquired: 09/27/13 16:43:34
Analyzed: 10/2/2013 1:16:47 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
34.247	766.540	I8	3-methyl-3-ethylpentane	0.006	0.007	0.006
34.627	768.950	N8	1c,2c,4-trimethylcyclopentane	2.644	2.568	2.586
34.837	770.260	N8	1c,3-dimethylcyclohexane	0.984	0.955	0.962
35.063	771.670	I8	3-methylheptane	0.196	0.206	0.189
35.383	773.640	N8	1c,2t,3-trimethylcyclopentane	0.078	0.075	0.076
35.727	775.730	I8	3-ethylhexane	2.423	2.512	2.327
35.897	776.760	N8	1,1-dimethylcyclohexane	3.802	3.603	3.718
36.183	778.480	I9	2,2,5-trimethylhexane	1.616	1.691	1.382
37.017	783.370	N8	3c-ethylmethylcyclopentane	0.576	0.556	0.563
37.393	785.540	I8	C8-Iso-Paraffin	0.086	0.083	0.084
37.597	786.700	N8	3t-ethylmethylcyclopentane	0.127	0.122	0.124
37.940	788.640	N8	2t-ethylmethylcyclopentane	0.115	0.111	0.112
38.147	789.790	N8	1,1-methylethylcyclopentane	0.164	0.155	0.160
38.477	791.620	I9	2,2,4-trimethylhexane	0.065	0.066	0.056
38.930	794.110	N8	1t,2-dimethylcyclohexane	1.349	1.287	1.320
40.030	800.000	P8	n-octane	4.470	4.709	4.294
40.163	800.780	N8	1c,4-dimethylcyclohexane	0.843	0.797	0.824
41.467	808.310	N8	i-propylcyclopentane	0.075	0.071	0.073
41.907	810.780	I9	2,4,4-trimethylhexane	0.006	0.006	0.005
42.127	812.010	I9	C9-Iso-Paraffin	0.007	0.007	0.006
42.543	814.310	I9	C9-Iso-Paraffin	0.039	0.039	0.034
42.980	816.700	N8	N1	0.063	0.060	0.062
43.310	818.480	I9	2,3,4-trimethylhexane	0.023	0.023	0.020
43.673	820.420	I9	2,2,3,4-tetramethylpentane	0.264	0.264	0.226
44.473	824.640	I9	2,3,5-trimethylhexane	0.733	0.751	0.627
44.840	826.540	N8	N4	0.036	0.034	0.036
45.050	827.620	N8	1c,2-dimethylcyclohexane	0.009	0.009	0.009
45.520	830.010	I9	2,2-dimethylheptane	2.227	2.319	1.905
45.837	831.610	N9	1,1,4-trimethylcyclohexane	0.681	0.653	0.592
46.213	833.490	I9	C9-Iso-Paraffin	0.023	0.022	0.020
46.647	835.640	I9	2,2,3-trimethylhexane	0.555	0.574	0.474
47.223	838.460	I9	2,4-dimethylheptane	1.121	1.160	0.959
47.553	840.050	I9	2,5-dimethylheptane	0.250	0.258	0.214
47.760	841.040	I9	3,3-&3,5-dimethylheptane	0.019	0.020	0.016
48.047	842.410	N8	ethylcyclohexane	0.053	0.050	0.051
48.400	844.080	N8	n-propylcyclopentane	0.026	0.025	0.025
49.443	848.940	A8	ethylbenzene	0.485	0.414	0.501
49.647	849.870	I9	2,6-dimethylheptane	0.046	0.048	0.039

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:19:09 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf
Sample: 13090743-001A JD
Processed 274 Peaks
Reference File: H:\DHA Application Software\References\DHA REF1309 JL_09092013.DHA
Comments:

Acquired: 09/27/13 16:43:34
Analyzed: 10/2/2013 1:16:47 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
49.763	850.400	N9	1,1,3-trimethylcyclohexane	0.051	0.048	0.045
50.033	851.630	N9	1c,2t,4t-trimethylcyclohexane	0.477	0.453	0.415
50.730	854.770	N8	N8	0.007	0.007	0.007
50.967	855.820	I9	I3	0.036	0.037	0.031
51.527	858.290	A8	m-xylene	3.808	4.129	3.311
51.787	859.420	A8	p-xylene	1.344	1.457	1.168
52.037	860.510	A8	1,4-dimethylbenzene	0.438	0.377	0.453
52.507	862.530	I9	I4	0.073	0.074	0.063
52.800	863.790	N9	N13	0.249	0.237	0.217
53.293	865.880	I9	3,4-dimethylheptane	0.123	0.125	0.106
54.117	869.320	I9	4-ethylheptane	0.783	0.805	0.670
54.400	870.490	I9	4-methyloctane	0.945	0.971	0.808
54.920	872.610	I9	I5	0.093	0.095	0.080
55.693	875.740	N9	N15	0.247	0.234	0.215
56.047	877.150	I9	3-methyloctane	1.011	1.039	0.865
56.697	879.710	N9	1c,2t,4c-trimethylcyclohexane	0.054	0.052	0.047
57.020	880.980	A8	o-xylene	1.148	1.121	0.983
57.343	882.240	I9	C9-Iso-Paraffin	0.041	0.040	0.035
57.937	884.520	A8	1,2-dimethylbenzene	0.036	0.030	0.037
58.433	886.410	I9	I7	0.106	0.108	0.091
58.660	887.270	N9	N18	0.779	0.739	0.677
59.133	889.050	N9	N19	0.506	0.480	0.440
59.367	889.920	N9	N20	0.042	0.040	0.037
59.760	891.380	I9	I9	0.012	0.012	0.010
60.073	892.530	N9	i-butylcyclopentane	0.019	0.018	0.017
61.087	896.220	N9	N22	0.148	0.141	0.129
61.640	898.210	I9	I10	0.022	0.022	0.019
62.143	900.000	P9	n-nonane	2.625	2.707	2.246
62.480	902.480	N9	1,1-methylethylcyclohexane	0.397	0.365	0.345
62.907	905.620	I10	C10-Iso-Paraffin	0.100	0.092	0.087
63.047	906.640	N9	N25	0.064	0.060	0.056
63.887	912.720	A9	i-propylbenzene	0.083	0.072	0.076
64.363	916.130	I10	I11	0.263	0.267	0.203
64.630	918.030	I10	C10-Iso-Paraffin	0.042	0.042	0.032
64.790	919.160	N9	i-propylcyclohexane	0.146	0.135	0.127
65.237	922.310	I10	2,2-dimethyloctane	0.064	0.065	0.049
65.523	924.320	I10	2,4-dimethyloctane	0.161	0.164	0.124
65.653	925.220	I10	C10-Iso-Paraffin	0.208	0.212	0.161

RawFile: M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf
Acquired: 09/27/13 16:43:34
Sample: 13090743-001A JD
Analyzed: 10/2/2013 1:16:47 PM
Processed 274 Peaks
Reference File: H:\DHA Application Software\References\DHA REF1309 JL_09092013.DHA
Comments:
Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
65.843	926.550	I10	C10-Iso-Paraffin	0.035	0.035	0.027
65.967	927.400	N9	N28	0.039	0.036	0.034
66.297	929.680	N9	N29	0.059	0.055	0.051
66.683	932.340	I10	2,6-dimethyloctane	0.648	0.659	0.500
66.853	933.500	I10	2,5-dimethyloctane	0.331	0.336	0.256
67.430	937.420	I10	I13	0.040	0.041	0.031
67.563	938.320	N10	N30	0.123	0.114	0.096
67.703	939.270	I10	C10-Iso-Paraffin	0.089	0.083	0.070
67.957	940.970	I10	I14	0.046	0.047	0.036
68.303	943.290	I10	3,3-dimethyloctane	0.496	0.497	0.383
68.557	944.970	N10	N31	0.093	0.086	0.072
68.720	946.060	A9	n-propylbenzene	0.034	0.029	0.031
68.860	946.980	I10	3,6-dimethyloctane	0.197	0.198	0.152
69.110	948.630	I10	C10-Iso-Paraffin	0.071	0.072	0.055
69.210	949.290	I10	C10-Iso-Paraffin	0.060	0.060	0.046
69.393	950.490	I10	3-methyl-5-ethylheptane	0.105	0.107	0.081
69.750	952.820	I10	C10-Iso-Paraffin	0.084	0.086	0.065
70.083	954.990	A9	1,3-methylethylbenzene	0.548	0.469	0.500
70.370	956.840	A9	1,4-methylethylbenzene	0.201	0.173	0.183
70.847	959.910	N10	N33	0.060	0.055	0.047
71.247	962.460	A9	1,3,5-trimethylbenzene	0.557	0.477	0.509
71.370	963.240	I10	I15	0.163	0.163	0.126
71.573	964.530	N10	N34	0.121	0.112	0.095
71.830	966.150	I10	I16	0.098	0.098	0.075
72.220	968.600	I10	5-methylnonane	0.140	0.141	0.108
72.460	970.110	A9	1,2-methylethylbenzene	0.408	0.343	0.373
72.833	972.430	I10	2-methylnonane	0.343	0.350	0.265
73.013	973.550	I10	3-ethyloctane	0.024	0.024	0.018
73.260	975.070	N10	N35	0.101	0.093	0.079
73.407	975.970	I10	C10-Iso-Paraffin	0.092	0.085	0.072
73.717	977.880	I10	3-methylnonane	0.378	0.382	0.292
74.250	981.130	I10	I19	0.023	0.023	0.018
74.653	983.580	A9	1,2,4-trimethylbenzene	0.795	0.672	0.726
74.880	984.940	N10	i-butylcyclohexane	0.185	0.172	0.145
75.237	987.080	I10	I21	0.184	0.184	0.142
75.447	988.340	I10	I22	0.030	0.030	0.023
75.713	989.930	I10	I23	0.028	0.028	0.021
75.907	991.080	N10	N37	0.009	0.008	0.007

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:19:09 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf
Sample: 13090743-001A JD
Processed 274 Peaks
Reference File: H:\DHA Application Software\References\DHA REF1309 JL_09092013.DHA
Comments:

Acquired: 09/27/13 16:43:34
Analyzed: 10/2/2013 1:16:47 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
76.390	993.930	I10	I24	0.046	0.046	0.035
76.580	995.110	I10	C10-Iso-Paraffin	0.069	0.069	0.054
76.697	995.740	A10	i-butylbenzene	0.028	0.024	0.023
77.040	997.750	A10	sec-butylbenzene	0.103	0.089	0.084
77.427	1000.000	P10	n-decane	1.042	1.056	0.804
77.600	1001.720	I11	I26	0.032	0.032	0.023
77.870	1004.400	N10	N38	0.025	0.023	0.020
78.090	1006.580	A9	1,2,3-trimethylbenzene	0.111	0.092	0.101
78.227	1007.930	I11	C11-Iso-Paraffin	0.010	0.009	0.009
78.393	1009.570	A10	1,3-methyl-i-propylbenzene	0.073	0.063	0.060
78.760	1013.160	A10	1,4-methyl-i-propylbenzene	0.039	0.033	0.031
79.253	1017.980	I11	I29	0.039	0.039	0.028
79.360	1019.010	I11	C11-Iso-Paraffin	0.048	0.048	0.034
79.480	1020.170	A10	2-3-dihydroindene	0.028	0.022	0.026
79.593	1021.270	I11	C11-Iso-Paraffin	0.015	0.012	0.014
79.740	1022.690	N10	sec-butylcyclohexane	0.019	0.017	0.015
79.960	1024.810	I11	I30	0.143	0.143	0.100
80.307	1028.140	A10	1,2-methyl-i-propylbenzene	0.190	0.160	0.155
80.527	1030.240	I11	3-ethylnonane	0.011	0.011	0.007
80.800	1032.850	I11	I31	0.275	0.275	0.193
81.293	1037.530	I11	I32	0.047	0.043	0.033
81.613	1040.540	A10	1,3-diethylbenzene	0.112	0.096	0.091
81.803	1042.330	A10	1,3-methyl-n-propylbenzene	0.087	0.075	0.071
82.077	1044.890	A10	1,4-diethylbenzene	0.068	0.058	0.055
82.220	1046.230	I11	C11-Iso-Paraffin	0.044	0.038	0.036
82.320	1047.160	A10	1,4-methyl-n-propylbenzene	0.025	0.022	0.021
82.567	1049.460	A10	1,3-dimethyl-5-ethylbenzene	0.095	0.080	0.077
83.043	1053.870	I11	I34	0.113	0.113	0.079
83.160	1054.950	I11	C11-Iso-Paraffin	0.013	0.013	0.009
83.450	1057.620	I11	C11-Iso-Paraffin	0.074	0.074	0.052
83.633	1059.300	I11	I35	0.016	0.016	0.011
83.807	1060.890	I11	I36	0.013	0.013	0.009
84.033	1062.950	I11	I37	0.079	0.079	0.056
84.353	1065.860	A10	1,4,dimethyl-2-ethylbenzene	0.079	0.067	0.065
84.553	1067.680	A10	A3	0.039	0.034	0.032
84.730	1069.280	A10	1,3-dimethyl-4-ethylbenzene	0.131	0.113	0.107
84.960	1071.350	I11	I39	0.020	0.020	0.014
85.367	1075.000	I11	I40	0.144	0.144	0.101

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Comments:

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Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
85.530	1076.460	I11	C11-Iso-Paraffin	0.009	0.009	0.006
85.733	1078.280	I11	I41	0.023	0.023	0.016
85.897	1079.730	A10	1,3-dimethyl-2-ethylbenzene	0.016	0.013	0.013
86.207	1082.490	I11	I42	0.008	0.008	0.005
86.547	1085.500	I11	I43	0.054	0.054	0.038
86.700	1086.850	I11	C11-Iso-Paraffin	0.010	0.010	0.007
86.940	1088.960	A12	1,3-di-n-propylbenzene	0.030	0.025	0.020
87.213	1091.350	I11	C11-Iso-Paraffin	0.044	0.036	0.029
87.343	1092.490	A11	1,4-methyl-t-butylbenzene	0.023	0.020	0.017
87.440	1093.340	A10	1,2-dimethyl-3-ethylbenzene	0.030	0.025	0.024
87.813	1096.590	A11	1,2-ethyl-i-propylbenzene	0.065	0.054	0.048
88.040	1098.550	I11	C11-Iso-Paraffin	0.024	0.020	0.018
88.207	1100.000	P11	n-undecane	0.366	0.364	0.257
88.550	1104.120	A10	1,2,4,5-tetramethylbenzene	0.049	0.041	0.040
88.867	1107.900	A11	1,2-methyl-n-butylbenzene	0.028	0.023	0.021
88.983	1109.290	A10	1,2,3,5-tetramethylbenzene	0.040	0.033	0.033
89.153	1111.310	I12	C12-Iso-Paraffin	0.009	0.008	0.008
89.923	1120.420	A11	1,2-methyl-t-butylbenzene	0.014	0.011	0.010
90.020	1121.560	I12	C12-Iso-Paraffin	0.022	0.019	0.017
90.523	1127.460	A10	5-methylindan	0.065	0.054	0.054
90.663	1129.100	I12	C12-Iso-Paraffin	0.005	0.004	0.004
90.883	1131.660	I12	I44	0.035	0.035	0.023
91.063	1133.760	A10	4-methylindan	0.011	0.009	0.009
91.297	1136.460	A11	1,2-ethyl-n-propylbenzene	0.073	0.060	0.054
91.460	1138.350	A10	2-methylindan	0.009	0.007	0.007
91.660	1140.660	A11	1,3-methyl-n-butylbenzene	0.014	0.012	0.011
91.907	1143.510	A12	1,3-di-i-propylbenzene	0.012	0.010	0.008
92.037	1145.000	A11	s-pentylbenzene	0.008	0.006	0.006
92.267	1147.640	I12	C12-Iso-Paraffin	0.020	0.017	0.015
92.380	1148.930	A11	n-pentylbenzene	0.018	0.015	0.013
92.683	1152.400	A12	1,2-di-i-propylbenzene	0.017	0.014	0.011
92.837	1154.140	I12	C12-Iso-Paraffin	0.011	0.009	0.007
93.227	1158.570	I12	C12-Iso-Paraffin	0.034	0.028	0.023
93.337	1159.820	A12	1,4-di-i-propylbenzene	0.024	0.020	0.016
93.660	1163.470	A10	tetrahydronaphthalene	0.030	0.023	0.025
93.923	1166.430	I12	C12-Iso-Paraffin	0.030	0.023	0.025
94.030	1167.630	A10	naphthalene	0.035	0.025	0.030
94.207	1169.610	A12	1-t-butyl-3,5-dimethylbenzene	0.012	0.010	0.008

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Comments:

Acquired: 09/27/13 16:43:34
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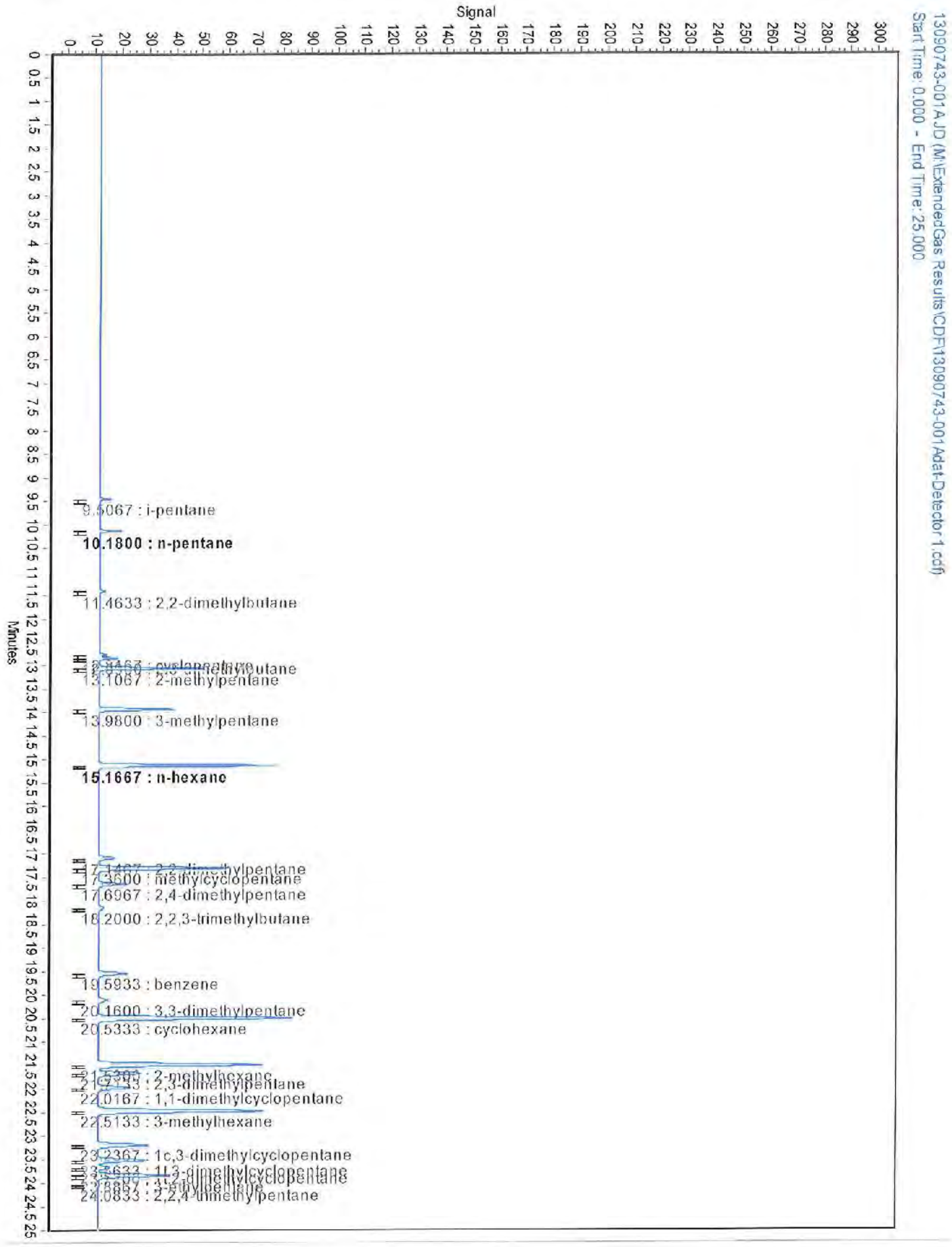
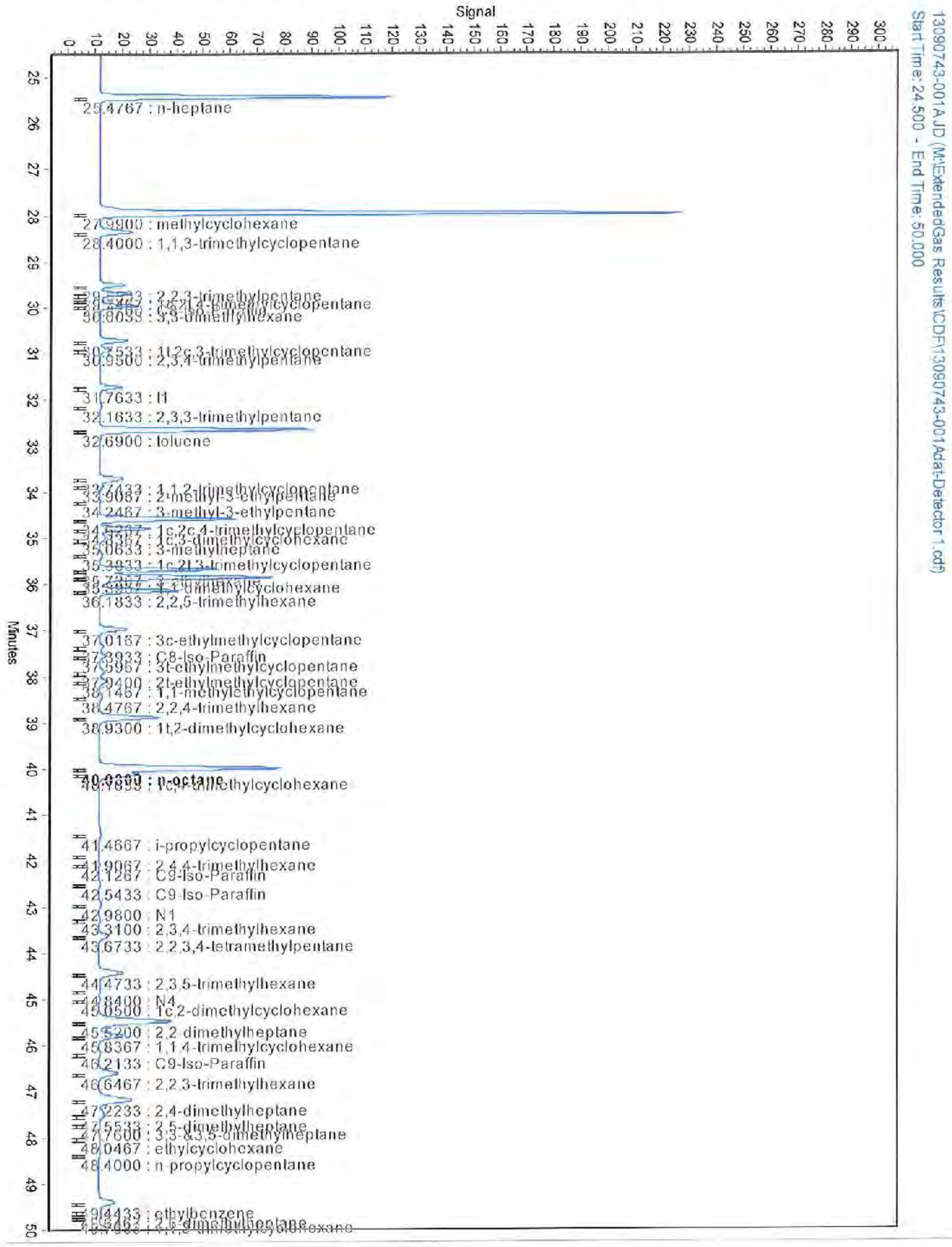
Normalized to 100.0000%

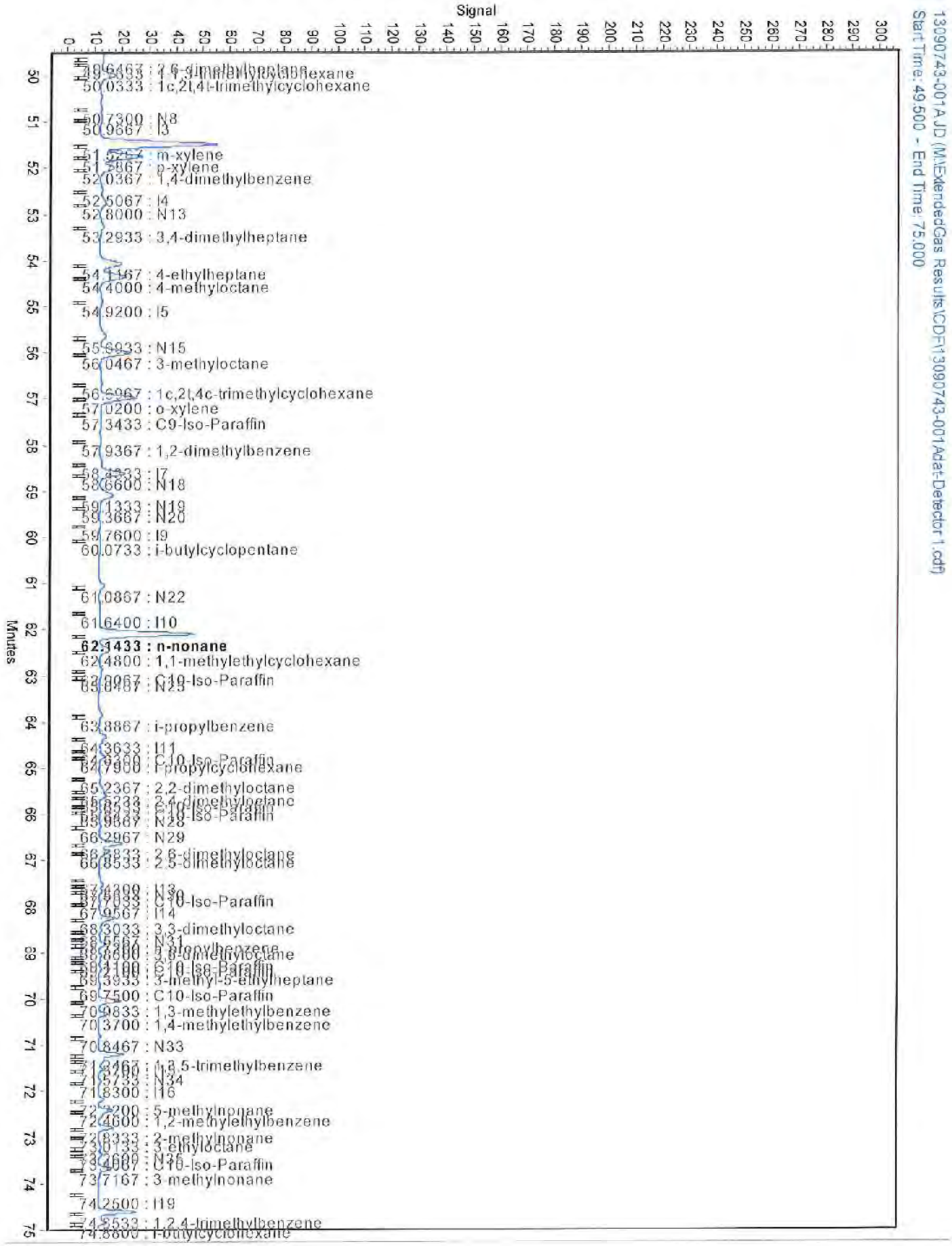
Hold

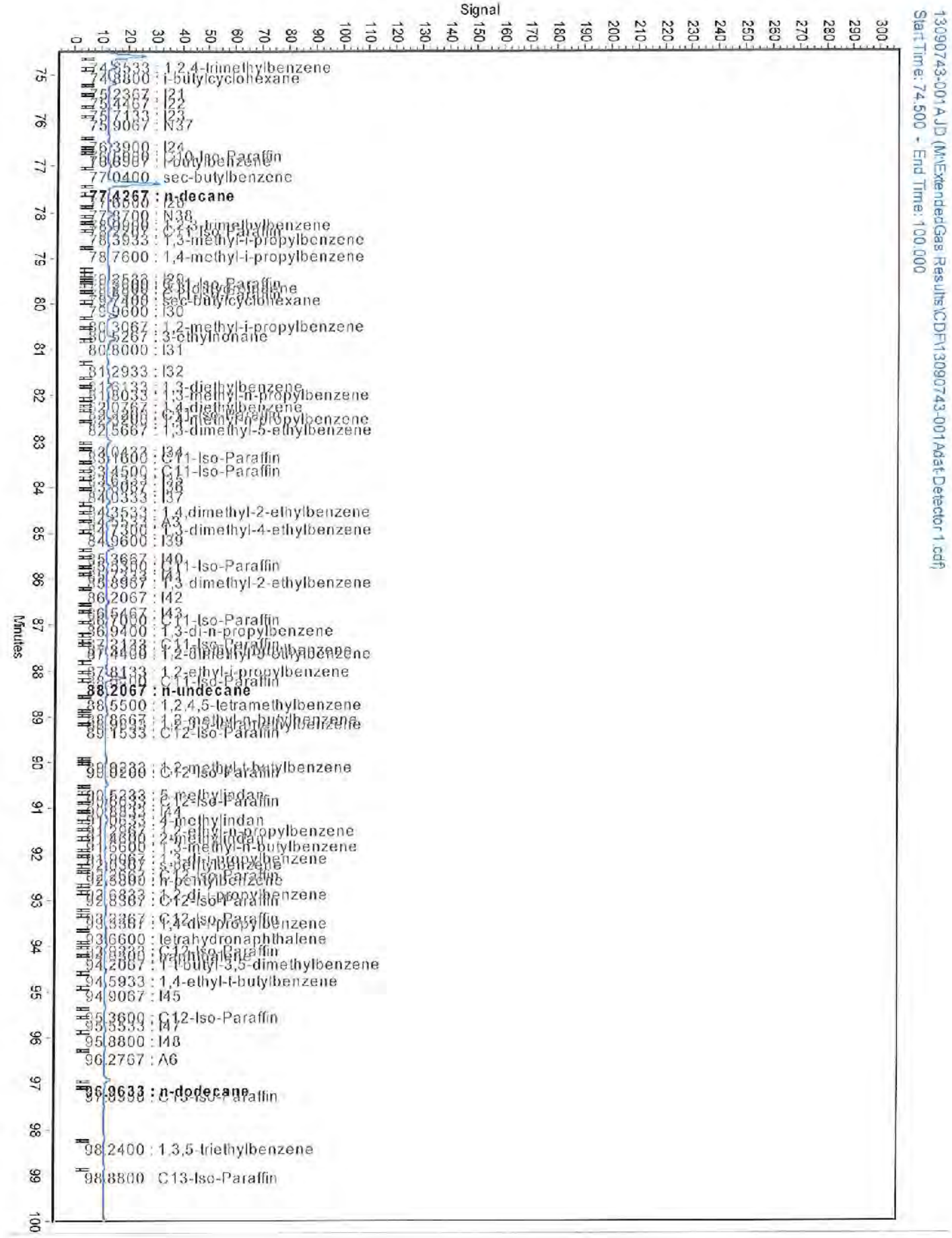
Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
94.593	1173.930	A12	1,4-ethyl-t-butylbenzene	0.028	0.023	0.019
94.907	1177.410	I12	I45	0.019	0.018	0.012
95.360	1182.440	I12	C12-Iso-Paraffin	0.015	0.014	0.009
95.553	1184.570	I12	I47	0.004	0.004	0.003
95.880	1188.170	I12	I48	0.008	0.008	0.005
96.277	1192.510	A12	A6	0.011	0.009	0.007
96.963	1200.000	P12	n-dodecane	0.112	0.110	0.072
97.090	1201.720	I13	C13-Iso-Paraffin	0.011	0.011	0.007
98.240	1217.310	A12	1,3,5-triethylbenzene	0.028	0.023	0.019
98.880	1225.890	I13	C13-Iso-Paraffin	0.006	0.005	0.004
100.053	1241.480	A12	1,4-methyl-n-pentylbenzene	0.008	0.006	0.005
101.030	1254.310	I13	C13-Iso-Paraffin	0.007	0.006	0.005
101.130	1255.610	A12	n-hexylbenzene	0.004	0.004	0.003
101.283	1257.610	I13	C13-Iso-Paraffin	0.006	0.005	0.004
101.640	1262.250	I13	C13-Iso-Paraffin	0.006	0.005	0.004
101.987	1266.740	I13	C13-Iso-Paraffin	0.011	0.009	0.007
102.493	1273.280	A11	1,2,3,4,5-pentamethylbenzene	0.005	0.004	0.004
102.813	1277.380	A11	2-methylnaphthalene	0.011	0.008	0.008
103.033	1280.200	A11	1-methylnaphthalene	0.015	0.011	0.011
104.213	1295.200	I13	C13-Iso-Paraffin	0.005	0.004	0.004
104.593	1300.000	P13	n-tridecane	0.030	0.029	0.018
111.503	1400.000	P14	C14	0.006	0.006	0.003
127.330	1688.980	I17	C17-Iso-Paraffin	0.023	0.022	0.013
134.097	1855.900	I19	C19-Iso-Paraffin	0.010	0.010	0.006
135.830	1901.740	P19	C19	0.000	0.000	0.000
139.720	2014.620	I21	C21-Iso-Paraffin	0.007	0.007	0.003
140.777	2047.320	I21	C21-Iso-Paraffin	0.015	0.015	0.006
142.570	2102.420	P21	C21	0.000	0.000	0.000
144.677	2171.620	I22	C22-Iso-Paraffin	0.007	0.007	0.003
145.047	2183.660	I22	C22-Iso-Paraffin	0.012	0.011	0.004
149.340	2321.210	I24	C24-Iso-Paraffin	0.004	0.004	0.002
152.150	2403.240	P24	C24	0.000	0.000	0.000
156.080	2499.990	P25	C25	0.000	0.000	0.000

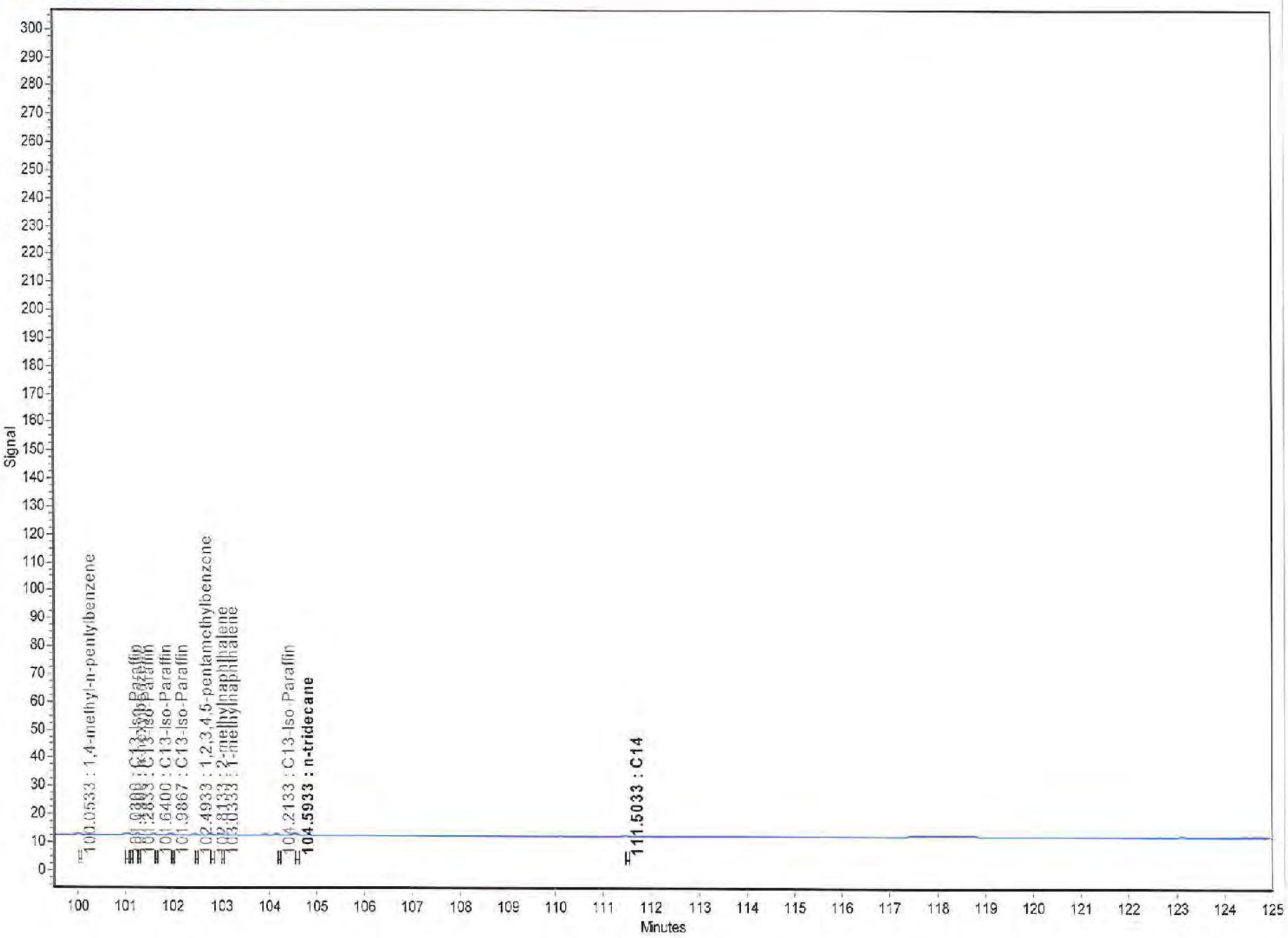

1309743-001A,JD (M:\ExtendedGas Results\CDF\1309743-001Adat-Detector 1.cdf)
Start Time: 0.000 - End Time: 25.000
Signal
Minutes
9.5067 : i-pentane
10.1800 : n-pentane
11.4633 : 2,2-dimethylbutane
13.1067 : 2-methylpentane
13.9800 : 3-methylpentane
15.1667 : n-hexane
17.3600 : methylcyclopentane
17.6967 : 2,4-dimethylpentane
18.2000 : 2,2,3-trimethylbutane
19.5933 : benzene
20.1600 : 3,3-dimethylpentane
20.5333 : cyclohexane
22.0167 : 1,1-dimethylcyclopentane
22.5133 : 3-methylhexane
23.2367 : 1c,3-dimethylcyclopentane
24.0833 : 2,2,4-trimethylpentane

