

Chapter NR 270

MINING AND MILLING ORES

(Interim Effluent Limitations)

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Note: Pursuant to chapter 147, Wis. Stats. and under the procedure of section 227.027, Wis. Stats., the department of natural resources has promulgated interim effluent limitations which were in effect for one year. These interim effluent limitations will be periodically replaced by permanent effluent limitations.

NR 270.01 Purpose The purpose of this chapter is to establish interim effluent limitations for discharges from industrial point sources identified herein as authorized by section 147.04 (5), Wisconsin Statutes.

History: Cr. eff. 2-28-75.

NR 270.02 Applicability. These interim limitations apply to Standard Industrial Classification Codes:

1011 iron	1062 manganese
1021 copper	1064 tungsten
1031 lead and zinc	1069 ferroalloys except Va
1042 lode gold	1092 mercury
1043 placer gold	1093 titanium
1044 silver	1094 uranium, radium, vanadium
1051 aluminum	1099 not elsewhere classified

History: Cr. eff. 2-28-75.

NR 270.03 Application of interim limitations. These limitations should be applied only in very selected circumstances in the hard rock milling industry. The effluent limitations are expressed only in concentrations. Due to the wide variations in ore types processed in this industry, a pound-per-day limitation has been found to be impractical.

History: Cr. eff. 2-28-75.

NR 270.04 Effluent characteristics and treatment technology.
 (1) Mine Discharge - Mine discharge is commonly characterized by high acidity, and high metal and sulfate concentrations, resulting from the oxidation of sulfate minerals to form sulfuric acid and metal ions. Major reduction in the pollution caused by mine discharge can be achieved by procedures such as reducing the flow of the water to the mines, reducing the exposure of sulfide minerals to the atmosphere or by flooding abandoned mine working to reduce the rate of sulfide oxidation. Treatment of coal mine discharge usually takes the form of lime or limestone neutralization of free acidity, followed by sedimentation to remove the various metal hydroxides. Common treatment techniques are neutralization and sedimentation, with further metals removal by precipitation of the remaining metals as

metal sulfide; for example, by adding barium sulfide. The sludge can be smelted to recover the various metals. The reagent requirements are minor, as most of the metal ions are removed during the neutralization process.

(2) Milling Discharge - Waste from milling consists of a water stream, frequently containing dissolved metals, is a carrier for ground mineral fragments. These latter usually include metal sulfides, subject to oxidation if exposed to atmospheric conditions. Other materials of concern include reagents, such cyanide, added to the milling circuit. The mill waste generally is alkaline.

Common treatment techniques utilized by the milling industry consist of discharging the slurry into a tailings pond, with sufficient detention to reduce the suspended-sediment concentration to approximately 20 mg/l. The clarified water is then either decanted to receiving streams or, in an increasing number of cases, recycled as mill process water. The latter procedure is preferred for environmental considerations. Following sedimentation, the waste should be neutralized and treated for metals removal by sulfide precipitation.

(3) Cyanide - Cyanide is frequently used in milling, both to dissolve gold and to prevent flotation of pyrite. Several other less toxic reagents are known to function as well as cyanide as pyrite suppressant, and are recommended. Cyanide often decomposes during detention in a tailings pond. If the tailings pond decant contains high concentration of cyanide, it should be reduced by the use of the alkali chlorination procedure.

History: r. eff. 2-28-75.

NR 270.05 Table of interim effluent limitations.

Parameter	Recommended Limits
Suspended Solids	20 mg/1
Cyanide (Total)	When cyanide compounds are used in the milling process, effluent from the waste abatement system shall not exceed 0.02 mg/1.
Radioactivity	Discharge concentration shall not exceed 1/10 of Bureau of Standards Handbook 69 values, or such Standards as may be developed. RA-226 concentration shall be as close to background as possible but in no case to exceed the addition of 1.0 picocurie per liter.
Iron (Dissolved)	0.5 mg/1
Manganese	0.1 mg/1.

History: Cr. eff 2-28-75.