



NR 270

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

L. P. Voigt
Secretary

BOX 450
MADISON, WISCONSIN 53701

IN REPLY REFER TO: _____

STATE OF WISCONSIN)
)
DEPARTMENT OF NATURAL RESOURCES) SS

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, L. P. Voigt, Secretary of the Department of Natural Resources and custodian of the official records, do hereby certify that the annexed copy of Natural Resources Board Order No. W-19-74 (E) has been compared by me with the original order on file in this office of the Department of Natural Resources, Madison, Wisconsin, and that the same is a true copy thereof, and of the whole of such original order; that said order was duly passed and published as set forth therein.

IN TESTIMONY WHEREOF, I have hereunto set my hand at the Pyare Square Building in the City of Madison, this 17th Day of January, 1974.


L. P. Voigt, Secretary

(SEAL)

STATE OF WISCONSIN NATURAL RESOURCES BOARD

.....
IN THE MATTER of creating NR 270 .
of the Wisconsin Administrative .
Code .
.....

ORDER NUMBER W-19-74 (E)

ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES
BOARD CREATING RULES

Pursuant to authority vested in the State of Wisconsin Natural Resources Board by sections 147.04(5) and 227.027, Wisconsin Statutes, the State of Wisconsin Natural Resources Board hereby creates rules as follows:

CHAPTER NR 270
Interim Effluent Limitations for the
Mining and Milling Ores
Wisconsin Pollutant Discharge Elimination System

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.

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 |

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.

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 workings 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 as 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 a pyrite suppressant, and are recommended. Cyanide often decomposes during detention in a tailings pond. If the tailings pond decant contains high concentrations of cyanide, it should be reduced by the use of the alkali chlorination procedure.

270.05 Table of Interim Effluent Limitations

| <u>Parameter</u> | <u>Recommended Limits</u> |
|------------------|---|
| Suspended Solids | 20 mg/l |
| Cyanide (Total) | When cyanide compounds are used in the milling process, effluent from the waste abatement system shall not exceed 0.02 mg/l. |
| Radioactivity | Discharge concentration shall not exceed 1/10 of Bureau of Standards Handbook 69 values, or such Standards as may be developed. RA-226 concentrations 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/l |
| Manganese | 0.1 mg/l |

The rules contained herein shall take effect upon publication on
February 1, 1974.

Dated at Madison, Wisconsin JAN 17 1974

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

By 
L. P. Voigt, Secretary

(SEAL)