

Comparison of Lab Analysis of Creosote Treated RTDFs to Concentrations of similar Chemicals in Traditional Fuels

Compound Name	National Salvage CRT Avg % of 3 samples taken from 3 different trucks (1)	Stella Jones CRT Avg % of 3 Samples taken from from 3 different trucks (2)	CRT Sample Collected by M.A. Energy Resources (5)	#2 Fuel Oil [see footnotes (3) and (6)]	Appropriate Footnotes for #2 Fuel Oil Assay	Residual Fuel #5 (3)	Bunker C Residual Fuel (3)				
Naphthalene	0.117%	0.290%	0.0444%	0.400%	(3)	0.003%	0.100%				
2-Methyl Naphthalene	0.110%	0.096%	0.0251%	1.890%	(3)		0.470%				
1-Methyl Naphthalene			0.0144%	0.820%	(3)		0.280%				
Methylnaphthalenes						0.409%					
C2-naphthalenes				3.110%	(3)	0.487%	1.230%				
C3-naphthalenes				1.840%	(3)	0.479%	0.880%				
C4-naphthalenes						0.269%					
Acenaphthylene	0.006%	0.0038%	Not detected			0.000%					
Diphenyl (Biphenyl)	0.0260%	0.027%	0.0137%								
Hexachlorobenzene (4)	All samples Non-Detected	All samples Non-Detected	Not detected								
4-methyl-2-pentanone			Not detected								
Quinoline			0.00402%								
Acrolein			Not Detected								
Benzene			Not detected	0.0067%	(6)						
Carbon Disulfide			Not detected								
Chlorobenzene			Not detected								
2-ethyltoluene				0.0194%	(6)						
4-ethyltoluene				0.0400%	(6)						
Ethyl Benzene			0.00000575%	0.0124%	(6)						
Isopropyl Benzene			Not detected	0.0044%	(6)						
n-Hexane			Not detected								
Methylene Chloride			Not detected								
Styrene			Not detected	Not Detected	(6)						
Tetrachloroethene			Not detected								
Trichloroethene			Not detected								
Toluene			Not detected	0.0238%	(6)						
1,2,3-trimethylbenzene				0.2120%	(6)						
1,2,4-trimethylbenzene				0.0720%	(6)						
1,3,5-trimethylbenzene				0.0202%	(6)						
Vinyl Chloride			Not detected								
m,p-xylenes			0.0000018%	0.0420%	(6)						
o-xylene			0.0000148%	0.0185%	(6)						
2,4-Dinitrotoluene	All samples Non-Detected	All samples Non-Detected	not detected								
Acenaphthene	0.143%	0.166%	0.061%			0.011%					
Fluorene	0.149%	0.147%	0.0529%	0.360%	(3)	0.022%	0.240%				
C1-C3 fluorenes						0.318%					
Carbazole	0.0456%	0.0390%		0.0088%	(3)						
Phenanthrene	0.473%	0.52%	0.1930%	0.043%	(3)	0.078%	0.048%				
1-methylphenanthrene				0.017%	(3)		0.004%				
2-methylphenanthrene				0.068%	(3)		0.083%				
C1-C4 Phenanthrenes						0.758%					
Anthracene	0.123%	0.117%	0.0447%			0.010%					
Dibenzofuran	0.117%	0.105%	0.0798%								
Dibenzothiophene						0.003%					
C1-C3-Dibenzothiophene						0.553%					
Fluoranthene	0.257%	0.257%	0.1100%	0.004%	(3)	0.003%	0.024%				
Pyrene	0.197%	0.153%	0.0930%	0.004%	(3)	0.018%	0.002%				
C1-Pyrene						0.057%					

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Compound Name	National Salvage CRTA Avg % of 3 samples taken from 3 different trucks (1)	Stella Jones CRTA Avg % of 3 Samples taken from from 3 different trucks (2)	CRTA Sample Collected by M.A. Energy Resources (5)	#2 Fuel Oil [see footnotes (3) and (6)]	Appropriate Footnotes for #2 Fuel Oil Assay	Residual Fuel #5 (3)	Bunker C Residual Fuel (3)				
Benzo(a)anthracene	0.057%	0.038%	0.0201%			0.004%					
Benzo(a)fluorene											
Chrysene	0.056%	0.053%	0.0182%			0.007%					
C1-C3-Chrysene						0.071%					
Benzo(b)fluoranthene	0.032%	0.018%	0.0128%			0.001%					
Benzo(k)fluoranthene	0.0112%	0.0088%	0.00579%								
Benzo(a)pyrene	0.020%	0.011%	0.00819%			0.002%	0.004%				
Benzo(e)pyrene						0.003%	0.001%				
Indeno(1,2,3-c,d)pyrene	0.0068%	0.0088%	not detected								
Benzo(g,h,i)perylene	0.0065%	0.0083%	not detected			0.001%					
Dibenz(a,h)anthracene	Not detected	Not detected	not detected			0.000%					
<b>Total POM or HAP Measured</b>	<b>1.953%</b>	<b>1.547%</b>	<b>0.801%</b>	<b>9.04%</b>		<b>3.57%</b>	<b>3.37%</b>				
Yellow Shaded Compound Entries are specifically listed in the Hazardous Air Pollutant List											
Orange Shaded Compound Entries are likely considered a POM by EPA, and therefore are on the HAP list by default.											
The EPA footnote at the end of the HAP List for POM's states: "Includes organic compounds with more than one benzene ring, and which have a boiling point greater than or equal to 100 °C."											
Note: If a result is left blank, it means that no analytical result was found for that compound.											
Footnotes:											
(1) Creosote Treated Railroad Ties (CRTA) processed for use as fuel sampled from National Salvage Co. from outside Selma, AL, avg of three samples											
(2) CRTA processed for use as fuel sampled from Stella Jones Processing Located in Duluth, MN, avg. of three samples											
(3) (Semi-volatile organics) (Irwin, R.J., M. VanMouwerik, L. Stevens, M.D.Seese, and W. Basham. 1997. Environmental Contaminants Encyclopedia. National Park Service, Water Resources, (3 cont) Fort Collins, CO. Distributed within the Federal Government as an Electronic Document 7) National Parks Service Water resources Division 1997											
(3 cont.) This reference is divided into chapters by subject material. results for No. 2 Fuel Oil and Bunker C come from reference chapter on #6 Fuel Oil, Table on page 29.											
(3 cont.) The results are from API reference oils. The residual fuel oil #5 comes from the same document, page 31-32.											
(4) Hexachlorobenzene was not detected in any of the six RTDF samples collected by AECOM (all qualified "U"). The laboratory was instructed to include any detections down to the MDL (J-qualified results), (4 cont.) but none were detected. The limits varied based on sample size taken for analysis, The MDL (Method Detection Limit) values reported by the lab for Hexachlorobenzene ranged from <7.8 to <15 mg/kg.											
(4 cont) All RTDF samples from both National Salvage and Stella Jones were Analyzed by Test America, North Canton, using Method 8270C (GC/MS).											
4(cont.) The one sample collected by M.A. Energy Resources was also analyzed using GC/MS was also not detected for hexachlorobenzene.											
(5) These CDF results were from a report submitted to EPA by M. A. Energy Resources as a Categorical Petition for a Non-Waste Determination, submitted February, 2013.											
(6) Volatile Organics for #2 Fuel Oil from "VOC Composition of Current Motor Fuels and Vapors, and Colinearity Analyses for Receptor Modeling" (Jo-Yu Chin, S. Batterman, Chemosphere, 2012 Mar; 86(9): 951-958.											