

Beneficial Use of Industrial Byproducts

1999 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 1999 as reported under the requirements specified in Chapter NR 538 of the Wisconsin Administrative Code. In addition this summary will also estimate the total statewide amount of industrial byproducts beneficially used from all generators. 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 not possible to estimate the total amount of industrial byproducts generated from all sources on a statewide basis nor the total amount beneficially used from just those generators that report under Chapter NR 538.

Additional data that was obtained to supplement the information under Chapter NR 538 include: annual reports of individual beneficial use exemptions; the 1999 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.

Summary of the Beneficial Use of Industrial Byproducts in 1999 As Reported Under

Chapter NR 538

In 1999 the Department received 3 initial certifications and 45 annual certifications. According to the information provided, the total amount of industrial byproducts available for beneficial use in 1999 was 1,361,449 cu yds or 1,617,333 tons. The amount of industrial byproducts beneficially used was 1,066,056 cu. yds. or 1,205,166 tons. The percentage of industrial byproducts used under Chapter NR 538 was

approximately 75% 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 1,128,162 yds. or 1,240,978 tons. The amount beneficially used was 903,534 cu. yds. or 993,887 tons. The percentage of coal ash and slag that was beneficially used was approximately 80% 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 subbase of roads, and soil stabilization under roads.
2. Foundry Sand and Slag - The amount of foundry sand generated was 323,571 cu. yds. or 433,555 tons. The amount beneficially used was 208,238 cu. yds. or 278,735 tons. The percentage of foundry sand and slag that was beneficially used was approximately 64% 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 1999

This section of the report estimates the total amount of industrial byproducts generated and used in the state in 1999. 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 Department of Administration, and the 1999 landfill tonnage report, indicate that 1,450,568 cu. yds. or 1,595,625 tons of ash were generated in the state. The amount beneficially used was 1,050,198 cu. yds. or 1,155,218 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 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 1999 landfill tonnage report indicate that 938,470 cu. yds. or 1,232,894 tons of foundry sand and slag were generated in the state. The amount beneficially used 388,418 cu. yds. or 506,469 tons. The percentage of foundry sand and slag beneficially used was approximately 41%. 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.

2. 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 1999 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 1,195,533 tons of sludge generated and 449,729 tons beneficially used. The percentage of sludge beneficially used is approximately 38%. Information not readily available is the amount of sludge landspread and the amount of sludge combusted for energy recovery internally at a paper mill. Therefore, these figures underreport the amount generated or beneficially used.

Data obtained from the Wisconsin Paper Council indicates that approximately 1,730,000 tons of paper mill sludge was generated in the state for 1999. They also report that 1,150,000 tons of paper mill sludge was beneficially used. The figures reported in this data set do include the amount of material landspread and the amount of sludge combusted for energy recovery at other facilities. The percentage of sludge beneficially used is approximately 66%. Chapter NR 538 does not address landspreading, but for the purposes of this report it will be included as a beneficial use. The other beneficial uses of the material include; daily cover at landfills, energy recovery, and aggregate production.

Other Beneficial Use Projects

There were other beneficial uses of industrial byproducts to report in calendar year 1999. These beneficial uses were not reported in the annual certifications required for generators under Chapter NR 538 or the statewide totals estimated for 1999. The beneficial uses of industrial byproducts reported here is a project that occurred in 1999 but the material used had been landfilled or land disposed in years prior to 1999.

This project was the excavation of coal ash from landfills owned by Wisconsin Electric Power Company (WEPCO). WEPCO has proposed to excavate and reuse the ash from nine of its landfills where bottom and fly ash was placed over a period of years. The coal ash will either be reburned at its Pleasant Prairie Generating Station or used for sand/gravel aggregate substitutes. A pilot project demonstrating the feasibility of this has been completed. The company will be reporting the amount of material recovered annually as the project progresses over the next five years.