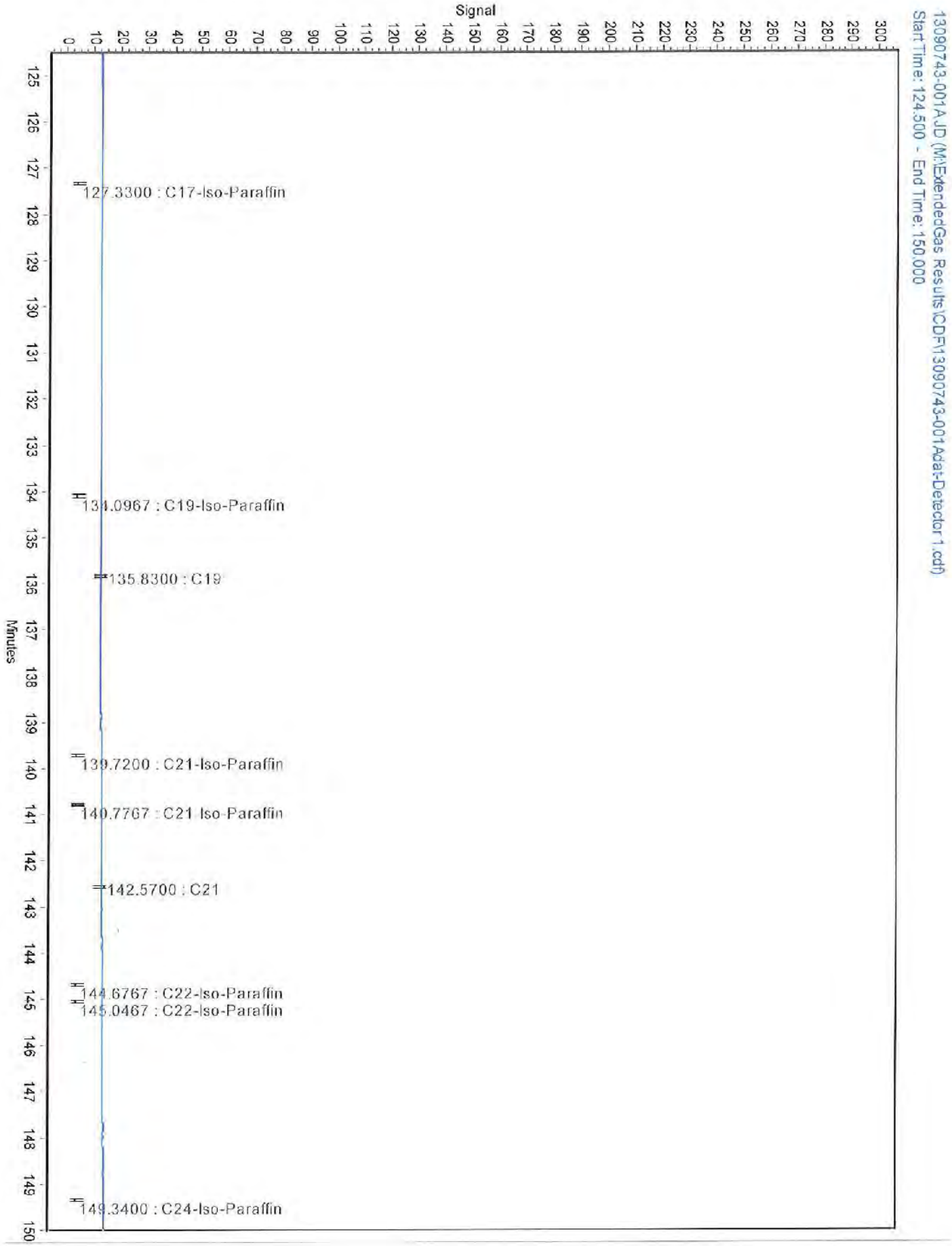

Signal
Minutes
13090743-001A.JD (M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf)
Start Time: 24.500 - End Time: 50.000
25.4767 : n-heptane
27.9900 : methylcyclohexane
28.4000 : 1,1,3-trimethylcyclopentane
30.0033 : 3,3-dimethylhexane
30.7533 : 1t,2c,3-trimethylcyclopentane
30.9500 : 2,3,4-trimethylpentane
31.7633 : I1
32.1633 : 2,3,3-trimethylpentane
32.6900 : toluene
33.9067 : 2-methyl-3-ethylpentane
34.2467 : 3-methyl-3-ethylpentane
35.0633 : 3-methylheptane
36.1833 : 2,2,5-trimethylhexane
37.0167 : 3c-ethylmethylcyclopentane
37.3933 : C8-Iso-Paraffin
37.5967 : 3t-ethylmethylcyclopentane
37.9400 : 2t-ethylmethylcyclopentane
38.1467 : 1,1-methylethylcyclopentane
38.4767 : 2,2,4-trimethylhexane
38.9300 : 1t,2-dimethylcyclohexane
40.0000 : n-octane
41.4667 : i-propylcyclopentane
41.9067 : 2,4,4-trimethylhexane
42.1267 : C9-Iso-Paraffin
42.5433 : C9-Iso-Paraffin
42.9800 : N1
43.3100 : 2,3,4-trimethylhexane
43.6733 : 2,2,3,4-tetramethylpentane
44.4733 : 2,3,5-trimethylhexane
44.8400 : N4
45.0500 : 1c,2-dimethylcyclohexane
45.5200 : 2,2 dimethylheptane
45.8367 : 1,1,4-trimethylcyclohexane
46.2133 : C9-Iso-Paraffin
46.6467 : 2,2,3-trimethylhexane
47.2233 : 2,4-dimethylheptane
47.5533 : 2,5-dimethylheptane
47.7600 : 3,3-&3,5-dimethylheptane
48.0467 : ethylcyclohexane
48.4000 : n-propylcyclopentane
49.4433 : ethylbenzene


13090743-001A.JD (MExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf)
Start Time: 49.500 - End Time: 75.000
Signal
Minutes
59.6467 : 2,6-dimethylheptane
60.0333 : 1c,2t,4t-trimethylcyclohexane
60.7300 : N8
60.9867 : I3
61.5267 : m-xylene
61.7867 : p-xylene
62.0367 : 1,4-dimethylbenzene
62.5067 : I4
62.8000 : N13
63.2933 : 3,4-dimethylheptane
64.1167 : 4-ethylheptane
64.4000 : 4-methyloctane
64.9200 : I5
65.6933 : N15
66.0467 : 3-methyloctane
66.6967 : 1c,2t,4c-trimethylcyclohexane
67.0200 : o-xylene
67.3433 : C9-Iso-Paraffin
67.9367 : 1,2-dimethylbenzene
68.4333 : I7
68.6600 : N18
69.1333 : N19
69.3667 : N20
69.7600 : I9
70.0733 : i-butylcyclopentane
71.0867 : N22
71.6400 : I10
72.1433 : n-nonane
72.4800 : 1,1-methylethylcyclohexane
73.0967 : C10-Iso-Paraffin
73.8467 : N25
74.2867 : i-propylbenzene
74.3633 : I11
74.7900 : i-propylcyclohexane
75.2367 : 2,2-dimethyloctane
75.6233 : 2,4-dimethyloctane
75.8533 : C10-Iso-Paraffin
75.9867 : N28
76.2967 : N29
76.6833 : 2,6-dimethyloctane
76.8533 : 2,5-dimethyloctane
77.4300 : I13
77.7033 : N30
77.9033 : C10-Iso-Paraffin
78.9567 : I14
79.3033 : 3,3-dimethyloctane
79.5567 : N31
79.7300 : n-propylbenzene
79.8600 : 3,5-dimethyloctane
80.4100 : C10-Iso-Paraffin
80.7100 : 3-methyl-5-ethylheptane
81.7500 : C10-Iso-Paraffin
82.0833 : 1,3-methylethylbenzene
82.3700 : 1,4-methylethylbenzene
82.8467 : N33
83.3467 : 1,3,5-trimethylbenzene
83.7733 : N34
84.8300 : I16
85.2200 : 5-methylnonane
85.4600 : 1,2-methylethylbenzene
85.8333 : 2-methylnonane
86.0133 : 3-ethyloctane
86.4667 : N35
86.7667 : C10-Iso-Paraffin
87.7167 : 3-methylnonane
88.2500 : I19
88.5533 : 1,2,4-trimethylbenzene
88.8800 : i-butylcyclohexane

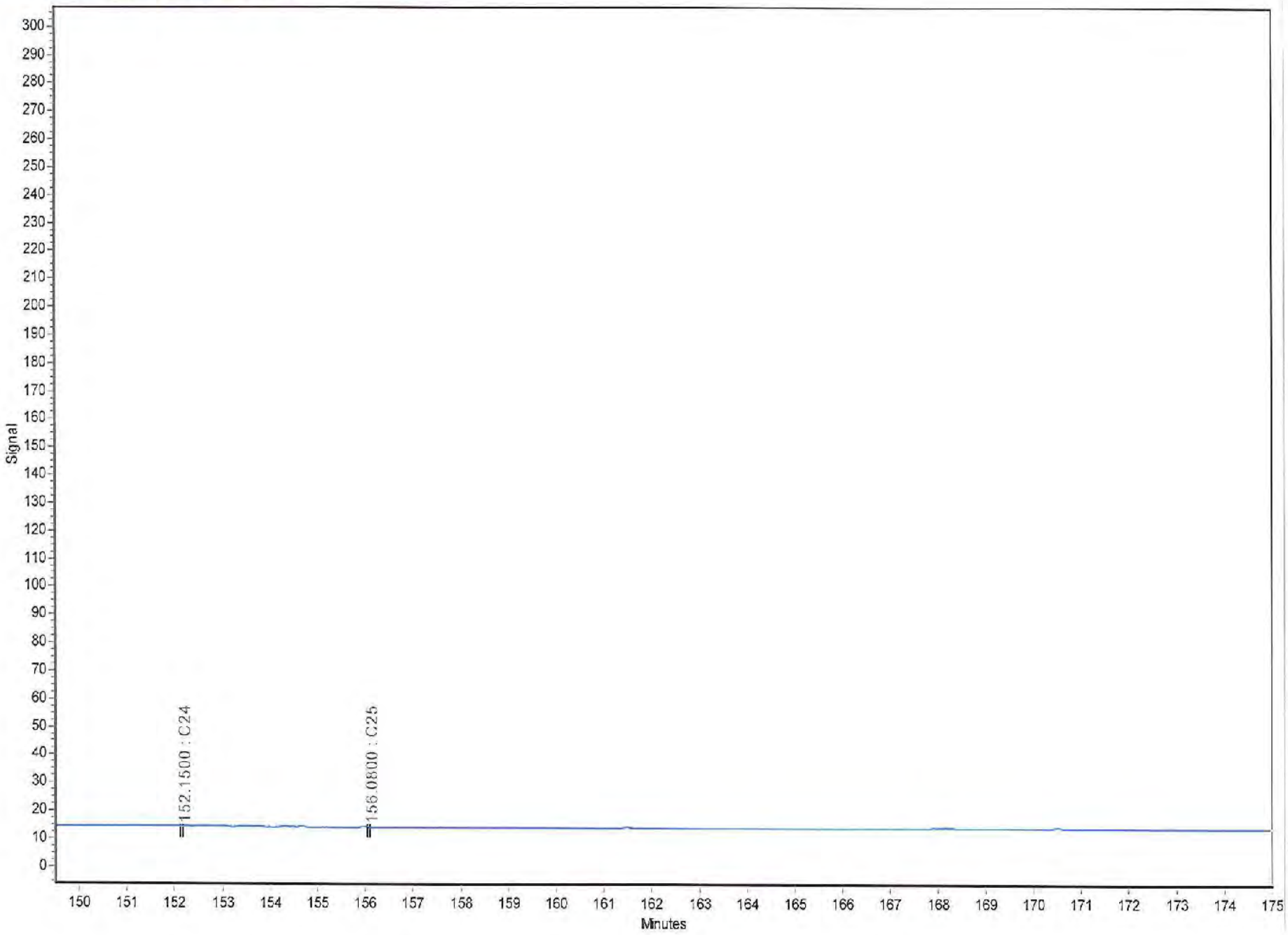

13090743-001A.JD (M:\Extended\Gas Results\CDF\13090743-001A\dat.Detector 1.cdf)
Start Time: 74.500 - End Time: 100.000
Signal
Minutes
74.3533 : 1,2,4-trimethylbenzene
74.3800 : i-butylcyclohexane
75.2367 : I21
75.4467 : I22
75.7133 : I23
75.9067 : N37
76.3900 : I24
76.6667 : C10-Iso-Paraffin
76.8967 : i-butylbenzene
77.0400 : sec-butylbenzene
77.4267 : n-decane
77.6600 : I26
77.8700 : N38
78.0900 : C10-Iso-Paraffin
78.3933 : 1,3-methyl-i-propylbenzene
78.7600 : 1,4-methyl-i-propylbenzene
79.3533 : I28
79.5600 : C11-Iso-Paraffin
79.7400 : sec-butylcyclohexane
79.9600 : I30
80.3067 : 1,2-methyl-i-propylbenzene
80.5267 : 3-ethylnonane
80.8000 : I31
81.2933 : I32
81.6133 : 1,3-diethylbenzene
81.8033 : 1,3-methyl-n-propylbenzene
82.0767 : 1,4-diethylbenzene
82.3400 : C11-Iso-Paraffin
82.4867 : 1,4-methyl-n-propylbenzene
82.5667 : 1,3-dimethyl-5-ethylbenzene
83.0433 : I34
83.1600 : C11-Iso-Paraffin
83.4500 : C11-Iso-Paraffin
83.6033 : I36
84.0333 : I37
84.3533 : 1,4dimethyl-2-ethylbenzene
84.5133 : A3
84.7300 : 1,3-dimethyl-4-ethylbenzene
84.9600 : I39
85.3667 : I40
85.5300 : C11-Iso-Paraffin
85.8333 : I41
85.8967 : 1,3 dimethyl-2-ethylbenzene
86.2067 : I42
86.5467 : I43
86.7000 : C11-Iso-Paraffin
86.9400 : 1,3-di-n-propylbenzene
87.2133 : C11-Iso-Paraffin
87.3400 : 1,2-dimethyl-3-butylbenzene
87.8133 : 1,2-ethyl-i-propylbenzene
88.0000 : C11-Iso-Paraffin
88.2067 : n-undecane
88.5500 : 1,2,4,5-tetramethylbenzene
88.8667 : 1,3-methyl-n-butylbenzene
89.1533 : C12-Iso-Paraffin
98.0233 : 1,2-methyl-t-butylbenzene
98.0200 : C12-Iso-Paraffin
90.5233 : 5-methylindan
90.6667 : C12-Iso-Paraffin
90.8333 : I44
91.0033 : 4-methylindan
91.2067 : 1,2-ethyl-n-propylbenzene
91.4800 : 2-methylindan
91.5600 : 1,3-methyl-n-butylbenzene
91.8067 : 1,3-di-n-propylbenzene
92.0367 : 5-methylindan
92.3800 : n-pentylbenzene
92.5200 : C12-Iso-Paraffin
92.8233 : 1,2-di-n-propylbenzene
93.0367 : C12-Iso-Paraffin
93.3367 : 1,4-di-n-propylbenzene
93.6600 : tetrahydronaphthalene
93.8200 : C12-Iso-Paraffin
94.2067 : 1,4-butyl-3,5-dimethylbenzene
94.5933 : 1,4-ethyl-t-butylbenzene
94.9067 : I45
95.3600 : C12-Iso-Paraffin
95.5533 : I47
95.8800 : I48
96.2767 : A6
96.9633 : n-dodecane
97.3333 : C13-Iso-Paraffin
98.2400 : 1,3,5-triethylbenzene
98.8800 : C13-Iso-Paraffin

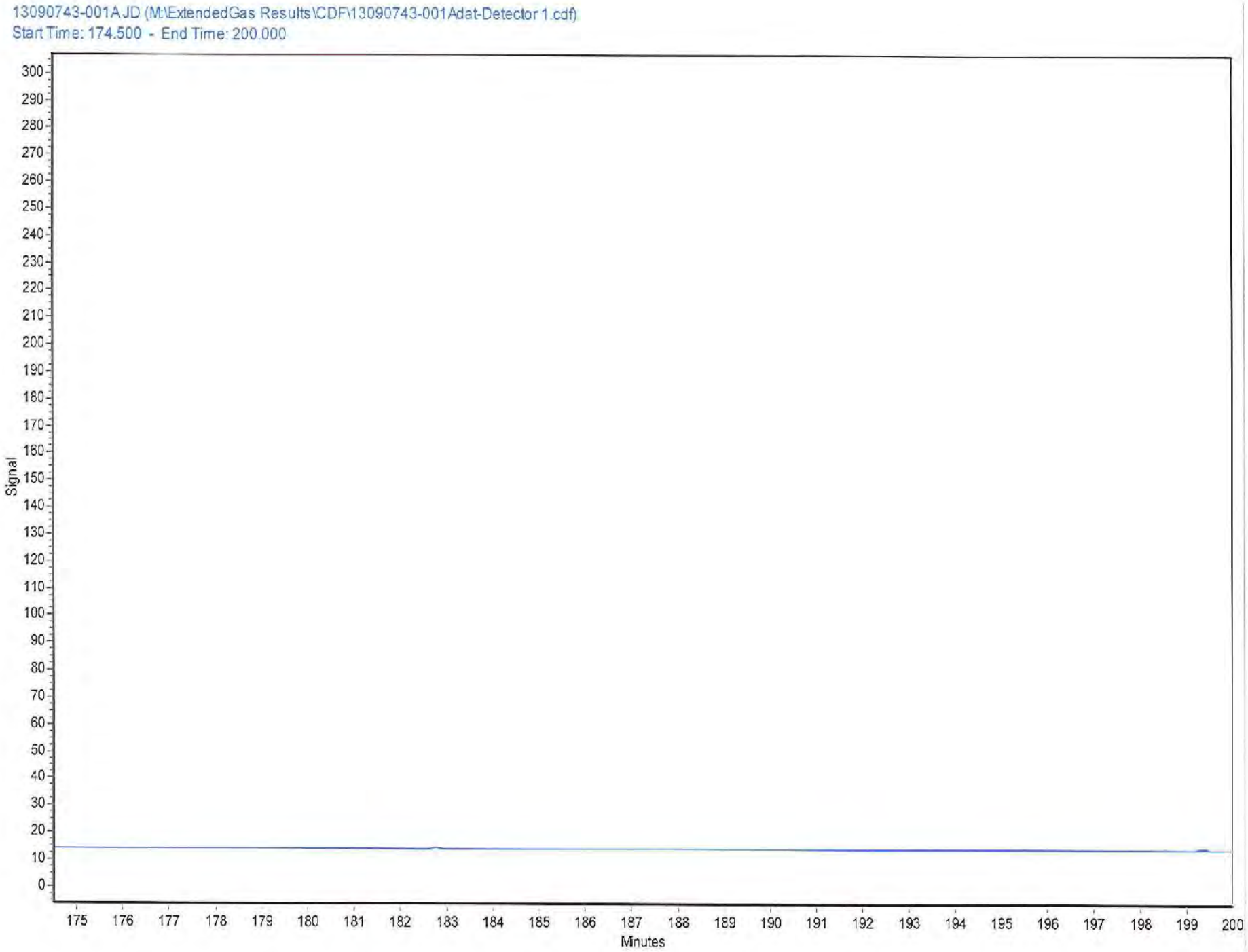
13090743-001A JD (M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf)
Start Time: 99.500 - End Time: 125.000




13090743-001AJD (M:\ExtendedGas Results\CDF\13090743-001Adat-Detector1.cdf)
Start Time: 124.500 - End Time: 150.000
Signal
Minutes
127.3300 : C17-Iso-Paraffin
134.0967 : C19-Iso-Paraffin
135.8300 : C19
139.7200 : C21-Iso-Paraffin
140.7767 : C21 Iso-Paraffin
142.5700 : C21
144.6767 : C22-Iso-Paraffin
145.0467 : C22-Iso-Paraffin
149.3400 : C24-Iso-Paraffin

13090743-001A.JD (M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf)
Start Time: 149.500 - End Time: 175.000




13090743-001A JD (M:\ExtendedGas Results\CDF\13090743-001Adat-Detector 1.cdf)
Start Time: 174.500 - End Time: 200.000
Signal
300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
Minutes

Certificate of Analysis

HOUSTON LABORATORIES
8820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Analysis Number: 13090743- 002A

Sample ID:	Pritchard MW2	**Date of Sample:**	09/12/13
Location:	San Juan Basin	**Time Sampled:**	12:05
Project Name:	Williams Remediation	**Date Sample Analyzed:**	10/03/13
Client	LT Environmental	**Contact(s):**	Brooke Herb
Address	2243 Main Ave.		
Suite / Department	Suite 3		
City	Durango	**State**	Colorado **Zip** 81301
Phone	970-385-1096	**e-mail**	bherb@ltenv.com
Fax			
Color:	Straw	**Odor:**	Aromatic
Specific Gravity @ 60° F.	0.7591	**API @ 60° F.**	54.91
Carbon Range	C5-C16	**Major Range**	C6-C10

Paraffin	12.517	wt%	**N-Hexane**	1.914	wt%
Isoparaffins	34.807	wt%	**Benzene**	0.334	wt%
Naphthenics	38.209	wt%	**Ethyl Benzene**	0.431	wt%
Aromatics	14.468	wt%	**Toluene**	2.740	wt%
Olefins	N/D	wt%	**Meta-Xylene**	3.009	wt%
Unknowns	N/D	wt%	**Para-Xylene**	1.288	wt%
2,2,4-Tri Methylpentane	0.017	wt%	**Ortho-Xylene**	1.095	wt%
			Xylenes	5.392	wt%
Calculated Research Octane	N/A		**EDB**	N/A	wt%
Lead/Manganese	N/A		**EDC**	N/A	wt%
Oxygnates	N/D	wt%	**Ethanol**	N/D	wt%
C_{17}	N/D	wt%	**C_{18}**	N/D	wt%
Pristane	N/D	wt%	**Phytane**	N/D	wt%
Naphthalene	0.049	wt%	**2-Methyl Naphthalene**	0.020	wt%
1-Methyl Naphthalene	0.021	wt%			

Gasoline Range:	C_4-C_{13}	Indicators:	2,2,4-TMP, Olefins
Diesel Range:	C_7-C_{22}	Indicators:	Pristane, Phytane
Condensate Range:	C_2-C_{25+}	Indicators:	No Olefins, Light & Heavies
Heavy Oil:	C_{20+}		

Comments: **N/A Not Applicable N/D None Detected**

Chris Staley
Hydrocarbon Laboratory Manager

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:44:38 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf
Sample: 13090743-002A JD
Processed 287 Peaks
Reference File: H:\DHA Application Software\References\13090743-001A JD_10022013.DHA
Comments:

Acquired: 09/28/13 05:38:45
Analyzed: 10/2/2013 1:42:46 PM

Normalized to 100.0000%

Oxygenates

Compound	Mass%	Mass% Oxygen	Vol%
No Oxy Compounds Found	0.00	0.00	0.00

Molecular Weight and Relative Density Data

Group	Avg Mw.	Avg Rel. Density
C1	0.000	0.000
C2	0.000	0.000
C3	0.000	0.000
C4	0.000	0.000
C5	71.676	0.649
C6	84.812	0.718
C7	98.394	0.738
C8	115.063	0.741
C9	126.707	0.748
C10	140.043	0.768
C11	153.426	0.774
C12	161.363	0.833
C13	168.129	0.824
C14	192.789	0.760
C15	0.000	0.000
C16	198.390	0.763
C17	0.000	0.000
C18	0.000	0.000
C19	0.000	0.000
C20	0.000	0.000
C21	0.000	0.000
C22	0.000	0.000
C23	0.000	0.000
C24	0.000	0.000
C25	0.000	0.000
C26	0.000	0.000
C27	0.000	0.000
C28	0.000	0.000

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:44:38 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf
Sample: 13090743-002A JD
Processed 287 Peaks
Reference File: H:\DHA Application Software\References\13090743-001A JD_10022013.DHA
Comments:

Acquired: 09/28/13 05:38:45
Analyzed: 10/2/2013 1:42:46 PM

Normalized to 100.0000%

C29	0.000	0.000
Total Sample:	111.00	0.74

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:44:38 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf
Sample: 13090743-002A JD
Processed 287 Peaks
Reference File: H:\DHA Application Software\References\13090743-001A JD_10022013.DHA
Comments:

Acquired: 09/28/13 05:38:45
Analyzed: 10/2/2013 1:42:46 PM

Normalized to 100.0000%

Totals by Group Type & Carbon Number (in Mass Percent)

	Paraffins	I-Paraffins	Olefins	Napthenes	Aromatics	Unknowns	Total
C1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C5	0.15693	0.06586	0.00000	0.06684	0.00000	0.00000	0.28964
C6	1.91430	2.24866	0.00000	4.83372	0.33448	0.00000	9.33117
C7	3.67707	8.19197	0.00000	13.70282	2.74049	0.00000	28.31235
C8	3.04698	4.67354	0.00000	13.92445	6.36279	0.00000	28.00775
C9	2.09790	11.06626	0.00000	4.69101	2.56871	0.00000	20.42387
C10	0.98878	6.30829	0.00000	0.98985	1.81378	0.00000	10.10070
C11	0.42237	1.77370	0.00000	0.00000	0.39064	0.00000	2.58671
C12	0.16020	0.33943	0.00000	0.00000	0.25716	0.00000	0.75680
C13	0.04337	0.12543	0.00000	0.00000	0.00000	0.00000	0.16880
C14	0.00878	0.00542	0.00000	0.00000	0.00000	0.00000	0.01420
C15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C16	0.00000	0.00802	0.00000	0.00000	0.00000	0.00000	0.00802
C17	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C18	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C19	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C20	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C21	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C22	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C23	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C24	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C25	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C26	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C27	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C28	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total:	12.51668	34.80659	0.00000	38.20869	14.46804	0.00000	100.00000

Oxygenates	0.00000	Total C30+:	0.00000
Total Unknowns:	0.00000	Grand Total:	100.00000

Totals by Group Type & Carbon Number (in Volume Percent)

	Paraffins	I-Paraffins	Olefins	Napthenes	Aromatics	Unknowns	Total
C1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C5	0.18625	0.07900	0.00000	0.06665	0.00000	0.00000	0.33190
C6	2.15755	2.53897	0.00000	4.68321	0.28283	0.00000	9.66256
C7	3.99701	8.87552	0.00000	13.30267	2.34913	0.00000	28.52433
C8	3.22346	4.85793	0.00000	13.41160	6.58668	0.00000	28.07967

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:44:38 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf
Sample: 13090743-002A JD
Processed 287 Peaks
Reference File: H:\DHA Application Software\References\13090743-001A JD_10022013.DHA
Comments:

Acquired: 09/28/13 05:38:45
Analyzed: 10/2/2013 1:42:46 PM

Normalized to 100.0000%

C9	2.17270	11.47359	0.00000	4.45507	2.18682	0.00000	20.28819
C10	1.00664	6.31720	0.00000	0.92023	1.53521	0.00000	9.77928
C11	0.42191	1.74076	0.00000	0.00000	0.32236	0.00000	2.48502
C12	0.15811	0.30224	0.00000	0.00000	0.21476	0.00000	0.67512
C13	0.04261	0.10963	0.00000	0.00000	0.00000	0.00000	0.15224
C14	0.00855	0.00533	0.00000	0.00000	0.00000	0.00000	0.01388
C15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C16	0.00000	0.00781	0.00000	0.00000	0.00000	0.00000	0.00781
C17	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C18	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C19	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C20	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C21	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C22	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C23	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C24	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C25	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C26	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C27	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C28	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total:	13.37480	36.30798	0.00000	36.83943	13.47779	0.00000	100.00000

Oxygenates	0.00000	Total C30+:	0.00000
Total Unknowns:	0.00000	Grand Total:	100.00000

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:44:38 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf
Sample: 13090743-002A JD
Processed 287 Peaks
Reference File: I:\DHA Application Software\References\13090743-001A JD_10022013.DHA

Acquired: 09/28/13 05:38:45
Analyzed: 10/2/2013 1:42:46 PM

Comments:

Normalized to 100.0000%

Totals by Group Type & Carbon Number (in Mol Percent)

	Paraffins	I-Paraffins	Olefins	Napthenes	Aromatics	Unknowns	Total
C1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C5	0.24135	0.10129	0.00000	0.10576	0.00000	0.00000	0.44840
C6	2.46486	2.89538	0.00000	6.37299	0.47513	0.00000	12.20836
C7	4.07184	9.07145	0.00000	15.48548	3.30022	0.00000	31.92898
C8	2.95978	4.54202	0.00000	13.76895	5.73894	0.00000	27.00969
C9	1.81499	9.57641	0.00000	4.12322	2.37140	0.00000	17.88602
C10	0.77111	4.94140	0.00000	0.78304	1.50773	0.00000	8.00327
C11	0.29983	1.27748	0.00000	0.00000	0.29349	0.00000	1.87079
C12	0.10436	0.24021	0.00000	0.00000	0.17585	0.00000	0.52042
C13	0.02610	0.08531	0.00000	0.00000	0.00000	0.00000	0.11141
C14	0.00491	0.00326	0.00000	0.00000	0.00000	0.00000	0.00817
C15	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C16	0.00000	0.00448	0.00000	0.00000	0.00000	0.00000	0.00448
C17	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C18	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C19	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C20	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C21	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C22	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C23	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C24	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C25	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C26	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C27	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C28	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total:	12.75912	32.73868	0.00000	40.63943	13.86277	0.00000	100.00000

Oxygenates	0.00000	Total C30+:	0.00000
Total Unknowns:	0.00000	Grand Total:	100.00000

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:44:39 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf
Sample: 13090743-002A JD
Processed 287 Peaks
Reference File: H:\DHA Application Software\References\13090743-001A JD_10022013.DHA
Comments:

Acquired: 09/28/13 05:38:45
Analyzed: 10/2/2013 1:42:46 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
9.493	474.810	I5	i-pentane	0.066	0.079	0.101
10.167	500.000	P5	n-pentane	0.157	0.186	0.241
11.447	536.170	I6	2,2-dimethylbutane	0.047	0.054	0.060
12.803	564.300	N5	cyclopentane	0.067	0.067	0.106
12.877	565.620	I6	2,3-dimethylbutane	0.213	0.239	0.274
13.090	569.380	I6	2-methylpentane	1.098	1.250	1.414
13.963	583.460	I6	3-methylpentane	0.890	0.998	1.146
15.153	600.000	P6	n-hexane	1.914	2.158	2.465
17.133	626.460	I7	2,2-dimethylpentane	0.248	0.274	0.275
17.343	628.950	N6	methylcyclopentane	1.803	1.790	2.377
17.680	632.840	I7	2,4-dimethylpentane	0.427	0.472	0.473
18.187	638.470	I7	2,2,3-trimethylbutane	0.075	0.081	0.083
19.580	652.720	A6	benzene	0.334	0.283	0.475
20.147	658.060	I7	3,3-dimethylpentane	0.163	0.175	0.181
20.520	661.450	N6	cyclohexane	3.031	2.893	3.996
21.520	670.100	I7	2-methylhexane	2.460	2.694	2.724
21.700	671.590	I7	2,3-dimethylpentane	0.796	0.851	0.881
22.003	674.060	N7	1,1-dimethylcyclopentane	0.563	0.555	0.636
22.500	678.000	I7	3-methylhexane	2.739	2.963	3.033
23.227	683.550	N7	1c,3-dimethylcyclopentane	0.894	0.892	1.010
23.553	685.960	N7	1t,3-dimethylcyclopentane	0.849	0.843	0.960
23.707	687.080	N7	1t,2-dimethylcyclopentane	0.210	0.208	0.237
23.873	688.280	I7	3-ethylpentane	1.284	1.366	1.421
24.070	689.680	I8	2,2,4-trimethylpentane	0.017	0.018	0.016
25.463	699.170	P7	n-heptane	3.677	3.997	4.072
27.983	721.100	N7	methylcyclohexane	11.187	10.806	12.642
28.390	724.450	N8	1,1,3-trimethylcyclopentane	0.816	0.811	0.807
29.540	733.570	I8	2,2,3-trimethylpentane	0.449	0.466	0.436
29.733	735.060	N8	1c,2t,4-trimethylcyclopentane	0.653	0.635	0.645
29.857	736.000	I8	C8-Iso-Paraffin	0.031	0.030	0.031
29.993	737.040	I8	3,3-dimethylhexane	0.800	0.837	0.777
30.743	742.630	N8	1t,2c,3-trimethylcyclopentane	0.580	0.559	0.573
30.940	744.060	I8	2,3,4-trimethylpentane	0.236	0.244	0.229
31.753	749.880	I8	I1	0.469	0.485	0.456
32.153	752.670	I8	2,3,3-trimethylpentane	0.037	0.038	0.036
32.680	756.280	A7	toluene	2.740	2.349	3.300
33.733	763.270	N8	1,1,2-trimethylcyclopentane	0.657	0.632	0.650
33.900	764.360	I8	2-methyl-3-ethylpentane	0.064	0.067	0.062

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:44:39 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf
Sample: 13090743-002A JD
Processed 287 Peaks
Reference File: H:\DHA Application Software\References\13090743-001A JD_10022013.DHA
Comments:

Acquired: 09/28/13 05:38:45
Analyzed: 10/2/2013 1:42:46 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
34.240	766.540	I8	3-methyl-3-ethylpentane	0.006	0.007	0.006
34.617	768.930	N8	1c,2c,4-trimethylcyclopentane	2.107	2.055	2.084
34.830	770.270	N8	1c,3-dimethylcyclohexane	1.033	1.006	1.021
35.053	771.660	I8	3-methylheptane	0.223	0.235	0.217
35.380	773.680	N8	1c,2t,3-trimethylcyclopentane	0.087	0.084	0.086
35.720	775.750	I8	3-ethylhexane	2.244	2.337	2.180
35.890	776.770	N8	1,1-dimethylcyclohexane	4.078	3.881	4.032
36.177	778.490	I9	2,2,5-trimethylhexane	1.719	1.806	1.487
37.007	783.370	N8	3c-ethylmethylcyclopentane	0.647	0.627	0.639
37.383	785.540	I8	C8-Iso-Paraffin	0.097	0.094	0.096
37.590	786.720	N8	3t-ethylmethylcyclopentane	0.137	0.133	0.135
37.933	788.660	N8	2t-ethylmethylcyclopentane	0.123	0.119	0.122
38.137	789.800	N8	1,1-methylethylcyclopentane	0.175	0.166	0.173
38.470	791.650	I9	2,2,4-trimethylhexane	0.072	0.073	0.063
38.920	794.120	N8	1t,2-dimethylcyclohexane	1.525	1.461	1.508
40.017	800.000	P8	n-octane	3.047	3.223	2.960
40.153	800.800	N8	1c,4-dimethylcyclohexane	0.994	0.943	0.983
41.460	808.340	N8	i-propylcyclopentane	0.082	0.079	0.081
41.900	810.820	I9	2,4,4-trimethylhexane	0.005	0.005	0.004
42.103	811.950	I9	C9-Iso-Paraffin	0.008	0.008	0.007
42.533	814.330	I9	C9-Iso-Paraffin	0.045	0.046	0.039
42.977	816.750	N8	N1	0.073	0.070	0.073
43.297	818.480	I9	2,3,4-trimethylhexane	0.025	0.025	0.021
43.667	820.460	I9	2,2,3,4-tetramethylpentane	0.296	0.298	0.256
44.467	824.670	I9	2,3,5-trimethylhexane	0.834	0.859	0.722
44.833	826.570	N8	N4	0.042	0.040	0.041
45.023	827.540	N8	1c,2-dimethylcyclohexane	0.012	0.011	0.012
45.513	830.040	I9	2,2-dimethylheptane	2.390	2.500	2.068
45.830	831.640	N9	1,1,4-trimethylcyclohexane	0.784	0.755	0.689
46.203	833.500	I9	C9-Iso-Paraffin	0.027	0.026	0.024
46.637	835.650	I9	2,2,3-trimethylhexane	0.643	0.668	0.557
47.217	838.480	I9	2,4-dimethylheptane	1.317	1.369	1.140
47.547	840.080	I9	2,5-dimethylheptane	0.288	0.299	0.249
47.767	841.130	I9	3,3-&3,5-dimethylheptane	0.022	0.023	0.019
48.047	842.470	N8	ethylcyclohexane	0.061	0.057	0.060
48.390	844.090	N8	n-propylcyclopentane	0.030	0.028	0.029
49.440	848.980	A8	ethylbenzene	0.431	0.370	0.451
49.633	849.860	I9	2,6-dimethylheptane	0.058	0.061	0.050

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:44:39 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf
Sample: 13090743-002A JD
Processed 287 Peaks
Reference File: H:\DHA Application Software\References\13090743-001A JD_10022013.DHA
Comments:

