

-- Meteorological Data -----

City : Pittsburgh, PA
 Ambient Pressure : 14.70[psia]
 Ambient Temperature : 70.00[F]
 Min Ambient Temperature : 40.70[F]
 Max Ambient Temperature : 59.90[F]
 Total Solar Insolation : 1067.00[Btu/ft^2*day]

* Calculation Results *

-- Emission Summary -----

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
Total HAPs	0.020	0.005
Total HC	0.789	0.180
VOCs, C2+	0.789	0.180
VOCs, C3+	0.776	0.177

Uncontrolled Recovery Info.

Vapor	28.0000 x1E-3	[MSCFD]
HC Vapor	27.8400 x1E-3	[MSCFD]
GOR	4.83	[SCF/bbl]

-- Emission Composition -----

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
1	H2S	0.002	0.000
2	O2	0.000	0.000
3	CO2	0.000	0.000
4	N2	0.000	0.000
5	C1	0.000	0.000
6	C2	0.013	0.003
7	C3	0.163	0.037
8	i-C4	0.078	0.018
9	n-C4	0.242	0.055
10	i-C5	0.090	0.021
11	n-C5	0.107	0.024
12	C6	0.031	0.007
13	C7	0.029	0.007
14	C8	0.011	0.003
15	C9	0.002	0.000
16	C10+	0.000	0.000
17	Benzene	0.002	0.000
18	Toluene	0.000	0.000
19	E-Benzene	0.000	0.000
20	Xylenes	0.000	0.000
21	n-C6	0.021	0.005
22	224Trimethylp	0.000	0.000
	Total	0.791	0.181

-- Stream Data -----

No.	Component	MW	LP Oil mol %	Flash Oil mol %	Sale Oil mol %	Flash Gas mol %	W&S Gas mol %	Total Emissions mol %
1	H2S	34.80	0.0298	0.0298	0.0087	0.0000	0.5053	0.5053
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0813	0.0813	0.0003	0.0000	0.0577	0.0577
4	N2	28.01	0.0006	0.0006	0.0000	0.0000	0.0001	0.0001
5	C1	16.04	0.1429	0.1429	0.0000	0.0000	0.0001	0.0001
6	C2	30.07	0.3200	0.3200	0.0290	0.0000	3.1778	3.1778
7	C3	44.10	1.6601	1.6601	0.8534	0.0000	27.3536	27.3536
8	i-C4	58.12	1.0163	1.0163	0.7986	0.0000	9.9376	9.9376
9	n-C4	58.12	4.3102	4.3102	3.7058	0.0000	30.8512	30.8512
10	i-C5	72.15	3.0783	3.0783	2.9686	0.0000	9.2189	9.2189
11	n-C5	72.15	5.0568	5.0568	4.9743	0.0000	10.9826	10.9826

12	C6	86.16	4.2584	4.2584	4.3374	0.0000	2.7512	2.7512
13	C7	100.20	10.6399	10.6399	10.9415	0.0000	2.2322	2.2322
14	C8	114.23	11.1525	11.1525	11.5048	0.0000	0.7184	0.7184
15	C9	128.28	5.6739	5.6739	5.8585	0.0000	0.1223	0.1223
16	C10+	166.00	47.3307	47.3307	48.8933	0.0000	0.0209	0.0209
17	Benzene	78.11	0.5815	0.5815	0.5960	0.0000	0.2101	0.2101
18	Toluene	92.13	0.2191	0.2191	0.2259	0.0000	0.0212	0.0212
19	E-Benzene	106.17	0.0732	0.0732	0.0756	0.0000	0.0023	0.0023
20	Xylenes	106.17	0.6999	0.6999	0.7226	0.0000	0.0186	0.0186
21	n-C6	86.18	3.6746	3.6746	3.7553	0.0000	1.8178	1.8178
22	224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	MW		126.33	126.33	128.16	0.00	58.73	58.73
	Stream Mole Ratio		1.0000	1.0000	0.9942	0.0000	0.0058	0.0058
	Heating Value	[BTU/SCF]				0.00	3278.27	3278.27
	Gas Gravity	[Gas/Air]				0.00	2.03	2.03
	Bubble Pt. @ 100F	[psia]	18.82	18.82	7.89			
	RVP @ 100F	[psia]	75.59	75.59	48.10			
	Spec. Gravity @ 100F		0.804	0.804	0.807			

```

*****
*      Project Setup Information      *
*****
Project File       : \\tsclient\C\projects2\wfs\LMM\Springhill\Springhill 100 bbl Produced Water Tank.ept
Flowsheet Selection : Oil Tank with Separator
Calculation Method  : AP42
Control Efficiency  : 100.0%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No

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Filed Name       : Marcellus Shale
Well Name        : Springhill Compressor Station
Well ID          : 100 bbl Produced Water Tank
Date             : 2011.05.31

