

WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

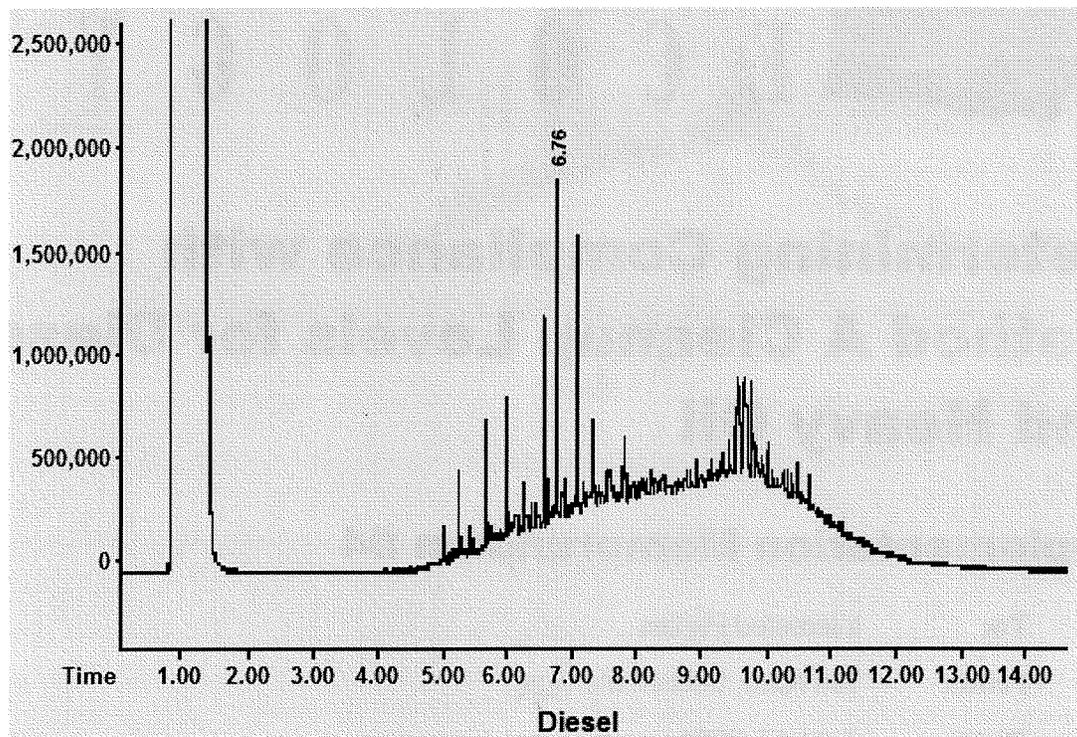
Determining Compliance with Method A Cleanup Levels for Diesel and Heavy Oil

Implementation Memorandum #4

To: Interested Parties
From: Tim Nord, Section Manager
Date: June 17, 2004
Re: Determining Compliance with Method A Cleanup Levels for Diesel and Heavy Oil

It is the practice of some labs to report separate diesel and heavy oil concentrations for the same soil (or water) sample when using the NWTPH-Dx method. This is done without using the NWTPH-HCID method or pre-screening the samples to determine the type of petroleum product present, as recommended in *Analytical Methods for Petroleum Hydrocarbons* (Ecology publication ECY 97-602, June 1997). For example, consider the chromatogram in Figure 1 (next page):

Figure 1: Chromatogram of petroleum-contaminated soil sample using NWTPH-Dx



The lab doing this analysis reported the following results for this soil sample:

Diesel Range Hydrocarbons = 1,600 mg/kg (C12-C25)
Lube Oil Range Hydrocarbons = 1,120 mg/kg (C25-C36)

If these soil concentrations are compared to the Method A values for diesel and heavy oil (lube oil fits in the heavy oil category), one would conclude that this soil sample meets the Method A cleanup levels. This would be incorrect for the following reasons.