Acquired: 09/28/13 05:38:45
Analyzed: 10/2/2013 1:42:46 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
49.753	850.410	N9	1,1,3-trimethylcyclohexane	0.061	0.058	0.054
50.027	851.650	N9	1c,2t,4t-trimethylcyclohexane	0.568	0.541	0.499
50.493	853.760	N8	N8	0.014	0.013	0.014
50.733	854.830	I9	C9-Iso-Paraffin	0.017	0.016	0.017
50.967	855.870	I9	I3	0.047	0.048	0.041
51.517	858.290	A8	m-xylene	3.009	3.276	2.645
51.783	859.450	A8	p-xylene	1.288	1.403	1.133
52.027	860.510	A8	1,4-dimethylbenzene	0.494	0.426	0.516
52.500	862.550	I9	I4	0.085	0.087	0.074
52.787	863.770	N9	N13	0.283	0.270	0.249
53.290	865.910	I9	3,4-dimethylheptane	0.145	0.148	0.126
54.113	869.340	I9	4-ethylheptane	0.836	0.863	0.723
54.393	870.500	I9	4-methyloctane	0.811	0.837	0.702
54.913	872.630	I9	I5	0.107	0.109	0.093
55.687	875.750	N9	N15	0.293	0.279	0.258
56.040	877.160	I9	3-methyloctane	1.027	1.059	0.889
56.690	879.720	N9	1c,2t,4c-trimethylcyclohexane	0.064	0.061	0.056
57.017	881.000	A8	o-xylene	1.095	1.073	0.947
57.343	882.270	I9	C9-Iso-Paraffin	0.048	0.047	0.041
57.940	884.570	A8	1,2-dimethylbenzene	0.045	0.038	0.047
58.427	886.420	I9	I7	0.125	0.127	0.108
58.657	887.290	N9	N18	0.916	0.872	0.805
59.130	889.070	N9	N19	0.598	0.569	0.525
59.363	889.940	N9	N20	0.051	0.049	0.045
59.743	891.350	I9	I9	0.013	0.013	0.011
60.073	892.560	N9	i-butylcyclopentane	0.032	0.030	0.028
61.077	896.210	N9	N22	0.179	0.170	0.157
61.627	898.180	I9	I10	0.026	0.027	0.023
61.867	899.040	I9	C9-Iso-Paraffin	0.029	0.030	0.025
62.137	900.000	P9	n-nonane	2.098	2.173	1.815
62.473	902.480	N9	1,1-methylethylcyclohexane	0.486	0.448	0.428
62.900	905.610	I10	C10-Iso-Paraffin	0.124	0.114	0.109
63.040	906.640	N9	N25	0.077	0.072	0.068
63.887	912.760	A9	i-propylbenzene	0.092	0.080	0.085
64.360	916.150	I10	I11	0.317	0.323	0.247
64.633	918.090	I10	C10-Iso-Paraffin	0.055	0.056	0.043
64.787	919.180	N9	i-propylcyclohexane	0.179	0.166	0.157
65.237	922.350	I10	2,2-dimethyloctane	0.081	0.084	0.064

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:44:39 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf
Sample: 13090743-002A JD
Processed 287 Peaks
Reference File: H:\DHA Application Software\References\13090743-001A JD_10022013.DHA
Comments:

Acquired: 09/28/13 05:38:45
Analyzed: 10/2/2013 1:42:46 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
65.527	924.380	I10	2,4-dimethyloctane	0.196	0.200	0.153
65.647	925.210	I10	C10-Iso-Paraffin	0.253	0.259	0.198
65.847	926.610	I10	C10-Iso-Paraffin	0.042	0.043	0.033
65.967	927.440	N9	N28	0.048	0.045	0.042
66.293	929.700	N9	N29	0.073	0.068	0.064
66.680	932.350	I10	2,6-dimethyloctane	0.762	0.778	0.594
66.853	933.540	I10	2,5-dimethyloctane	0.417	0.424	0.325
67.557	938.310	N10	N30	0.198	0.184	0.157
67.700	939.280	I10	C10-Iso-Paraffin	0.116	0.108	0.092
67.957	941.000	I10	I14	0.061	0.062	0.048
68.153	942.320	I10	C10-Iso-Paraffin	0.047	0.048	0.037
68.303	943.320	I10	3,3-dimethyloctane	0.576	0.580	0.450
68.553	944.980	N10	N31	0.122	0.113	0.096
68.710	946.020	A9	n-propylbenzene	0.044	0.038	0.040
68.860	947.010	I10	3,6-dimethyloctane	0.228	0.230	0.178
69.107	948.640	I10	C10-Iso-Paraffin	0.090	0.091	0.070
69.213	949.340	I10	C10-Iso-Paraffin	0.081	0.082	0.063
69.390	950.500	I10	3-methyl-5-ethylheptane	0.134	0.137	0.105
69.743	952.800	I10	C10-Iso-Paraffin	0.111	0.113	0.086
70.080	954.990	A9	1,3-methylethylbenzene	0.592	0.509	0.546
70.370	956.860	A9	1,4-methylethylbenzene	0.231	0.200	0.214
70.847	959.930	N10	N33	0.077	0.071	0.061
71.247	962.480	I10	C10-Iso-Paraffin	0.617	0.573	0.488
71.373	963.280	I10	I15	0.213	0.214	0.166
71.573	964.550	N10	N34	0.157	0.146	0.124
71.827	966.150	I10	I16	0.123	0.124	0.096
72.217	968.600	I10	5-methylnonane	0.167	0.170	0.130
72.460	970.120	A9	1,2-methylethylbenzene	0.496	0.418	0.457
72.833	972.440	I10	2-methylnonane	0.365	0.374	0.285
73.007	973.520	I10	3-ethyloctane	0.032	0.032	0.025
73.260	975.080	N10	N35	0.129	0.120	0.102
73.407	975.990	I10	C10-Iso-Paraffin	0.120	0.111	0.095
73.713	977.870	I10	3-methylnonane	0.439	0.445	0.342
74.250	981.140	I10	I19	0.031	0.031	0.024
74.653	983.580	A9	1,2,4-trimethylbenzene	0.981	0.832	0.905
74.880	984.950	N10	i-butylcyclohexane	0.235	0.219	0.186
75.233	987.070	I10	I21	0.240	0.241	0.187
75.447	988.350	I10	I22	0.038	0.039	0.030

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:44:39 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf
Sample: 13090743-002A JD
Processed 287 Peaks
Reference File: H:\DHA Application Software\References\13090743-001A JD_10022013.DHA
Comments:

Acquired: 09/28/13 05:38:45
Analyzed: 10/2/2013 1:42:46 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
75.717	989.950	I10	I23	0.035	0.035	0.027
75.913	991.120	N10	N37	0.011	0.011	0.009
76.390	993.940	I10	I24	0.061	0.061	0.047
76.590	995.110	I10	C10-Iso-Paraffin	0.094	0.094	0.073
76.697	995.740	I10	C10-Iso-Paraffin	0.039	0.039	0.030
76.867	996.730	A10	i-butylbenzene	0.020	0.017	0.016
77.040	997.750	A10	sec-butylbenzene	0.118	0.102	0.098
77.427	1000.000	P10	n-decane	0.989	1.007	0.771
77.603	1001.750	I11	I26	0.043	0.043	0.031
77.873	1004.430	N10	N38	0.034	0.032	0.027
78.090	1006.580	A9	1,2,3-trimethylbenzene	0.133	0.111	0.123
78.217	1007.830	I11	C11-Iso-Paraffin	0.016	0.013	0.014
78.387	1009.500	A10	1,3-methyl-i-propylbenzene	0.091	0.079	0.075
78.753	1013.100	A10	1,4-methyl-i-propylbenzene	0.067	0.058	0.056
79.247	1017.910	I11	I29	0.058	0.058	0.041
79.363	1019.040	I11	C11-Iso-Paraffin	0.063	0.063	0.045
79.480	1020.170	A10	2-3-dihydroindene	0.038	0.029	0.036
79.593	1021.270	I11	C11-Iso-Paraffin	0.024	0.018	0.022
79.747	1022.750	N10	sec-butylcyclohexane	0.027	0.024	0.021
79.953	1024.750	I11	I30	0.196	0.196	0.139
80.307	1028.140	A10	1,2-methyl-i-propylbenzene	0.260	0.221	0.215
80.530	1030.270	I11	3-ethylnonane	0.016	0.016	0.011
80.803	1032.880	I11	I31	0.354	0.355	0.251
81.300	1037.590	I11	I32	0.059	0.055	0.043
81.613	1040.540	A10	1,3-diethylbenzene	0.156	0.134	0.129
81.807	1042.360	A10	1,3-methyl-n-propylbenzene	0.106	0.092	0.088
82.077	1044.890	A10	1,4-diethylbenzene	0.095	0.082	0.078
82.220	1046.230	I11	C11-Iso-Paraffin	0.058	0.050	0.048
82.320	1047.160	A10	1,4-methyl-n-propylbenzene	0.023	0.020	0.019
82.427	1048.160	A10	n-butylbenzene	0.015	0.013	0.012
82.567	1049.460	A10	1,3-dimethyl-5-ethylbenzene	0.111	0.094	0.092
82.767	1051.310	A10	1,2-diethylbenzene	0.010	0.008	0.008
83.043	1053.870	I11	I34	0.146	0.147	0.104
83.153	1054.890	I11	C11-Iso-Paraffin	0.018	0.018	0.013
83.453	1057.650	I11	C11-Iso-Paraffin	0.102	0.103	0.073
83.630	1059.270	I11	I35	0.021	0.021	0.015
83.793	1060.760	I11	I36	0.018	0.018	0.013
84.033	1062.950	I11	I37	0.104	0.104	0.073

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:44:39 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf
Sample: 13090743-002A JD
Processed 287 Peaks
Reference File: H:\DHA Application Software\References\13090743-001A JD_10022013.DHA
Comments:

Acquired: 09/28/13 05:38:45
Analyzed: 10/2/2013 1:42:46 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
84.353	1065.860	A10	1,4,dimethyl-2-ethylbenzene	0.104	0.088	0.086
84.550	1067.650	A10	A3	0.053	0.046	0.044
84.730	1069.280	A10	1,3-dimethyl-4-ethylbenzene	0.161	0.140	0.133
84.960	1071.350	I11	I39	0.027	0.028	0.020
85.363	1074.970	I11	I40	0.187	0.188	0.133
85.540	1076.550	I11	C11-Iso-Paraffin	0.012	0.012	0.009
85.733	1078.280	I11	I41	0.033	0.033	0.023
85.900	1079.760	A10	1,3-dimethyl-2-ethylbenzene	0.023	0.019	0.019
86.207	1082.490	I11	I42	0.012	0.012	0.009
86.547	1085.500	I11	I43	0.078	0.078	0.055
86.687	1086.730	I11	C11-Iso-Paraffin	0.014	0.014	0.010
86.943	1088.990	A12	1,3-di-n-propylbenzene	0.041	0.035	0.028
87.137	1090.680	I11	C11-Iso-Paraffin	0.031	0.026	0.021
87.213	1091.350	I11	C11-Iso-Paraffin	0.030	0.025	0.020
87.340	1092.460	A11	1,4-methyl-t-butylbenzene	0.033	0.029	0.024
87.430	1093.250	A10	1,2-dimethyl-3-ethylbenzene	0.020	0.017	0.016
87.503	1093.890	I11	C11-Iso-Paraffin	0.022	0.018	0.018
87.810	1096.560	A11	1,2-ethyl-i-propylbenzene	0.092	0.077	0.069
88.037	1098.520	I11	C11-Iso-Paraffin	0.033	0.027	0.024
88.207	1100.000	P11	n-undecane	0.422	0.422	0.300
88.547	1104.080	A10	1,2,4,5-tetramethylbenzene	0.068	0.057	0.056
88.867	1107.900	A11	1,2-methyl-n-butylbenzene	0.039	0.032	0.029
88.980	1109.250	A10	1,2,3,5-tetramethylbenzene	0.058	0.048	0.048
89.147	1111.230	I12	C12-Iso-Paraffin	0.012	0.010	0.010
89.927	1120.460	A11	1,2-methyl-t-butylbenzene	0.022	0.018	0.016
90.013	1121.480	I12	C12-Iso-Paraffin	0.032	0.027	0.024
90.527	1127.500	A10	5-methylindan	0.095	0.079	0.080
90.670	1129.180	I12	C12-Iso-Paraffin	0.007	0.006	0.006
90.883	1131.660	I12	I44	0.050	0.050	0.033
91.073	1133.870	A10	4-methylindan	0.017	0.014	0.014
91.297	1136.460	A11	1,2-ethyl-n-propylbenzene	0.102	0.085	0.076
91.467	1138.430	A10	2-methylindan	0.013	0.010	0.011
91.760	1141.820	A11	1,3-methyl-n-butylbenzene	0.018	0.015	0.014
91.907	1143.510	A12	1,3-di-i-propylbenzene	0.016	0.013	0.011
92.033	1144.960	A11	s-pentylbenzene	0.011	0.009	0.008
92.260	1147.560	I12	C12-Iso-Paraffin	0.028	0.023	0.021
92.387	1149.010	A11	n-pentylbenzene	0.024	0.020	0.018
92.687	1152.440	A12	1,2-di-i-propylbenzene	0.023	0.019	0.016

RawFile: M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf
Acquired: 09/28/13 05:38:45
Sample: 13090743-002A JD
Analyzed: 10/2/2013 1:42:46 PM
Processed 287 Peaks
Reference File: H:\DHA Application Software\References\13090743-001A JD_10022013.DHA
Comments:
Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
92.837	1154.140	I12	C12-Iso-Paraffin	0.016	0.013	0.011
93.067	1156.760	I12	C12-Iso-Paraffin	0.013	0.011	0.009
93.223	1158.530	I12	C12-Iso-Paraffin	0.036	0.030	0.024
93.333	1159.780	A12	1,4-di-I-propylbenzene	0.032	0.027	0.022
93.663	1163.500	A10	tetrahydronaphthalene	0.042	0.033	0.036
93.750	1164.480	I12	C12-Iso-Paraffin	0.010	0.008	0.008
93.923	1166.430	I12	C12-Iso-Paraffin	0.028	0.021	0.023
94.030	1167.630	A10	naphthalene	0.049	0.035	0.042
94.207	1169.610	A12	1-t-butyl-3,5-dimethylbenzene	0.017	0.014	0.012
94.593	1173.930	A12	1,4-ethyl-t-butylbenzene	0.039	0.032	0.026
94.907	1177.410	I12	I45	0.029	0.028	0.019
95.347	1182.290	I12	I46	0.026	0.025	0.017
95.547	1184.500	I12	I47	0.007	0.007	0.005
95.880	1188.170	I12	I48	0.029	0.029	0.019
96.283	1192.590	A12	A6	0.018	0.015	0.012
96.793	1198.150	I12	C12-Iso-Paraffin	0.016	0.014	0.011
96.963	1200.000	P12	n-dodecane	0.160	0.158	0.104
97.093	1201.770	I13	C13-Iso-Paraffin	0.018	0.018	0.012
97.553	1208.030	I13	C13-Iso-Paraffin	0.015	0.014	0.009
97.790	1211.240	I13	C13-Iso-Paraffin	0.005	0.005	0.003
98.233	1217.220	A12	1,3,5-triethylbenzene	0.044	0.036	0.030
98.517	1221.030	I13	C13-Iso-Paraffin	0.007	0.006	0.005
98.867	1225.720	I13	C13-Iso-Paraffin	0.022	0.019	0.015
99.160	1229.640	I13	C13-Iso-Paraffin	0.006	0.005	0.004
100.057	1241.540	A12	1,4-methyl-n-pentylbenzene	0.020	0.017	0.014
101.040	1254.460	I13	C13-Iso-Paraffin	0.012	0.010	0.008
101.133	1255.680	A12	n-hexylbenzene	0.008	0.006	0.005
101.280	1257.590	I13	C13-Iso-Paraffin	0.009	0.008	0.006
101.640	1262.270	I13	C13-Iso-Paraffin	0.010	0.008	0.007
101.987	1266.770	I13	C13-Iso-Paraffin	0.013	0.011	0.009
102.487	1273.220	A11	1,2,3,4,5-pentamethylbenzene	0.009	0.006	0.006
102.810	1277.370	A11	2-methylnaphthalene	0.020	0.014	0.015
103.030	1280.190	A11	1-methylnaphthalene	0.021	0.015	0.016
104.213	1295.240	I13	C13-Iso-Paraffin	0.008	0.006	0.006
104.590	1300.000	P13	n-tridecane	0.043	0.043	0.026
110.153	1381.040	I14	C14-Iso-Paraffin	0.005	0.005	0.003
111.500	1400.000	P14	C14	0.009	0.009	0.005
118.770	1517.890	I16	C16-Iso-Paraffin	0.008	0.008	0.004

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:44:39 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf
Sample: 13090743-002A JD
Processed 287 Peaks
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Comments:

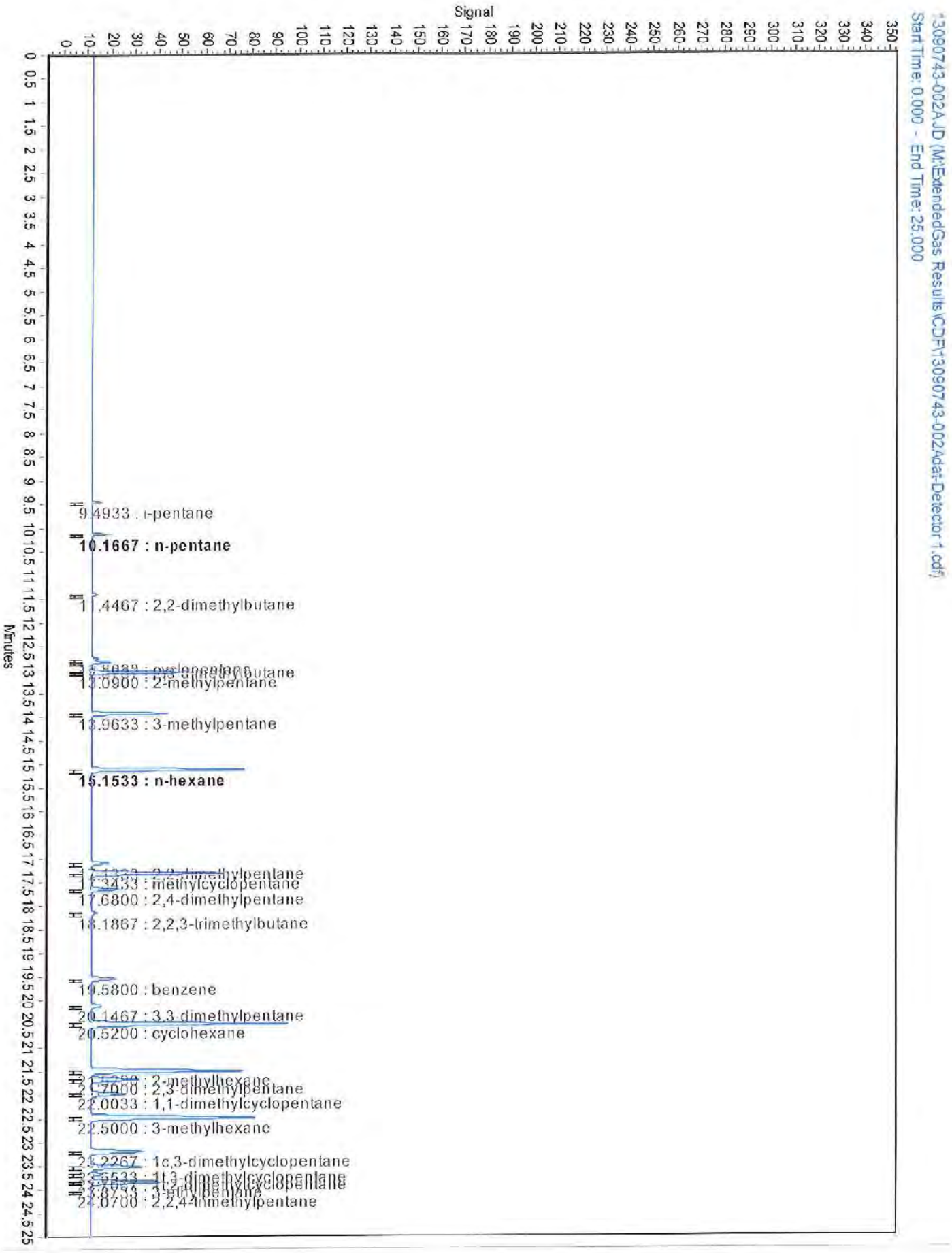
Acquired: 09/28/13 05:38:45
Analyzed: 10/2/2013 1:42:46 PM

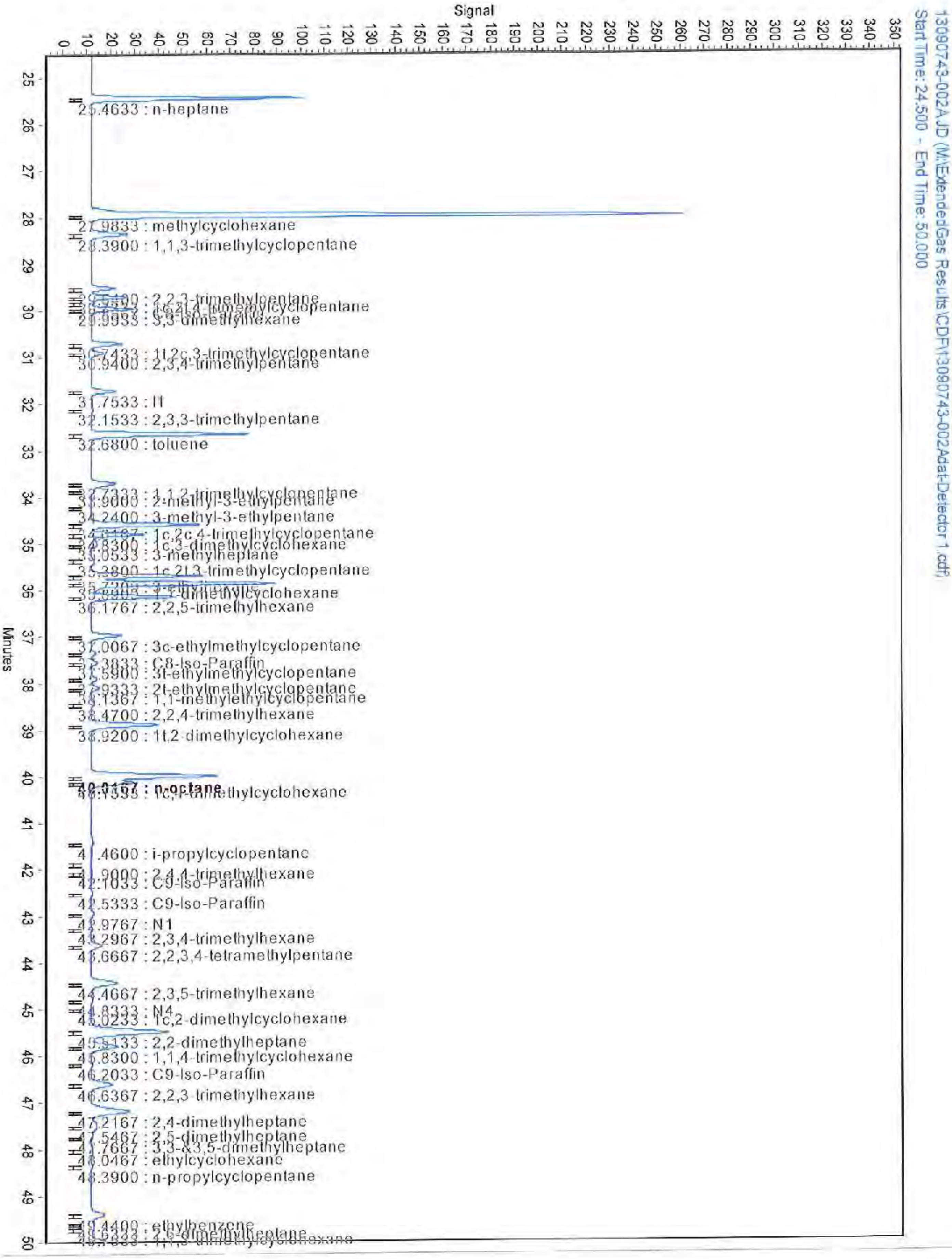
Normalized to 100.0000%

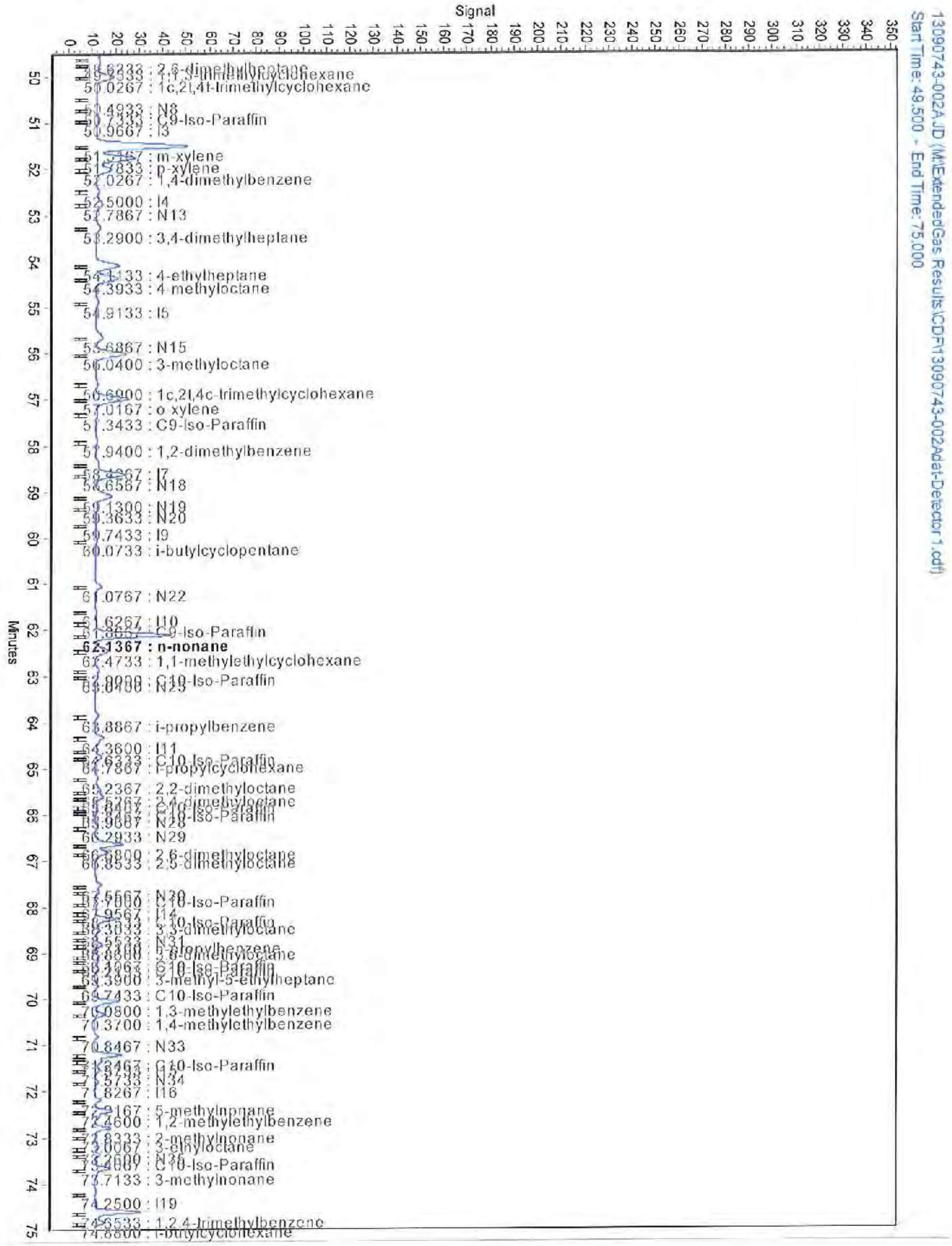
Hold

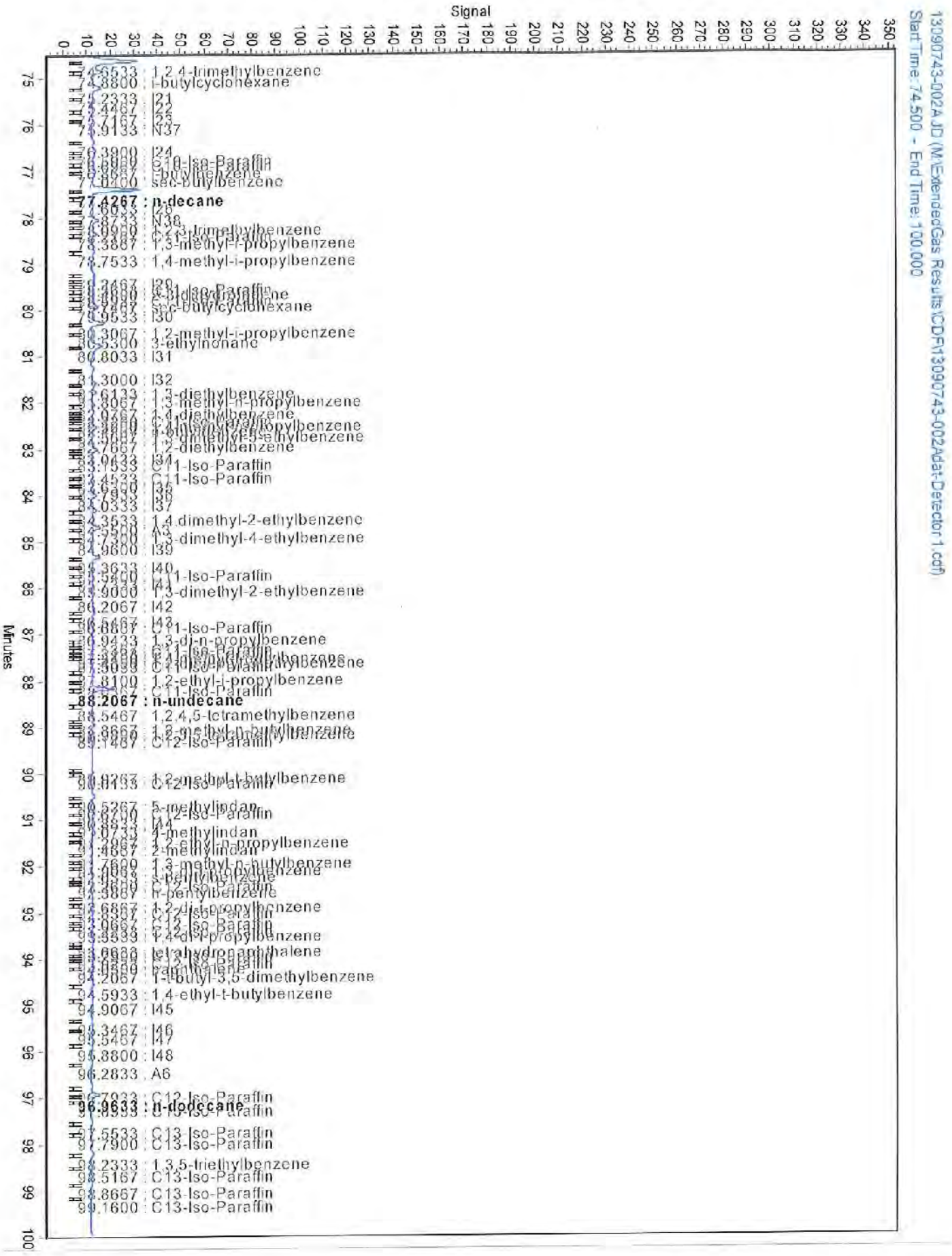
Components Listed in Chromatographic Order

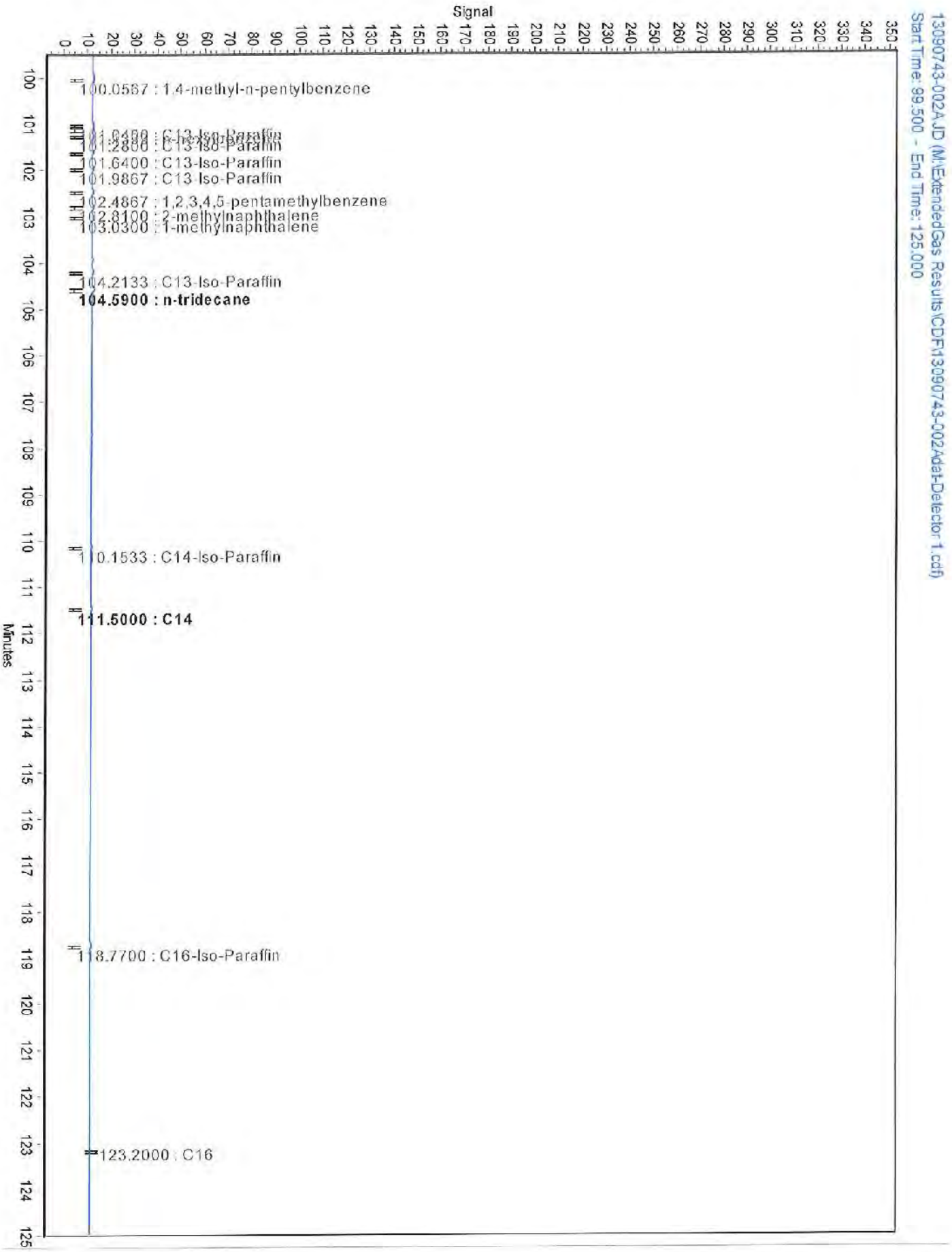
Minutes	Index	Group	Component	Mass %	Volume %	Mol %
123.200	1600.290	P16	C16	0.000	0.000	0.000
127.880	1700.650	P17	C17	0.000	0.000	0.000
132.050	1801.160	P18	C18	0.000	0.000	0.000
135.830	1901.740	P19	C19	0.000	0.000	0.000
139.320	2002.180	P20	C20	0.000	0.000	0.000
142.570	2102.420	P21	C21	0.000	0.000	0.000
145.640	2202.950	P22	C22	0.000	0.000	0.000
148.730	2303.070	P23	C23	0.000	0.000	0.000
152.150	2403.240	P24	C24	0.000	0.000	0.000
156.080	2499.990	P25	C25	0.000	0.000	0.000


*3090743-002AJD (M:\ExtendedGas Results\CDF\13090743-002A\dat-Detector 1.cdf)
Start Time: 0.000 - End Time: 25.000
Signal
Minutes
9.4933 : i-pentane
10.1667 : n-pentane
11.4467 : 2,2-dimethylbutane
13.0900 : 2-methylpentane
13.9633 : 3-methylpentane
15.1533 : n-hexane
16.3433 : methylcyclopentane
16.6800 : 2,4-dimethylpentane
18.1867 : 2,2,3-trimethylbutane
19.5800 : benzene
20.1467 : 3,3-dimethylpentane
20.5200 : cyclohexane
22.0033 : 1,1-dimethylcyclopentane
22.5000 : 3-methylhexane
23.2267 : 1c,3-dimethylcyclopentane
24.0700 : 2,2,4-trimethylpentane

