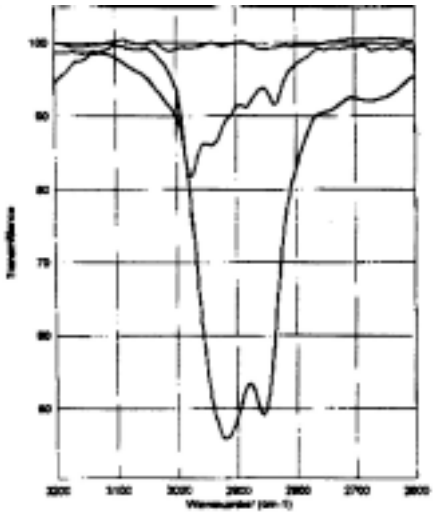
BUCK Scientific

Application Note #AZ3005

Rapid Analysis of Petroleum Hydrocarbons (TPH) in Soil and Water by Infrared Spectroscopy

In 1988 the US EPA estimated that there were 3 to 5 million underground chemical storage tanks (UST's) in the United States, of which up to 1% would develop leaks every year. In response to growing concerns about the quality and future availability of safe drinking water, federal and state programs have begun to systematically replace virtually all UST's installed before 1986 either with above ground tanks, or with new underground tanks having built-in protection systems.

When a UST is removed from the ground, the surrounding soil must be tested to determine whether the tank leaked, and if so, the extent of the contamination.



Infra-red scan showing typical hydrocarbon stretch in the 2800 – 3050cm^{-1} region.

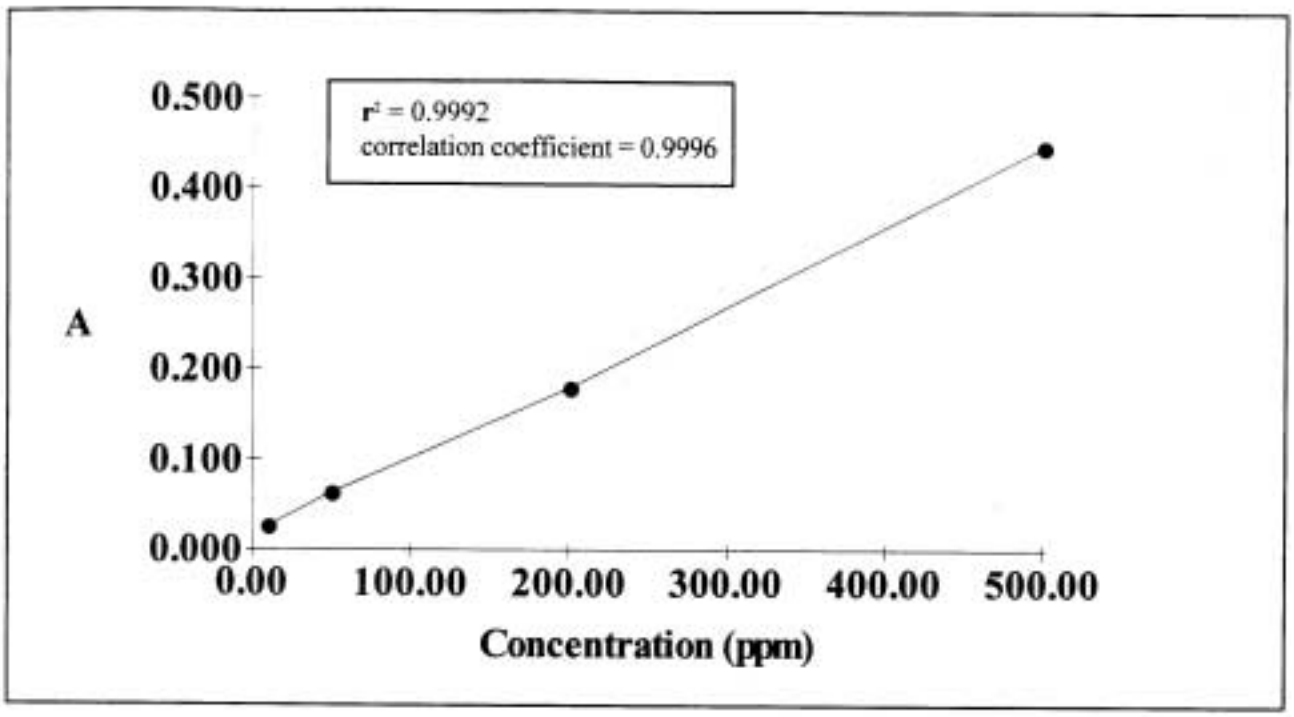
To facilitate the UST replacement program, a simple, inexpensive test method is used to quantify the total petroleum hydrocarbon (TPH) content of the soil tested. Performed in accordance with EPA method 418.1, TPH testing results in a standardized "number", similar to the measurement of "hardness" in water, that simplifies the decision for clean-up and provides a clear goal for treatment.

Buck Scientific's model *HC-404* hydrocarbon analyzer is a rugged, highly sensitive IR spectrophotometer, dedicated to the analysis of TPH by EPA Method 418.1. a sample of soil is shaken with *Freon 113*, which is then filtered, transferred to a quartz cell and analyzed directly. The analysis of 5 soil samples takes less than 15 minutes. The instrument is built for field or lab use, with a foot print of less than one square foot. Using Buck Scientific's certified calibration standards, the *HC-404* can be calibrated in less than five minutes, and will maintain calibration within 1%, even after repeated shutdowns. This means you can be at several sites in a day without wasting time to recalibrate. Your excavator will thank you for buying a Buck (but not until the tank grave is backfilled). The *HC-404* is also suitable for Oil & Grease analyses in accordance with EPA Method 413.2.

Analyst: Kevin Attra

SIC: 0389, 1381, 1382, 1541, 1794, 291, 517, 598, 871, 873, 951

Performance Specifications



Analysis: Total Petroleum Hydrocarbons by Infrared Spectroscopy (EPA 418.1)

Method: Sample extracted in 20 to 30ml Spectrophotometric Grade Freon 113, and analyzed directly. Concentration determined by comparison with known standards.

Standards	Absorbance	Sample Results		
		Sample Id.	*abs*	*conc.*
10.00	0.026	Rock Salt	0.475	543.6
50.00	0.063	duplicate	0.447	509.3
200.00	0.179	Gran Salt	-0.008	ND
500.00	0.447	duplicate	-0.011	ND
		Control (14ppm)	0.043	13.7

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