```

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*****
*      Data Input      *
*****

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```

Separator Pressure : 23.00[psig]
Separator Temperature : 85.00[F]
Ambient Pressure    : 14.70[psia]
Ambient Temperature : 70.00[F]
C10+ SG             : 0.8990
C10+ MW             : 166.00

```

-- Low Pressure Oil -----

No.	Component	mol %
1	H2S	0.0298
2	O2	0.0000
3	CO2	0.0813
4	N2	0.0006
5	C1	0.1429
6	C2	0.3200
7	C3	1.6601
8	i-C4	1.0163
9	n-C4	4.3102
10	i-C5	3.0783
11	n-C5	5.0568
12	C6	4.2584
13	C7	10.6399
14	C8	11.1525
15	C9	5.6739
16	C10+	47.3307
17	Benzene	0.5815
18	Toluene	0.2191
19	E-Benzene	0.0732
20	Xylenes	0.6999
21	n-C6	3.6746
22	224Trimethylp	0.0000

-- Sales Oil -----

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Production Rate      : 3.8 [bbl/day]
Days of Annual Operation : 365 [days/year]
API Gravity          : 46.0
Reid Vapor Pressure   : 7.70 [psia]
Bulk Temperature     : 60.00 [F]

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-- Tank and Shell Data -----

```

Diameter      : 8.50 [ft]
Shell Height   : 10.00 [ft]
Cone Roof Slope : 0.06
Average Liquid Height : 5.00 [ft]
Vent Pressure Range : 0.06 [psi]
Solar Absorbance : 0.89

```

```
-- Meteorological Data -----
City                : Pittsburgh, PA
Ambient Pressure    : 14.70[psia]
Ambient Temperature : 70.00[F]
Min Ambient Temperature : 40.70[F]
Max Ambient Temperature : 59.90[F]
Total Solar Insolation : 1067.00[Btu/ft^2*day]
```

```
*****
*      Calculation Results
*****
```

```
-- Emission Summary -----
Item                Uncontrolled    Uncontrolled
                   [ton/yr]         [lb/hr]
Total HAPs          0.010          0.002
Total HC            0.489          0.112
VOCs, C2+          0.489          0.112
VOCs, C3+          0.481          0.110
```

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Uncontrolled Recovery Info.
```

```
Vapor      17.4400 x1E-3 [MSCFD]
HC Vapor   17.3300 x1E-3 [MSCFD]
GOR         4.59         [SCF/bbl]
```

```
-- Emission Composition -----
No Component        Uncontrolled    Uncontrolled
                   [ton/yr]         [lb/hr]
1  H2S              0.002          0.000
2  O2               0.000          0.000
3  CO2             0.000          0.000
4  N2              0.000          0.000
5  C1              0.000          0.000
6  C2             0.009          0.002
7  C3             0.103          0.024
8  i-C4            0.048          0.011
9  n-C4            0.149          0.034
10 i-C5            0.055          0.013
11 n-C5            0.066          0.015
12 C6             0.019          0.004
13 C7             0.018          0.004
14 C8             0.007          0.002
15 C9             0.001          0.000
16 C10+           0.000          0.000
17 Benzene        0.001          0.000
18 Toluene        0.000          0.000
19 E-Benzene      0.000          0.000
20 Xylenes        0.000          0.000
21 n-C6           0.013          0.003
22 224Trimethylp 0.000          0.000
Total            0.491          0.112
```

```
-- Stream Data -----
No. Component        MW          LP Oil      Flash Oil  Sale Oil   Flash Gas  W&S Gas   Total Emissions
                   mol %       mol %       mol %      mol %      mol %      mol %      mol %
1  H2S              34.80      0.0298     0.0298     0.0093     0.0000     0.5244     0.5244
2  O2              32.00      0.0000     0.0000     0.0000     0.0000     0.0000     0.0000
3  CO2             44.01      0.0813     0.0813     0.0005     0.0000     0.0931     0.0931
4  N2              28.01      0.0006     0.0006     0.0000     0.0000     0.0001     0.0001
5  C1              16.04      0.1429     0.1429     0.0000     0.0000     0.0001     0.0001
6  C2              30.07      0.3200     0.3200     0.0329     0.0000     3.4850     3.4850
7  C3              44.10      1.6601     1.6601     0.8822     0.0000     27.7080     27.7080
8  i-C4            58.12      1.0163     1.0163     0.8084     0.0000     9.8891     9.8891
9  n-C4            58.12      4.3102     4.3102     3.7350     0.0000     30.5859     30.5859
10 i-C5            72.15      3.0783     3.0783     2.9751     0.0000     9.0958     9.0958
11 n-C5            72.15      5.0568     5.0568     4.9803     0.0000     10.8272     10.8272
```

