

CASE STUDY 05 · SOIL SEGREGATION

Site Remediation in Taiwan

A decommissioned petrochemical plant in southern Taiwan: 14 hectares, three treatment streams, and RemScan classifying the soil into each of them.

A petrochemical plant in southern Taiwan was shut down and AECOM carried out a detailed soil and groundwater assessment. High concentrations of Total Petroleum Hydrocarbons (TPH) were found, mainly originating from base oil, lubricants and process by-products. Site remediation included approximately 14 hectares of land and required remediation over a three-to-four-year period.

According to the results of the site investigation, the remediation plan used a combination of biological treatment, soil washing and thermal treatment. All of the contaminated soil was excavated – down to several metres in some areas – and the appropriate remediation method was chosen based on soil texture, contaminant levels and regulatory targets.

Biological treatment was used for low TPH concentration soil. Soil washing and thermal treatment were used for higher TPH concentration soil with sandy or silty textures respectively.

RemScan was employed as a screening tool to help classify and segregate soils for the different remediation methods.

RemScan was calibrated using representative soils from the remediation site. The instrument was then validated by scanning selected soils and sending the scanned soils to an external laboratory for TPH (C₁₀ to C₃₆) analysis using US EPA Method 3570:8015C.



In-field sampling prior to measurement with RemScan.

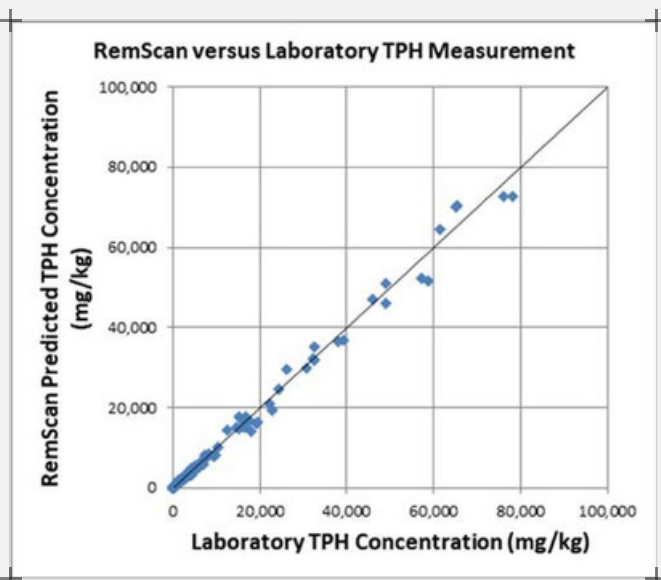
VALIDATION VERSUS LABORATORY

SAMPLE ID	LAB (ALS) TPH (MG/KG)	REMSCAN TPH (MG/KG)*
S1 B-0.5 m	2,900	2,365
B-5 m	4,570	4,410
B-5.5 m	8,410	8,334
B-5.5 m (duplicate)	42,100	41,648

* Average of 10 measurements with mixing between each measurement. Very good agreement between the two sets of readings.

REMSCAN VERSUS LABORATORY

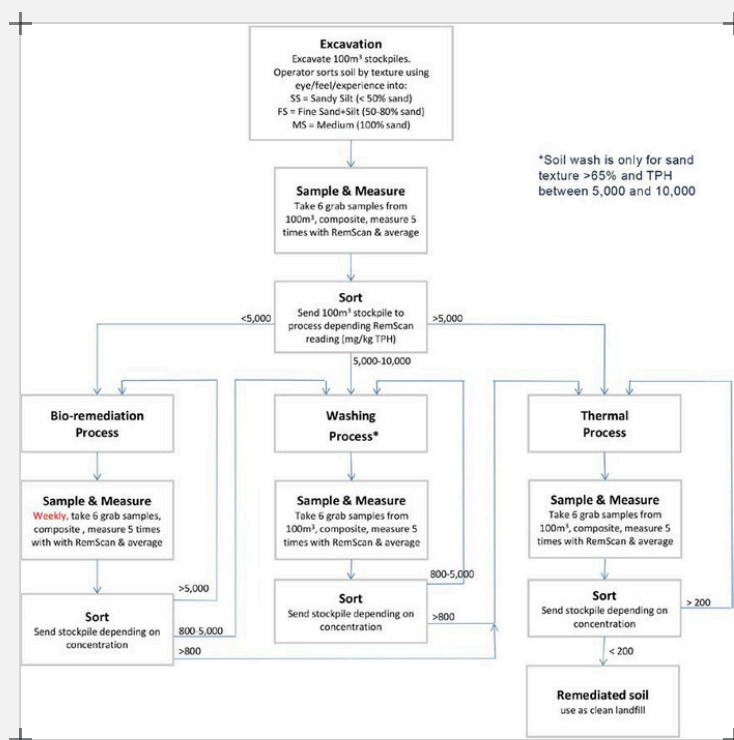
The tight clustering of points about the Y=X line demonstrates RemScan's high level of accuracy for this application. Some validation samples were measured by both RemScan and the laboratory, again demonstrating a high level of accuracy against laboratory analysis.



RemScan-predicted TPH versus laboratory TPH concentration (mg/kg) for the site calibration model.

OUTCOME

Based on these results, the instrument was used as an integral part of the site remediation plan – segregating soils for the various remediation methods and analysing samples before and after treatment. Use of RemScan has resulted in savings of hundreds of thousands of dollars in operational and laboratory costs.



Remediation process flow chart, including the points at which RemScan screening directs the soil stream.



Measuring prepared samples with RemScan.