

baseline EC measurements exceeded 308 $\mu\text{g}/\text{m}^3$. The remaining 51 mines (30

percent) had at least one sample for which EC exceeded 308 $\mu\text{g}/\text{m}^3$. All

samples taken at 14 of the mines exceeded the proposed interim limit.

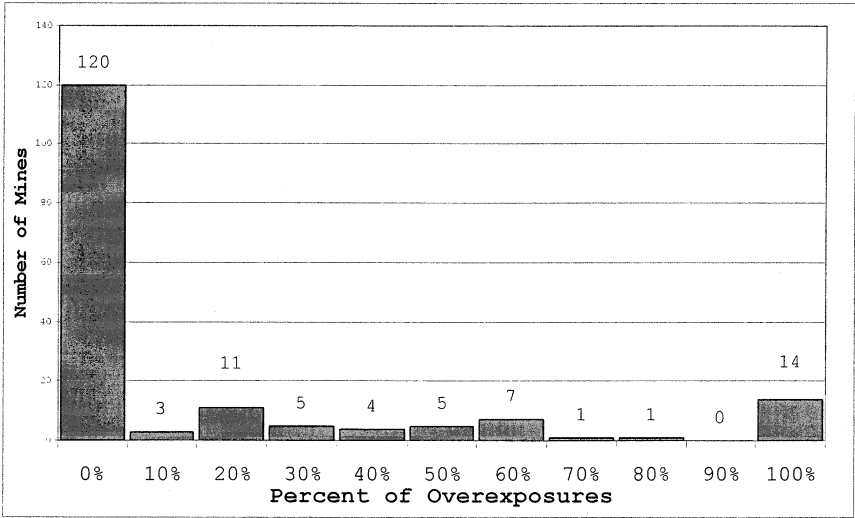


Figure VI-2. Distribution of samples exceeding proposed interim EC limit.

3. Relationship Between Elemental and Total Carbon

Unlike the 31-Mine Study, no special precautions were taken during MSHA's baseline sampling to avoid tobacco smoke or other substances that could potentially interfere with using TC (*i.e.*, EC + OC) as a surrogate measure of DPM. Therefore, the baseline data should not be used to evaluate the OC content of DPM or the ratio of EC to TC within DPM. In the 31-Mine Study, great care was taken to void all samples that may have been exposed to tobacco

smoke or other extraneous sources of organic carbon. Accordingly, the analysis of the EC:TC ratio we present here relies entirely on data from the 31-Mine Study. It is important to note that most of the samples in this study were taken in the absence of exhaust filters to control DPM emissions. Since exhaust filters may have different effects on EC and OC emissions, the results described here apply only to mine areas where exhaust filters are not employed.

Figure VI-3 plots the EC:TC ratios observed in the 31-Mine Study against

the corresponding TC concentrations. The various symbols shown in the plot identify samples taken at the same mine. The EC:TC ratio ranged from 23 percent to 100 percent, with a mean of 75.7 percent and a median of 78.2 percent. Note that the reciprocal of 0.78, which is 1.3, equals the median of the TC:EC ratio observed in these samples.³ The 1.3 TC:EC ratio was the value accepted, under terms of the settlement agreement, for the purpose of temporarily converting EC measurements to TC measurements.

³ The median of reciprocal values is always equal to the reciprocal of the median. This relationship does not hold for the mean.