12	C6	86.16	4.2584	4.2584	4.3352	0.0000	2.7087	2.7087
13	C7	100.20	10.6399	10.6399	10.9308	0.0000	2.1968	2.1968
14	C8	114.23	11.1525	11.1525	11.4917	0.0000	0.7070	0.7070
15	C9	128.28	5.6739	5.6739	5.8516	0.0000	0.1204	0.1204
16	C10+	166.00	47.3307	47.3307	48.8345	0.0000	0.0206	0.0206
17	Benzene	78.11	0.5815	0.5815	0.5955	0.0000	0.2068	0.2068
18	Toluene	92.13	0.2191	0.2191	0.2256	0.0000	0.0209	0.0209
19	E-Benzene	106.17	0.0732	0.0732	0.0755	0.0000	0.0022	0.0022
20	Xylenes	106.17	0.6999	0.6999	0.7217	0.0000	0.0183	0.0183
21	n-C6	86.18	3.6746	3.6746	3.7528	0.0000	1.7895	1.7895
22	224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
MW			126.33	126.33	128.11	0.00	58.50	58.50
Stream Mole Ratio			1.0000	1.0000	0.9945	0.0000	0.0055	0.0055
Heating Value		[BTU/SCF]				0.00	3265.27	3265.27
Gas Gravity		[Gas/Air]				0.00	2.02	2.02
Bubble Pt. @ 100F		[psia]	18.82	18.82	8.02			
RVP @ 100F		[psia]	75.59	75.59	48.68			
Spec. Gravity @ 100F			0.804	0.804	0.807			

```

*****
*      Project Setup Information
*****
Project File       : \\tsclient\C\projects2\wfs\LMM\Springhill\Springhill 24 bbl Produced Water Tank.ept
Flowsheet Selection : Oil Tank with Separator
Calculation Method  : AP42
Control Efficiency  : 100.0%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No

Filed Name         : Marcellus Shale
Well Name          : Springhill Compressor Station
Well ID            : 24 bbl Produced Water Tank
Date               : 2011.05.31

```

```

*****
*      Data Input
*****
Separator Pressure : 23.00[psig]
Separator Temperature : 60.00[F]
Ambient Pressure    : 14.70[psia]
Ambient Temperature : 70.00[F]
C10+ SG             : 0.8990
C10+ MW             : 166.00

```

```

-- Low Pressure Oil -----
No.    Component          mol %
1      H2S                0.0298
2      O2                 0.0000
3      CO2                0.0813
4      N2                 0.0006
5      C1                 0.1429
6      C2                 0.3200
7      C3                 1.6601
8      i-C4               1.0163
9      n-C4               4.3102
10     i-C5               3.0783
11     n-C5               5.0568
12     C6                 4.2584
13     C7                 10.6399
14     C8                 11.1525
15     C9                 5.6739
16     C10+               47.3307
17     Benzene            0.5815
18     Toluene            0.2191
19     E-Benzene          0.0732
20     Xylenes            0.6999
21     n-C6               3.6746
22     224Trimethylp      0.0000

