3. Options for Controlling Pollutants From Metal Mines

There are two options for reducing pollutants in storm water discharges; end-of-pipe treatment and implementing Best Management Practices to prevent and/or eliminate pollution. Discharges from mining operations are in some ways dissimilar to other types of industrial facilities. Mining facilities are often in remote locations and may operate only seasonally or intermittently, yet need year-round controls because significant materials remain exposed to precipitation when reclamation is not completed. These characteristics make resource intensive end-of-pipe management controls less desirable. A comprehensive storm water management program for a given plant may include controls from each of these categories. Development of comprehensive control strategies should be based on a consideration of site and facility plant characteristics.

a. End-of-Pipe Treatment. At many ore mining and dressing facilities, it may be appropriate to collect and treat the runoff from targeted areas of the facility. This approach was taken with 11 industrial subcategories within the ore mining and dressing industry, subject to national effluent limitation guidelines mill process wastewater and mine drainage. There are several areas where effluent limitation guidelines influence the permitting strategy for storm water discharges: whenever storm water and mill process wastewater and mine drainage combine, the storm water discharge is also subject to effluent limitation guidelines; to meet the numeric effluent limitation guidelines, most, if not all, facilities must collect and temporarily store onsite runoff from targeted areas of the plant; the effluent limitation guidelines do not apply to discharges whenever rainfall events, either chronic or catastrophic, cause an overflow of storage devices designed, constructed, and maintained to contain a 10-year, 24-hour storm; and most technology-based treatment standards, used for treating discharges subject to effluent limitation guidelines, are based on relatively simple technologies such as settling of solids, neutralization, and drum filtration.

For storm water discharges that are not covered by the effluent limitations guidelines, BMPs may be an appropriate means for limiting pollutant contributions. However, in cases of poor quality storm water discharges (e.g., low pH, high metals, etc.), treatment may be necessary to protect receiving waters.

b. Best Management Practices. Effective storm water management controls for limiting the offsite discharge of storm water pollutants from ore mining and dressing facilities are source reduction BMPs. Source reduction BMPs are methods by which discharges of contaminants are controlled with little or no required maintenance. Examples of these types of controls include source reduction diversion dikes, vegetative covers, and berms. Source reduction practices are typically (but not always) low in cost and relatively easy to implement. In some instances, more resource intensive treatment BMPs, including sedimentation ponds, may be necessary depending upon the type of discharge, types and concentrations of contaminants, and volume of flow.

The selection of the most effective BMPs will be based on site-specific considerations such as: facility size, climate, geographic location, hydrogeology and the environmental setting of each facility, and volume and type of discharge generated. Each facility will be unique in that the source, type, and volume of contaminated storm water discharges will differ. In addition, the fate and transport of pollutants in these discharges will vary. The management practices discussed herein are well suited mechanisms to prevent or control the contamination of storm water discharges associated with mining activity.

The following four categories describe best management practice options for reducing pollutants in storm water discharges from ore mining and dressing facilities: discharge diversions; sediment and erosion control; capping of contaminated sources; treatment.

Because ore mining and dressing is largely a land disturbance activity, BMPs that minimize erosion and sedimentation will be most effective if installed at the inception of operations and maintained throughout active operations and reclamation of the site. From the construction of access and haul roads, to closure and reclamation activities, implementation of BMPs is often essential to minimizing long-term environmental impacts to an area.

Part 1 group application data indicates that few storm water BMPs have been implemented at sampling facilities. The group application process did not require a description of BMP locations, and did not require applicants to describe the number of identical BMPs implemented at each site. As a result, the effectiveness of BMPs, for storm water management, at these facilities cannot be evaluated.

Many BMPs were not listed by facilities because they have been implemented to treat waters subject to effluent limitation guidelines, and are not exclusively used for storm water management. For instance, 29 percent of the sampling subgroup reported using ponds for sediment control and collection. Since some facilities classified as SIC Code 10 are subject to effluent limitation guidelines, sedimentation ponds may be implemented at greater proportions than indicated in part 1 of the group applications.

Because BMPs described in the part 1 data are limited, EPA is providing an overview of supplementary BMPs for use at ore mining and dressing facilities. However, due to the site-specific nature of facilities within this sector, BMPs cited do not preclude the use of other viable BMP options. Table G-3 summarizes BMP options as they apply to land disturbance activities at ore mining and dressing facilities. Sources of BMP information include: "Sediment and Erosion Control: An Inventory of Current Practices-Draft," EPA, April 20, 1990; "Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices," EPA, September, 1992, (EPA 832-R-92-006); "Best Management Practices for Mining in Idaho," Idaho Department of Lands, November 1992; and "Erosion & Sediment Control Handbook," Goldman et al., McGraw-Hill Book Company, 1986.