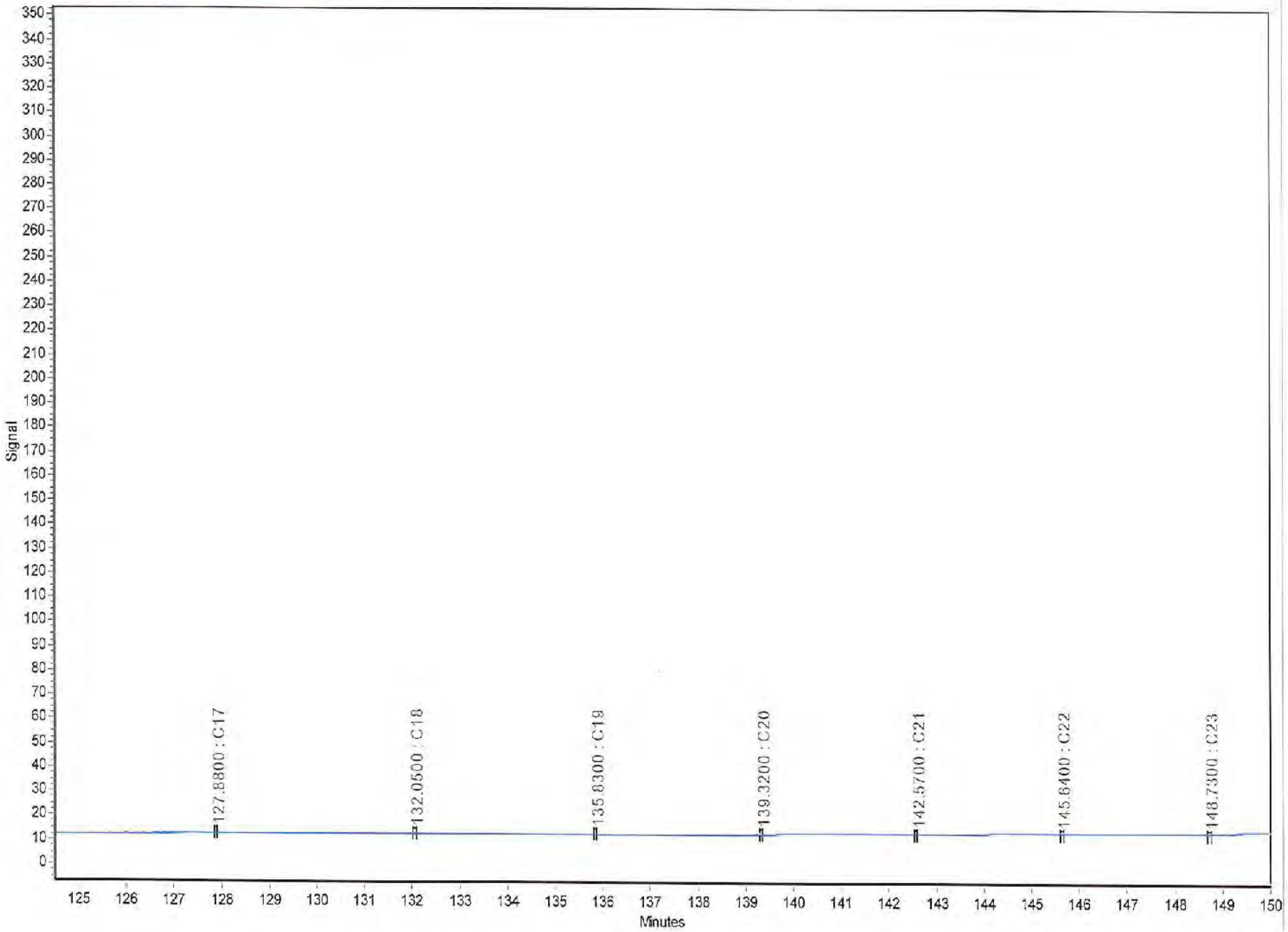

13090743-002A.JD (M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf)
Start Time: 24.500 - End Time: 50.000
Signal
Minutes
25.4633 : n-heptane
27.9833 : methylcyclohexane
28.3900 : 1,1,3-trimethylcyclopentane
29.9933 : 3,3-dimethylhexane
30.9400 : 2,3,4-trimethylpentane
31.7533 : I1
32.1533 : 2,3,3-trimethylpentane
32.6800 : toluene
34.2400 : 3-methyl-3-ethylpentane
35.3800 : 1c,2t,3-trimethylcyclopentane
36.1767 : 2,2,5-trimethylhexane
37.0067 : 3c-ethylmethylcyclopentane
38.4700 : 2,2,4-trimethylhexane
38.9200 : 1t,2-dimethylcyclohexane
n-octane
41.4600 : i-propylcyclopentane
42.5333 : C9-Iso-Paraffin
42.9767 : N1
43.2967 : 2,3,4-trimethylhexane
43.6667 : 2,2,3,4-tetramethylpentane
44.4667 : 2,3,5-trimethylhexane
45.8300 : 1,1,4-trimethylcyclohexane
46.2033 : C9-Iso-Paraffin
46.6367 : 2,2,3-trimethylhexane
47.2167 : 2,4-dimethylheptane
48.0467 : ethylcyclohexane
48.3900 : n-propylcyclopentane

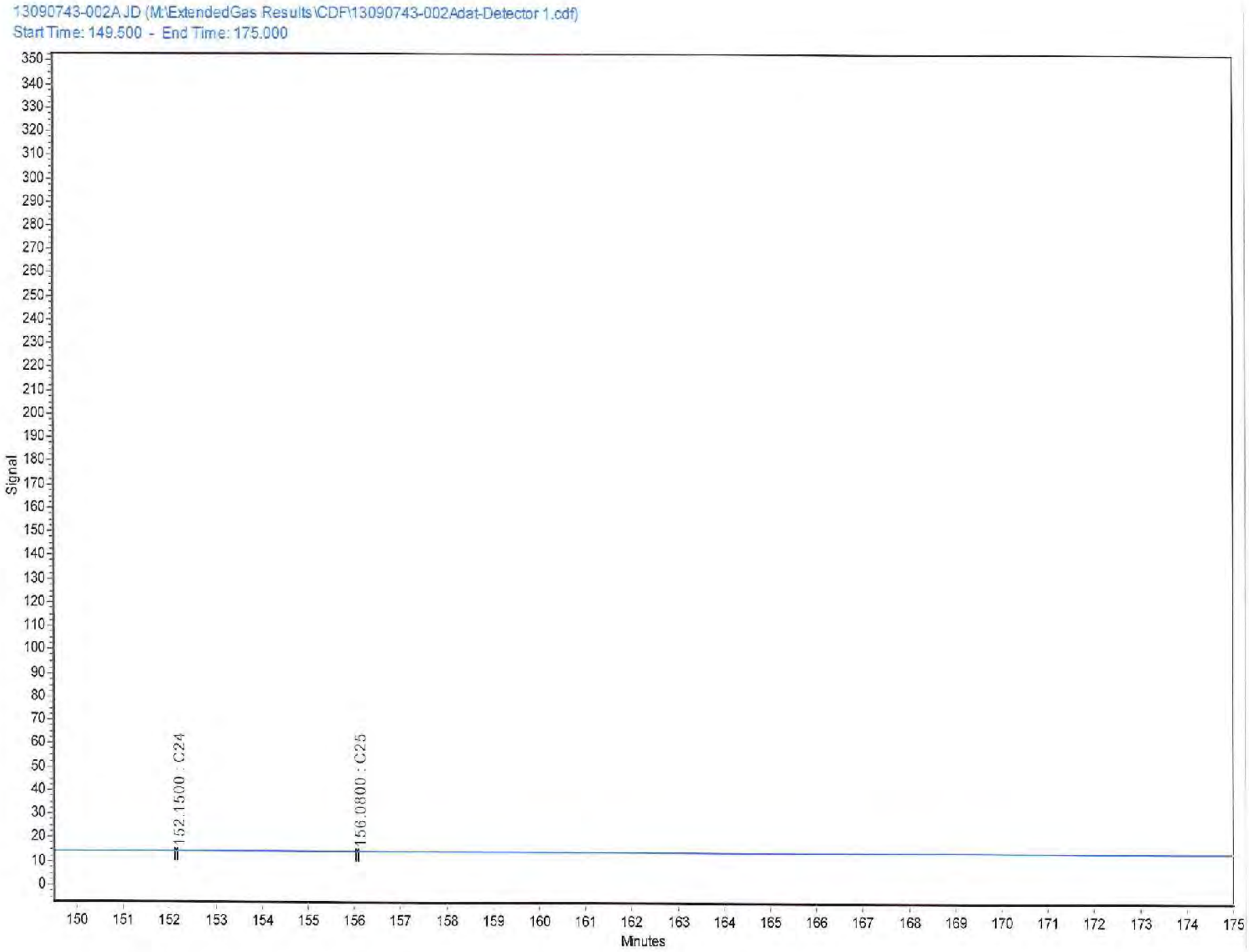

13090743-002AJD (M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf)
Start Time: 49.500 - End Time: 75.000
Signal
Minutes
56.6233 : 2,6-dimethylheptane
56.0267 : 1c,2t,4t-trimethylcyclohexane
56.4933 : N8
56.9667 : I3
57.1467 : m-xylene
57.7833 : p-xylene
58.0267 : 1,4-dimethylbenzene
58.5000 : I4
58.7867 : N13
59.2900 : 3,4-dimethylheptane
59.9133 : I5
60.6867 : N15
61.0400 : 3-methyloctane
61.6900 : 1c,2t,4c-trimethylcyclohexane
62.0167 : o xylene
62.3433 : C9-Iso-Paraffin
62.9400 : 1,2-dimethylbenzene
63.4667 : I7
63.6567 : N18
64.1300 : N19
64.3633 : N20
64.7433 : I9
65.0733 : i-butylcyclopentane
66.0767 : N22
66.6267 : I10
66.8667 : C9-Iso-Paraffin
67.1367 : n-nonane
67.4733 : 1,1-methylethylcyclohexane
67.8000 : C10-Iso-Paraffin
68.0700 : N25
68.8867 : i-propylbenzene
69.3600 : I11
69.6333 : C10-Iso-Paraffin
69.7867 : i-propylcyclohexane
70.2367 : 2,2-dimethyloctane
70.6267 : 2,4-dimethyloctane
70.8467 : C10-Iso-Paraffin
70.9667 : N28
71.2933 : N29
71.5800 : 2,6-dimethyloctane
71.8533 : 2,5-dimethyloctane
72.5667 : N30
72.7000 : C10-Iso-Paraffin
72.9567 : I14
73.0933 : C10-Iso-Paraffin
73.3033 : 3,3-dimethyloctane
73.5533 : N31
73.7300 : n-propylbenzene
73.8800 : 3,6-dimethyloctane
74.1067 : C10-Iso-Paraffin
74.3900 : 3-methyl-5-ethylheptane
74.7433 : C10-Iso-Paraffin
75.0800 : 1,3-methylethylbenzene
75.3700 : 1,4-methylethylbenzene
75.8467 : N33
76.0467 : C10-Iso-Paraffin
76.3733 : N34
76.8267 : I16
77.0167 : 5-methylnonane
77.4600 : 1,2-methylethylbenzene
77.8333 : 2-methylnonane
78.0067 : 3-ethyloctane
78.2600 : N36
78.4667 : C10-Iso-Paraffin
78.7133 : 3-methylnonane
79.2500 : I19
79.5533 : 1,2,4-trimethylbenzene
79.8800 : i-butylcyclohexane


13090743-002A JD (M:\Extended\Gas Results\CDF\13090743-002Adat-Detector 1.cdf)
Start Time: 74.500 - End Time: 100.000
Signal
Minutes
77.4267 : n-decane
88.2067 : n-undecane
96.9633 : n-dodecane

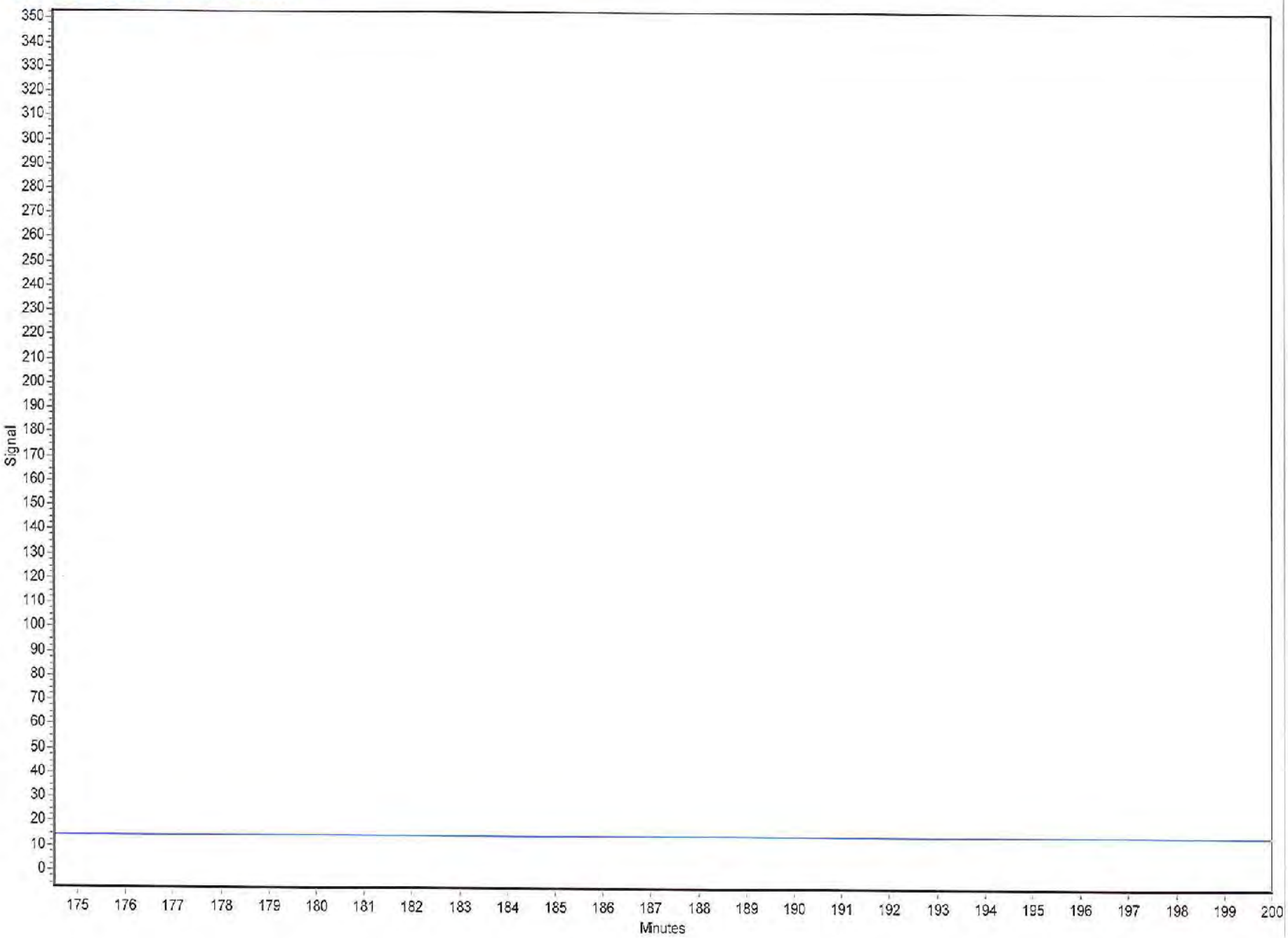

13090743-002A.JD (M:\ExtendedGas Results\CDF\13090743-002A\dat-Detector 1.cdf)
Start Time: 99.500 - End Time: 125.000
Signal
Minutes
100.0567 : 1,4-methyl-n-pentylbenzene
101.0480 : C13-Iso-Paraffin
101.2800 : C13-Iso-Paraffin
101.6400 : C13-Iso-Paraffin
101.9867 : C13-Iso-Paraffin
102.4867 : 1,2,3,4,5-pentamethylbenzene
102.8100 : 2-methylnaphthalene
103.0300 : 1-methylnaphthalene
104.2133 : C13-Iso-Paraffin
104.5900 : n-tridecane
110.1533 : C14-Iso-Paraffin
111.5000 : C14
118.7700 : C16-Iso-Paraffin
123.2000 : C16

13090743-002A JD (M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf)
Start Time: 124.500 - End Time: 150.000




13090743-002A JD (M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf)
Start Time: 149.500 - End Time: 175.000
Signal
Minutes
152.1500 : C24
156.0800 : C25

13090743-002AJD (M:\ExtendedGas Results\CDF\13090743-002Adat-Detector 1.cdf)
Start Time: 174.500 - End Time: 200.000



Certificate of Analysis

HOUSTON LABORATORIES
8820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Analysis Number: 13090743- 003A

Sample ID:	Flor.47 MW3	**Date of Sample:**	09/12/13
Location:	San Juan Basin	**Time Sampled:**	14:45
Project Name:	Williams Remediation	**Date Sample Analyzed:**	10/03/13
Client	LT Environmental	**Contact(s):**	Brooke Herb
Address	2243 Main Ave.		
Suite / Department	Suite 3		
City	Durango	**State**	Colorado **Zip** 81301
Phone	970-385-1096	e-mail	bherb@ltenv.com
Fax			
Color:	Dark Straw	**Odor:**	Aromatic
Specific Gravity @ 60° F.	0.7754	**API @ 60° F.**	50.99
Carbon Range	C5-C28	**Major Range**	C6-C11

Paraffin	16.457	wt%	**N-Hexane**	0.410	wt%
Isoparaffins	35.766	wt%	**Benzene**	0.081	wt%
Naphthenics	35.634	wt%	**Ethyl Benzene**	0.271	wt%
Aromatics	12.143	wt%	**Toluene**	0.067	wt%
Olefins	N/D	wt%	**Meta-Xylene**	3.174	wt%
Unknowns	N/D	wt%	**Para-Xylene**	1.113	wt%
2,2,4-Trl Methylpentane	0.018	wt%	**Ortho-Xylene**	0.977	wt%
			Xylenes	5.264	wt%
Calculated Research Octane	N/A		**EDB**	N/A	wt%
Lead/Manganese	N/A		**EDC**	N/A	wt%
Oxygnates	N/D	wt%	**Ethanol**	N/D	wt%
C_{17}	0.049	wt%	**C_{18}**	0.048	wt%
Pristane	0.129	wt%	**Phytane**	0.065	wt%
Naphthalene	0.090	wt%	**2-Methyl Naphthalene**	0.075	wt%
1-Methyl Naphthalene	0.057	wt%			

Gasoline Range:	C_4-C_{13}	Indicators:	2,2,4-TMP, Olefins
Diesel Range:	C_7-C_{22}	Indicators:	Pristane, Phytane
Condensate Range:	C_2-C_{25}+	Indicators:	No Olefins, Light & Heavies
Heavy Oil:	C_{20}+		

Comments: **N/A Not Applicable N/D None Detected**

Chris Staley
Hydrocarbon Laboratory Manager

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:54:26 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Sample: 13090743-003A JD
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:

Acquired: 09/28/13 09:26:24
Analyzed: 10/2/2013 1:51:10 PM

Normalized to 100.0000%

Oxygenates

Compound	Mass%	Mass% Oxygen	Vol%
No Oxy Compounds Found	0.00	0.00	0.00

Molecular Weight and Relative Density Data

Group	Avg Mw.	Avg Rel. Density
C1	0.000	0.000
C2	0.000	0.000
C3	0.000	0.000
C4	0.000	0.000
C5	71.448	0.660
C6	84.621	0.733
C7	98.967	0.732
C8	114.876	0.739
C9	127.003	0.743
C10	138.453	0.772
C11	153.309	0.777
C12	161.906	0.829
C13	168.172	0.830
C14	188.523	0.758
C15	200.221	0.822
C16	210.561	0.937
C17	230.725	0.775
C18	242.984	0.778
C19	259.897	0.777
C20	275.844	0.783
C21	287.837	0.790
C22	304.053	0.793
C23	320.101	0.796
C24	338.670	0.799
C25	352.690	0.800
C26	370.000	0.800
C27	384.000	0.805
C28	398.000	0.805

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:54:26 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-003\dat-Detector 1.cdf
Sample: 13090743-003A JD
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:

Acquired: 09/28/13 09:26:24
Analyzed: 10/2/2013 1:51:10 PM

Normalized to 100.0000%

C29	0.000	0.000
Total Sample:	118.00	0.75

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:54:26 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Sample: 13090743-003A JD
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:

Acquired: 09/28/13 09:26:24
Analyzed: 10/2/2013 1:51:10 PM

Normalized to 100.0000%

Totals by Group Type & Carbon Number (In Mass Percent)

	Paraffins	I-Paraffins	Olefins	Napthenes	Aromatics	Unknowns	Total
C1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C5	0.01746	0.01647	0.00000	0.01766	0.00000	0.00000	0.05159
C6	0.40999	0.70712	0.00000	2.46594	0.08100	0.00000	3.66404
C7	3.03393	5.40056	0.00000	12.51893	0.06686	0.00000	21.02027
C8	4.94317	4.74165	0.00000	14.74367	6.23761	0.00000	30.66610
C9	3.70526	12.76670	0.00000	4.82216	2.28871	0.00000	23.58283
C10	1.89511	7.30068	0.00000	1.06572	2.35522	0.00000	12.61672
C11	0.92518	2.22311	0.00000	0.00000	0.55142	0.00000	3.69971
C12	0.45919	0.66080	0.00000	0.00000	0.56192	0.00000	1.68191
C13	0.27329	0.46037	0.00000	0.00000	0.00000	0.00000	0.73366
C14	0.19867	0.43860	0.00000	0.00000	0.00000	0.00000	0.63726
C15	0.13876	0.35041	0.00000	0.00000	0.00000	0.00000	0.48916
C16	0.06511	0.16839	0.00000	0.00000	0.00000	0.00000	0.23350
C17	0.04933	0.10599	0.00000	0.00000	0.00000	0.00000	0.15532
C18	0.04793	0.20844	0.00000	0.00000	0.00000	0.00000	0.25637
C19	0.07457	0.11325	0.00000	0.00000	0.00000	0.00000	0.18782
C20	0.03675	0.03207	0.00000	0.00000	0.00000	0.00000	0.06882
C21	0.02507	0.03962	0.00000	0.00000	0.00000	0.00000	0.06469
C22	0.02471	0.02073	0.00000	0.00000	0.00000	0.00000	0.04544
C23	0.02387	0.01092	0.00000	0.00000	0.00000	0.00000	0.03480
C24	0.02337	0.00000	0.00000	0.00000	0.00000	0.00000	0.02337
C25	0.01817	0.00000	0.00000	0.00000	0.00000	0.00000	0.01817
C26	0.02393	0.00000	0.00000	0.00000	0.00000	0.00000	0.02393
C27	0.02793	0.00000	0.00000	0.00000	0.00000	0.00000	0.02793
C28	0.01660	0.00000	0.00000	0.00000	0.00000	0.00000	0.01660
C29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total:	16.45732	35.76586	0.00000	35.63408	12.14274	0.00000	100.00000

Oxygenates 0.00000
Total Unknowns: 0.00000
Total C30+: 0.00000
Grand Total: 100.00000

Totals by Group Type & Carbon Number (in Volume Percent)

	Paraffins	I-Paraffins	Olefins	Napthenes	Aromatics	Unknowns	Total
C1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C5	0.02083	0.01985	0.00000	0.01769	0.00000	0.00000	0.05838
C6	0.46437	0.80156	0.00000	2.39682	0.06883	0.00000	3.73159
C7	3.31428	5.87200	0.00000	12.20174	0.05760	0.00000	21.44560
C8	5.25541	4.94580	0.00000	14.27622	6.49531	0.00000	30.97274

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:54:26 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Sample: 13090743-003A JD
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:

Acquired: 09/28/13 09:26:24
Analyzed: 10/2/2013 1:51:10 PM

Normalized to 100.0000%

C9	3.85641	13.29815	0.00000	4.60190	1.96354	0.00000	23.72000
C10	1.93891	7.26800	0.00000	0.99565	1.99591	0.00000	12.19848
C11	0.92876	2.18185	0.00000	0.00000	0.44647	0.00000	3.55708
C12	0.45546	0.58904	0.00000	0.00000	0.47162	0.00000	1.51611
C13	0.26985	0.39060	0.00000	0.00000	0.00000	0.00000	0.66045
C14	0.19452	0.43307	0.00000	0.00000	0.00000	0.00000	0.62759
C15	0.10160	0.34309	0.00000	0.00000	0.00000	0.00000	0.44469
C16	0.06288	0.12330	0.00000	0.00000	0.00000	0.00000	0.18618
C17	0.04735	0.10237	0.00000	0.00000	0.00000	0.00000	0.14972
C18	0.04608	0.20010	0.00000	0.00000	0.00000	0.00000	0.24619
C19	0.07164	0.10889	0.00000	0.00000	0.00000	0.00000	0.18053
C20	0.03481	0.03081	0.00000	0.00000	0.00000	0.00000	0.06561
C21	0.02365	0.03753	0.00000	0.00000	0.00000	0.00000	0.06118
C22	0.02323	0.01955	0.00000	0.00000	0.00000	0.00000	0.04279
C23	0.02238	0.01027	0.00000	0.00000	0.00000	0.00000	0.03265
C24	0.02184	0.00000	0.00000	0.00000	0.00000	0.00000	0.02184
C25	0.01696	0.00000	0.00000	0.00000	0.00000	0.00000	0.01696
C26	0.02234	0.00000	0.00000	0.00000	0.00000	0.00000	0.02234
C27	0.02591	0.00000	0.00000	0.00000	0.00000	0.00000	0.02591
C28	0.01540	0.00000	0.00000	0.00000	0.00000	0.00000	0.01540
C29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total:	17.23486	36.77583	0.00000	34.49003	11.49929	0.00000	100.00000

Oxygenates	0.00000	Total C30+:	0.00000
Total Unknowns:	0.00000	Grand Total:	100.00000

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:54:26 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Sample: 13090743-003A JD
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:

Acquired: 09/26/13 09:26:24
Analyzed: 10/2/2013 1:51:10 PM

Normalized to 100.0000%

Totals by Group Type & Carbon Number (in Mol Percent)

	Paraffins	I-Paraffins	Olefins	Napthenes	Aromatics	Unknowns	Total
C1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C4	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C5	0.02849	0.02687	0.00000	0.02964	0.00000	0.00000	0.08501
C6	0.56004	0.96592	0.00000	3.44916	0.12207	0.00000	5.09720
C7	3.56421	6.34449	0.00000	15.00900	0.08542	0.00000	25.00311
C8	5.09407	4.89028	0.00000	15.46673	5.97391	0.00000	31.42498
C9	3.40077	11.72007	0.00000	4.49657	2.24157	0.00000	21.85898
C10	1.56790	6.18704	0.00000	0.89439	2.07802	0.00000	10.72735
C11	0.69675	1.70249	0.00000	0.00000	0.44161	0.00000	2.84085
C12	0.31734	0.49791	0.00000	0.00000	0.40764	0.00000	1.22289
C13	0.17450	0.33906	0.00000	0.00000	0.00000	0.00000	0.51356
C14	0.11788	0.28004	0.00000	0.00000	0.00000	0.00000	0.39792
C15	0.07968	0.20792	0.00000	0.00000	0.00000	0.00000	0.28760
C16	0.03385	0.09670	0.00000	0.00000	0.00000	0.00000	0.13054
C17	0.02415	0.05510	0.00000	0.00000	0.00000	0.00000	0.07924
C18	0.02217	0.10204	0.00000	0.00000	0.00000	0.00000	0.12420
C19	0.03269	0.05238	0.00000	0.00000	0.00000	0.00000	0.08507
C20	0.01531	0.01406	0.00000	0.00000	0.00000	0.00000	0.02937
C21	0.00995	0.01651	0.00000	0.00000	0.00000	0.00000	0.02646
C22	0.00936	0.00823	0.00000	0.00000	0.00000	0.00000	0.01759
C23	0.00866	0.00414	0.00000	0.00000	0.00000	0.00000	0.01280
C24	0.00812	0.00000	0.00000	0.00000	0.00000	0.00000	0.00812
C25	0.00606	0.00000	0.00000	0.00000	0.00000	0.00000	0.00606
C26	0.00761	0.00000	0.00000	0.00000	0.00000	0.00000	0.00761
C27	0.00856	0.00000	0.00000	0.00000	0.00000	0.00000	0.00856
C28	0.00491	0.00000	0.00000	0.00000	0.00000	0.00000	0.00491
C29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total:	15.79305	33.51122	0.00000	39.34549	11.35024	0.00000	100.00000

Oxygenates	0.00000	Total C30+:	0.00000
Total Unknowns:	0.00000	Grand Total:	100.00000

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:54:26 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Sample: 13090743-003A JD
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:

Acquired: 09/28/13 09:26:24
Analyzed: 10/2/2013 1:51:10 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
9.507	475.050	I5	i-pentane	0.016	0.020	0.027
10.180	500.000	P5	n-pentane	0.017	0.021	0.028
11.460	536.140	I6	2,2-dimethylbutane	0.013	0.014	0.017
12.817	564.270	N5	cyclopentane	0.018	0.018	0.030
12.890	565.600	I6	2,3-dimethylbutane	0.070	0.079	0.095
13.103	569.350	I6	2-methylpentane	0.306	0.350	0.418
13.977	583.440	I6	3-methylpentane	0.319	0.358	0.436
15.167	600.000	P6	n-hexane	0.410	0.464	0.560
17.147	626.470	I7	2,2-dimethylpentane	0.119	0.132	0.140
17.357	628.970	N6	methylcyclopentane	0.810	0.809	1.134
17.693	632.860	I7	2,4-dimethylpentane	0.228	0.253	0.268
18.200	638.490	I7	2,2,3-trimethylbutane	0.038	0.041	0.045
19.597	652.780	A6	benzene	0.081	0.069	0.122
20.157	658.070	I7	3,3-dimethylpentane	0.091	0.098	0.107
20.533	661.490	N6	cyclohexane	1.655	1.588	2.316
21.527	670.090	I7	2-methylhexane	1.463	1.610	1.718
21.710	671.610	I7	2,3-dimethylpentane	0.540	0.580	0.634
22.013	674.090	N7	1,1-dimethylcyclopentane	0.399	0.395	0.478
22.510	678.040	I7	3-methylhexane	1.850	2.011	2.174
23.233	683.570	N7	1c,3-dimethylcyclopentane	0.652	0.654	0.781
23.560	685.980	N7	1t,3-dimethylcyclopentane	0.636	0.634	0.762
23.717	687.120	N7	1t,2-dimethylcyclopentane	0.164	0.163	0.196
23.880	688.300	I7	3-ethylpentane	1.071	1.146	1.258
24.080	689.730	I8	2,2,4-trimethylpentane	0.018	0.019	0.018
25.467	699.190	P7	n-heptane	3.034	3.314	3.564
27.983	721.100	N7	methylcyclohexane	10.669	10.356	12.791
28.397	724.490	N8	1,1,3-trimethylcyclopentane	0.805	0.804	0.845
29.547	733.610	I8	2,2,3-trimethylpentane	0.356	0.371	0.367
29.740	735.100	N8	1c,2t,4-trimethylcyclopentane	0.536	0.524	0.562
29.863	736.040	I8	C8-Iso-Paraffin	0.033	0.032	0.034
29.997	737.050	I8	3,3-dimethylhexane	0.700	0.737	0.722
30.747	742.640	N8	1t,2c,3-trimethylcyclopentane	0.644	0.624	0.676
30.943	744.070	I8	2,3,4-trimethylpentane	0.201	0.209	0.207
31.757	749.890	I8	I1	0.567	0.589	0.584
32.160	752.700	I8	2,3,3-trimethylpentane	0.058	0.060	0.060
32.733	756.620	A7	toluene	0.067	0.058	0.085
33.743	763.320	N8	1,1,2-trimethylcyclopentane	0.674	0.651	0.707
33.903	764.360	I8	2-methyl-3-ethylpentane	0.068	0.072	0.070

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:54:26 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Acquired: 09/28/13 09:26:24
Sample: 13090743-003A JD
Analyzed: 10/2/2013 1:51:10 PM
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:
Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
34.237	766.500	I8	3-methyl-3-ethylpentane	0.007	0.007	0.007
34.620	768.930	N8	1c,2c,4-trimethylcyclopentane	2.837	2.781	2.976
34.830	770.250	N8	1c,3-dimethylcyclohexane	1.017	0.996	1.067
34.983	771.200	I8	C8-Iso-Paraffin	0.090	0.088	0.095
35.060	771.680	I8	3-methylheptane	0.130	0.137	0.133
35.387	773.690	N8	1c,2t,3-trimethylcyclopentane	0.101	0.098	0.106
35.720	775.720	I8	3-ethylhexane	2.428	2.541	2.502
35.890	776.750	N8	1,1-dimethylcyclohexane	4.158	3.977	4.362
36.177	778.460	I9	2,2,5-trimethylhexane	1.685	1.779	1.546
37.010	783.360	N8	3c-ethylmethylcyclopentane	0.582	0.567	0.611
37.387	785.530	I8	C8-Iso-Paraffin	0.086	0.084	0.091
37.590	786.690	N8	3t-ethylmethylcyclopentane	0.136	0.132	0.143
37.933	788.630	N8	2t-ethylmethylcyclopentane	0.123	0.120	0.129
38.137	789.770	N8	1,1-methylethylcyclopentane	0.228	0.218	0.239
38.473	791.640	I9	2,2,4-trimethylhexane	0.085	0.086	0.078
38.923	794.110	N8	1t,2-dimethylcyclohexane	1.598	1.538	1.676
40.023	800.000	P8	n-octane	4.943	5.255	5.094
40.153	800.760	N8	1c,4-dimethylcyclohexane	0.912	0.870	0.957
41.457	808.290	N8	i-propylcyclopentane	0.102	0.098	0.107
41.890	810.730	I9	2,4,4-trimethylhexane	0.006	0.006	0.006
42.120	812.010	I9	C9-Iso-Paraffin	0.010	0.010	0.009
42.533	814.290	I9	C9-Iso-Paraffin	0.054	0.055	0.050
42.970	816.680	N8	N1	0.076	0.073	0.080
43.307	818.500	I9	2,3,4-trimethylhexane	0.031	0.032	0.029
43.663	820.400	I9	2,2,3,4-tetramethylpentane	0.279	0.282	0.256
44.467	824.630	I9	2,3,5-trimethylhexane	0.904	0.936	0.830
44.827	826.500	N8	N4	0.039	0.038	0.041
45.033	827.560	N8	1c,2-dimethylcyclohexane	0.016	0.015	0.017
45.513	830.010	I9	2,2-dimethylheptane	2.562	2.694	2.352
45.827	831.590	N9	1,1,4-trimethylcyclohexane	0.874	0.846	0.815
46.203	833.470	I9	C9-Iso-Paraffin	0.037	0.036	0.035
46.633	835.600	I9	2,2,3-trimethylhexane	0.894	0.934	0.821
47.213	838.440	I9	2,4-dimethylheptane	1.255	1.311	1.152
47.543	840.030	I9	2,5-dimethylheptane	0.264	0.275	0.243
47.763	841.090	I9	3,3-&3,5-dimethylheptane	0.038	0.040	0.035
48.040	842.410	N8	ethylcyclohexane	0.101	0.096	0.106
48.383	844.030	N8	n-propylcyclopentane	0.042	0.040	0.044
49.440	848.950	A8	ethylbenzene	0.271	0.234	0.301

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Acquired: 09/28/13 09:26:24
Sample: 13090743-003A JD
Analyzed: 10/2/2013 1:51:10 PM
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:
Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
49.640	849.870	I9	2,6-dimethylheptane	0.178	0.187	0.163
50.023	851.610	N9	1c,2t,4t-trimethylcyclohexane	0.701	0.672	0.654
50.493	853.730	N8	N8	0.017	0.016	0.018
50.727	854.770	I9	C9-Iso-Paraffin	0.015	0.014	0.015
50.967	855.840	I9	I3	0.053	0.054	0.049
51.510	858.240	A8	m-xylene	3.174	3.473	2.960
51.780	859.420	A8	p-xylene	1.113	1.218	1.038
52.023	860.470	A8	1,4-dimethylbenzene	0.651	0.565	0.722
52.497	862.510	I9	I4	0.088	0.090	0.081
52.787	863.750	N9	N13	0.308	0.295	0.287
53.290	865.890	I9	3,4-dimethylheptane	0.143	0.146	0.131
54.107	869.300	I9	4-ethylheptane	0.955	0.991	0.877
54.387	870.450	I9	4-methyloctane	1.172	1.215	1.075
54.903	872.570	I9	I5	0.104	0.107	0.096
55.660	875.620	I9	2-methyloctane	0.334	0.350	0.307
56.033	877.110	I9	3-methyloctane	1.308	1.356	1.200
56.687	879.690	N9	1c,2t,4c-trimethylcyclohexane	0.097	0.094	0.090
57.013	880.970	A8	o-xylene	0.977	0.963	0.897
57.333	882.210	I9	C9-Iso-Paraffin	0.070	0.069	0.064
57.630	883.360	I9	C9-Iso-Paraffin	0.023	0.023	0.021
57.933	884.520	A8	1,2-dimethylbenzene	0.051	0.043	0.056
58.437	886.440	I9	I7	0.159	0.162	0.146
58.650	887.250	N9	N18	0.992	0.950	0.925
59.123	889.030	N9	N19	0.642	0.614	0.598
59.360	889.910	N9	N20	0.052	0.049	0.048
59.750	891.360	I9	I9	0.024	0.025	0.022
60.073	892.550	N9	i-butylcyclopentane	0.049	0.047	0.046
60.333	893.500	N9	N21	0.011	0.011	0.011
61.077	896.200	N9	N22	0.139	0.133	0.130
61.623	898.160	I9	I10	0.035	0.036	0.032
62.140	900.000	P9	n-nonane	3.705	3.856	3.401
62.467	902.410	N9	1,1-methylethylcyclohexane	0.551	0.510	0.514
62.893	905.540	I10	C10-Iso-Paraffin	0.109	0.101	0.102
63.043	906.640	N9	N25	0.080	0.076	0.075
63.880	912.700	A9	i-propylbenzene	0.080	0.070	0.079
64.357	916.110	I10	I11	0.411	0.420	0.340
64.627	918.030	I10	C10-Iso-Paraffin	0.058	0.060	0.048
64.783	919.140	N9	i-propylcyclohexane	0.191	0.178	0.178