```

```

-- Sales Oil -----
Production Rate      : 1[bbl/day]
Days of Annual Operation : 365 [days/year]
API Gravity          : 46.0
Reid Vapor Pressure  : 7.70[psia]
Bulk Temperature     : 60.00[F]

```

```

-- Tank and Shell Data -----
Diameter             : 5.30[ft]
Shell Height          : 6.00[ft]
Cone Roof Slope       : 0.06
Average Liquid Height : 6.00[ft]
Vent Pressure Range   : 0.06[psi]
Solar Absorbance      : 0.89

```



```
-- Meteorological Data -----
City                : Pittsburgh, PA
Ambient Pressure    : 14.70 [psia]
Ambient Temperature : 70.00 [F]
Min Ambient Temperature : 40.70 [F]
Max Ambient Temperature : 59.90 [F]
Total Solar Insolation : 1067.00 [Btu/ft^2*day]
```

```
*****
*      Calculation Results
*****
```

```
-- Emission Summary -----
Item                Uncontrolled    Uncontrolled
                   [ton/yr]         [lb/hr]
Total HAPs          0.000          0.000
Total HC            0.067          0.015
VOCs, C2+          0.067          0.015
VOCs, C3+          0.060          0.014
```

```
Uncontrolled Recovery Info.
Vapor              2.8700 x1E-3    [MSCFD]
HC Vapor           2.6900 x1E-3    [MSCFD]
GOR                2.87            [SCF/bbl]
```

```
-- Emission Composition -----
No Component        Uncontrolled    Uncontrolled
                   [ton/yr]         [lb/hr]
1  H2S              0.000          0.000
2  O2               0.000          0.000
3  CO2              0.003          0.001
4  N2               0.000          0.000
5  C1               0.000          0.000
6  C2               0.007          0.002
7  C3               0.018          0.004
8  i-C4             0.006          0.001
9  n-C4             0.017          0.004
10 i-C5             0.006          0.001
11 n-C5             0.007          0.002
12 C6               0.002          0.000
13 C7               0.002          0.000
14 C8               0.001          0.000
15 C9               0.000          0.000
16 C10+             0.000          0.000
17 Benzene          0.000          0.000
18 Toluene          0.000          0.000
19 E-Benzene        0.000          0.000
20 Xylenes          0.000          0.000
21 n-C6             0.001          0.000
22 224Trimethylp    0.000          0.000
    Total           0.070          0.016
```

```
-- Stream Data -----
No. Component        MW          LP Oil    Flash Oil  Sale Oil  Flash Gas  W&S Gas  Total Emissions
                   mol %      mol %      mol %      mol %      mol %      mol %      mol %
1  H2S              34.80      0.0298    0.0298    0.0241    0.0000    0.9087    0.9087
2  O2               32.00      0.0000    0.0000    0.0000    0.0000    0.0000    0.0000
3  CO2              44.01      0.0813    0.0813    0.0369    0.0000    5.2457    5.2457
4  N2               28.01      0.0006    0.0006    0.0000    0.0000    0.0003    0.0003
5  C1               16.04      0.1429    0.1429    0.0033    0.0000    1.6794    1.6794
6  C2               30.07      0.3200    0.3200    0.2095    0.0000    15.7255    15.7255
7  C3               44.10      1.6601    1.6601    1.4843    0.0000    29.9417    29.9417
8  i-C4             58.12      1.0163    1.0163    0.9782    0.0000    7.5098    7.5098
9  n-C4             58.12      4.3102    4.3102    4.2123    0.0000    21.5588    21.5588
10 i-C5             72.15      3.0783    3.0783    3.0669    0.0000    5.8290    5.8290
11 n-C5             72.15      5.0568    5.0568    5.0548    0.0000    6.8279    6.8279
```

