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**DISCUSSION PROTOCOL**

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**BACKGROUND**

1. Please describe your firm's mining-related activities. Is your firm executing or planning a shift in strategy?
2. What are the most important market and management trends governing your market segment? How are they affecting your firm?
3. In relation to its competitors, how does your firm excel or stand out in terms of the mix of technologies deployed?

**CRITICAL TECHNOLOGY TRENDS AND DEVELOPMENTS**

4. Considering the issue of mine productivity, what are the most critical factors (bottlenecks) you are tackling to improve productivity?
5. What are the recently available (or currently emerging) mining innovations critical to the success of your firm (or to the mining companies with which your firm works)?
6. What impact do these mining innovations have in terms of
  - Enhancing productivity?
  - Developing new products/markets?
  - Opening up new reserves/extending existing ore bodies?
  - Health, safety, and the environment?
7. Are the innovations part of a broad trend in the mining sector?
  - What kinds of firms (facilities) are adopting these technologies (e.g., big/small, new/old)?
  - What is their state and rate of diffusion across the sector?

8. What longer-term technological and management breakthroughs are likely to make the greatest difference to your firm and, more generally, to the mining industry?

#### **THE INNOVATION ENVIRONMENT**

9. What factors impact technology innovation and diffusion in the mining industry (e.g., R&D, commodity prices, consolidation, globalization)?
10. What is your assessment of the character and source of innovation in your segment?
  - Incremental gains or breakthrough advances?
  - Spinoffs from other industries?
11. Looking at the stream of technology/practice innovations you have identified as critical, where are they coming from (e.g., technology users/suppliers, in-house R&D, research institutions, abroad)?
12. How do health, safety, and environmental regulatory drivers governing the industry affect critical-technology changes?
13. The market for mining technologies is becoming increasingly global. How does globalization affect technology trends in the U.S. mining industry?