Wadesville Sandstone (Sample Wadesville #29). Wadesville sandstone was selected as a secondary protocol standard because it has physical and chemical characteristics in marked contrast to the primary standard, the friable "gray-zone" Brush Creek Shale. The Wadesville is a calcareous sandstone that forms a hard lithologic unit (Hornberger et al., 2003). The sample was collected from a large open-pit surface anthracite mine in Schuylkill County, PA, where the mine pool discharge is one of the most alkaline natural discharges in the state of Pennsylvania (alkalinity >400 mg/L). The sample had negligible total sulfur (<0.1 weight percent) and significant NP (255 to 282 ppt). The Wadesville contained significantly more calcium (11.23 weight percent CaO), more carbon dioxide (16.2 weight percent CO_2), and less total sulfur (<0.02 weight percent) than any of the other samples included in this study (Table 5.2). In thin section, the sandstone was homogeneous from chip to chip (Figure 5.24). Coarse-grained carbonate cemented quartz grains; pyrite was sparse (Figure 5.25). XRD analysis estimated the mineralogical composition (in weight percent) as: 42 % quartz, 9% micas and clay minerals, 4% chlorite, 4% feldspar, <1% pyrite, and 38% carbonate minerals (Table 5.4).The low temperature ash treatment produced no mass loss. The sandstone also had the lowest estimated content of amorphous material (15 weight percent). No organic material was observed. SEM images and compositions confirm that the dominant carbonate mineral in the sample is zoned ankerite (Figure 5.26), in agreement with the XRD data. The outermost rims of each carbonate grain are iron-rich relative to the interior parts of the grain.

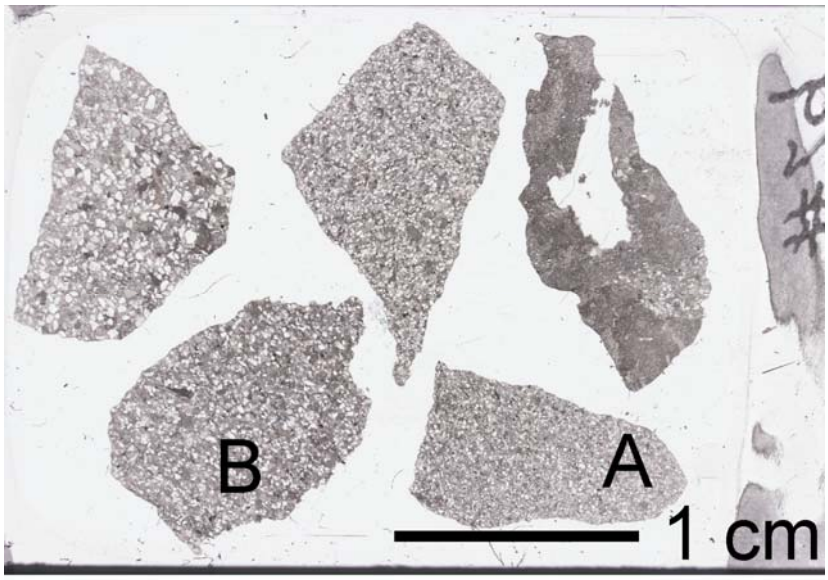

Figure 5.24. Wadesville Sandstone. Scanned image of polished thin section. Note homogeneous texture of this rock.