12	C6	86.16	4.2584	4.2584	4.2815	0.0000	1.6655	1.6655
13	C7	100.20	10.6399	10.6399	10.7146	0.0000	1.3410	1.3410
14	C8	114.23	11.1525	11.1525	11.2366	0.0000	0.4307	0.4307
15	C9	128.28	5.6739	5.6739	5.7176	0.0000	0.0733	0.0733
16	C10+	166.00	47.3307	47.3307	47.6988	0.0000	0.0128	0.0128
17	Benzene	78.11	0.5815	0.5815	0.5853	0.0000	0.1271	0.1271
18	Toluene	92.13	0.2191	0.2191	0.2207	0.0000	0.0128	0.0128
19	E-Benzene	106.17	0.0732	0.0732	0.0738	0.0000	0.0014	0.0014
20	Xylenes	106.17	0.6999	0.6999	0.7053	0.0000	0.0112	0.0112
21	n-C6	86.18	3.6746	3.6746	3.6966	0.0000	1.0975	1.0975
22	224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	MW		126.33	126.33	126.71	0.00	51.21	51.21
	Stream Mole Ratio		1.0000	1.0000	0.9966	0.0000	0.0034	0.0034
	Heating Value	[BTU/SCF]				0.00	2745.96	2745.96
	Gas Gravity	[Gas/Air]				0.00	1.77	1.77
	Bubble Pt. @ 100F	[psia]	18.82	18.82	11.73			
	RVP @ 100F	[psia]	75.59	75.59	64.16			
	Spec. Gravity @ 100F		0.804	0.804	0.805			

**ATTACHMENT D-3
SUPPORTING DOCUMENTS**

GAS ANALYSIS

- Gas Analysis

LAUREL MOUNTAIN MIDSTREAM, LLC
Springhill Compressor Station
General Permit BAQ-GPA/GP-5 Permit Application

Gas Analysis

Gas Analysis No 1010015-04A - Sampled on 10/11/2010

Compound	Formula	Mole % (M%)	Molecular Weight (MW)	Weighted Sum (WS)	Weight % (WS/Sum-WS)	lb/MMscf
Oxygen	O2	0.0000	31.9988	0.0000	0.0000	0.00
Nitrogen	N2	0.4510	28.0134	0.1263	0.7609	332.93
Carbon Dioxide	CO2	0.2350	44.0095	0.1034	0.6228	272.54
Carbon Monoxide	CO	0.0000	28.0101	0.0000	0.0000	0.00
Hydrogen Sulfide	H2S	0.0000	34.0809	0.0000	0.0000	0.00
Methane*	CH4	96.7360	16.0425	15.5188	93.4605	40,894.78
Ethane*	C2H6	2.2410	30.0690	0.6738	4.0582	1,775.70
Propane**	C3H8	0.2080	44.0956	0.0917	0.5524	241.69
i-Butane**	C4H10	0.0300	58.1222	0.0174	0.1050	45.95
n-Butane**	C4H10	0.0430	58.1222	0.0250	0.1505	65.86
i-Pentane**	C5H12	0.0160	72.1488	0.0115	0.0695	30.42
n-Pentane**	C5H12	0.0120	72.1488	0.0087	0.0521	22.81
Cyclohexane**	C6H12	0.0005	84.1595	0.0004	0.0025	1.11
i-Hexanes***	C6H14	0.0079	86.1754	0.0068	0.0410	17.94
i-Heptanes**	C7H16	0.0036	100.2019	0.0036	0.0217	9.51
n-Heptane**	C7H16	0.0017	100.2019	0.0017	0.0103	4.49
i-Octanes**	C8H18	0.0091	114.2285	0.0104	0.0626	27.39
n-Octane**	C8H18	0.0007	114.2285	0.0008	0.0048	2.11
i-Nonanes**	C9H20	0.0001	128.2551	0.0001	0.0008	0.34
n-Nonane**	C9H20	0.0000	128.2551	0.0000	0.0000	0.00
i-Decanes**	C10H22	0.0001	142.2817	0.0001	0.0009	0.37
n-Decane**	C10H22	0.0000	142.2817	0.0000	0.0000	0.00
i-Undecanes***	C11H24	0.0000	156.3083	0.0000	0.0000	0.00
n-Hexane***	C6H14	0.0042	86.1754	0.0036	0.0218	9.54
Benzene***	C6H6	0.0001	78.1118	0.0001	0.0005	0.21
Toluene***	C7H8	0.0001	92.1384	0.0001	0.0006	0.24
Ethylbenzene***	C8H10	0.0000	106.1650	0.0000	0.0000	0.00
Xylenes***	C8H10	0.0001	106.1650	0.0001	0.0006	0.28
Totals:		100.0002	16.6047	16.6047	100.0000	43,756.21

