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Chapter 5

Legal Implications for Mine Mapping Errors and Practical Considerations for Reducing and Managing Risk[1]

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Synopses

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[1] The first section of this chapter is written by Hans Naumann, a professional mining engineer, who outlines a series of applied methods to identify the edges of mine workings, and identifies the overarching requirement of confirming the discoveries made as a result of geophysical exploration and testing techniques. The second part of this chapter, beginning at § 5.05, discusses liability for engineers and land surveyors, written by Marco Rajkovich, registered professional engineer – mining, registered land surveyor, certified underground mine foreman, and attorney. Attorney John T. Boyd prepared the final portion of the chapter, beginning at § 5.09, providing a discussion of federal and state efforts to collect abandoned mine maps.

§ 5.01. Introduction.

Mining of all types and in all minerals relies heavily on mapping for a variety of reasons. One of the most important bases for maps is the relative location of prior mined works to those currently being excavated. Accurate mapping is important to underground mining ventures because an unanticipated cut-through into an adjacent mine can have significant health, safety, and operational consequences. Most authorities having regulatory jurisdiction over the mining industry require that engineers and/or land surveyors engaged in preparing mine plans take all steps necessary to identify these adjacent mines and to incorporate sound methods in their plans that will accommodate those mines. Similarly, the design and construction of surface facilities in mined-over areas need to accommodate these underground mine workings for surface subsidence and mine gas/water migration-related issues.

To date, the best efforts of these professionals can still fall short of preventing an unanticipated cut-through, surface subsidence event, or surface gas/water migration problem. Many factors play into each event. Among the most significant is that an accurate location of those mines relative to the mine or facility under design (or in operation) was not

known. This often is the case even when mine maps purported to represent the final shape of the perimeter of the mine can be found. Confirmation of that mine presence, no less its perimeter, is therefore an essential component of the engineer's/land surveyor's task.

§ 5.02. Geophysical Exploration Methods.

Mining of all types (surface and underground) of a variety of minerals has been conducted within boundaries of the United States well prior to the time of the first settlers. This mining has been conducted at various levels of intensity. These range from minerals collected for domestic and/or household use to those recovered on a commercial basis. The results of the former activities are rarely mapped and their presence today is noted mostly by accident. Many of the commercial-grade mines predating the promulgation of mining regulations may have been mapped in a cursory manner and if those were underground mines, often cannot be physically located in the field today. Even after the development and adoption of mining regulations addressing mapping requirements, most mine workings (surface or underground) were not mapped using traversed/coordinate methods, and if they were, they did not share a common coordinate grid. Only with the advent of electronic distance measuring equipment did the adoption of state plane grids become a practice with the mining industry. Relatively recently, both federal and state mine regulating agencies are now requiring the documentation of at least one coordinated reference point on all mining maps. Furthermore, steps are being taken at both the federal and state level to replace the paper map archives with electronic (often scanned) images of mine maps collected at the various agency offices. In short, the mine mapping requirements, and the attendant quality of the maps, have been the subject of an evolving process and the correlation of mine maps to specific sites, mining horizons, and date has yet to be fully accomplished. Finally, those mines that were never mapped or whose maps have been lost and/or destroyed may never be identified unless identified by exploratory processes.

§ 5.03. Relevance to the Coal Mining Industry.

The substance of this chapter can be applied to all types of mining; however, the focus of this chapter will be the coal mining sector and its specific character. Specific attention is often addressed to the allowable