Current Issues in Seafloor Massive Sulfide Mining Development

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ABSTRACT

The shortage of metals around the world has brought about renewed interest in the development of seafloor massive sulfide (SMS). There being no precedent for SMS development, then a lot of problems are concerned about. Among them, these are problems that must be overcome for successful development, and others that challenge the idea of development itself. The former are standard problems attendant on all new developments. While the latter are new problems arising as the result of increasing diversity of ocean use, and will require considering possible trade-offs with ocean mining and another activities such as bioprospecting. Given to those backgrounds, as part of an examination of the trade-off problem between SMS development and the other activities, the authors examined SMS development techniques, possible impacts on organisms, and the legal framework for bioprospecting. In consequence, they discovered that the respective knowledge bases were not only inadequate, but that a three-way deadlock situation prevails.

KEY WORDS: seafloor massive sulfide; ocean mining; environmental impact; bioprospecting; UNCLOS; CBD.

INTRODUCTION

Currently, there are some activities that prepare for the commercial mining of SMS. A preparation of commercial mining of the deep sea was conducted in the past, however it has failed. Consequently, if it were done successfully, it is the first case. As it is the first case, developers must consider variety of possible problems. For example, while future demand for copper is predicted to rise dramatically, the necessary mining development is not expected to keep pace (Masuda et al., 2005; Tokimatsu et al., 2004). Also, by 2050, the cumulative use amounts of Cu, Pt, Sn, Ni, Sb, and In will exceed present reserve bases (NIMS website). In fact, since the beginning of the century, metallic resources have been under strain, leading to collapse of the supply and demand balance, soaring prices, and incidents of metals theft around the world (Fukushima, 2008). While temporary respite from these extreme conditions might occur from time to time, the prevailing view is that they will only intensify over the long run. This is the background against which the development of previously un-mined deep-sea mineral resources is now receiving so much attention.

One reason why commercial development of deep-sea mineral resources did not get underway earlier, was that it was not considered economically viable. However, estimates based on recent year’s metal prices prove that viability (Yamazaki et al., 2002, 2003), making commercial development a more realistic proposition. Among the resources being considered, activities leading to the development of SMS have been especially prominent. Nautilus Minerals, Inc., headquartered in Vancouver, has announced that it contracted with the Jan de Nul Company of Belgium on October 4, 2006 to build a mining vessel to be used from 2009 in the commercial mining of SMS in the Solwara 1 Strait in Papua New Guinea (Nautilus Minerals web site). Outlooks for production operations have since been postponed, but on October 7, 2009, Nautilus Minerals Inc. secured rights to port capacity at Rabaul for handling ore. Likewise, Neptune Minerals, headquartered in London, is proceeding with development preparations by acquiring mining areas in New Zealand, Papua New Guinea, Micronesia, and Vanuatu. Korea’s Ministry of Land, Transport and Maritime Affairs (MLTM) announced that it had acquired from the Kingdom of Tonga sole exploration rights for deep-sea mineral resources in a 20,000 square kilometer area within its EEZ (Chosun com website). Also, Nauru Ocean Resources, Inc., and Tonga Offshore Mining, Ltd., applied in 2008 to the International Seabed Authority (ISA) for exploratory rights to prospect in manganese nodule reserved areas; this application was taken up for discussion at the ISA’s Annual Session in 2009. Japan has also begun making preparations for commercial mining, with the passing of a Basic Act on Ocean Policy in June 2007 and the