* = Hydrocarbon (HC) ** = also Volatile Organic Compound (EPA-VOC) *** = also Hazardous Air Pollutant (EPA-HAP)

BTU/dscf =	1,025.301	Universal Gas Content =	379.482 scf/lb-mol @ 60 F and 14.696 psia
MW of Gas =	16.605	Pound "X"/scf =	M% of "X" * MW of "X" * 1 lb-mol/379.482 scf
Weight% Total Hydrocarbon (THC) =	98.593	lb THC/MMscf =	43,150.745 = percent of THC = 100.000%
Weight% of Methane (CH4) =	93.461	lb CH4/MMscf =	40,894.783 = percent of THC = 94.772%
Weight% NM/NE VOCs =	1.074	lb VOC/MMscf =	480.259 = percent of THC = 1.113%
Weight% HAPs =	0.064	lb HAP/MMscf =	10.266 = percent of THC = 0.024%
MW Hydrogen (H) =	1.008	MW Nitrogen Dioxide (NO2) =	46.006
MW Carbon (C) =	12.011	MW Sulfur Dioxide (SO2) =	64.064
MW Nitrogen (N) =	14.007	MW Formaldehyde (HCHO) =	30.026
MW Oxygen (O) =	15.999	MW Nitric Oxide (N2O) =	44.013
MW Sulfur (S) =	32.065	MW Hydrogen Sulfide (H2S) =	34.081



MICHIGAN LABORATORY
459 HUGHES DRIVE
TRAVERSE CITY, MICHIGAN 49686
PHONE (231) 947-5777
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www.spl-inc.com

Certificate of Analysis Number: 1010015-04A

FOR: Williams Midstream
Katie Maley
1550 Coraopolis Heights Rd.

Moon Township, PA 15108

CUSTOMER: Williams Midstream
FIELD : PA
LOCATION : Springhill Compressor Station
SAMPLE POINT: Dehydrator Inlet
REPORT DATE: 10/11/2010
SAMPLE DATE: 10/5/2010 @ 12:27
SAMPLED BY: AS
MEMO: GlyCalc

TYPE: Extended Gas
REPORT: C12
CYLINDER: 4
PRESSURE: 695
TEMPERATURE: 76

<u>COMPONENT</u>	<u>MOL %</u>	<u>WEIGHT %</u>	<u>GPM's @ 14:73</u>
N2	0.451	0.761	
CO2	0.235	0.623	
METHANE	96.736	93.458	
ETHANE	2.241	4.058	0.598
PROPANE	0.208	0.552	0.057
I-BUTANE	0.030	0.105	0.010
N-BUTANE	0.043	0.151	0.014
I-PENTANE	0.016	0.070	0.006
N-PENTANE	0.012	0.051	0.004
I-HEXANES	0.0079	0.0410	0.003
N-HEXANE	0.0042	0.0218	0.002
I-HEPTANES	0.0036	0.0217	0.002
N-HEPTANE	0.0017	0.0103	0.001
BENZENE	0.0001	0.0007	NIL
CYCLOHEXANE	0.0005	0.0028	0.0002
TOLUENE	0.0001	0.0006	NIL
I-OCTANES	0.0091	0.0626	0.0046
N-OCTANE	0.0007	0.0048	0.0004
*E-BENZENE	NIL	NIL	NIL
*m,o,&p-XYLENE	0.0001	0.0006	NIL
I-NONANES	0.0001	0.0008	NIL
N-NONANE	NIL	0.0031	0.0002
I-DECANES	0.0001	0.0009	NIL
N-DECANE	NIL	NIL	NIL
I-UNDECANES +	NIL	NIL	NIL
TOTALS	100.000	100.000	0.702