- No prescreening or NWTPH-HCID product matching was done to identify this product as diesel and lube oil. It appears the lab simply segmented the chromatogram into carbon fractions arbitrarily designated as representing diesel and lube oil.
- Historic knowledge of the site indicates heavy fuel oil was used at this site, and the type of product represented by this chromatogram best matches a Bunker C product, not a diesel/heavy oil mixture (see figures 2 & 3).

Thus, the lab should not have reported separate values for diesel and lube oil for this sample. Rather, the results should be summed together and reported as a heavy oil concentration of 2,720 mg/kg. If that was done, the soil sample would not meet the Method A table value for heavy oil.

The NWTPH-HCID method is recommended for use in determining the petroleum products within a soil or water sample where the petroleum products are unknown and/or when multiple types of petroleum products are suspected to be present. If this method is not used, Ecology publication ECY 97-602 recommends that the analyst pre-screen the samples to determine the petroleum product.

If the sample results cannot be reasonably matched to a particular product, a Method B cleanup level should be established to determine compliance under MTCA.

If a lab reports separate values for diesel and heavy oil products in the same sample, Ecology staff should request the following information:

- Chromatograms for each sample.
- Chromatograms for the product standards (that the lab used to identify the product).
- Chromatograms of the method blanks.

Ecology staff should consult with staff at the Manchester Lab for assistance in using these chromatograms to determine if reporting separate values is appropriate.

Figure 2: Bunker C fuel oil chromatogram using NWTPH-Dx

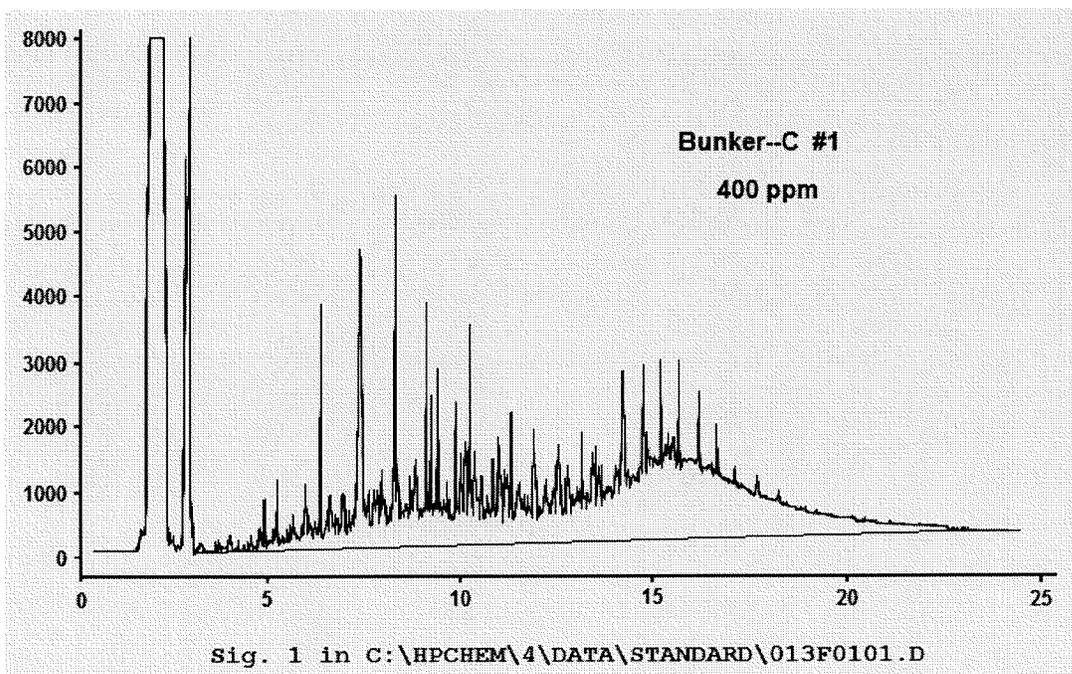


Figure 3: Bunker C fuel oil chromatogram using NWTPH-Dx

