

Beneficial Use of Industrial Byproducts

2000 Usage Summary

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**Wisconsin Department of Natural Resources
Bureau of Waste Management**

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This report is intended to provide a summary of information regarding the beneficial use of industrial byproducts during calendar year 2000 as reported under the requirements specified in Chapter NR 538 of the Wisconsin Administrative Code. In addition this report will also provide information on the total statewide amount of industrial byproducts generated and beneficially used from generators who do not participate in the program.

Chapter NR 538 is a regulatory program designed to encourage and simplify the reuse of industrial byproducts. Generators voluntarily obtain an initial certification that qualifies them for specified, pre-approved reuses based on the characterization of their material. Participating generators are required to maintain their certification through the submittal of an annual report to the Department of Natural Resources.

Industrial byproduct means paper mill sludge, coal ash including slag, foundry excess system sand, foundry slag or other non-hazardous solid waste with similar characteristics as determined by the Department of Natural Resources. The primary source of information for this report is obtained from data provided in the initial and annual certifications of generators that are required to report under Chapter NR 538.

The required reporting for Chapter NR 538 provides only enough information to determine the amount of industrial byproducts that are generated and beneficially used annually by those generators or their designee who report under the rule. For example, if the amount of a generator's industrial byproduct, beneficially used or stored for beneficial use, is less than 1000 cu. yds. in the calendar year, no annual report is required. In addition, generators which were granted individual beneficial use exemptions prior to January 1, 1998 and issued under s.289.43(7) or (8), Stats. are not required to report under this rule. Because of these limitations it is only possible to estimate the total amount of industrial byproducts generated from all sources on a statewide basis.

Additional data that was obtained to supplement the information under Chapter NR 538 include: annual reports of individual beneficial use exemptions; the 2000 landfill tonnage reports submitted to the Department by licensed solid waste disposal facilities; and other information provided to the Department by direct contacts made to individual generators. This additional information was used to provide a more comprehensive report as to what industrial byproducts are generated and beneficially used by all generators in the state.

Beneficial Use of Industrial Byproducts in 2000 As Reported Under Chapter NR 538

This section of the report presents information on those generators that voluntarily participate in the program specified under Chapter NR 538. According to the information provided, the total amount of industrial byproducts available for beneficial use in 2000 was 1,881,355 tons. The amount of industrial byproducts beneficially used was 1,466,657 tons. The percentage of industrial byproducts used under Chapter NR 538 was approximately 78% of the materials generated or available. The specific categorical breakdown is detailed below.

1. *Coal Ash and Slag* - The amount of coal ash generated was 1,425,140 tons. The amount beneficially used was 1,157,153 tons. The percentage of coal ash and slag that was beneficially used was approximately 81% of the materials generated or available. Most of the material generated was from coal fired electric utility generating stations. Examples of the beneficial use of this material include, concrete additives, flowable fill material, aggregate for sub-base of roads, and soil stabilization under roads.
2. *Foundry Sand and Slag* - The amount of foundry sand generated was 456,215 tons. The amount beneficially used was 309,504 tons. The percentage of foundry sand and slag that was beneficially used was approximately 68% of the materials generated or available. Most of the material was used for geotechnical fill material in construction projects.
3. *Paper Mill Sludge* - The beneficial use of paper mill sludge is primarily regulated under the Wastewater program. As a result, there were no generators that submitted initial and annual certifications under Chapter NR 538.

Statewide Beneficial Use of Industrial Byproducts in 2000

This section of the report provides estimates on the total amount of industrial byproducts generated and used in the state in 2000. It includes information from those generators of industrial byproducts that participate in the voluntary program specified under Chapter NR 538, those generators that do not beneficially use their material, and those generators that received approvals to beneficially use their materials prior to the passage of Chapter NR 538.

The total amount of industrial byproducts generated statewide was 4,676,273 tons. The amount of industrial byproducts beneficially used was 2,902,263 tons. The percentage of industrial byproducts used was approximately 62% of the materials generated or available. The information presented here includes data obtained from those generators or their designee that reported under Chapter NR 538 and supplemented by other data specified below.

1. *Coal Ash and Slag* - Data obtained from those sources that reported under Chapter NR 538, information on industrial and institutional coal boilers supplied by the Wisconsin Paper Council and the Wisconsin Department of Administration, and the 2000 landfill tonnage report, indicate that 1,815,621 tons of ash were generated in the state. The amount beneficially used was or 1,307,284 tons. The percentage of coal ash and slag that was beneficially used was approximately 72%. The primary beneficial use of the ash from the industrial and institutional boilers was unbonded surface course for roads, cold weather road abrasive, confined structural fill, and daily cover at landfills.
2. *Foundry Sand and Slag* - Data obtained from those sources that reported under Chapter NR 538 and the 2000 landfill tonnage report indicate that 1,192,652 tons of foundry sand and slag were generated in the state. The amount beneficially used was 536,979 tons. The percentage of foundry sand and slag beneficially used was approximately 45%. The primary beneficial use of foundry sand from those facilities which are not required to submit data under Chapter NR 538 is daily cover material at landfills. The amount of foundry sand and slag used as daily cover was 213, 175 tons.
3. *Paper Mill Sludge* - Information submitted to the Waste Management Program can account for only a portion of the paper mill sludge generated or beneficially used. Information on the amount of paper mill sludge used as daily cover at landfills and the amount of paper mill sludge landfilled in the state can be found in the 2000 landfill tonnage report. Information is also available from one facility in the state (MINERGY) that receives paper mill sludge from a group of paper mills in the Neenah area. This company reports the annual amount of paper mill sludge brought to the facility for processing. The information from these sources accounts for 1,038,803 tons of sludge generated and 407,566 tons beneficially used. The percentage of sludge beneficially used is approximately 39%. The beneficial uses of the material include: daily cover at landfills, energy recovery, and aggregate production.

Information not available to the Waste Management Program is the total amount of sludge generated statewide and the amount of sludge which is landspread or the amount of sludge that is combusted for energy recovery internally at a paper mill. Therefore, the figures reported above underestimate the amount paper mill sludge generated or beneficially used.

Data obtained from the Wisconsin Paper Council indicates that approximately 1,668,000 tons of paper mill sludge was generated in the state for the year 2000. They also report that 1,058,000 tons of paper mill sludge was beneficially used. This data represents those pulp and paper mills that participate in the Pollution Prevention Partnership (P3). P3 participants include most, but not all mills in the state. The percentage of sludge beneficially used is approximately 63%. The figures reported in this data set do segregate the amount of material landspread, combusted for energy recovery, etc or other beneficial uses.

Other Beneficial Use Projects

There were other beneficial uses of industrial byproducts to report in calendar year 2000. These beneficial uses were not reported in the annual certifications required for generators under Chapter NR 538 or the statewide totals estimated for 2000. The beneficial uses of industrial byproducts reported here is a project that occurred in 2000 but the material used had been landfilled or land disposed in years prior to 2000.

STH 26/USH 41- The Wisconsin Department of Transportation (WDOT) used 75,903 tons of foundry process waste in constructing a highway embankment for State Highway 26 east from the bridge over United States Highway 41 to the southeast ramp and under the ramp. This project involved the partial excavation of foundry waste from a closed landfill in the Town of Algoma in Winnebago County. The closed landfill was used by Mercury Marine. The remaining foundry waste at this landfill which could exceed over 100,000 tons is scheduled to be used in future WDOT projects in the area.