

Table 9.1 Brush Creek Shale Summary ABA Data

Sample Treatment		N	%S			NP		
			Min	Mean	Max	Min	Mean	Max
BCS3-PA	Initial Standard NP	4	0.56	0.58	0.59	96.96	96.97	96.98
BCS3-PA	Initial Modified NP	4	0.56	0.58	0.59	47.07	48.42	49.68
BCS3-PA	Splits Before Leaching	6	0.59	0.63	0.75	21.13	44.66	89.30
BCS3-PA	Splits After Leaching	25	0.44	0.59	1.09	3.99	57.43	106.05

Overall the total sulfur percentages in the splits at the various labs are much more consistent than the NP values, but some unweathered splits have greater sulfur content than the weathered samples (i.e. Labs 3, 5 and 7) as would be expected, but some weathered material had higher sulfur values than the unweathered sample (i.e. Lab 2). Some differences in sulfur content by particle size were also observed with the fines having the higher sulfur values, as expected, at Lab 1 and in Column 1 at Lab 6.

The most troubling aspect of this Brush Creek data set is the tremendous variation in NP values, (as shown in Table 9.8), which appears to be related to differences in fizz ratings on the splits of the same homogenous sample, tested on different dates, and maybe not by the same lab analyst. The unweathered splits at the participating labs range from 21.13 (Lab 5) to 89.30 (Lab 4) and the fizz ratings of the entire Brush Creek data set range from 0 to 3. There is no consistency to the unweathered and weathered sample fizz ratings, for example in Labs 3 and 4, where the unweathered samples have lower fizz ratings than the weathered samples. In summary, no lab shows weathered NP values consistently lower than the unweathered sample, as would have been expected.

Houchin Creek Shale

Of the four shale samples used in the study, the Houchin Creek shale has the highest sulfur content. This shale sample was collected from a surface mine in Indiana by OSM staff from the Mid Continent office. The summary ABA data are contained in Table 9.2 and the raw data are found in Table 9.9. The first four samples in Table 9.9 are the original splits from the homogenization of the large sample volume. The sulfur and NP values for these four samples are consistent, but with two curiosities: Split 16 has a sulfur content about a half a percent less than the other three splits, and three of the four NP values from the revised 1997 method are slightly higher than those for the original method. In most of the labs, except Lab 2, the weathered samples from the columns have less sulfur than the unweathered samples, as would be expected. There is also a large variation in sulfur content by particle size classes in Lab 6, with the fines having the highest sulfur, as reported in previous studies.