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Acquired: 09/28/13 09:26:24
Sample: 13090743-003A JD
Analyzed: 10/2/2013 1:51:10 PM
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:
Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
65.240	922.360	I10	2,2-dimethyloctane	0.089	0.092	0.074
65.513	924.270	I10	2,4-dimethyloctane	0.193	0.199	0.160
65.647	925.200	I10	C10-Iso-Paraffin	0.274	0.282	0.227
65.833	926.500	I10	C10-Iso-Paraffin	0.045	0.046	0.037
65.987	927.430	N9	N28	0.047	0.045	0.044
66.290	929.660	N9	N29	0.088	0.083	0.082
66.673	932.300	I10	2,6-dimethyloctane	0.817	0.839	0.676
66.847	933.480	I10	2,5-dimethyloctane	0.404	0.414	0.334
67.427	937.420	I10	I13	0.064	0.066	0.053
67.553	938.280	N10	N30	0.149	0.139	0.125
67.697	939.250	I10	C10-Iso-Paraffin	0.119	0.111	0.100
67.960	941.020	I10	I14	0.066	0.067	0.054
68.297	943.270	I10	3,3-dimethyloctane	0.719	0.727	0.595
68.547	944.930	N10	N31	0.142	0.132	0.119
68.703	945.970	A9	n-propylbenzene	0.045	0.039	0.044
68.853	946.960	I10	3,6-dimethyloctane	0.214	0.217	0.177
69.113	948.680	I10	C10-Iso-Paraffin	0.100	0.102	0.083
69.200	949.250	I10	C10-Iso-Paraffin	0.072	0.073	0.059
69.393	950.520	I10	3-methyl-5-ethylheptane	0.187	0.192	0.154
69.733	952.740	I10	C10-Iso-Paraffin	0.109	0.112	0.090
70.077	954.970	A9	1,3-methylethylbenzene	0.597	0.516	0.585
70.367	956.840	A9	1,4-methylethylbenzene	0.208	0.181	0.204
70.840	959.880	N10	N33	0.124	0.116	0.104
71.240	962.440	A9	1,3,5-trimethylbenzene	0.588	0.508	0.576
71.367	963.240	I10	I15	0.256	0.259	0.212
71.573	964.550	N10	N34	0.160	0.149	0.134
71.820	966.110	I10	I16	0.133	0.134	0.110
72.213	968.580	I10	5-methylnonane	0.184	0.188	0.152
72.453	970.080	A9	1,2-methylethylbenzene	0.572	0.485	0.561
72.827	972.410	I10	2-methylnonane	0.477	0.491	0.395
73.003	973.500	I10	3-ethyloctane	0.038	0.039	0.032
73.253	975.050	N10	N35	0.127	0.119	0.107
73.400	975.950	I10	C10-Iso-Paraffin	0.131	0.122	0.110
73.710	977.860	I10	3-methylnonane	0.536	0.546	0.443
74.237	981.070	I10	I19	0.032	0.032	0.026
74.477	982.530	A9	1,2,4-trimethylbenzene	0.023	0.019	0.022
74.647	983.560	I10	C10-Iso-Paraffin	0.871	0.743	0.853
74.873	984.920	N10	i-butylcyclohexane	0.269	0.252	0.226

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:54:26 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Sample: 13090743-003A JD
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:

Acquired: 09/28/13 09:26:24
Analyzed: 10/2/2013 1:51:10 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
75.227	987.040	I10	I21	0.280	0.283	0.232
75.433	988.280	I10	I22	0.048	0.049	0.040
75.567	989.080	I10	I23	0.011	0.011	0.009
75.707	989.910	I10	C10-Iso-Paraffin	0.045	0.046	0.037
75.900	991.060	N10	N37	0.020	0.019	0.017
76.387	993.930	I10	I24	0.069	0.070	0.057
76.583	995.090	I10	C10-Iso-Paraffin	0.137	0.138	0.113
77.040	997.760	A10	sec-butylbenzene	0.156	0.135	0.137
77.423	1000.000	P10	n-decane	1.895	1.939	1.568
77.600	1001.750	I11	I26	0.045	0.045	0.034
77.863	1004.370	N10	N38	0.040	0.038	0.034
78.083	1006.550	A9	1,2,3-trimethylbenzene	0.174	0.145	0.170
78.383	1009.500	A10	1,3-methyl-i-propylbenzene	0.106	0.092	0.093
78.750	1013.100	A10	1,4-methyl-i-propylbenzene	0.062	0.054	0.054
78.893	1014.500	I11	I27	0.007	0.007	0.005
79.243	1017.910	I11	I29	0.055	0.056	0.042
79.357	1019.010	I11	C11-Iso-Paraffin	0.069	0.070	0.052
79.480	1020.210	A10	2-3-dihydroindene	0.043	0.033	0.043
79.590	1021.270	I11	C11-Iso-Paraffin	0.021	0.016	0.021
79.737	1022.690	N10	sec-butylcyclohexane	0.034	0.032	0.029
79.947	1024.710	I11	I30	0.213	0.215	0.161
80.300	1028.110	A10	1,2-methyl-i-propylbenzene	0.326	0.278	0.286
80.520	1030.210	I11	3-ethylnonane	0.018	0.018	0.013
80.793	1032.820	I11	I31	0.413	0.417	0.311
81.283	1037.460	I11	I32	0.085	0.079	0.065
81.607	1040.510	A10	1,3-diethylbenzene	0.161	0.139	0.141
81.800	1042.330	A10	1,3-methyl-n-propylbenzene	0.124	0.108	0.109
82.073	1044.890	A10	1,4-diethylbenzene	0.116	0.100	0.102
82.217	1046.230	I11	C11-Iso-Paraffin	0.062	0.054	0.055
82.313	1047.130	A10	1,4-methyl-n-propylbenzene	0.037	0.032	0.033
82.410	1048.030	A10	n-butylbenzene	0.016	0.013	0.014
82.563	1049.460	A10	1,3-dimethyl-5-ethylbenzene	0.127	0.108	0.111
82.767	1051.340	A10	1,2-diethylbenzene	0.014	0.012	0.013
83.037	1053.840	I11	I34	0.166	0.167	0.125
83.153	1054.920	I11	C11-Iso-Paraffin	0.021	0.021	0.016
83.447	1057.620	I11	C11-Iso-Paraffin	0.121	0.122	0.091
83.623	1059.240	I11	I35	0.028	0.028	0.021
83.790	1060.760	I11	I36	0.023	0.024	0.018

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:54:26 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Sample: 13090743-003A JD
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:

Acquired: 09/28/13 09:26:24
Analyzed: 10/2/2013 1:51:10 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
84.030	1062.950	I11	I37	0.136	0.137	0.102
84.347	1065.830	A10	1,4,dimethyl-2-ethylbenzene	0.141	0.120	0.123
84.543	1067.620	A10	A3	0.069	0.060	0.061
84.723	1069.250	A10	1,3-dimethyl-4-ethylbenzene	0.217	0.188	0.190
84.953	1071.320	I11	I39	0.039	0.040	0.030
85.233	1073.840	A10	1,2-dimethyl-4-ethylbenzene	0.026	0.022	0.023
85.360	1074.970	I11	I40	0.220	0.222	0.166
85.527	1076.460	I11	C11-Iso-Paraffin	0.024	0.024	0.018
85.717	1078.160	I11	I41	0.050	0.050	0.037
85.890	1079.710	A10	1,3-dimethyl-2-ethylbenzene	0.048	0.040	0.042
86.210	1082.550	I11	I42	0.025	0.025	0.019
86.540	1085.470	I11	I43	0.111	0.112	0.083
86.683	1086.730	I11	C11-Iso-Paraffin	0.028	0.029	0.021
86.940	1088.990	A12	1,3-di-n-propylbenzene	0.060	0.050	0.043
87.130	1090.650	I11	C11-Iso-Paraffin	0.047	0.039	0.034
87.200	1091.270	I11	C11-Iso-Paraffin	0.031	0.026	0.022
87.337	1092.460	A11	1,4-methyl-t-butylbenzene	0.043	0.038	0.034
87.427	1093.250	A10	1,2-dimethyl-3-ethylbenzene	0.030	0.025	0.027
87.497	1093.860	I11	C11-Iso-Paraffin	0.026	0.022	0.023
87.800	1096.500	I11	C11-Iso-Paraffin	0.094	0.078	0.082
87.913	1097.480	A11	1,2-ethyl-i-propylbenzene	0.019	0.016	0.015
88.037	1098.550	I11	C11-Iso-Paraffin	0.045	0.038	0.036
88.203	1100.000	P11	n-undecane	0.925	0.929	0.697
88.543	1104.080	A10	1,2,4,5-tetramethylbenzene	0.093	0.079	0.082
88.863	1107.900	A11	1,2-methyl-n-butylbenzene	0.053	0.045	0.042
88.977	1109.250	A10	1,2,3,5-tetramethylbenzene	0.089	0.075	0.078
89.143	1111.240	I12	C12-Iso-Paraffin	0.024	0.020	0.021
89.367	1113.890	I12	C12-Iso-Paraffin	0.017	0.014	0.015
89.560	1116.180	A11	1,2-methyl-t-butylbenzene	0.025	0.021	0.020
89.660	1117.360	I12	C12-Iso-Paraffin	0.030	0.025	0.024
89.920	1120.430	I12	C12-Iso-Paraffin	0.040	0.033	0.032
90.010	1121.490	I12	C12-Iso-Paraffin	0.061	0.051	0.048
90.520	1127.470	A10	5-methylindan	0.142	0.119	0.127
90.653	1129.030	I12	C12-Iso-Paraffin	0.009	0.008	0.008
90.877	1131.640	I12	I44	0.081	0.080	0.056
91.063	1133.810	A10	4-methylindan	0.026	0.022	0.023
91.290	1136.440	A11	1,2-ethyl-n-propylbenzene	0.158	0.133	0.126
91.467	1138.480	A10	2-methylindan	0.016	0.013	0.014

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Sample: 13090743-003A JD
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:

Acquired: 09/28/13 09:26:24
Analyzed: 10/2/2013 1:51:10 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
91.653	1140.640	A11	1,3-methyl-n-butylbenzene	0.022	0.018	0.017
91.753	1141.790	I12	C12-Iso-Paraffin	0.017	0.015	0.014
91.900	1143.480	A12	1,3-di-i-propylbenzene	0.027	0.023	0.020
92.033	1145.020	A11	s-pentylbenzene	0.018	0.015	0.014
92.250	1147.500	I12	C12-Iso-Paraffin	0.038	0.032	0.030
92.380	1148.990	A11	n-pentylbenzene	0.039	0.033	0.031
92.673	1152.340	A12	1,2-di-i-propylbenzene	0.039	0.033	0.029
92.827	1154.090	I12	C12-Iso-Paraffin	0.022	0.018	0.016
93.067	1156.820	I12	C12-Iso-Paraffin	0.021	0.018	0.015
93.213	1158.480	I12	C12-Iso-Paraffin	0.066	0.055	0.048
93.330	1159.800	A12	1,4-di-i-propylbenzene	0.058	0.049	0.042
93.657	1163.490	A10	tetrahydronaphthalene	0.080	0.062	0.071
93.830	1165.440	I12	C12-Iso-Paraffin	0.016	0.013	0.015
93.917	1166.410	I12	C12-Iso-Paraffin	0.023	0.018	0.021
94.023	1167.610	A10	naphthalene	0.090	0.065	0.083
94.200	1169.590	A12	1-t-butyl-3,5-dimethylbenzene	0.030	0.025	0.022
94.583	1173.880	A12	1,4-ethyl-t-butylbenzene	0.071	0.059	0.051
94.900	1177.400	I12	I45	0.045	0.044	0.031
95.400	1182.940	I12	C12-Iso-Paraffin	0.047	0.047	0.033
95.547	1184.560	I12	I47	0.017	0.017	0.012
95.870	1188.120	I12	I48	0.054	0.054	0.037
96.273	1192.550	A12	A6	0.037	0.031	0.027
96.537	1195.420	I12	C12-Iso-Paraffin	0.011	0.009	0.008
96.780	1198.070	I12	C12-Iso-Paraffin	0.023	0.019	0.016
96.957	1200.000	P12	n-dodecane	0.459	0.455	0.317
97.093	1201.860	I13	C13-Iso-Paraffin	0.034	0.034	0.023
97.533	1207.850	I13	C13-Iso-Paraffin	0.026	0.026	0.018
97.790	1211.330	I13	C13-Iso-Paraffin	0.010	0.010	0.007
98.007	1214.260	I13	C13-Iso-Paraffin	0.016	0.016	0.011
98.227	1217.220	A12	1,3,5-triethylbenzene	0.133	0.111	0.096
98.513	1221.080	I13	C13-Iso-Paraffin	0.013	0.011	0.009
98.863	1225.770	I13	C13-Iso-Paraffin	0.053	0.044	0.038
99.153	1229.640	I13	C13-Iso-Paraffin	0.025	0.021	0.018
99.253	1230.980	I13	C13-Iso-Paraffin	0.006	0.005	0.004
99.443	1233.500	I13	C13-Iso-Paraffin	0.014	0.012	0.010
99.583	1235.360	A12	1,2,4-triethylbenzene	0.011	0.009	0.008
99.783	1238.010	I13	C13-Iso-Paraffin	0.006	0.005	0.004
100.050	1241.540	A12	1,4-methyl-n-pentylbenzene	0.067	0.057	0.049

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:54:26 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Sample: 13090743-003A JD
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:

Acquired: 09/28/13 09:26:24
Analyzed: 10/2/2013 1:51:10 PM

Normalized to 100.0000%

Hold

Components Listed In Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
100.257	1244.270	I13	C13-Iso-Paraffin	0.012	0.010	0.009
100.820	1251.670	I13	C13-Iso-Paraffin	0.009	0.008	0.007
101.027	1254.370	I13	C13-Iso-Paraffin	0.031	0.026	0.023
101.120	1255.590	A12	n-hexylbenzene	0.029	0.024	0.021
101.277	1257.640	I13	C13-Iso-Paraffin	0.033	0.028	0.024
101.633	1262.280	I13	C13-Iso-Paraffin	0.039	0.033	0.028
101.973	1266.680	I13	C13-Iso-Paraffin	0.052	0.044	0.038
102.477	1273.180	A11	1,2,3,4,5-pentamethylbenzene	0.042	0.031	0.033
102.807	1277.420	A11	2-methylnaphthalene	0.075	0.055	0.062
103.020	1280.150	A11	1-methylnaphthalene	0.057	0.042	0.047
103.167	1282.030	I13	C13-Iso-Paraffin	0.005	0.003	0.004
103.303	1283.770	I13	C13-Iso-Paraffin	0.006	0.004	0.005
103.567	1287.130	I13	C13-Iso-Paraffin	0.010	0.007	0.008
103.947	1291.950	I13	C13-Iso-Paraffin	0.022	0.016	0.018
104.203	1295.200	I13	C13-Iso-Paraffin	0.031	0.023	0.026
104.383	1297.470	I13	C13-Iso-Paraffin	0.009	0.007	0.007
104.583	1300.000	P13	n-tridecane	0.273	0.270	0.174
104.753	1302.540	I14	C14-Iso-Paraffin	0.015	0.015	0.009
105.103	1307.760	I14	C14-Iso-Paraffin	0.019	0.019	0.012
105.327	1311.090	I14	C14-Iso-Paraffin	0.011	0.010	0.007
105.540	1314.250	I14	C14-Iso-Paraffin	0.012	0.012	0.008
105.900	1319.590	I14	C14-Iso-Paraffin	0.010	0.010	0.006
106.020	1321.360	I14	C14-Iso-Paraffin	0.025	0.025	0.016
106.727	1331.750	I14	C14-Iso-Paraffin	0.008	0.008	0.005
106.960	1335.170	I14	C14-Iso-Paraffin	0.009	0.009	0.006
107.740	1346.530	I14	C14-Iso-Paraffin	0.025	0.025	0.016
107.853	1348.170	I14	C14-Iso-Paraffin	0.010	0.010	0.006
108.003	1350.340	I14	C14-Iso-Paraffin	0.009	0.009	0.006
108.227	1353.570	I14	C14-Iso-Paraffin	0.020	0.020	0.013
108.423	1356.410	I14	C14-Iso-Paraffin	0.020	0.019	0.012
108.767	1361.350	I14	C14-Iso-Paraffin	0.033	0.032	0.021
108.867	1362.780	I14	C14-Iso-Paraffin	0.008	0.008	0.005
109.107	1366.220	I14	C14-Iso-Paraffin	0.041	0.040	0.026
109.233	1368.040	I14	C14-Iso-Paraffin	0.010	0.010	0.006
109.587	1373.080	I14	C14-Iso-Paraffin	0.028	0.027	0.018
110.140	1380.940	I14	C14-Iso-Paraffin	0.077	0.076	0.049
110.953	1392.420	I14	C14-Iso-Paraffin	0.014	0.014	0.009
111.080	1394.200	I14	C14-Iso-Paraffin	0.036	0.036	0.023

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:54:26 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Sample: 13090743-003A JD
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:

Acquired: 09/28/13 09:26:24
Analyzed: 10/2/2013 1:51:10 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
111.493	1400.000	P14	C14	0.199	0.195	0.118
111.653	1402.590	I15	C15-Iso-Paraffin	0.009	0.009	0.006
111.933	1407.130	I15	C15-Iso-Paraffin	0.053	0.052	0.031
112.183	1411.170	I15	C15-Iso-Paraffin	0.038	0.037	0.023
112.387	1414.450	I15	C15-Iso-Paraffin	0.009	0.009	0.005
112.677	1419.120	I15	C15-Iso-Paraffin	0.009	0.009	0.006
114.733	1451.860	I15	C15-Iso-Paraffin	0.048	0.047	0.029
114.977	1455.690	I15	C15-Iso-Paraffin	0.013	0.012	0.007
115.327	1461.190	I15	C15-Iso-Paraffin	0.010	0.010	0.006
115.690	1466.880	I15	C15-Iso-Paraffin	0.097	0.095	0.058
115.853	1469.430	I15	C15-Iso-Paraffin	0.010	0.009	0.006
116.093	1473.170	I15	C15-Iso-Paraffin	0.019	0.019	0.011
116.220	1475.140	I15	C15-Iso-Paraffin	0.008	0.008	0.005
116.440	1478.560	I15	C15-Iso-Paraffin	0.006	0.005	0.003
116.840	1484.750	I15	C15-Iso-Paraffin	0.009	0.008	0.005
117.423	1493.750	I15	C15-Iso-Paraffin	0.007	0.007	0.004
117.593	1496.360	I15	C15-Iso-Paraffin	0.006	0.005	0.003
117.773	1499.130	P15	C15	0.139	0.102	0.080
117.943	1502.160	I16	C16-Iso-Paraffin	0.009	0.006	0.005
118.433	1511.500	I16	C16-Iso-Paraffin	0.008	0.006	0.004
118.700	1516.560	I16	C16-Iso-Paraffin	0.011	0.008	0.006
119.020	1522.620	I16	C16-Iso-Paraffin	0.008	0.006	0.005
119.880	1538.830	I16	C16-Iso-Paraffin	0.009	0.006	0.005
120.113	1543.200	I16	C16-Iso-Paraffin	0.008	0.006	0.005
120.440	1549.310	I16	C16-Iso-Paraffin	0.007	0.005	0.004
120.547	1551.300	I16	C16-Iso-Paraffin	0.007	0.005	0.004
120.817	1556.330	I16	C16-Iso-Paraffin	0.032	0.023	0.018
121.043	1560.550	I16	C16-Iso-Paraffin	0.029	0.021	0.016
121.330	1565.870	I16	C16-Iso-Paraffin	0.018	0.013	0.010
121.600	1570.860	I16	C16-Iso-Paraffin	0.014	0.011	0.008
121.723	1573.140	I16	C16-Iso-Paraffin	0.010	0.007	0.006
123.150	1599.330	P16	C16	0.065	0.063	0.034
125.683	1653.980	I17	C17-Iso-Paraffin	0.062	0.060	0.032
126.003	1660.820	I17	C17-Iso-Paraffin	0.024	0.023	0.012
126.227	1665.580	I17	C17-Iso-Paraffin	0.009	0.009	0.005
126.590	1673.310	I17	C17-Iso-Paraffin	0.011	0.010	0.006
127.833	1699.580	P17	C17	0.049	0.047	0.024
128.297	1710.860	I18	C18-Iso-Paraffin	0.129	0.124	0.063

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 1:54:26 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf
Sample: 13090743-003A JD
Processed 383 Peaks
Reference File: H:\DHA Application Software\References\13090743-002A JD_10022013.DHA
Comments:

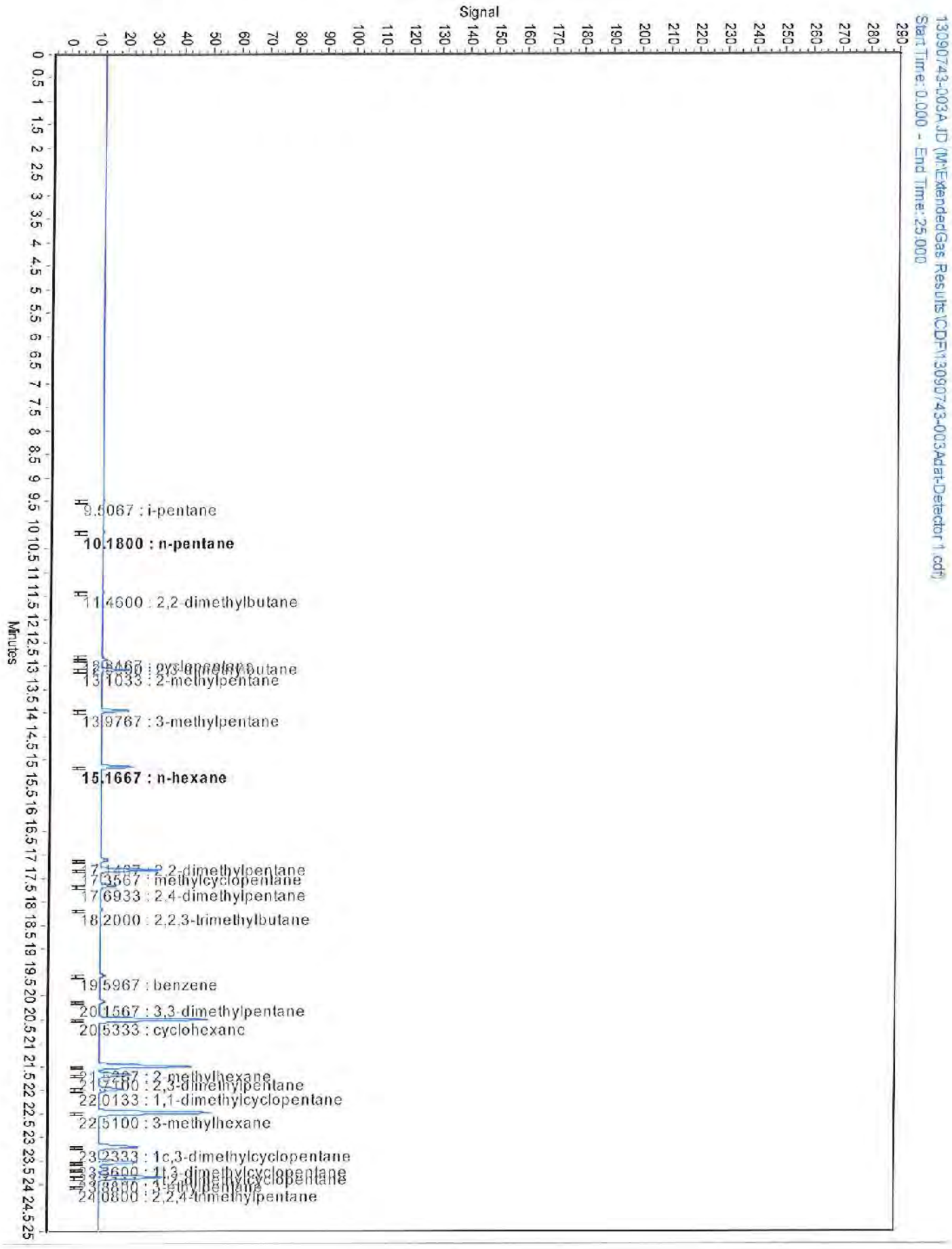
Acquired: 09/28/13 09:26:24
Analyzed: 10/2/2013 1:51:10 PM

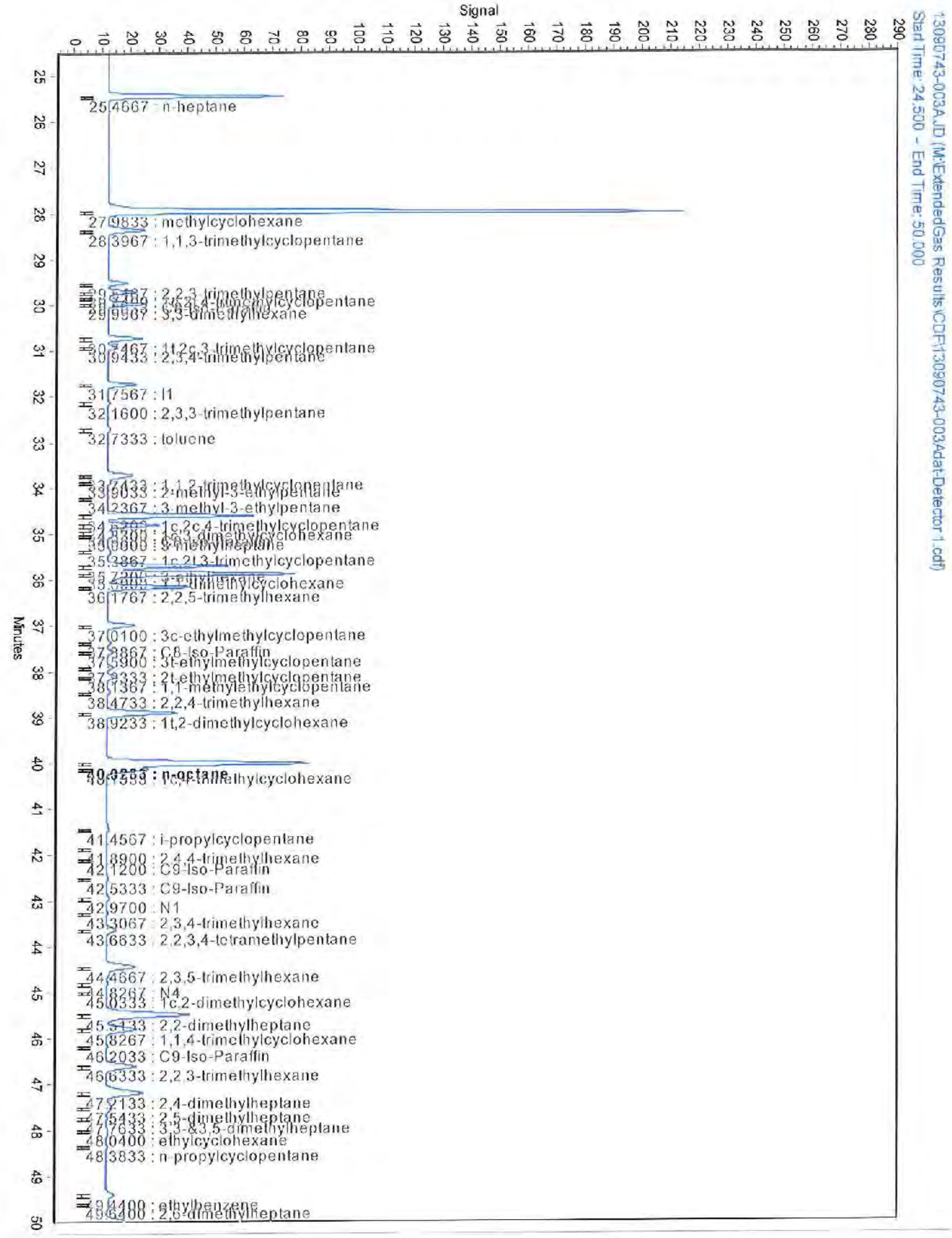
Normalized to 100.0000%

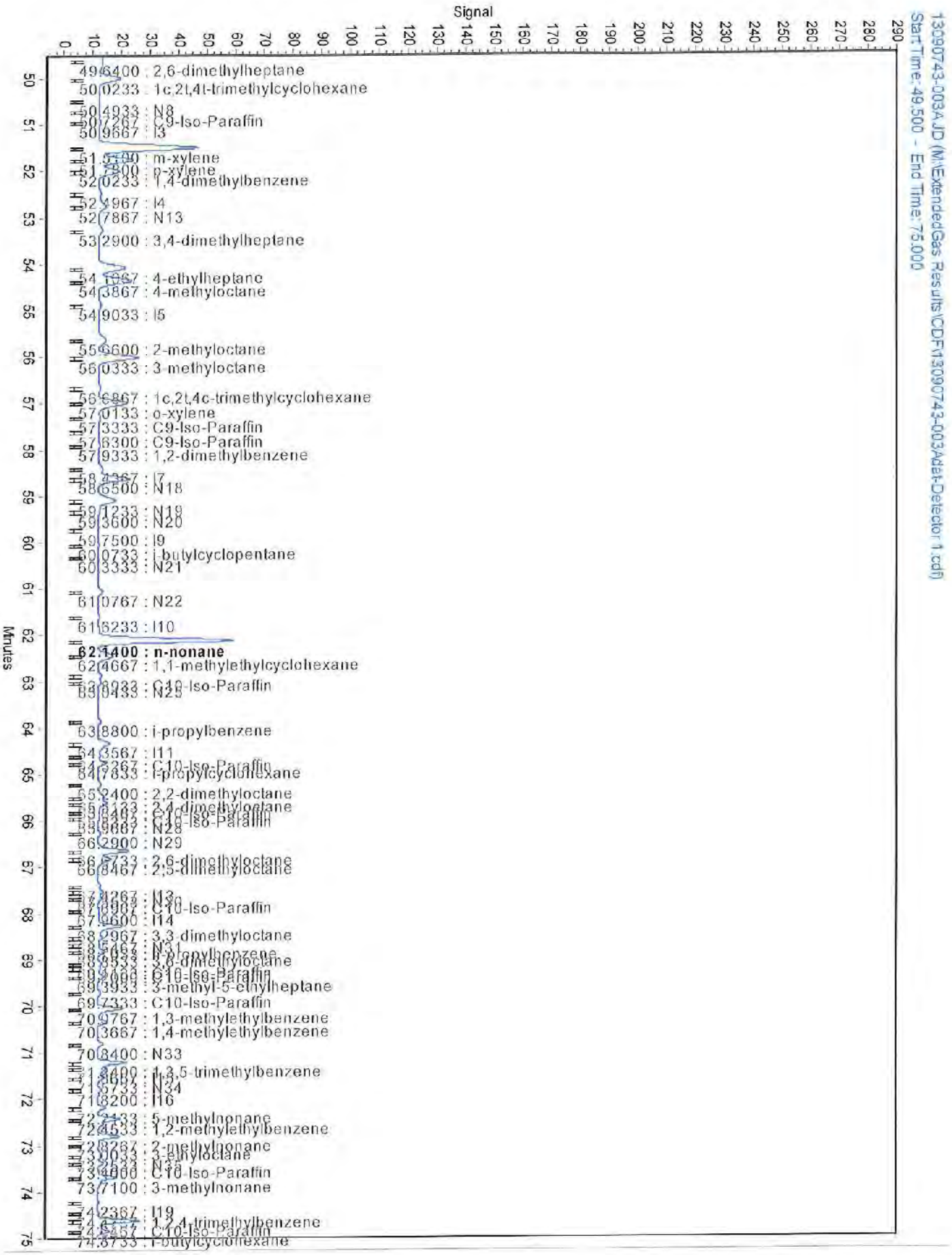
Hold

Components Listed in Chromatographic Order

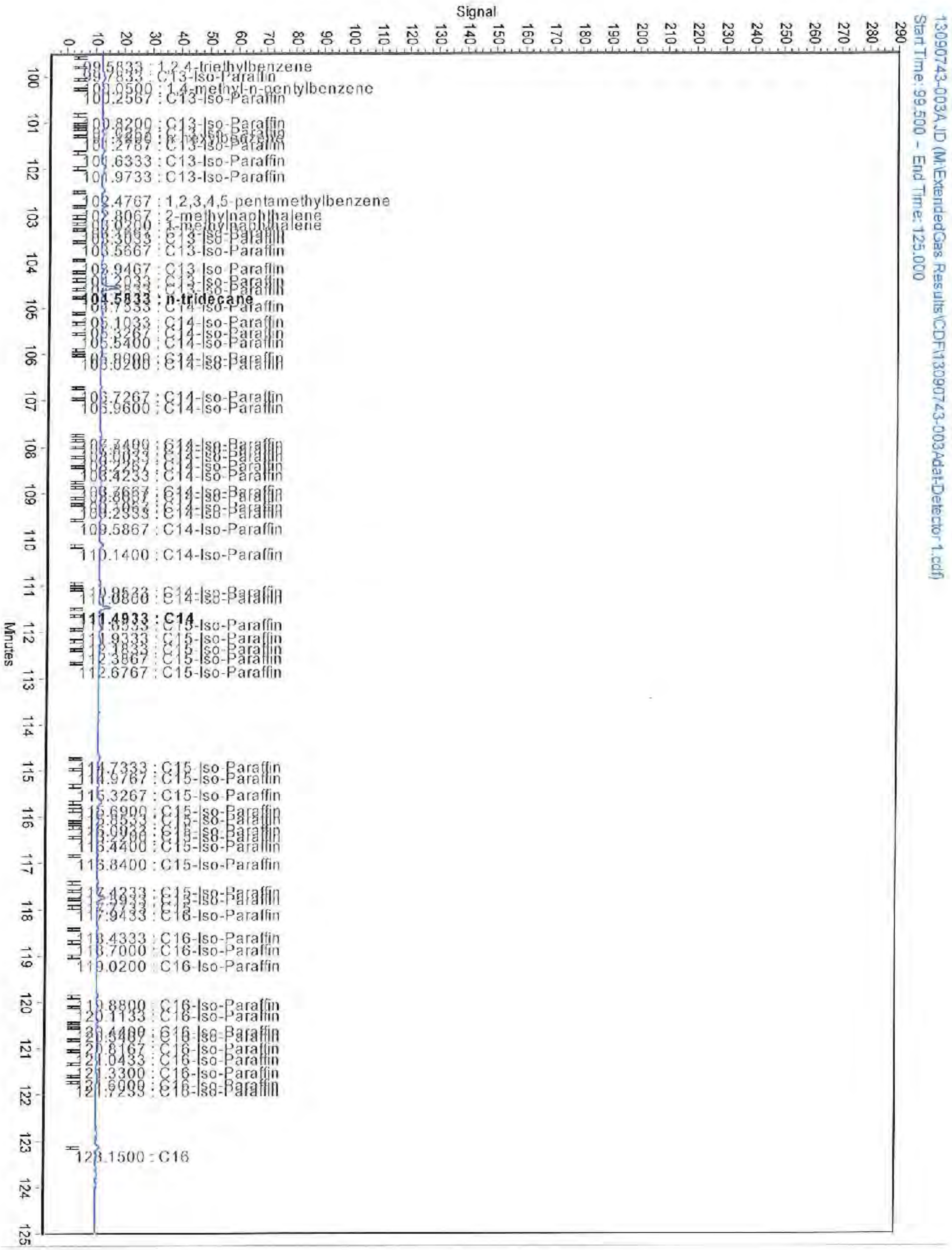
Minutes	Index	Group	Component	Mass %	Volume %	Mol %
129.913	1750.140	I18	C18-Iso-Paraffin	0.019	0.018	0.009
130.237	1757.930	I18	C18-Iso-Paraffin	0.017	0.016	0.008
130.337	1760.340	I18	C18-Iso-Paraffin	0.008	0.008	0.004
130.440	1762.820	I18	C18-Iso-Paraffin	0.005	0.004	0.002
130.570	1765.940	I18	C18-Iso-Paraffin	0.019	0.018	0.009
130.893	1773.690	I18	C18-Iso-Paraffin	0.013	0.012	0.006
131.997	1800.000	P18	C18	0.048	0.046	0.022
132.443	1811.950	I19	C19-Iso-Paraffin	0.008	0.008	0.004
132.580	1815.600	I19	C19-Iso-Paraffin	0.065	0.062	0.030
134.283	1860.740	I19	C19-Iso-Paraffin	0.009	0.009	0.004
134.487	1866.090	I19	C19-Iso-Paraffin	0.016	0.015	0.007
134.667	1870.810	I19	C19-Iso-Paraffin	0.008	0.008	0.004
134.793	1874.140	I19	C19-Iso-Paraffin	0.007	0.007	0.003
135.783	1900.000	P19	C19	0.075	0.072	0.033
138.057	1965.870	I20	C20-Iso-Paraffin	0.009	0.008	0.004
138.207	1970.180	I20	C20-Iso-Paraffin	0.006	0.005	0.002
138.393	1975.530	I20	C20-Iso-Paraffin	0.013	0.013	0.006
138.887	1989.640	I20	C20-Iso-Paraffin	0.005	0.004	0.002
139.273	2000.720	P20	C20	0.037	0.035	0.015
140.470	2037.860	I21	C21-Iso-Paraffin	0.006	0.005	0.002
141.400	2066.490	I21	C21-Iso-Paraffin	0.007	0.006	0.003
141.670	2074.760	I21	C21-Iso-Paraffin	0.012	0.011	0.005
141.953	2083.430	I21	C21-Iso-Paraffin	0.015	0.014	0.006
142.523	2100.880	P21	C21	0.025	0.024	0.010
143.757	2141.530	I22	C22-Iso-Paraffin	0.013	0.012	0.005
144.850	2177.270	I22	C22-Iso-Paraffin	0.008	0.008	0.003
145.593	2201.420	P22	C22	0.025	0.023	0.009
146.910	2244.470	I23	C23-Iso-Paraffin	0.011	0.010	0.004
148.673	2301.390	P23	C23	0.024	0.022	0.009
152.080	2401.490	P24	C24	0.023	0.022	0.008
155.993	2497.890	P25	C25	0.018	0.017	0.006
160.633	2601.460	P26	C26	0.024	0.022	0.008
166.240	2701.890	P27	C27	0.028	0.026	0.009
173.090	2801.590	P28	C28	0.017	0.015	0.005
181.770	2899.990	P29	C29	0.000	0.000	0.000

