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Supplementary material

Characterisation of oil contaminated soils by comprehensive multiphase NMR spectroscopy

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Table S1. Time constants with associated R^2 values determined from the cross-polarisation build-up curves measured for various soil–D_2O mixtures shown in Fig. 2 of the main text

Dry indicates the soil was run 'as is' and wet indicates that it was run with field capacity D_2O (~33 % by weight)

Soil Type	T_{CH} (ms)	R^2	Percentage change in T_{CH} upon wetting
Wettable (dry)	0.120	0.97	30.9
Wettable (wet)	0.0829	0.9886	
Non-wettable (dry)	0.0857	0.9356	12.4
Non-wettable (wet)	0.0751	0.8967	

Table S2. Time constants and associated R^2 values determined from the cross-polarisation build-up curves measured for various regions of wettable (control) soil (dry or wet) shown in Fig. 3 of the main text

Dry indicates the soil was run 'as is' and wet indicates that it was run with field capacity D_2O (~33 % by weight). The value for the carboxy group could not be determined (CNBT) because of the poor signal to noise ratio for this region after swelling. The poor signal-to-noise after swelling indicates the carbonyl groups interact with the water efficiently. NA, not applicable

	Dry soil		Wet soil		Percentage decrease
Region	T_{CH} (s)	R^2	T_{CH} (s)	R^2	from dry to wet
Aliphatic	7.97×10^{-4}	0.927	7.12×10^{-5}	0.984	91.07
O-alkyl	8.37×10^{-4}	0.920	4.39×10^{-5}	0.996	94.76
Aromatic	1.07×10^{-3}	0.908	5.16×10^{-5}	0.885	95.16

Carboxy	CNBT	NA	CNBT	NA	CNBT

Table S3. Time constants and associated R^2 values determined from the cross-polarisation build-up curves measured for various regions of non-wettable (contaminated) soil (dry or wet) shown in Fig. 3 of the main text

Dry indicates the soil was run 'as is' and wet indicates that it was run with field capacity D_2O (~33 % by weight)

Region	Dry soil		Wet soil		Percentage decrease from dry to wet
	T_{CH} (s)	R^2	T_{CH} (s)	R^2	
Aliphatic	8.91×10^{-5}	0.955	2.92×10^{-5}	0.989	67.23
O-alkyl	4.29×10^{-5}	0.958	2.68×10^{-9}	0.989	99.99
Aromatic	4.21×10^{-5}	0.946	1.76×10^{-11}	0.940	99.99
Carboxy	6.57×10^{-5}	0.921	1.60×10^{-8}	0.846	99.98

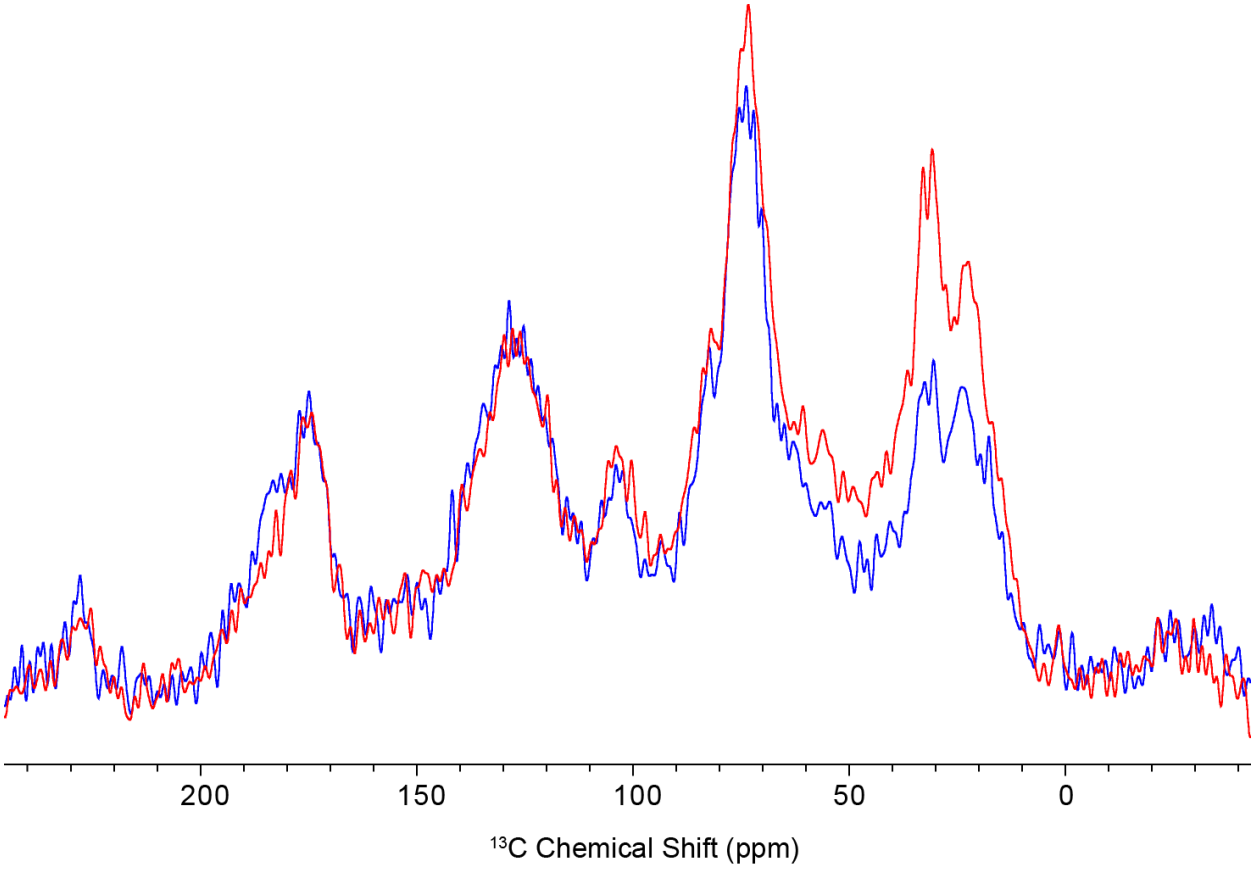

Fig. S1. ^{13}C spectra of the wettable (blue) and non-wettable (red) soil shown with an expanded spectroscopic region in the dry state. Spinning side bands (SSBs) arising from the aliphatic and the carboxy regions are seen between below 0 ppm and above 200 ppm, respectively. We can see that the SSBs in both samples for both regions are within error of each other.