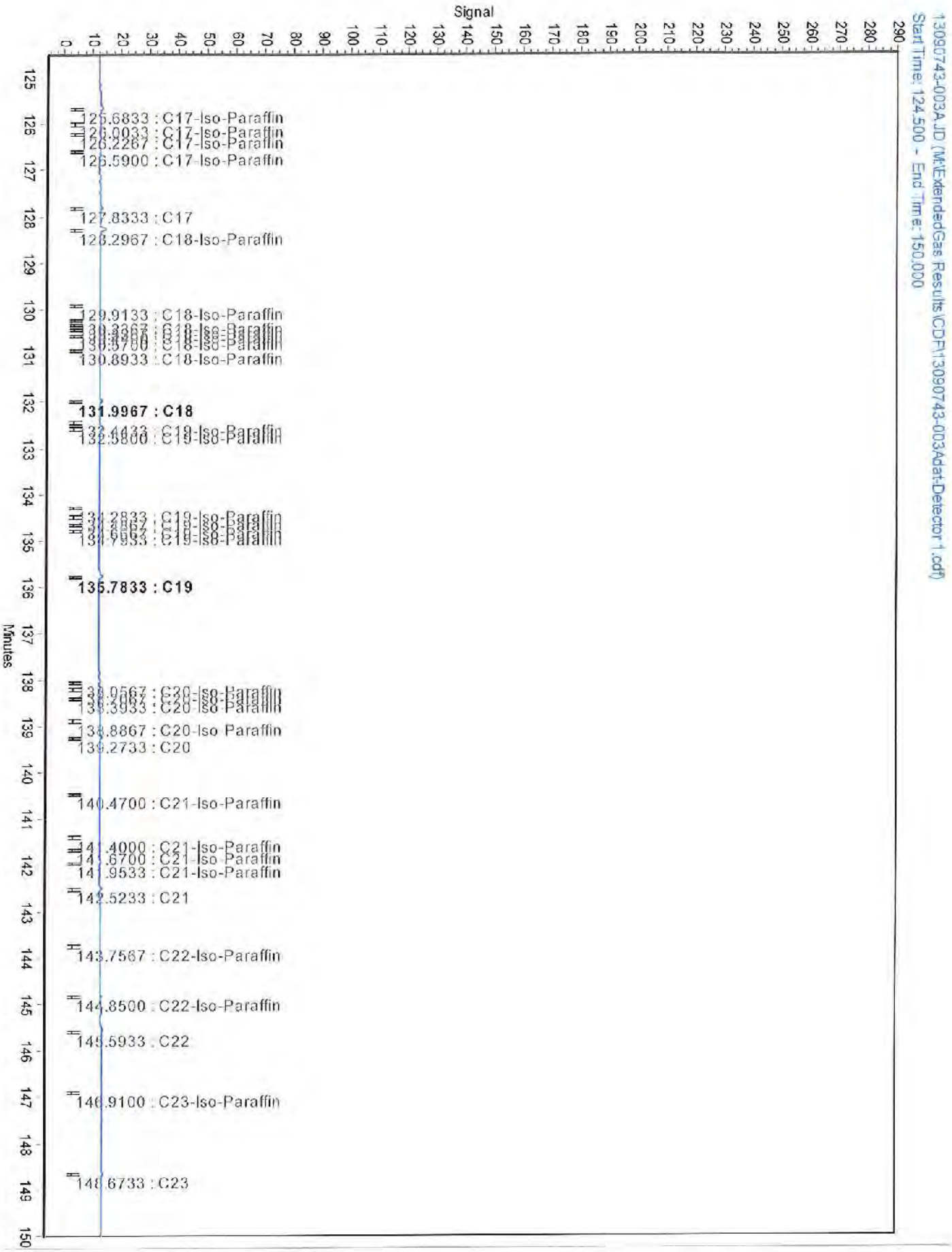

1309074 3-003A.JD (M:\Extended\Gas Results\CDF\1309074 3-003A\dat-Detector 1.cdf)
Start Time: 0.000 - End Time: 25.000
Signal
Minutes
9.5067 : i-pentane
10.1800 : n-pentane
11.4600 : 2,2-dimethylbutane
13.1033 : 2-methylpentane
13.9767 : 3-methylpentane
15.1667 : n-hexane
17.3567 : methylcyclopentane
17.6933 : 2,4-dimethylpentane
18.2000 : 2,2,3-trimethylbutane
19.5967 : benzene
20.1567 : 3,3-dimethylpentane
20.5333 : cyclohexane
22.0133 : 1,1-dimethylcyclopentane
22.5100 : 3-methylhexane
23.2333 : 1c,3-dimethylcyclopentane
24.0800 : 2,2,4-trimethylpentane

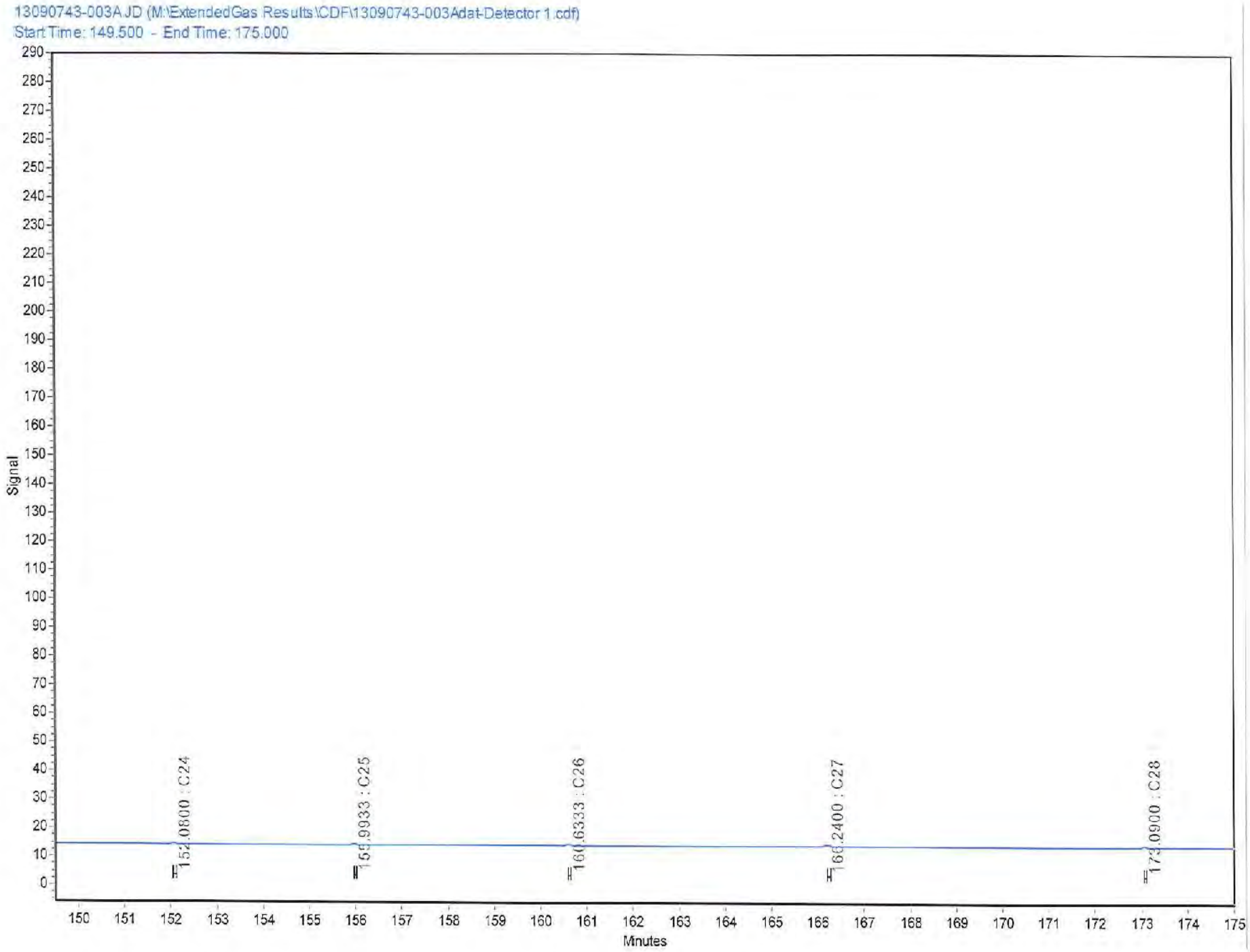

Signal
Minutes
1309D743-003A.JD (M:\Extended\Gas Results\CDF\1309D743-003A\dat-Detector 1.cdf)
Start Time: 24.500 - End Time: 50.000
25.4667 : n-heptane
27.9833 : methylcyclohexane
28.3967 : 1,1,3-trimethylcyclopentane
29.9567 : 3,3-dimethylhexane
30.5467 : 1t2c3-trimethylcyclopentane
30.9433 : 2,3,4-trimethylpentane
31.7567 : I1
32.1600 : 2,3,3-trimethylpentane
32.7333 : toluene
33.9033 : 2-methyl-3-ethylpentane
34.2367 : 3-methyl-3-ethylpentane
35.3867 : 1c,2c,4-trimethylcyclopentane
36.1767 : 2,2,5-trimethylhexane
37.0100 : 3c-ethylmethylcyclopentane
37.3867 : C8-Iso-Paraffin
37.5900 : 3t-ethylmethylcyclopentane
37.9333 : 2t-ethylmethylcyclopentane
38.1367 : 1,1-methylethylcyclopentane
38.4733 : 2,2,4-trimethylhexane
38.9233 : 1t,2-dimethylcyclohexane
40.0667 : n-octane
41.4567 : i-propylcyclopentane
41.8900 : 2,4,4-trimethylhexane
42.1200 : C9-Iso-Paraffin
42.5333 : C9-Iso-Paraffin
42.9700 : N1
43.3067 : 2,3,4-trimethylhexane
43.6833 : 2,2,3,4-tetramethylpentane
44.4667 : 2,3,5-trimethylhexane
44.8267 : N4
45.0333 : 1c,2-dimethylcyclohexane
45.5133 : 2,2-dimethylheptane
45.8267 : 1,1,4-trimethylcyclohexane
46.2033 : C9-Iso-Paraffin
46.6333 : 2,2,3-trimethylhexane
47.2133 : 2,4-dimethylheptane
47.5433 : 2,5-dimethylheptane
47.7633 : 3,3-&3,5-dimethylheptane
48.0400 : ethylcyclohexane
48.3833 : n-propylcyclopentane
49.1400 : ethylbenzene
49.6400 : 2,6-dimethylheptane

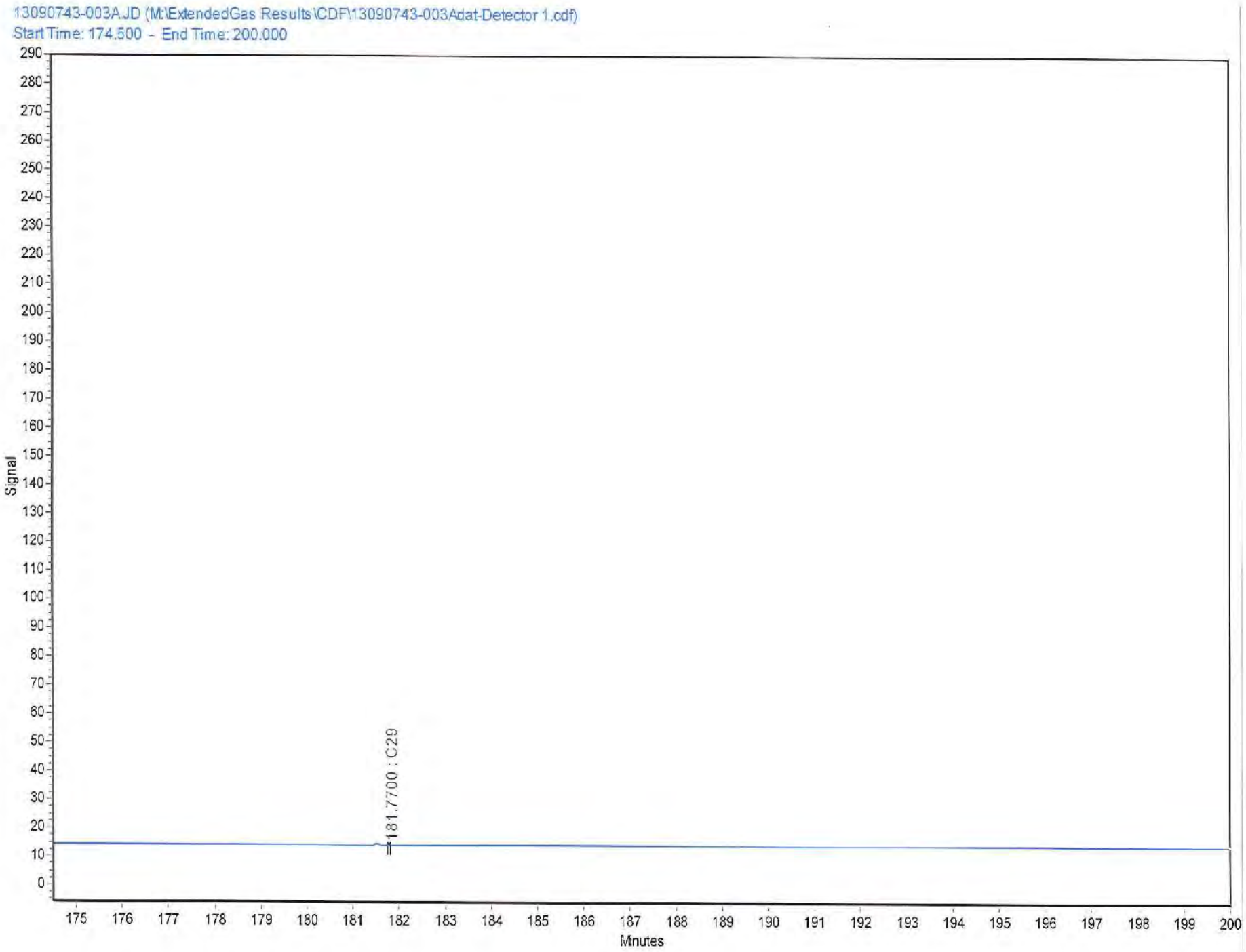

13090743-003A.JD (M:\Extended\Gas Results\CDF\13090743-003A\det-Detector 1.cdf)
Start Time: 49.500 - End Time: 75.000
Signal
Minutes
49.6400 : 2,6-dimethylheptane
50.0233 : 1c,2t,4t-trimethylcyclohexane
50.4933 : N8
50.7267 : C9-Iso-Paraffin
50.9667 : I3
51.5400 : m-xylene
51.7400 : p-xylene
52.0233 : 1,4-dimethylbenzene
52.4967 : I4
52.7867 : N13
53.2900 : 3,4-dimethylheptane
54.1867 : 4-ethylheptane
54.3867 : 4-methyloctane
54.9033 : I5
55.3600 : 2-methyloctane
56.0333 : 3-methyloctane
56.6867 : 1c,2t,4c-trimethylcyclohexane
57.0133 : o-xylene
57.3333 : C9-Iso-Paraffin
57.6300 : C9-Iso-Paraffin
57.9333 : 1,2-dimethylbenzene
58.4367 : I7
58.6500 : N18
59.1233 : N19
59.3600 : N20
59.7500 : I9
60.0733 : i-butylcyclopentane
60.3333 : N21
61.0767 : N22
61.6233 : I10
62.1400 : n-nonane
62.4667 : 1,1-methylethylcyclohexane
63.8800 : i-propylbenzene
64.3567 : I11
64.7833 : i-propylcyclohexane
65.2400 : 2,2-dimethyloctane
65.4133 : 2,4-dimethyloctane
66.2900 : N29
66.5733 : 2,6-dimethyloctane
66.8467 : 2,5-dimethyloctane
68.2967 : 3,3-dimethyloctane
69.3933 : 3-methyl-5-ethylheptane
70.0767 : 1,3-methylethylbenzene
70.3667 : 1,4-methylethylbenzene
70.8400 : N33
71.3400 : 1,3,5-trimethylbenzene
71.8200 : I16
72.2433 : 5-methylnonane
72.4533 : 1,2-methylethylbenzene
72.8267 : 2-methylnonane
73.7100 : 3-methylnonane
74.2367 : I19
74.4567 : 1,2,4-trimethylbenzene
74.8733 : i-butylcyclohexane


13090743-003A.JD (M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf)
Start Time: 74.500 - End Time: 100.000
Signal
Minutes
75.9000 : N37
76.5833 : C10-Iso-Paraffin
77.0400 : sec-butylbenzene
77.4233 : n-decane
78.0833 : 1,2,3-trimethylbenzene
78.3833 : 1,3-methyl-i-propylbenzene
78.7500 : 1,4-methyl-i-propylbenzene
79.9467 : I30
80.7933 : I31
81.2833 : I32
84.3467 : 1,4,dimethyl-2-ethylbenzene
84.9533 : I39
85.8900 : 1,3-dimethyl-2-ethylbenzene
86.2100 : I42
88.2033 : n-undecane
88.5433 : 1,2,4,5-tetramethylbenzene
90.0400 : C12-Iso-Paraffin
94.2000 : 1-t-butyl-3,5-dimethylbenzene
94.5833 : 1,4-ethyl-t-butylbenzene
94.9000 : I45
95.8700 : I48
96.2733 : A6
96.9567 : n-dodecane
97.5333 : C13-Iso-Paraffin
98.2267 : 1,3,5-triethylbenzene
98.5133 : C13-Iso-Paraffin
98.8633 : C13-Iso-Paraffin


1309743-003A.JD (M:\ExtendedGas Results\CDF\1309743-003Adat-Detector 1.cdf)
Start Time: 99.500 - End Time: 125.000
Signal
Minutes
1,2,4-triethylbenzene
102.4767 : 1,2,3,4,5-pentamethylbenzene
104.5833 : n-tridecane
105.5400 : C14-Iso-Paraffin
109.5867 : C14-Iso-Paraffin
110.1400 : C14-Iso-Paraffin
111.4933 : C14
112.6767 : C15-Iso-Paraffin
115.3267 : C15-Iso-Paraffin
116.8400 : C15-Iso-Paraffin
118.4333 : C16-Iso-Paraffin
119.0200 : C16-Iso-Paraffin
121.3300 : C16-Iso-Paraffin
123.1500 : C16


13090743-003A.JD (M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf)
Start Time: 124.500 - End Time: 150.000
Signal
Minutes
125.6833 : C17-Iso-Paraffin
126.0033 : C17-Iso-Paraffin
126.2267 : C17-Iso-Paraffin
126.5900 : C17-Iso-Paraffin
127.8333 : C17
128.2967 : C18-Iso-Paraffin
129.9133 : C18-Iso-Paraffin
130.8933 : C18-Iso-Paraffin
131.9967 : C18
135.7833 : C19
138.8867 : C20-Iso Paraffin
139.2733 : C20
140.4700 : C21-Iso-Paraffin
141.4000 : C21-Iso-Paraffin
141.6700 : C21-Iso-Paraffin
141.9533 : C21-Iso-Paraffin
142.5233 : C21
143.7567 : C22-Iso-Paraffin
144.8500 : C22-Iso-Paraffin
145.5933 : C22
146.9100 : C23-Iso-Paraffin
148.6733 : C23


13090743-003A JD (M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf)
Start Time: 149.500 - End Time: 175.000
Signal
Minutes
152.0800 : C24
159.9933 : C25
160.6333 : C26
166.2400 : C27
173.0900 : C28


13090743-003A.JD (M:\ExtendedGas Results\CDF\13090743-003Adat-Detector 1.cdf)
Start Time: 174.500 - End Time: 200.000
Signal
Minutes
181.7700 : C29

Certificate of Analysis

HOUSTON LABORATORIES
8820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Analysis Number: 13090743- 004A

Sample ID:	Dogie MW6	**Date of Sample:**	09/13/13
Location:	San Juan Basin	**Time Sampled:**	12:00
Project Name:	Williams Remediation	**Date Sample Analyzed:**	10/03/13
Client	LT Environmental	**Contact(s):**	Brooke Herb
Address	2243 Main Ave.		
Suite / Department	Suite 3		
City	Durango	**State**	Colorado **Zip** 81301
Phone	970-385-1096	**e-mail**	bherb@ltenv.com
Fax			
Color:	Med. Straw	**Odor:**	Aromatic
Specific Gravity @ 60° F.	0.7600	**API @ 60° F.**	54.67
Carbon Range	C1-C28	**Major Range**	C6-C11

Paraffin	21.607	wt%	**N-Hexane**	2.188	wt%
Isoparaffins	33.392	wt%	**Benzene**	0.177	wt%
Naphthenics	32.006	wt%	**Ethyl Benzene**	0.388	wt%
Aromatics	12.996	wt%	**Toluene**	0.878	wt%
Olefins	N/D	wt%	**Meta-Xylene**	2.636	wt%
Unknowns	N/D	wt%	**Para-Xylene**	0.919	wt%
2,2,4-Tri Methylpentane	0.014	wt%	**Ortho-Xylene**	0.807	wt%
			Xylenes	4.362	wt%
Calculated Research Octane	N/A		**EDB**	N/A	wt%
Lead/Manganese	N/A		**EDC**	N/A	wt%
Oxygnates	N/D	wt%	**Ethanol**	N/D	wt%
C_{17}	0.129	wt%	**C_{18}**	0.103	wt%
Pristane	0.090	wt%	**Phytane**	0.039	wt%
Naphthalene	0.130	wt%	**2-Methyl Naphthalene**	0.110	wt%
1-Methyl Naphthalene	0.132	wt%			

Gasoline Range:	C_4-C_{13}	Indicators:	2,2,4-TMP, Olefins
Diesel Range:	C_7-C_{22}	Indicators:	Pristane, Phytane
Condensate Range:	C_2-C_{25}+	Indicators:	No Olefins, Light & Heavies
Heavy Oil:	C_{20}+		

Comments: N/A Not Applicable N/D None Detected

Chris Staley
Hydrocarbon Laboratory Manager

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 2:04:06 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Sample: 13090743-004A JD
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Comments:

Acquired: 09/28/13 13:02:31
Analyzed: 10/2/2013 2:01:14 PM

Normalized to 100.0000%

Oxygenates

Compound	Mass%	Mass% Oxygen	Vol%
No Oxy Compounds Found	0.00	0.00	0.00

Molecular Weight and Relative Density Data

Group	Avg Mw.	Avg Rel. Density
C1	16.043	0.260
C2	0.000	0.000
C3	44.097	0.500
C4	58.124	0.574
C5	71.882	0.631
C6	85.092	0.707
C7	98.948	0.726
C8	115.037	0.737
C9	126.486	0.751
C10	139.637	0.771
C11	153.520	0.781
C12	163.021	0.819
C13	168.675	0.825
C14	189.246	0.759
C15	200.716	0.839
C16	214.307	0.890
C17	234.403	0.776
C18	246.519	0.777
C19	263.220	0.777
C20	279.980	0.787
C21	293.163	0.791
C22	308.583	0.794
C23	324.640	0.797
C24	338.670	0.799
C25	352.690	0.800
C26	370.000	0.800
C27	384.000	0.805
C28	398.000	0.805

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Acquired: 09/28/13 13:02:31
Sample: 13090743-004A JD
Analyzed: 10/2/2013 2:01:14 PM
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Comments:
Normalized to 100.0000%

C29	0.000	0.000
Total Sample:	113.00	0.74

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 2:04:06 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Acquired: 09/28/13 13:02:31
Sample: 13090743-004A JD
Analyzed: 10/2/2013 2:01:14 PM
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Normalized to 100.0000%
Comments:

Totals by Group Type & Carbon Number (in Mass Percent)

	Paraffins	I-Paraffins	Olefins	Napthenes	Aromatics	Unknowns	Total
C1	0.00645	0.00000	0.00000	0.00000	0.00000	0.00000	0.00645
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.03171	0.00000	0.00000	0.00000	0.00000	0.00000	0.03171
C4	0.22588	0.06639	0.00000	0.00000	0.00000	0.00000	0.29226
C5	0.63200	0.58595	0.00000	0.11097	0.00000	0.00000	1.32891
C6	2.18767	3.09861	0.00000	4.59465	0.17743	0.00000	10.05836
C7	4.91734	7.93443	0.00000	12.46855	0.87774	0.00000	26.19806
C8	4.20182	3.89099	0.00000	10.94004	5.13986	0.00000	24.17271
C9	3.07911	8.10955	0.00000	3.14808	2.83217	0.00000	17.16892
C10	2.04329	4.58971	0.00000	0.74350	2.45961	0.00000	9.83611
C11	1.35128	1.95681	0.00000	0.00000	0.80413	0.00000	4.11222
C12	0.86864	0.79006	0.00000	0.00000	0.70487	0.00000	2.36357
C13	0.53151	0.80160	0.00000	0.00000	0.00000	0.00000	1.33311
C14	0.34825	0.60701	0.00000	0.00000	0.00000	0.00000	0.95526
C15	0.24450	0.43593	0.00000	0.00000	0.00000	0.00000	0.68043
C16	0.16450	0.19430	0.00000	0.00000	0.00000	0.00000	0.35880
C17	0.12918	0.09295	0.00000	0.00000	0.00000	0.00000	0.22213
C18	0.10330	0.12917	0.00000	0.00000	0.00000	0.00000	0.23247
C19	0.10744	0.06208	0.00000	0.00000	0.00000	0.00000	0.16952
C20	0.07648	0.01638	0.00000	0.00000	0.00000	0.00000	0.09286
C21	0.06505	0.02003	0.00000	0.00000	0.00000	0.00000	0.08508
C22	0.06049	0.00976	0.00000	0.00000	0.00000	0.00000	0.07025
C23	0.05238	0.00000	0.00000	0.00000	0.00000	0.00000	0.05238
C24	0.04859	0.00000	0.00000	0.00000	0.00000	0.00000	0.04859
C25	0.04055	0.00000	0.00000	0.00000	0.00000	0.00000	0.04055
C26	0.03473	0.00000	0.00000	0.00000	0.00000	0.00000	0.03473
C27	0.03144	0.00000	0.00000	0.00000	0.00000	0.00000	0.03144
C28	0.02312	0.00000	0.00000	0.00000	0.00000	0.00000	0.02312
C29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total:	21.60670	33.39170	0.00000	32.00580	12.99580	0.00000	100.00000

Oxygenates 0.00000
Total C30+: 0.00000
Total Unknowns: 0.00000
Grand Total: 100.00000

Totals by Group Type & Carbon Number (in Volume Percent)

	Paraffins	I-Paraffins	Olefins	Napthenes	Aromatics	Unknowns	Total
C1	0.01835	0.00000	0.00000	0.00000	0.00000	0.00000	0.01835
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.04691	0.00000	0.00000	0.00000	0.00000	0.00000	0.04691
C4	0.28893	0.08821	0.00000	0.00000	0.00000	0.00000	0.37714
C5	0.74724	0.70079	0.00000	0.11022	0.00000	0.00000	1.55824
C6	2.45633	3.48615	0.00000	4.44212	0.14947	0.00000	10.53408
C7	5.32498	8.56837	0.00000	12.05749	0.74955	0.00000	26.70039
C8	4.42838	4.02991	0.00000	10.51543	5.31016	0.00000	24.28388

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 2:04:06 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Acquired: 09/28/13 13:02:31
Sample: 13090743-004A JD
Analyzed: 10/2/2013 2:01:14 PM
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Normalized to 100.0000%
Comments:

C9	3.17685	8.37512	0.00000	2.97935	2.40518	0.00000	16.93650
C10	2.07234	4.61779	0.00000	0.68860	2.06086	0.00000	9.43960
C11	1.34471	1.91510	0.00000	0.00000	0.63985	0.00000	3.89966
C12	0.85408	0.69548	0.00000	0.00000	0.58646	0.00000	2.13703
C13	0.52025	0.67581	0.00000	0.00000	0.00000	0.00000	1.19607
C14	0.33801	0.59416	0.00000	0.00000	0.00000	0.00000	0.93217
C15	0.17748	0.42311	0.00000	0.00000	0.00000	0.00000	0.60059
C16	0.15749	0.14104	0.00000	0.00000	0.00000	0.00000	0.29853
C17	0.12294	0.08899	0.00000	0.00000	0.00000	0.00000	0.21193
C18	0.09846	0.12293	0.00000	0.00000	0.00000	0.00000	0.22138
C19	0.10233	0.05917	0.00000	0.00000	0.00000	0.00000	0.16149
C20	0.07181	0.01560	0.00000	0.00000	0.00000	0.00000	0.08740
C21	0.06083	0.01881	0.00000	0.00000	0.00000	0.00000	0.07964
C22	0.05637	0.00913	0.00000	0.00000	0.00000	0.00000	0.06550
C23	0.04866	0.00000	0.00000	0.00000	0.00000	0.00000	0.04866
C24	0.04502	0.00000	0.00000	0.00000	0.00000	0.00000	0.04502
C25	0.03752	0.00000	0.00000	0.00000	0.00000	0.00000	0.03752
C26	0.03214	0.00000	0.00000	0.00000	0.00000	0.00000	0.03214
C27	0.02892	0.00000	0.00000	0.00000	0.00000	0.00000	0.02892
C28	0.02127	0.00000	0.00000	0.00000	0.00000	0.00000	0.02127
C29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total:	22.67861	34.62665	0.00000	30.79321	11.90153	0.00000	100.00000

Oxygenates	0.00000	Total C30+:	0.00000
Total Unknowns:	0.00000	Grand Total:	100.00000

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 2:04:06 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Acquired: 09/28/13 13:02:31
Sample: 13090743-004A JD
Analyzed: 10/2/2013 2:01:14 PM
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Normalized to 100.0000%
Comments:

Totals by Group Type & Carbon Number (in Mol Percent)

	Paraffins	I-Paraffins	Olefins	Napthenes	Aromatics	Unknowns	Total
C1	0.04528	0.00000	0.00000	0.00000	0.00000	0.00000	0.04528
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.08105	0.00000	0.00000	0.00000	0.00000	0.00000	0.08105
C4	0.43799	0.12873	0.00000	0.00000	0.00000	0.00000	0.56672
C5	0.98725	0.91811	0.00000	0.17832	0.00000	0.00000	2.08368
C6	2.86112	4.05250	0.00000	6.15302	0.25601	0.00000	13.32265
C7	5.53085	8.92438	0.00000	14.31215	1.07363	0.00000	29.84102
C8	4.14573	3.84065	0.00000	10.98793	4.70889	0.00000	23.68321
C9	2.70576	7.12654	0.00000	2.81055	2.65574	0.00000	15.29859
C10	1.61852	3.64467	0.00000	0.59741	2.07836	0.00000	7.93915
C11	0.97432	1.42679	0.00000	0.00000	0.61788	0.00000	3.01899
C12	0.57475	0.56977	0.00000	0.00000	0.48957	0.00000	1.63409
C13	0.32492	0.56585	0.00000	0.00000	0.00000	0.00000	0.89077
C14	0.19784	0.37107	0.00000	0.00000	0.00000	0.00000	0.56892
C15	0.13443	0.24765	0.00000	0.00000	0.00000	0.00000	0.38208
C16	0.08187	0.10682	0.00000	0.00000	0.00000	0.00000	0.18870
C17	0.06054	0.04626	0.00000	0.00000	0.00000	0.00000	0.10681
C18	0.04575	0.06054	0.00000	0.00000	0.00000	0.00000	0.10629
C19	0.04510	0.02749	0.00000	0.00000	0.00000	0.00000	0.07259
C20	0.03051	0.00687	0.00000	0.00000	0.00000	0.00000	0.03738
C21	0.02472	0.00799	0.00000	0.00000	0.00000	0.00000	0.03271
C22	0.02195	0.00371	0.00000	0.00000	0.00000	0.00000	0.02566
C23	0.01819	0.00000	0.00000	0.00000	0.00000	0.00000	0.01819
C24	0.01617	0.00000	0.00000	0.00000	0.00000	0.00000	0.01617
C25	0.01296	0.00000	0.00000	0.00000	0.00000	0.00000	0.01296
C26	0.01058	0.00000	0.00000	0.00000	0.00000	0.00000	0.01058
C27	0.00923	0.00000	0.00000	0.00000	0.00000	0.00000	0.00923
C28	0.00655	0.00000	0.00000	0.00000	0.00000	0.00000	0.00655
C29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total:	21.00392	32.07662	0.00000	35.03938	11.88008	0.00000	100.00000

Oxygenates	0.00000	Total C30+:	0.00000
Total Unknowns:	0.00000	Grand Total:	100.00000

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 2:04:06 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Sample: 13090743-004A JD
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Comments:

Acquired: 09/28/13 13:02:31
Analyzed: 10/2/2013 2:01:14 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
7.160	100.000	P1	methane	0.006	0.018	0.045
7.523	300.000	P3	propane	0.032	0.047	0.081
7.923	366.290	I4	i-butane	0.066	0.088	0.129
8.263	400.000	P4	n-butane	0.226	0.289	0.438
9.153	458.410	I5	C5-Iso-Paraffin	0.007	0.009	0.014
9.513	474.920	I5	i-pentane	0.579	0.691	0.904
10.187	500.000	P5	n-pentane	0.632	0.747	0.987
11.467	536.160	I6	2,2-dimethylbutane	0.081	0.092	0.106
12.823	564.310	N5	cyclopentane	0.111	0.110	0.178
12.897	565.630	I6	2,3-dimethylbutane	0.316	0.354	0.413
13.110	569.390	I6	2-methylpentane	1.523	1.727	1.992
13.983	583.480	I6	3-methylpentane	1.179	1.313	1.541
15.170	600.000	P6	n-hexane	2.188	2.456	2.861
17.153	626.520	I7	2,2-dimethylpentane	0.237	0.260	0.266
17.363	629.020	N6	methylcyclopentane	1.908	1.887	2.555
17.700	632.910	I7	2,4-dimethylpentane	0.419	0.461	0.471
18.203	638.510	I7	2,2,3-trimethylbutane	0.074	0.079	0.083
19.600	652.800	A6	benzene	0.177	0.149	0.256
20.163	658.120	I7	3,3-dimethylpentane	0.141	0.151	0.159
20.537	661.510	N6	cyclohexane	2.687	2.556	3.598
21.533	670.140	I7	2-methylhexane	2.567	2.801	2.888
21.717	671.660	I7	2,3-dimethylpentane	0.731	0.779	0.822
22.020	674.140	N7	1,1-dimethylcyclopentane	0.482	0.473	0.554
22.513	678.060	I7	3-methylhexane	2.594	2.795	2.917
23.240	683.610	N7	1c,3-dimethylcyclopentane	0.805	0.800	0.924
23.567	686.030	N7	1t,3-dimethylcyclopentane	0.762	0.753	0.874
23.720	687.150	N7	1t,2-dimethylcyclopentane	0.188	0.185	0.216
23.887	688.350	I7	3-ethylpentane	1.172	1.243	1.318
24.080	689.730	I8	2,2,4-trimethylpentane	0.014	0.015	0.014
25.473	699.230	P7	n-heptane	4.917	5.325	5.531
27.987	721.130	N7	methylcyclohexane	10.232	9.846	11.745
28.400	724.530	N8	1,1,3-trimethylcyclopentane	0.662	0.655	0.665
29.550	733.640	I8	2,2,3-trimethylpentane	0.377	0.390	0.372
29.743	735.130	N8	1c,2t,4-trimethylcyclopentane	0.507	0.492	0.509
29.873	736.120	I8	C8-Iso-Paraffin	0.025	0.024	0.025
30.003	737.110	I8	3,3-dimethylhexane	0.585	0.610	0.578
30.750	742.670	N8	1t,2c,3-trimethylcyclopentane	0.480	0.461	0.482
30.950	744.130	I8	2,3,4-trimethylpentane	0.163	0.168	0.161

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 2:04:06 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Sample: 13090743-004A JD
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Comments:

Acquired: 09/28/13 13:02:31
Analyzed: 10/2/2013 2:01:14 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
31.763	749.950	I8	I1	0.390	0.401	0.385
32.163	752.730	I8	2,3,3-trimethylpentane	0.032	0.033	0.032
32.690	756.340	A7	toluene	0.878	0.750	1.074
33.740	763.310	N8	1,1,2-trimethylcyclopentane	0.499	0.478	0.501
33.907	764.390	I8	2-methyl-3-ethylpentane	0.050	0.052	0.050
34.233	766.490	I8	3-methyl-3-ethylpentane	0.010	0.010	0.010
34.620	768.940	N8	1c,2c,4-trimethylcyclopentane	2.473	2.402	2.483
34.833	770.280	N8	1c,3-dimethylcyclohexane	0.821	0.798	0.825
35.060	771.690	I8	3-methylheptane	0.159	0.167	0.157
35.390	773.730	N8	1c,2t,3-trimethylcyclopentane	0.067	0.065	0.068
35.717	775.720	I8	3-ethylhexane	2.020	2.095	1.993
35.887	776.740	N8	1,1-dimethylcyclohexane	2.823	2.676	2.835
36.177	778.480	I9	2,2,5-trimethylhexane	1.198	1.254	1.053
37.013	783.400	N8	3c-ethylmethylcyclopentane	0.414	0.400	0.416
37.390	785.570	I8	C8-Iso-Paraffin	0.065	0.063	0.066
37.593	786.720	N8	3t-ethylmethylcyclopentane	0.113	0.109	0.114
37.933	788.650	N8	2t-ethylmethylcyclopentane	0.102	0.098	0.102
38.140	789.800	N8	1,1-methylethylcyclopentane	0.158	0.150	0.159
38.477	791.670	I9	2,2,4-trimethylhexane	0.049	0.049	0.043
38.923	794.120	N8	1t,2-dimethylcyclohexane	1.011	0.965	1.015
40.020	800.000	P8	n-octane	4.202	4.428	4.146
40.157	800.800	N8	1c,4-dimethylcyclohexane	0.586	0.555	0.589
41.460	808.330	N8	i-propylcyclopentane	0.064	0.061	0.064
42.107	811.960	I9	2,4,4-trimethylhexane	0.006	0.006	0.005
42.530	814.300	I9	C9-Iso-Paraffin	0.036	0.037	0.032
42.973	816.720	N8	N1	0.047	0.045	0.048
43.300	818.480	I9	2,3,4-trimethylhexane	0.023	0.023	0.020
43.663	820.430	I9	2,2,3,4-tetramethylpentane	0.193	0.194	0.170
44.463	824.640	I9	2,3,5-trimethylhexane	0.529	0.543	0.465
44.833	826.560	N8	N4	0.024	0.023	0.025
45.030	827.570	N8	1c,2-dimethylcyclohexane	0.009	0.009	0.009
45.507	830.000	I9	2,2-dimethylheptane	1.592	1.659	1.399
45.823	831.600	N9	1,1,4-trimethylcyclohexane	0.647	0.621	0.578
46.203	833.500	I9	C9-Iso-Paraffin	0.021	0.021	0.019
46.633	835.620	I9	2,2,3-trimethylhexane	0.432	0.447	0.380
47.210	838.440	I9	2,4-dimethylheptane	0.872	0.903	0.767
47.547	840.070	I9	2,5-dimethylheptane	0.176	0.182	0.154
47.760	841.090	I9	3,3-&3,5-dimethylheptane	0.023	0.023	0.020

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 2:04:06 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Sample: 13090743-004A JD
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Comments:

Acquired: 09/28/13 13:02:31
Analyzed: 10/2/2013 2:01:14 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
48.037	842.410	N8	ethylcyclohexane	0.052	0.049	0.052
48.387	844.070	N8	n-propylcyclopentane	0.026	0.025	0.026
49.433	848.940	A8	ethylbenzene	0.388	0.331	0.411
49.633	849.860	I9	2,6-dimethylheptane	0.086	0.090	0.075
50.020	851.620	N9	1c,2t,4t-trimethylcyclohexane	0.380	0.361	0.340
50.953	855.810	I9	I3	0.023	0.023	0.020
51.507	858.250	A8	m-xylene	2.636	2.859	2.353
51.773	859.410	A8	p-xylene	0.919	0.997	0.820
52.023	860.500	A8	1,4-dimethylbenzene	0.363	0.312	0.385
52.490	862.510	I9	I4	0.055	0.056	0.048
52.780	863.750	N9	N13	0.182	0.173	0.163
53.290	865.910	I9	3,4-dimethylheptane	0.098	0.099	0.086
54.100	869.290	I9	4-ethylheptane	0.680	0.699	0.597
54.383	870.460	I9	4-methyloctane	0.878	0.902	0.771
54.900	872.580	I9	I5	0.066	0.066	0.058
55.680	875.730	N9	N15	0.194	0.185	0.174
56.030	877.120	I9	3-methyloctane	0.931	0.956	0.818
56.677	879.680	N9	1c,2t,4c-trimethylcyclohexane	0.028	0.027	0.025
57.010	880.980	A8	o-xylene	0.807	0.788	0.709
57.327	882.210	I9	C9-Iso-Paraffin	0.033	0.032	0.029
57.927	884.520	A8	1,2-dimethylbenzene	0.028	0.023	0.029
58.427	886.430	I9	I7	0.094	0.095	0.083
58.647	887.260	N9	N18	0.594	0.564	0.530
59.127	889.060	N9	N19	0.381	0.362	0.340
59.347	889.880	N9	N20	0.032	0.030	0.028
60.063	892.540	N9	I-butylcyclopentane	0.016	0.015	0.014
61.080	896.230	N9	N22	0.095	0.090	0.085
61.620	898.170	I9	I10	0.016	0.016	0.014
62.133	900.000	P9	n-nonane	3.079	3.177	2.706
62.470	902.480	N9	1,1-methylethylcyclohexane	0.324	0.298	0.289
62.893	905.590	I10	C10-Iso-Paraffin	0.073	0.067	0.065
63.033	906.610	N9	N25	0.051	0.048	0.046
63.877	912.720	A9	i-propylbenzene	0.086	0.073	0.080
64.353	916.130	I10	I11	0.210	0.213	0.166
64.627	918.070	I10	C10-Iso-Paraffin	0.035	0.036	0.028
64.777	919.140	N9	i-propylcyclohexane	0.141	0.130	0.126
65.230	922.330	I10	2,2-dimethyloctane	0.058	0.060	0.046
65.640	925.200	I10	2,4-dimethyloctane	0.298	0.303	0.236

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 2:04:06 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Acquired: 09/28/13 13:02:31
Sample: 13090743-004A JD
Analyzed: 10/2/2013 2:01:14 PM
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Comments:
Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
65.840	926.590	I10	C10-Iso-Paraffin	0.029	0.029	0.023
65.947	927.330	N9	N28	0.031	0.029	0.028
66.287	929.680	N9	N29	0.050	0.047	0.045
66.673	932.340	I10	2,6-dimethyloctane	0.545	0.554	0.432
66.847	933.520	I10	2,5-dimethyloctane	0.303	0.307	0.240
67.417	937.390	I10	I13	0.040	0.041	0.032
67.550	938.300	N10	N30	0.125	0.116	0.100
67.693	939.260	I10	C10-Iso-Paraffin	0.080	0.074	0.064
67.953	941.010	I10	I14	0.037	0.038	0.029
68.293	943.280	I10	3,3-dimethyloctane	0.522	0.523	0.414
68.547	944.970	N10	N31	0.077	0.071	0.062
68.707	946.030	A9	n-propylbenzene	0.030	0.026	0.028
68.860	947.040	I10	3,6-dimethyloctane	0.199	0.200	0.158
69.103	948.650	I10	C10-Iso-Paraffin	0.071	0.071	0.056
69.197	949.260	I10	C10-Iso-Paraffin	0.063	0.063	0.050
69.383	950.480	I10	3-methyl-5-ethylheptane	0.108	0.110	0.085
69.727	952.730	I10	C10-Iso-Paraffin	0.078	0.079	0.061
70.073	954.980	A9	1,3-methylethylbenzene	0.535	0.459	0.502
70.363	956.850	A9	1,4-methylethylbenzene	0.196	0.169	0.184
70.840	959.920	N10	N33	0.053	0.049	0.043
71.237	962.460	A9	1,3,5-trimethylbenzene	0.517	0.442	0.485
71.360	963.230	I10	I15	0.168	0.168	0.133
71.567	964.540	N10	N34	0.120	0.111	0.096
71.823	966.160	I10	I16	0.090	0.090	0.071
72.210	968.590	I10	5-methylnonane	0.159	0.161	0.126
72.450	970.090	A9	1,2-methylethylbenzene	0.486	0.409	0.456
72.823	972.420	I10	2-methylnonane	0.430	0.438	0.340
72.993	973.470	I10	3-ethyloctane	0.024	0.024	0.019
73.253	975.080	N10	N35	0.099	0.092	0.079
73.400	975.980	I10	C10-Iso-Paraffin	0.093	0.086	0.075
73.707	977.860	I10	3-methylnonane	0.452	0.456	0.358
74.247	981.160	I10	I19	0.022	0.022	0.018
74.643	983.560	A9	1,2,4-trimethylbenzene	0.843	0.712	0.790
74.870	984.930	N10	i-butylcyclohexane	0.198	0.184	0.159
75.227	987.070	I10	I21	0.205	0.206	0.163
75.417	988.200	I10	I22	0.036	0.036	0.029
75.707	989.930	I10	I23	0.036	0.036	0.029
75.907	991.120	N10	N37	0.014	0.013	0.011

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Acquired: 09/28/13 13:02:31
Sample: 13090743-004A JD
Analyzed: 10/2/2013 2:01:14 PM
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Comments:
Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
76.380	993.920	I10	I24	0.050	0.050	0.039
76.587	995.130	I10	C10-Iso-Paraffin	0.075	0.075	0.059
76.687	995.720	A10	i-butylbenzene	0.030	0.026	0.025
77.030	997.730	A10	sec-butylbenzene	0.118	0.101	0.099
77.420	1000.000	P10	n-decane	2.043	2.072	1.619
77.593	1001.720	I11	I26	0.038	0.038	0.027
77.863	1004.400	N10	N38	0.032	0.030	0.026
78.080	1006.540	A9	1,2,3-trimethylbenzene	0.139	0.115	0.130
78.207	1007.790	I11	C11-Iso-Paraffin	0.014	0.011	0.013
78.377	1009.470	A10	1,3-methyl-i-propylbenzene	0.099	0.085	0.083
78.747	1013.100	A10	1,4-methyl-i-propylbenzene	0.050	0.043	0.042
79.237	1017.870	I11	I29	0.052	0.052	0.037
79.360	1019.070	I11	C11-Iso-Paraffin	0.064	0.064	0.046
79.467	1020.100	A10	2-3-dihydroindene	0.035	0.027	0.033
79.590	1021.300	I11	C11-Iso-Paraffin	0.020	0.015	0.019
79.747	1022.810	N10	sec-butylcyclohexane	0.025	0.023	0.020
79.950	1024.770	I11	I30	0.190	0.190	0.137
80.297	1028.100	A10	1,2-methyl-i-propylbenzene	0.314	0.265	0.263
80.520	1030.230	I11	3-ethylnonane	0.014	0.014	0.010
80.793	1032.840	I11	I31	0.372	0.373	0.268
81.283	1037.480	I11	I32	0.071	0.066	0.052
81.607	1040.530	A10	1,3-diethylbenzene	0.169	0.145	0.142
81.797	1042.320	A10	1,3-methyl-n-propylbenzene	0.143	0.123	0.120
82.070	1044.880	A10	1,4-diethylbenzene	0.111	0.095	0.093
82.213	1046.220	I11	C11-Iso-Paraffin	0.069	0.059	0.058
82.313	1047.150	A10	1,4-methyl-n-propylbenzene	0.050	0.043	0.042
82.560	1049.440	A10	1,3-dimethyl-5-ethylbenzene	0.148	0.125	0.124
82.753	1051.240	A10	1,2-diethylbenzene	0.011	0.009	0.009
83.033	1053.830	I11	I34	0.130	0.130	0.094
83.150	1054.900	I11	C11-Iso-Paraffin	0.022	0.022	0.016
83.443	1057.600	I11	C11-Iso-Paraffin	0.117	0.117	0.084
83.627	1059.280	I11	I35	0.025	0.025	0.018
83.793	1060.810	I11	I36	0.021	0.021	0.015
84.027	1062.940	I11	I37	0.152	0.152	0.109
84.347	1065.850	A10	1,4,dimethyl-2-ethylbenzene	0.148	0.125	0.125
84.540	1067.600	A10	A3	0.065	0.056	0.054
84.720	1069.230	A10	1,3-dimethyl-4-ethylbenzene	0.258	0.222	0.216
84.953	1071.330	I11	I39	0.034	0.034	0.024

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 2:04:06 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Acquired: 09/28/13 13:02:31
Sample: 13090743-004A JD
Analyzed: 10/2/2013 2:01:14 PM
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Comments:
Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
85.227	1073.790	A10	1,2-dimethyl-4-ethylbenzene	0.024	0.020	0.020
85.357	1074.950	I11	I40	0.257	0.257	0.185
85.527	1076.470	I11	C11-Iso-Paraffin	0.013	0.013	0.009
85.720	1078.200	I11	I41	0.031	0.031	0.022
85.897	1079.770	A10	1,3-dimethyl-2-ethylbenzene	0.030	0.025	0.025
86.207	1082.520	I11	I42	0.013	0.013	0.009
86.537	1085.440	I11	I43	0.099	0.099	0.071
86.680	1086.700	I11	C11-Iso-Paraffin	0.019	0.019	0.014
86.933	1088.930	A12	1,3-di-n-propylbenzene	0.058	0.048	0.040
87.127	1090.630	I11	C11-Iso-Paraffin	0.040	0.033	0.028
87.203	1091.300	I11	C11-Iso-Paraffin	0.040	0.033	0.028
87.333	1092.440	A11	1,4-methyl-t-butylbenzene	0.049	0.043	0.037
87.420	1093.190	A10	1,2-dimethyl-3-ethylbenzene	0.052	0.043	0.044
87.800	1096.500	A11	1,2-ethyl-i-propylbenzene	0.111	0.093	0.085
88.033	1098.520	I11	C11-Iso-Paraffin	0.042	0.035	0.032
88.203	1100.000	P11	n-undecane	1.351	1.345	0.974
88.547	1104.120	A10	1,2,4,5-tetramethylbenzene	0.103	0.086	0.086
88.860	1107.860	A11	1,2-methyl-n-butylbenzene	0.057	0.048	0.043
88.973	1109.210	A10	1,2,3,5-tetramethylbenzene	0.069	0.058	0.058
89.143	1111.240	I12	C12-Iso-Paraffin	0.018	0.015	0.015
89.350	1113.690	I12	C12-Iso-Paraffin	0.007	0.006	0.006
89.547	1116.020	A11	1,2-methyl-t-butylbenzene	0.005	0.005	0.004
89.653	1117.280	I12	C12-Iso-Paraffin	0.009	0.008	0.007
89.917	1120.390	I12	C12-Iso-Paraffin	0.050	0.041	0.038
90.010	1121.490	I12	C12-Iso-Paraffin	0.063	0.052	0.048
90.517	1127.440	A10	5-methylindan	0.143	0.119	0.122
90.647	1128.960	I12	C12-Iso-Paraffin	0.009	0.008	0.008
90.877	1131.640	I12	I44	0.102	0.100	0.067
91.063	1133.810	A10	4-methylindan	0.032	0.027	0.027
91.293	1136.480	A11	1,2-ethyl-n-propylbenzene	0.187	0.156	0.142
91.463	1138.450	A10	2-methylindan	0.022	0.018	0.019
91.647	1140.560	A11	1,3-methyl-n-butylbenzene	0.021	0.017	0.016
91.753	1141.790	I12	C12-Iso-Paraffin	0.018	0.015	0.014
91.893	1143.410	A12	1,3-di-i-propylbenzene	0.035	0.029	0.024
92.033	1145.020	A11	s-pentylbenzene	0.023	0.019	0.017
92.250	1147.500	I12	C12-Iso-Paraffin	0.055	0.046	0.042
92.377	1148.950	A11	n-pentylbenzene	0.050	0.041	0.038
92.680	1152.420	A12	1,2-di-i-propylbenzene	0.045	0.037	0.031

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Sample: 13090743-004A JD
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Comments:

Acquired: 09/28/13 13:02:31
Analyzed: 10/2/2013 2:01:14 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
92.827	1154.090	I12	C12-Iso-Paraffin	0.029	0.024	0.020
93.060	1156.740	I12	C12-Iso-Paraffin	0.025	0.021	0.017
93.213	1158.480	I12	C12-Iso-Paraffin	0.086	0.071	0.059
93.327	1159.760	A12	1,4-di-i-propylbenzene	0.074	0.062	0.052
93.653	1163.450	A10	tetrahydronaphthalene	0.105	0.081	0.090
93.913	1166.380	I12	C12-Iso-Paraffin	0.081	0.062	0.069
94.020	1167.580	A10	naphthalene	0.130	0.094	0.115
94.187	1169.440	A12	1-t-butyl-3,5-dimethylbenzene	0.033	0.027	0.023
94.583	1173.880	A12	1,4-ethyl-t-butylbenzene	0.099	0.083	0.069
94.893	1177.330	I12	I45	0.054	0.053	0.036
95.187	1180.580	I12	I46	0.007	0.007	0.004
95.337	1182.240	I12	C12-Iso-Paraffin	0.053	0.052	0.035
95.537	1184.450	I12	I47	0.012	0.012	0.008
95.667	1185.890	I12	C12-Iso-Paraffin	0.008	0.008	0.005
95.863	1188.050	I12	I48	0.060	0.059	0.040
96.273	1192.550	A12	A6	0.045	0.038	0.032
96.533	1195.390	I12	C12-Iso-Paraffin	0.015	0.012	0.010
96.777	1198.040	I12	C12-Iso-Paraffin	0.030	0.025	0.021
96.957	1200.000	P12	n-dodecane	0.869	0.854	0.575
97.090	1201.820	I13	C13-Iso-Paraffin	0.052	0.051	0.034
97.293	1204.590	I13	C13-Iso-Paraffin	0.015	0.015	0.010
97.533	1207.850	I13	C13-Iso-Paraffin	0.041	0.040	0.027
97.793	1211.370	I13	C13-Iso-Paraffin	0.017	0.017	0.011
98.000	1214.170	I13	C13-Iso-Paraffin	0.033	0.032	0.022
98.227	1217.220	A12	1,3,5-triethylbenzene	0.180	0.150	0.125
98.513	1221.080	I13	C13-Iso-Paraffin	0.020	0.017	0.014
98.607	1222.330	I13	C13-Iso-Paraffin	0.008	0.006	0.005
98.720	1223.850	I13	C13-Iso-Paraffin	0.016	0.014	0.011
98.850	1225.590	I13	C13-Iso-Paraffin	0.045	0.038	0.031
99.150	1229.600	I13	C13-Iso-Paraffin	0.022	0.018	0.015
99.253	1230.980	I13	C13-Iso-Paraffin	0.010	0.008	0.007
99.377	1232.620	I13	C13-Iso-Paraffin	0.016	0.014	0.011
99.580	1235.320	A12	1,2,4-triethylbenzene	0.013	0.011	0.009
99.787	1238.060	I13	C13-Iso-Paraffin	0.009	0.007	0.006
100.047	1241.500	A12	1,4-methyl-n-pentylbenzene	0.084	0.070	0.059
100.250	1244.180	I13	C13-Iso-Paraffin	0.015	0.012	0.010
100.817	1251.620	I13	C13-Iso-Paraffin	0.013	0.010	0.009
101.027	1254.370	I13	C13-Iso-Paraffin	0.051	0.042	0.035

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 2:04:06 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Sample: 13090743-004A JD
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Comments:

Acquired: 09/28/13 13:02:31
Analyzed: 10/2/2013 2:01:14 PM

Normalized to 100.0000%

Hold

Components Listed in Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
101.120	1255.590	A12	n-hexylbenzene	0.038	0.031	0.026
101.273	1257.590	I13	C13-Iso-Paraffin	0.048	0.040	0.033
101.630	1262.230	I13	C13-Iso-Paraffin	0.063	0.053	0.044
101.973	1266.680	I13	C13-Iso-Paraffin	0.109	0.090	0.075
102.117	1268.540	I13	I50	0.024	0.023	0.015
102.480	1273.220	A11	1,2,3,4,5-pentamethylbenzene	0.059	0.044	0.045
102.807	1277.420	A11	2-methylnaphthalene	0.110	0.080	0.086
103.017	1280.110	A11	1-methylnaphthalene	0.132	0.096	0.104
103.173	1282.110	I13	C13-Iso-Paraffin	0.010	0.007	0.008
103.297	1283.690	I13	C13-Iso-Paraffin	0.013	0.010	0.011
103.560	1287.040	I13	C13-Iso-Paraffin	0.029	0.021	0.022
103.657	1288.270	I13	C13-Iso-Paraffin	0.007	0.005	0.006
103.947	1291.950	I13	C13-Iso-Paraffin	0.037	0.027	0.029
104.053	1293.300	I13	C13-Iso-Paraffin	0.006	0.004	0.005
104.197	1295.120	I13	C13-Iso-Paraffin	0.061	0.044	0.048
104.383	1297.470	I13	C13-Iso-Paraffin	0.013	0.009	0.010
104.583	1300.000	P13	n-tridecane	0.532	0.520	0.325
104.747	1302.440	I14	C14-Iso-Paraffin	0.015	0.015	0.009
105.103	1307.760	I14	C14-Iso-Paraffin	0.036	0.036	0.022
105.323	1311.040	I14	C14-Iso-Paraffin	0.025	0.024	0.015
105.540	1314.250	I14	C14-Iso-Paraffin	0.036	0.035	0.022
105.740	1317.220	I14	C14-Iso-Paraffin	0.014	0.014	0.008
105.897	1319.540	I14	C14-Iso-Paraffin	0.018	0.018	0.011
106.013	1321.260	I14	C14-Iso-Paraffin	0.037	0.036	0.023
106.720	1331.650	I14	C14-Iso-Paraffin	0.016	0.016	0.010
106.960	1335.170	I14	C14-Iso-Paraffin	0.010	0.010	0.006
107.117	1337.460	I14	C14-Iso-Paraffin	0.005	0.005	0.003
107.730	1346.380	I14	C14-Iso-Paraffin	0.032	0.032	0.020
107.847	1348.080	I14	C14-Iso-Paraffin	0.009	0.009	0.005
108.003	1350.340	I14	C14-Iso-Paraffin	0.009	0.009	0.005
108.223	1353.520	I14	C14-Iso-Paraffin	0.026	0.025	0.016
108.423	1356.410	I14	C14-Iso-Paraffin	0.023	0.022	0.014
108.767	1361.350	I14	C14-Iso-Paraffin	0.041	0.040	0.025
109.107	1366.220	I14	C14-Iso-Paraffin	0.043	0.042	0.027
109.237	1368.080	I14	C14-Iso-Paraffin	0.009	0.009	0.005
109.577	1372.940	I14	C14-Iso-Paraffin	0.031	0.030	0.019
110.140	1380.940	I14	C14-Iso-Paraffin	0.094	0.092	0.057
110.947	1392.330	I14	C14-Iso-Paraffin	0.028	0.027	0.017

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 2:04:06 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Sample: 13090743-004A JD
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Comments:

Acquired: 09/28/13 13:02:31
Analyzed: 10/2/2013 2:01:14 PM

Normalized to 100.0000%

Hold

Components Listed In Chromatographic Order

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
111.077	1394.160	I14	C14-Iso-Paraffin	0.051	0.050	0.031
111.493	1400.000	P14	C14	0.348	0.338	0.198
111.647	1402.490	I15	C15-Iso-Paraffin	0.010	0.010	0.006
111.933	1407.130	I15	C15-Iso-Paraffin	0.074	0.072	0.042
112.180	1411.120	I15	C15-Iso-Paraffin	0.056	0.055	0.032
112.380	1414.350	I15	C15-Iso-Paraffin	0.009	0.009	0.005
112.673	1419.070	I15	C15-Iso-Paraffin	0.011	0.011	0.006
113.273	1428.690	I15	C15-Iso-Paraffin	0.013	0.012	0.007
113.400	1430.710	I15	C15-Iso-Paraffin	0.006	0.006	0.003
113.747	1436.230	I15	C15-Iso-Paraffin	0.010	0.009	0.006
113.927	1439.100	I15	C15-Iso-Paraffin	0.005	0.005	0.003
114.723	1451.700	I15	C15-Iso-Paraffin	0.052	0.050	0.029
114.980	1455.750	I15	C15-Iso-Paraffin	0.013	0.013	0.007
115.323	1461.140	I15	C15-Iso-Paraffin	0.011	0.010	0.006
115.690	1466.880	I15	C15-Iso-Paraffin	0.099	0.096	0.056
115.853	1469.430	I15	C15-Iso-Paraffin	0.012	0.011	0.007
116.093	1473.170	I15	C15-Iso-Paraffin	0.020	0.019	0.011
116.227	1475.240	I15	C15-Iso-Paraffin	0.006	0.006	0.003
116.437	1478.510	I15	C15-Iso-Paraffin	0.007	0.007	0.004
116.833	1484.650	I15	C15-Iso-Paraffin	0.008	0.007	0.004
117.427	1493.800	I15	C15-Iso-Paraffin	0.012	0.011	0.007
117.587	1496.260	I15	C15-Iso-Paraffin	0.005	0.005	0.003
117.773	1499.130	P15	C15	0.245	0.177	0.134
117.947	1502.220	I16	C16-Iso-Paraffin	0.008	0.006	0.005
118.427	1511.370	I16	C16-Iso-Paraffin	0.008	0.006	0.004
118.687	1516.310	I16	C16-Iso-Paraffin	0.019	0.014	0.010
119.013	1522.500	I16	C16-Iso-Paraffin	0.018	0.013	0.010
119.873	1538.700	I16	C16-Iso-Paraffin	0.010	0.008	0.006
120.107	1543.070	I16	C16-Iso-Paraffin	0.012	0.009	0.007
120.430	1549.120	I16	C16-Iso-Paraffin	0.008	0.006	0.004
120.550	1551.360	I16	C16-Iso-Paraffin	0.007	0.005	0.004
120.820	1556.390	I16	C16-Iso-Paraffin	0.033	0.024	0.018
121.040	1560.490	I16	C16-Iso-Paraffin	0.028	0.020	0.015
121.327	1565.800	I16	C16-Iso-Paraffin	0.019	0.013	0.010
121.593	1570.740	I16	C16-Iso-Paraffin	0.015	0.011	0.008
121.723	1573.140	I16	C16-Iso-Paraffin	0.010	0.007	0.005
123.150	1599.330	P16	C16	0.164	0.157	0.082
125.680	1653.910	I17	C17-Iso-Paraffin	0.048	0.046	0.024

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 10/2/2013 2:04:06 PM

RawFile: M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf
Sample: 13090743-004A JD
Processed 374 Peaks
Reference File: H:\DHA Application Software\References\13090743-003A JD_10022013.DHA
Comments:

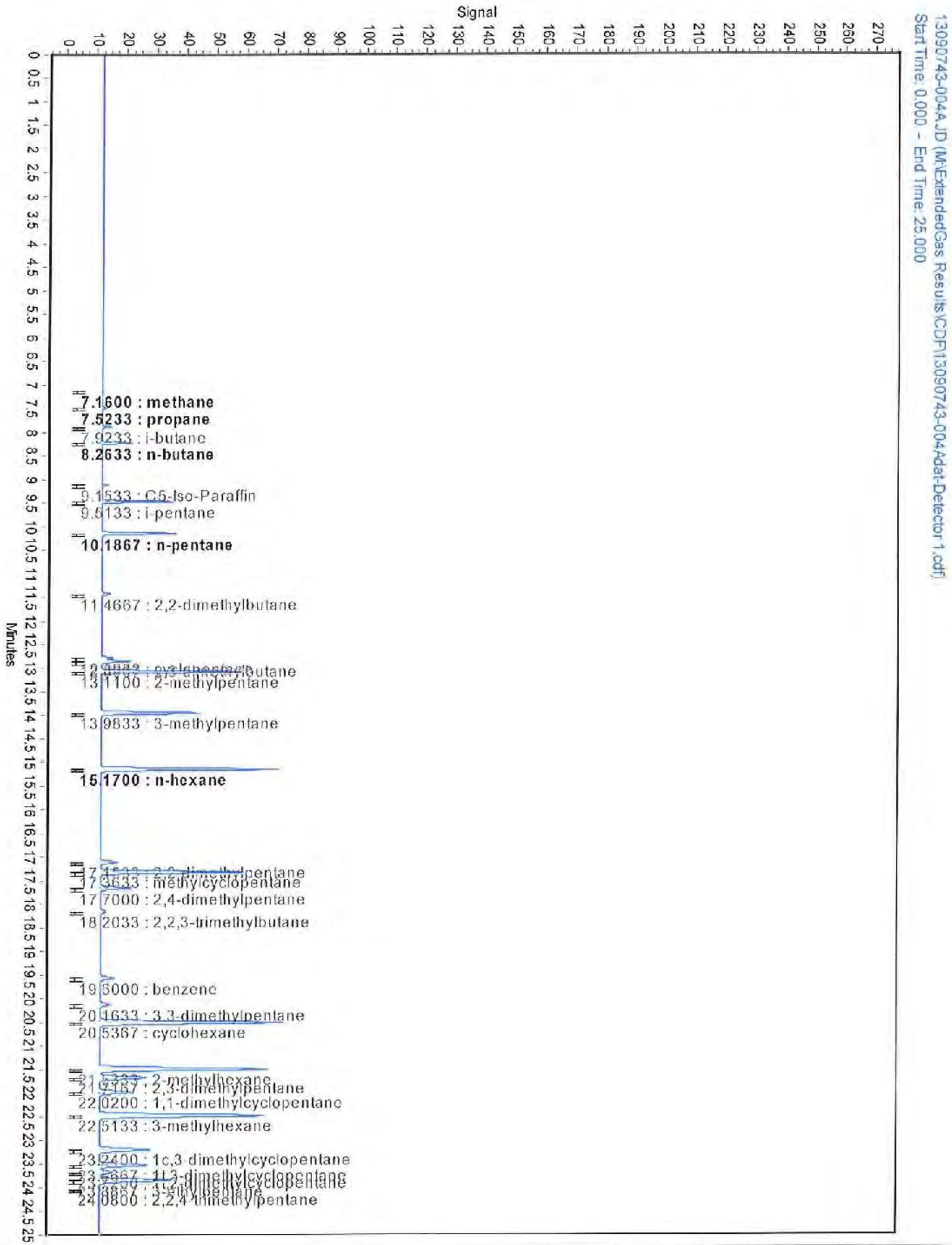
Acquired: 09/26/13 13:02:31
Analyzed: 10/2/2013 2:01:14 PM

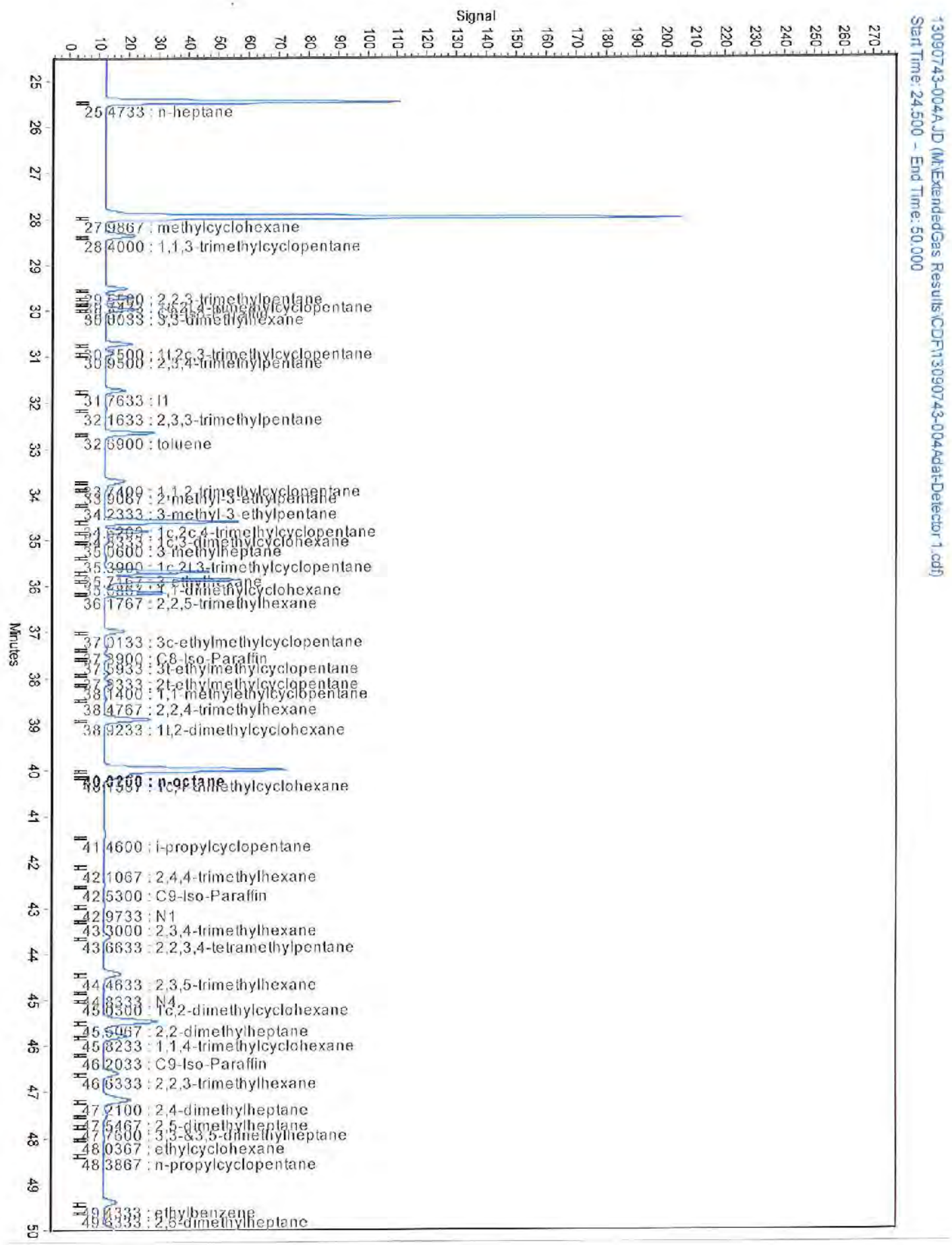
Normalized to 100.0000%

Hold

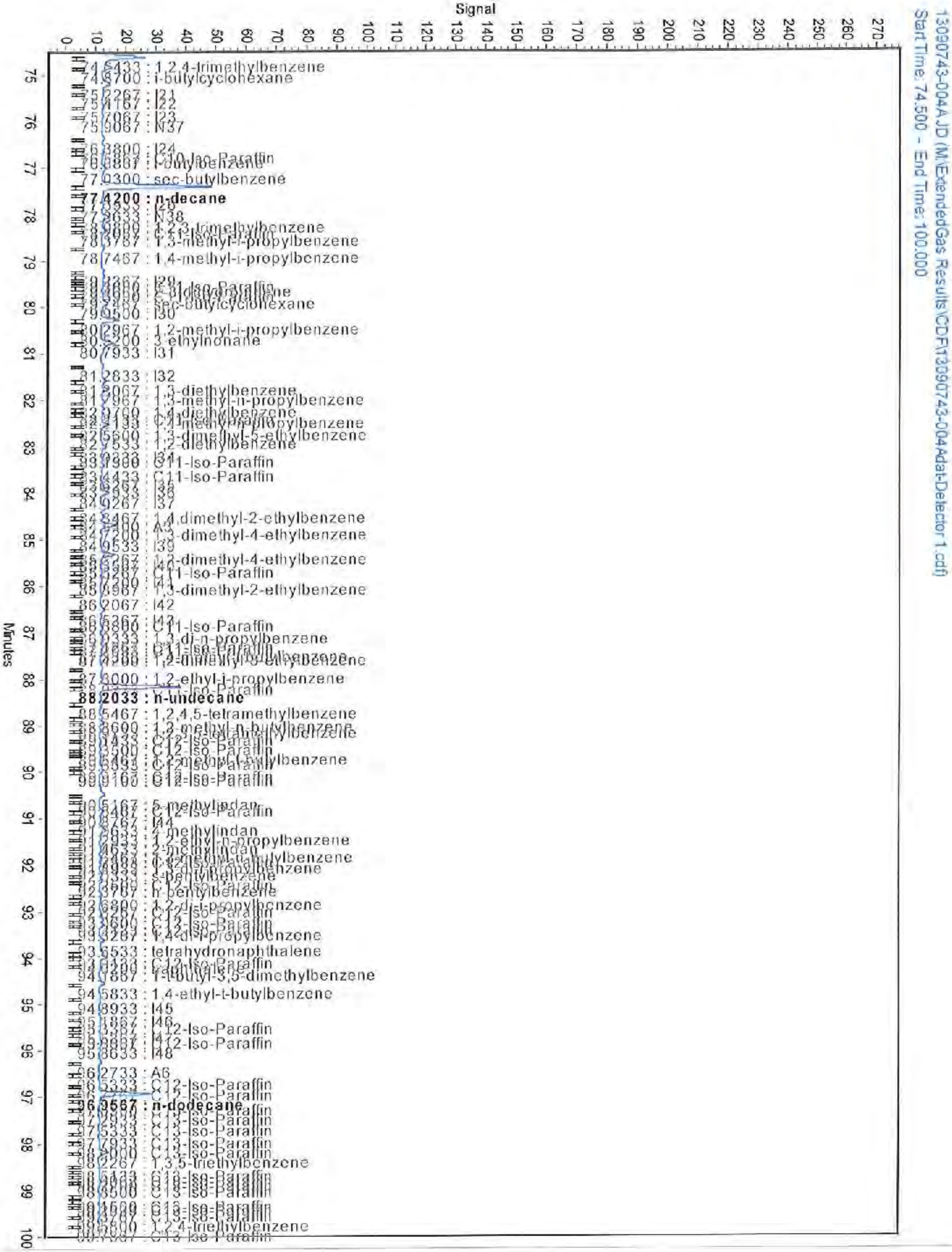
Components Listed in Chromatographic Order

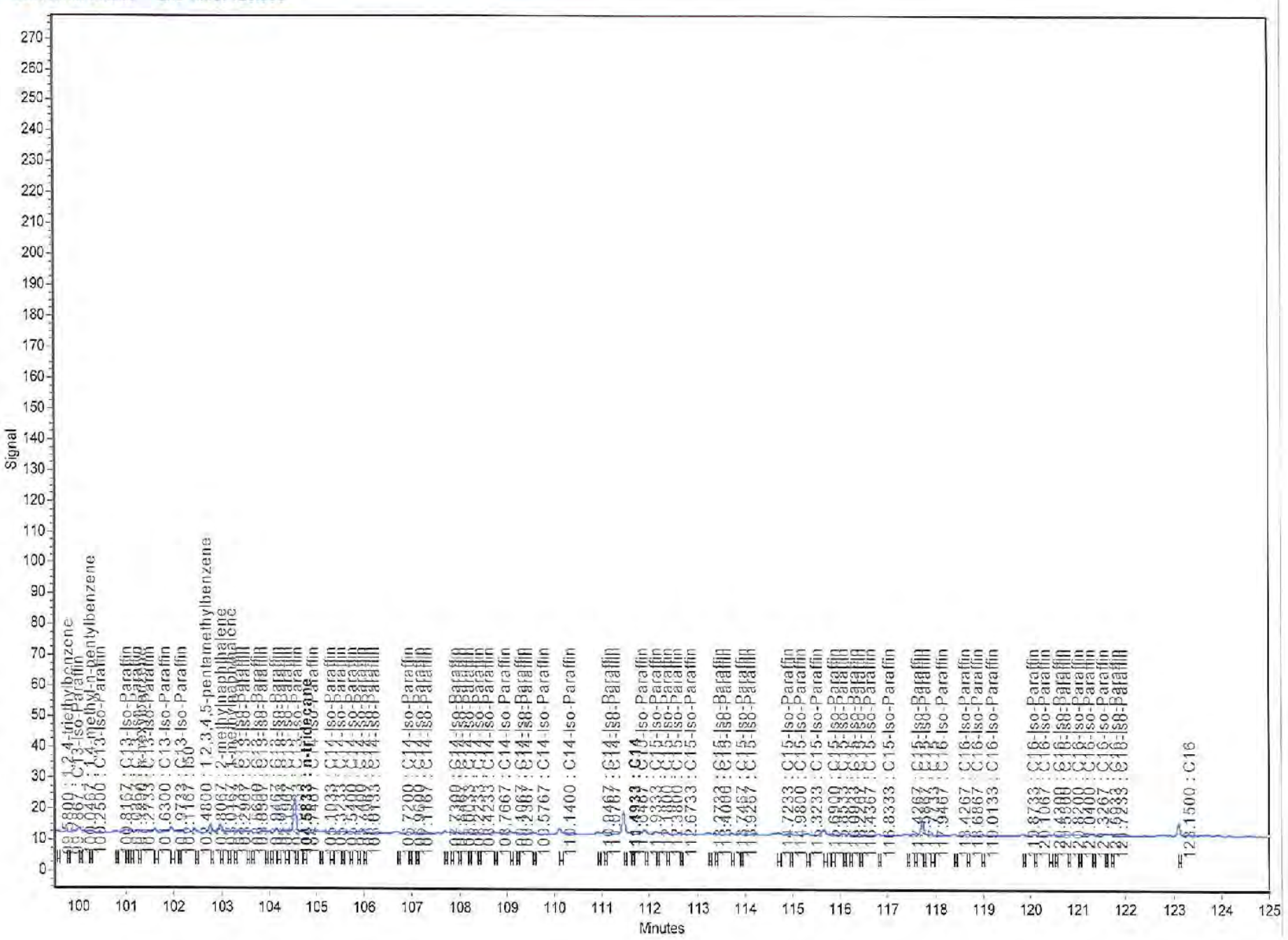
Minutes	Index	Group	Component	Mass %	Volume %	Mol %
126.003	1660.820	I17	C17-Iso-Paraffin	0.022	0.021	0.011
126.227	1665.580	I17	C17-Iso-Paraffin	0.015	0.014	0.007
126.590	1673.310	I17	C17-Iso-Paraffin	0.009	0.009	0.004
127.830	1699.510	P17	C17	0.129	0.123	0.061
128.300	1710.940	I18	C18-Iso-Paraffin	0.090	0.085	0.042
130.237	1757.930	I18	C18-Iso-Paraffin	0.010	0.010	0.005
130.567	1765.860	I18	C18-Iso-Paraffin	0.018	0.017	0.008
130.883	1773.450	I18	C18-Iso-Paraffin	0.011	0.011	0.005
131.997	1800.000	P18	C18	0.103	0.098	0.046
132.580	1815.610	I19	C19-Iso-Paraffin	0.039	0.037	0.017
134.480	1865.970	I19	C19-Iso-Paraffin	0.010	0.009	0.004
134.667	1870.880	I19	C19-Iso-Paraffin	0.007	0.007	0.003
134.787	1874.030	I19	C19-Iso-Paraffin	0.006	0.006	0.003
135.780	1900.000	P19	C19	0.107	0.102	0.045
138.060	1966.000	I20	C20-Iso-Paraffin	0.007	0.007	0.003
138.393	1975.550	I20	C20-Iso-Paraffin	0.009	0.009	0.004
139.270	2000.620	P20	C20	0.076	0.072	0.031
140.473	2037.960	I21	C21-Iso-Paraffin	0.006	0.006	0.002
141.390	2066.180	I21	C21-Iso-Paraffin	0.005	0.004	0.002
141.687	2075.270	I21	C21-Iso-Paraffin	0.009	0.009	0.004
142.527	2100.990	P21	C21	0.066	0.061	0.025
143.763	2141.750	I22	C22-Iso-Paraffin	0.010	0.009	0.004
145.590	2201.310	P22	C22	0.060	0.056	0.022
148.673	2301.390	P23	C23	0.052	0.049	0.018
152.077	2401.410	P24	C24	0.049	0.045	0.016
155.997	2497.970	P25	C25	0.041	0.038	0.013
160.633	2601.460	P26	C26	0.035	0.032	0.011
166.233	2701.790	P27	C27	0.031	0.029	0.009
173.093	2801.620	P28	C28	0.023	0.021	0.007
181.770	2899.990	P29	C29	0.000	0.000	0.000

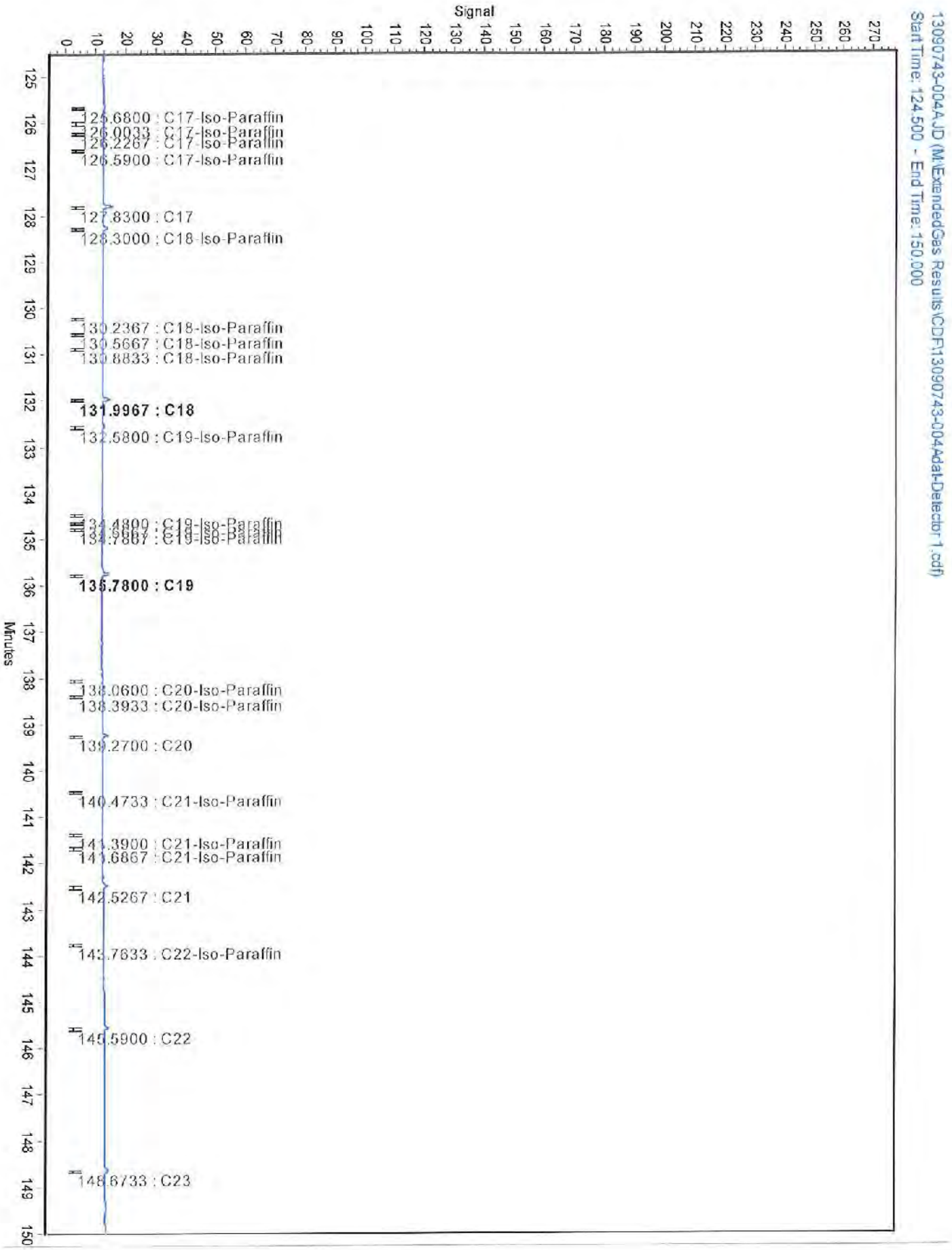

13090743-004A.JD (M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf)
Start Time: 0.000 - End Time: 25.000
Signal
Minutes
7.1600 : methane
7.5233 : propane
7.9233 : i-butane
8.2633 : n-butane
9.1533 : C5-Iso-Paraffin
9.5133 : i-pentane
10.1867 : n-pentane
11.4667 : 2,2-dimethylbutane
13.1100 : 2-methylpentane
13.9833 : 3-methylpentane
15.1700 : n-hexane
17.3633 : methylcyclopentane
17.7000 : 2,4-dimethylpentane
18.2033 : 2,2,3-trimethylbutane
19.3000 : benzene
20.4633 : 3,3-dimethylpentane
20.5367 : cyclohexane
22.0200 : 1,1-dimethylcyclopentane
22.5133 : 3-methylhexane
23.2400 : 1c,3-dimethylcyclopentane
24.0800 : 2,2,4-trimethylpentane

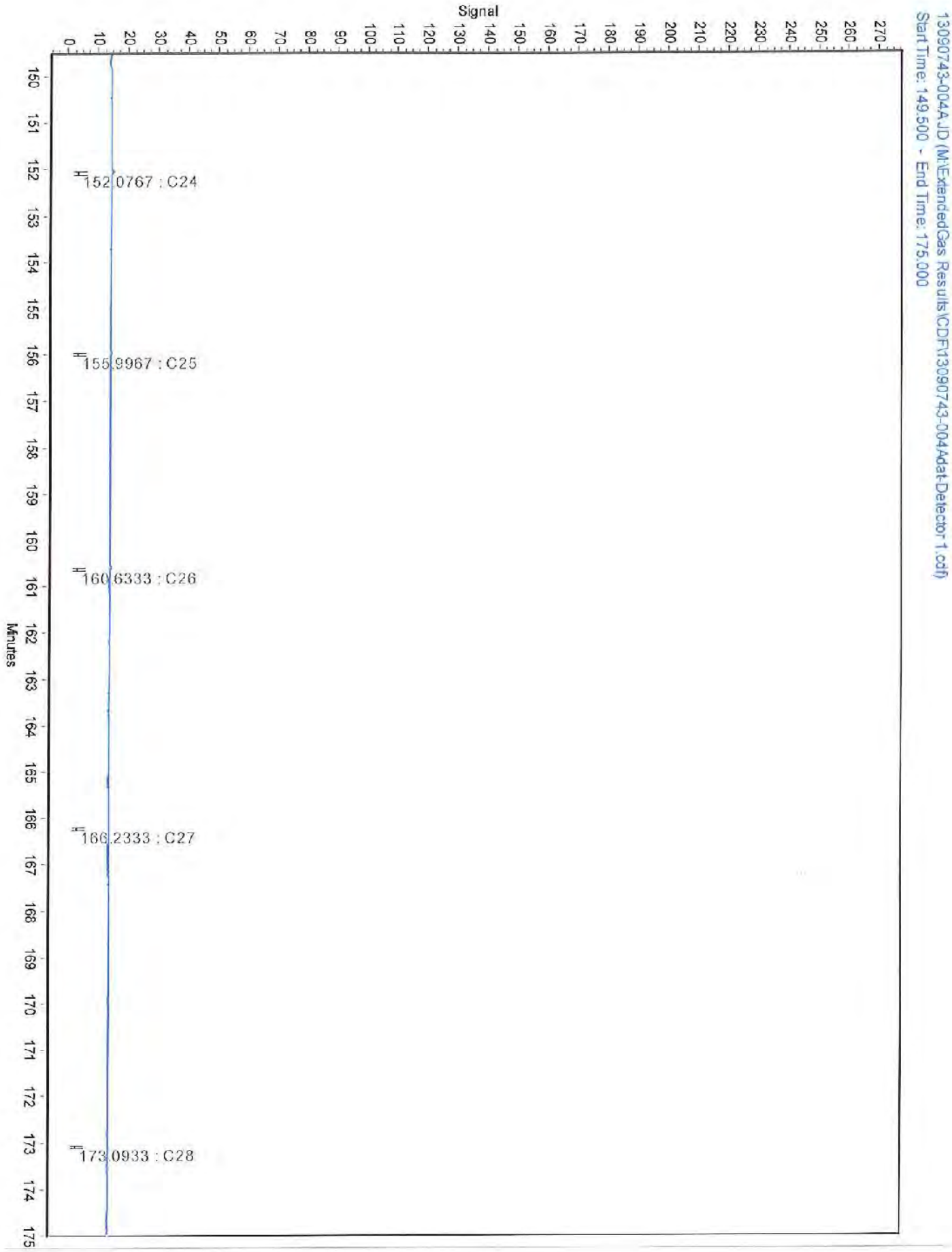

1309074 3-004A.JD (M:\ExtendedGas Results\CDF\1309074 3-004A\dat-Detector 1.cdf)
Start Time: 24.500 - End Time: 50.000
Signal
Minutes
25 4733 : n-heptane
27 9867 : methylcyclohexane
28 4000 : 1,1,3-trimethylcyclopentane
30 0033 : 3,3-dimethylhexane
30 9500 : 2,3,4-trimethylpentane
31 7633 : I1
32 1633 : 2,3,3-trimethylpentane
32 6900 : toluene
33 9067 : 2-methyl-3-ethylpentane
34 2333 : 3-methyl-3-ethylpentane
35 0600 : 3-methylheptane
36 1767 : 2,2,5-trimethylhexane
37 0133 : 3c-ethylmethylcyclopentane
37 3900 : C8-Iso-Paraffin
37 5933 : 3t-ethylmethylcyclopentane
37 9333 : 2t-ethylmethylcyclopentane
38 1400 : 1,1-methylethylcyclopentane
38 4767 : 2,2,4-trimethylhexane
38 9233 : 1t,2-dimethylcyclohexane
40 0200 : n-octane
41 4600 : i-propylcyclopentane
42 1067 : 2,4,4-trimethylhexane
42 5300 : C9-Iso-Paraffin
42 9733 : N1
43 3000 : 2,3,4-trimethylhexane
43 6633 : 2,2,3,4-tetramethylpentane
44 4633 : 2,3,5-trimethylhexane
44 8333 : N4
45 0300 : 1c,2-dimethylcyclohexane
45 5467 : 2,2-dimethylheptane
45 8233 : 1,1,4-trimethylcyclohexane
46 2033 : C9-Iso-Paraffin
46 6333 : 2,2,3-trimethylhexane
47 2100 : 2,4-dimethylheptane
47 5467 : 2,5-dimethylheptane
47 7600 : 3,3-&3,5-dimethylheptane
48 0367 : ethylcyclohexane
48 3867 : n-propylcyclopentane
49 4333 : ethylbenzene
49 8333 : 2,5-dimethylheptane

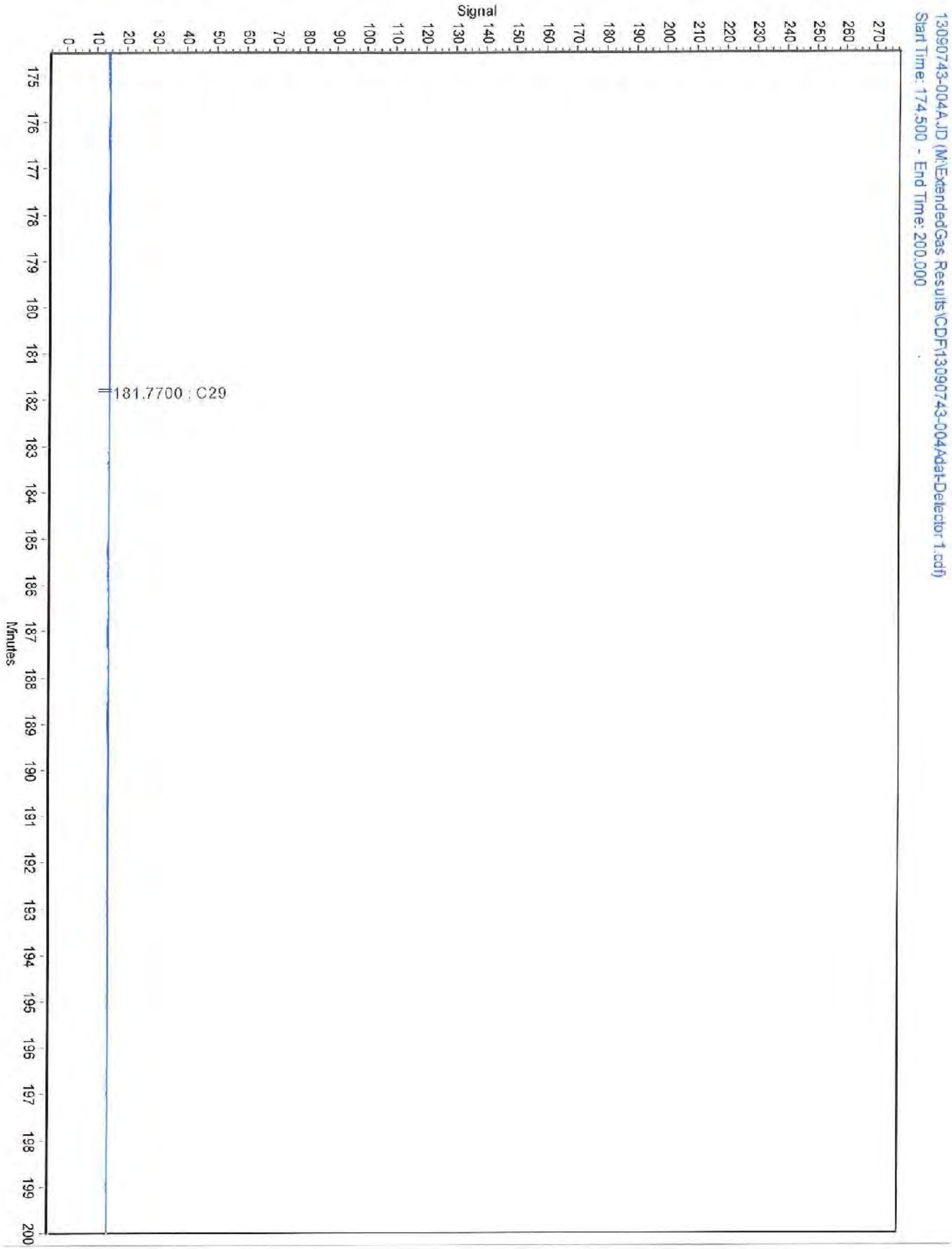
Signal
Minutes
13090743-004AJD (M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf)
Start Time: 49.500 - End Time: 75.000
49.8333 : 2,6-dimethylheptane
50.0200 : 1c,2t,4t-trimethylcyclohexane
50.3533 : I3
51.3567 : m-xylene
51.5733 : p-xylene
52.0233 : 1,4-dimethylbenzene
52.1900 : I4
52.7800 : N13
53.2900 : 3,4-dimethylheptane
54.1900 : 4-ethylheptane
54.3833 : 4-methyloctane
54.9000 : I5
55.3800 : N15
56.0300 : 3-methyloctane
56.6767 : 1c,2t,4c-trimethylcyclohexane
57.0100 : o-xylene
57.3267 : C9-Iso-Paraffin
57.9267 : 1,2-dimethylbenzene
58.2367 : I7
58.6467 : N18
59.1267 : N19
59.3467 : N20
60.0633 : i-butylcyclopentane
61.0800 : N22
61.6200 : I10
62.1333 : n-nonane
62.4700 : 1,1-methylethylcyclohexane
63.0333 : C10-Iso-Paraffin
63.8767 : i-propylbenzene
64.3533 : I11
64.9267 : C10-Iso-Paraffin
64.7767 : i-propylcyclohexane
65.2300 : 2,2-dimethyloctane
65.6400 : 2,4-dimethyloctane
66.2867 : N29
66.4733 : 2,6-dimethyloctane
66.8467 : 2,5-dimethyloctane
67.3533 : I14
68.2933 : 3,3-dimethyloctane
68.5467 : N31
69.3833 : 3-methyl-5-ethylheptane
69.7267 : C10-Iso-Paraffin
70.0733 : 1,3-methylethylbenzene
70.3633 : 1,4-methylethylbenzene
70.8400 : N33
71.3267 : 1,3,5-trimethylbenzene
71.8233 : I16
72.2400 : 5-methylnonane
72.4500 : 1,2 methylethylbenzene
73.0233 : 2-methylnonane
73.4500 : C10-Iso-Paraffin
73.7067 : 3-methylnonane
74.2467 : I19
74.5433 : 1,2,4-trimethylbenzene
74.8700 : i-butylcyclohexane


13090743-004A.JD (M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf)
Start Time: 74.500 - End Time: 100.000
Signal
Minutes
74.6433 : 1,2,4-trimethylbenzene
74.8700 : i-butylcyclohexane
75.9067 : N37
77.0300 : sec-butylbenzene
77.4200 : n-decane
78.7467 : 1,4-methyl-i-propylbenzene
80.2967 : 1,2-methyl-i-propylbenzene
80.7933 : I31
81.2833 : I32
83.4433 : C11-Iso-Paraffin
84.8467 : 1,4-dimethyl-2-ethylbenzene
85.8967 : 1,3-dimethyl-2-ethylbenzene
86.2067 : I42
87.8000 : 1,2-ethyl-i-propylbenzene
88.2033 : n-undecane
88.5467 : 1,2,4,5-tetramethylbenzene
93.6533 : tetrahydronaphthalene
94.5833 : 1,4-ethyl-t-butylbenzene
94.8933 : I45
95.8633 : I48
96.2733 : A6
96.9667 : n-dodecane
98.2267 : 1,3,5-triethylbenzene


13090743-004A.JD (M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf)
Start Time: 99.500 - End Time: 125.000
Signal
Minutes
1,2,4-triethylbenzene
C13-Iso-Paraffin
1,4-methyl-n-pentylbenzene
C13-Iso-Paraffin
1,2,3,4,5-pentamethylbenzene
2-methylnaphthalene
1-methylnaphthalene
n-tridecane
C14-Iso-Paraffin
C15-Iso-Paraffin
C16-Iso-Paraffin
C16


13090743-004A.JD (M:\Extended\Gas Results\CDF\13090743-004Adat-Detector 1.cdf)
Start Time: 124.500 - End Time: 150.000
Signal
Minutes
125.6800 : C17-Iso-Paraffin
126.0033 : C17-Iso-Paraffin
126.2267 : C17-Iso-Paraffin
126.5900 : C17-Iso-Paraffin
127.8300 : C17
128.3000 : C18-Iso-Paraffin
130.2367 : C18-Iso-Paraffin
130.5667 : C18-Iso-Paraffin
130.8833 : C18-Iso-Paraffin
131.9967 : C18
132.5800 : C19-Iso-Paraffin
134.4800 : C19-Iso-Paraffin
135.7800 : C19
138.0600 : C20-Iso-Paraffin
138.3933 : C20-Iso-Paraffin
139.2700 : C20
140.4733 : C21-Iso-Paraffin
141.3900 : C21-Iso-Paraffin
141.6867 : C21-Iso-Paraffin
142.5267 : C21
143.7633 : C22-Iso-Paraffin
145.5900 : C22
148.6733 : C23


13090743-004A.JD (M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf)
Start Time: 149.500 - End Time: 175.000
Signal
Minutes
152.0767 : C24
155.9967 : C25
160.6333 : C26
166.2333 : C27
173.0933 : C28


13090743-004A.JD (M:\ExtendedGas Results\CDF\13090743-004Adat-Detector 1.cdf)
Start Time: 174.500 - End Time: 200.000
Signal
181.7700 : C29
Minutes

SPL, Inc.
Analysis Request Chain of Custody Record

SPL

SPL Work Order No.:		Acct. Mate Code: NEEDS CLIENT CODE		Dept. Code	Page 1 / Pages 1

Report To: (Company Name):	LT Environmental	Project/Station Name:	Project/Station Number:	Project/Station Location:		Requested TAT*
Address:	2243 Main Avenue, Suite #3	Williams Remediation	34013010	San Juan Basin		
		Special Instructions:				10 business days
City/State/Zip:	Durango CO 81301					
Contact:	Brooke Herb bherb@ltenv.com	Indicate Billing Type: (Place "X", where appropriate)	Net 30 day Acct. X	Check #		
Phone:	970-385-1096 Fax:		Credit Card	<<<Contact SPL, Inc for CC payment arrangements.		* Surcharges May Apply (See quote for details)
Invoice To: (Company Name):	LT Environmental	† Terms: Cylinders will be rented for $10/cyl. All cylinders checked out are to be returned within 21 days, whether they contain sample or not. Cylinders not returned after 30 days will be considered lost and will be billed at current replacement cost.	Requested Analysis (Place an "X" next to Sample ID below)			
Address:	2243 Main Avenue, Suite #3					
City/State/Zip:	Durango CO 81301					
Contact:	Brooke Herb bherb@ltenv.com					
Phone:	970-385-1096 Fax:					
Client PO# or Ref. No.:	N/A					
Contract/Proposal #: (i.e. SPLQ####)	SPLQ5817					

Sample ID (used to log/track sample)	Sample Date	Sample Time	Sample Type (Gas/Liq. /Solid)	Duplicate	Composite	Spot	Cylinder Tracking Info† Cylinder #	Date Out	Date In	GPA-2186-02M(PIANO)												Comments
Pritchard MW-4	9/12/13	1145	LIQ			X				X												
Pritchard MW-2	9/12/13	1205	LIQ			X				X												

Sampled By-Print Name: Morgan Wagoner			Received By-Company:		
Signature: Morgan Wagoner					
Relinquished By-Print Name: Morgan Wagoner	Date: 9/19/13	Time: 1200	Received By-Print Name:	Date: 9/20/13	Time:
Signature: Morgan Wagoner			Signature:		
Relinquished By-Print Name:	Date:	Time:	Received By-Print Name:	Date:	Time:
Signature:			Signature:		
Relinquished By-Print Name:	Date:	Time:	Received By-Print Name:	Date:	Time:
Signature:			Signature:		

Choose SPL Facility>>>	Corporate HQ - Houston, TX	Ship to Address:	8820 Interchange Dr., Houston,TX 77054	Phone:	713.660.0901

Note - As a convenience to our clients, this form is available in an electronic format. Please contact one of our offices above for the form to be e-mailed to you.

SPL, Inc.
Analysis Request Chain of Custody Record

SPL Work Order No.:		Acct. Mate Code: NEEDS CLIENT CODE		Dept. Code	Page 1 / Pages 1

Report To: (Company Name):	LT Environmental	Project/Station Name:	Project/Station Number:	Project/Station Location:	Requested TAT*
Address:	2243 Main Avenue, Suite #3	Williams Remediation	34013010	San Juan Basin	
City/State/Zip:	Durango CO 81301	Special Instructions:			10 business days
Contact:	Brooke Herb bherb@ltenv.com	Indicate Billing Type: (Place "X", where appropriate)	Net 30 day Acct. X	Check #	
Phone:	970-385-1096 Fax:		Credit Card	<<<Contact SPL, Inc for CC payment arrangements.	* Surcharges May Apply (See quote for details)
Invoice To: (Company Name):	LT Environmental	† Terms: Cylinders will be rented for $10/cyl. All cylinders checked out are to be returned within 21 days, whether they contain sample or not. Cylinders not returned after 30 days will be considered lost and will be billed at current replacement cost.			
Address:	2243 Main Avenue, Suite #3				
City/State/Zip:	Durango CO 81301				
Contact:	Brooke Herb bherb@ltenv.com				
Phone:	970-385-1096 Fax:				
Client PO# or Ref. No.:	N/A				
Contract/Proposal #: (i.e. SPLQ####)	SPLQ5817				

Sample ID (used to log/track sample)	Sample Date	Sample Time	Sample Type (Gas/Liq. /Solid)	Duplicate	Composite	Spot	Cylinder Tracking Info† Cylinder #	Date Out	Date In	Requested Analysis (Place an "X" next to Sample ID below) GPA-2186-02M(PIANO)												Comments
Florance 47 MW-3	9/12/13	1445	Liq			X				X												

Sampled By-Print Name:	Morgan Wagoner		Received By-Company:		
Signature:	Morgan Wagoner				
Relinquished By-Print Name:	Morgan Wagoner	Date: 9/19/13 Time: 12:00	Received By-Print Name:		Date: 9/20/13 Time:
Signature:	Morgan Wagoner		Signature:		
Relinquished By-Print Name:		Date: Time:	Received By-Print Name:		Date: Time:
Signature:			Signature:		
Relinquished By-Print Name:		Date: Time:	Received By-Print Name:		Date: Time:
Signature:			Signature:		

Choose SPL Facility>>>	Corporate HQ - Houston, TX	Ship to Address:	8820 Interchange Dr., Houston, TX 77054	Phone:	713.660.0901

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SPL, Inc.
Analysis Request Chain of Custody Record

SPL	SPL Work Order No.:		Acct. Mate Code: NEEDS CLIENT CODE		Dept. Code	Page 1	Pages 1

Report To: (Company Name):	LT Environmental	Project/Station Name:	Project/Station Number:	Project/Station Location:		Requested TAT*
Address:	2243 Main Avenue, Suite #3	Williams Remediation	34013010	San Juan Basin		
		Special Instructions:				10 business days
City/State/Zip:	Durango CO 81301					
Contact:	Brooke Herb bherb@ltenv.com	Indicate Billing Type: (Place "X", where appropriate)	Net 30 day Acct. X	Check #		
Phone:	970-385-1096 Fax:		Credit Card	<<<Contact SPL, Inc for CC payment arrangements.		* Surcharges May Apply (See quote for details)
Invoice To: (Company Name):	LT Environmental					
Address:	2243 Main Avenue, Suite #3	† Terms: Cylinders will be rented for $10/cyl. All cylinders checked out are to be returned within 21 days, whether they contain sample or not. Cylinders not returned after 30 days will be considered lost and will be billed at current replacement cost.				
City/State/Zip:	Durango CO 81301					
Contact:	Brooke Herb bherb@ltenv.com					
Phone:	970-385-1096 Fax:					
Client PO# or Ref. No.:	N/A					
Contract/Proposal #: (i.e. SPLQ####)	SPLQ5817					

Sample ID (used to log/track sample)	Sample Date	Sample Time	Sample Type (Gas/Liq. /Solid)	Duplicate	Composite	Spot	Cylinder Tracking Info† Cylinder #	Date Out	Date In	GPA-2186-02M(PIANO)											Comments
Doyle MW-6	9/13/13	1200	Liq			X				X											

Sampled By-Print Name:	Morgan Wagoner			Received By-Company:	
Signature:	Morgan Wagoner				
Relinquished By-Print Name:	Morgan Wagoner	Date: 9/19/13	Time: 12:00	Received By-Print Name:	Date: 9/20/13 Time:
Signature:	Morgan Wagoner			Signature:	
Relinquished By-Print Name:		Date:	Time:	Received By-Print Name:	Date: Time:
Signature:				Signature:	
Relinquished By-Print Name:		Date:	Time:	Received By-Print Name:	Date: Time:
Signature:				Signature:	

Choose SPL Facility>>>	Corporate HQ - Houston, TX	Ship to Address:	8820 Interchange Dr., Houston,TX 77054	Phone:	713.660.0901

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Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

December 11, 2013

Ashley Ager
LTE
2243 Main Ave Suite 3
Durango, CO 81301
TEL: (970) 946-1093
FAX

RE: Williams Historical GW OrderNo.: 1312224

Dear Ashley Ager:

Hall Environmental Analysis Laboratory received 3 sample(s) on 12/5/2013 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1312224**
Date Reported: **12/11/2013**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-2
Project: Williams Historical GW
Collection Date: 12/4/2013 12:20:00 PM
Lab ID: 1312224-001
Matrix: AQUEOUS
Received Date: 12/5/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	39	5.0		µg/L	5	12/9/2013 4:52:34 PM	R15367
Toluene	72	5.0		µg/L	5	12/9/2013 4:52:34 PM	R15367
Ethylbenzene	ND	5.0		µg/L	5	12/9/2013 4:52:34 PM	R15367
Xylenes, Total	150	10		µg/L	5	12/9/2013 4:52:34 PM	R15367
Surr: 4-Bromofluorobenzene	99.7	85-136		%REC	5	12/9/2013 4:52:34 PM	R15367

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-5
Project: Williams Historical GW
Collection Date: 12/4/2013 1:10:00 PM
Lab ID: 1312224-002
Matrix: AQUEOUS
Received Date: 12/5/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	410	10		µg/L	10	12/9/2013 5:22:40 PM	R15367
Toluene	46	10		µg/L	10	12/9/2013 5:22:40 PM	R15367
Ethylbenzene	51	10		µg/L	10	12/9/2013 5:22:40 PM	R15367
Xylenes, Total	1000	20		µg/L	10	12/9/2013 5:22:40 PM	R15367
Surr: 4-Bromofluorobenzene	99.4	85-136		%REC	10	12/9/2013 5:22:40 PM	R15367

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: TRIP BLANK
Project: Williams Historical GW
Collection Date:
Lab ID: 1312224-003
Matrix: TRIP BLANK
Received Date: 12/5/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	1.0		µg/L	1	12/6/2013 5:44:32 PM	R15341
Toluene	ND	1.0		µg/L	1	12/6/2013 5:44:32 PM	R15341
Ethylbenzene	ND	1.0		µg/L	1	12/6/2013 5:44:32 PM	R15341
Xylenes, Total	ND	2.0		µg/L	1	12/6/2013 5:44:32 PM	R15341
Surr: 4-Bromofluorobenzene	89.2	85-136		%REC	1	12/6/2013 5:44:32 PM	R15341

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1312224**

11-Dec-13

Client: LTE

Project: Williams Historical GW

Sample ID	**5ML RB**	SampType:	**MBLK**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**PBW**	Batch ID:	**R15341**	RunNo:	**15341**					
Prep Date:		Analysis Date:	**12/6/2013**	SeqNo:	**441968**	Units:	**µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	19		20.00		92.7	85	136			

Sample ID	**100NG BTEX LCS**	SampType:	**LCS**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**LCSW**	Batch ID:	**R15341**	RunNo:	**15341**					
Prep Date:		Analysis Date:	**12/6/2013**	SeqNo:	**441969**	Units:	**µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	105	80	120			
Toluene	21	1.0	20.00	0	104	80	120			
Ethylbenzene	21	1.0	20.00	0	103	80	120			
Xylenes, Total	63	2.0	60.00	0	105	80	120			
Surr: 4-Bromofluorobenzene	19		20.00		97.0	85	136			

Sample ID	**1312224-001AMS**	SampType:	**MS**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**MW-2**	Batch ID:	**R15341**	RunNo:	**15341**					
Prep Date:		Analysis Date:	**12/6/2013**	SeqNo:	**441973**	Units:	**µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1000	50	1000	42.90	100	73.4	119			
Toluene	1100	50	1000	68.20	102	80	120			
Ethylbenzene	1000	50	1000	0	101	80	120			
Xylenes, Total	3300	100	3000	116.2	106	80	120			
Surr: 4-Bromofluorobenzene	1000		1000		104	85	136			

Sample ID	**1312224-001AMSD**	SampType:	**MSD**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**MW-2**	Batch ID:	**R15341**	RunNo:	**15341**					
Prep Date:		Analysis Date:	**12/6/2013**	SeqNo:	**441975**	Units:	**µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1000	50	1000	42.90	97.5	73.4	119	2.86	20	
Toluene	1100	50	1000	68.20	100	80	120	1.30	20	
Ethylbenzene	1000	50	1000	0	99.5	80	120	1.63	20	
Xylenes, Total	3300	100	3000	116.2	105	80	120	1.00	20	
Surr: 4-Bromofluorobenzene	1000		1000		102	85	136	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1312224**

11-Dec-13

Client: LTE

Project: Williams Historical GW

Sample ID **B16**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBW**	Batch ID: **R15367**	RunNo: **15367**
Prep Date:	Analysis Date: **12/9/2013**	SeqNo: **442688** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	19		20.00		94.4	85	136			

Sample ID **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSW**	Batch ID: **R15367**	RunNo: **15367**
Prep Date:	Analysis Date: **12/9/2013**	SeqNo: **442689** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	108	80	120			
Toluene	22	1.0	20.00	0	108	80	120			
Ethylbenzene	21	1.0	20.00	0	106	80	120			
Xylenes, Total	65	2.0	60.00	0	108	80	120			
Surr: 4-Bromofluorobenzene	21		20.00		104	85	136			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: LTE Work Order Number: **1312224** RcptNo: 1

Received by/date: 12/05/2013

Logged By: **Ashley Gallegos** 12/5/2013 10:00:00 AM

Completed By: **Ashley Gallegos** 12/5/2013 3:51:28 PM

Reviewed By: 12/05/13

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted? _____
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by:

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Client: LT Environmental	Turn-Around Time: ☒ Standard ☐ Rush
Mailing Address: 2213 main Ave Durango Co 81301	Project Name: Williams Historical GW
Phone #: 920-946-1096	Project #: 034013610
email or Fax#: aager@ltenv.com	Project Manager: Ashley Ager
QA/QC Package: ☒ Standard ☐ Level 4 (Full Validation)	Sampler: Daniel Newman
Accreditation ☐ NELAP ☐ Other	On Ice: ☒ Yes ☐ No
☐ EDD (Type)	Sample Temperature: 1.0

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1312224	BTEX + ~~MTBE + TMB's~~ (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Air Bubbles (Y or N)
12/4/13	1220	~~MW~~ GW	MW-32	VOA/3	HCL	-001	X											
12/4/13	1310	~~MW~~ GW	MW-5	VOA/2	HCL	-002	X											
			Trip Blank	VOA/2	HCL	-003	X											

Date:	Time:	Relinquished by:	Received by:	Date	Time
12/4/13	1705		Chet Ward	12/4/13	1705
12/4/13	1800	Chet Ward			

Received by: 12/05/13 1000

Remarks: