

NR 538 Byproduct Uses- Scenarios and Assumptions - **DRAFT- 5/5/17**

NR 538.10

	Allowable Beneficial Uses with Direct Contact Risks	DHS Notes
(6)	Soil or Plant Additive	Assume that this use does not need to be evaluated by DHS.
(7)	Capped Transportation Facility Embankment	Capped. No exposure risk to public.
(8)	Unconfined Geotechnical fill	Exposure risk to public limited to periods when material is uncovered and exposed. DNR to insert language in code to limit exposure.
(9)	Nonmetallic Mine Reclamation	Basically the same exposure scenario as unconfined fill.
(10)	Unbonded Surface Course	Highest exposure risk to public of these various uses.
(11)	Bonded Surface Course	Lower risk than Unbonded Surface Course (#10)
(12)	Decorative Stone	Use to be removed from code and to be addressed on case by case basis
(13)	Cold Weather Abrasive	This use also potentially constitutes an exposure risk to public, but limited in terms of quantities and application.
(14)	Blasting Grit/Abrasive	Assume that this use does not need to be evaluated by DHS.

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NR 538.10(8) and (9): Unconfined geotechnical fill including use in mine reclamation

This scenario is considered an insignificant exposure when the fill is covered and seeded.

However, fill projects currently are often left uncovered for several months while the project is filling but final cover has not yet been applied.

Current Code Restrictions

- Prohibited in residential areas.
- Requires 2ft of soil cover and seeding. Gravel can be used as a substitute for topsoil and seed if needed for parking surfaces.

Proposed Code Restrictions

- Same as current restrictions but the Department will propose the addition of language restricting the time material can be uncovered. Proposed draft language includes beneficial use projects utilizing fill materials must be completed within one year of first accepting industrial byproduct material. If the beneficial use project requires more than one year of filling, the project shall be planned in phases with each years' worth of filling completed and capped prior to initiation of filling the next phase. If no filling of industrial byproduct has occurred within 30 days, all exposed byproduct material shall be covered with an interim cover consisting of a waterproof tarp, at least 6 inches of native soils, or other cover material as approved by the Department. Proposed restrictions are subject to change based on consideration of additional information and comments.

NR 538.10(10): Unbonded Surface Course

Application Locations

Uses mentioned in code (but not restricted to these uses) include surface course material in unpaved driveways, parking areas and recreation or exercise trails, including the following:

- road shoulders
- farm lanes
- rural driveways/access roads (industrial only)
- parking lots – industrial and recreational (e.g. park parking lots)
- recreational hiking, biking and ATV trails

Current Code Restrictions

- Cumulative thickness of 6” or less. DOT spec for unbonded surface course is to lay down & compact the material in 3 inch lifts. “Cumulative” means there would be 2 of the 3-inch lifts.
- Department concurrence for >6” thickness or >1,000 cu. Yds
- Industrial byproducts used as surface course must conform to the requirements of Wisconsin department of transportation standard specifications for highway and structure construction applicable to base materials, and may be placed at a cumulative thickness of 6 inches or less and in areas separated by at least a 25 foot vegetated buffer to a navigable surface water.
- Prohibited in residential areas.

Proposed Code Restrictions

- Existing prohibitions and language for use will remain with exception of concurrence.
- The requirement for concurrence for >6” or >1,000 cu yds. will be removed since the material is used as a product applied at approved rates.
- "Residential area" means properties that are zoned as residential, are in areas planned for residential zoning under a master plan approved or adopted by a local municipal authority or an area within 100 feet of a human residence.

DOT Info

Also referred to as “dense graded base” in DOT literature. According to 305 Standard Specifications, the recommended size gradation is ¾ inch aggregate with no more than 5-15% passing P200 (silt and clay-sized particles). The application rate is still 3 inches, but could be up to 1 foot thick in a specific use as road shoulders. DOT 301 Standard Specifications allow aggregate composition of no more than 75% byproduct materials. Most applications would meet the DOT specifications, but certain applications may be different and would not adhere to the 75% mixture limitation (could be up to 100% byproduct material).

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Unbonded Surface Course Exposure Scenario: **ATV (and Bicycle) use on Recreational Trail**

- *Activity description:* Child & adult exposure from mountain bike or ATV use on recreational trails.
- *Exposure pathways:* Incidental ingestion, dermal, inhalation
- *Age:* Child & adult
- *Risk Values* Hazard Quotient of 0.2, Target Risk of 1×10^{-6}
- *Exposure Frequency (EF):* 20 days/yr ^[1]
- *Exposure Time (ET):* 8 hrs/day ^[2]
- *Exposure Factor (Dilution):* 100% byproduct material (conservative)
- *Particulate Emission Factor (PEF):* ATV: 4,579,803 m³/kg, BIKE: 7,973,437 m³/kg ^[3]

Air Modeling Assumptions:

Trail moisture content:	0.2%	ATV weight:	800 lb
Trail silt content:	15%	ATV traffic:	50 vehicles/hr (central tendency value)
Trail width:	3,048 m²		

Notes:

[1] 20 days per year = 1-2 days/week x 12-20 weeks/year. Based on middle range of assumptions used in Amery-Dresser Health Consultation (<http://www.atsdr.cdc.gov/hac/pha/amerydressertrailhc/amery-dresserhc012307.pdf>) professional judgment of Gary Eddy, DNR recreational trails engineer.

[2] Professional judgment of a reasonable day of ATV use.

[3] PEF developed from average modeled air concentrations by DNR air modelers. Scaled to 50 vehicles per hour, based on professional judgment of Gary Eddy, DNR recreational trails engineer.

Unbonded Surface Course Exposure Scenario 2: **Occupational Farm exposure scenario**

- *Activity description:* Adult farm-worker exposure from driving farm equipment and walking and working on and around farm lanes and road shoulders. (large ATV/UTV at dairy farm type setting would be a worst case scenario)
- *Exposure pathways:* Incidental ingestion, dermal, inhalation
- *Age:* Adult
- *Risk Values* Hazard Quotient of 0.2, Target Risk of 1×10^{-6}
- *Exposure Frequency (EF):* 240 days/yr ^[4]
- *Exposure Time (ET):* 8 hrs/day (conservative) ^[5]
- *Exposure Factor (Dilution):* 100% byproduct material (conservative)
- *Particulate Emission Factor (PEF):* 22,899,015 m³/kg ^[6]

Air Modeling Assumptions:

Trail moisture content:	0.2%	UTV weight:	2000 lb
Trail silt content:	15%	UTV traffic:	10 vehicles/ hr
Trail width:	3,048 m²		

Notes:

- Residential exposure does not apply due to 100ft restriction from residences.

[4] 240 days per year = 6 days/week x 40 weeks/year. Basis is the assumption that 12 weeks of the year ground is frozen.

[5] A conservative slag material exposure time for an occupational farm work day.

[6] PEF developed from average modeled air concentration by DNR air modelers. Scaled to 10 vehicles per hour, per Gretchen Wheat, DNR Water Resources Engineer, based on CAFO Environmental Analysis Questionnaire for Pinnacle Dairy.

NR 538.10(11): Bonded Surface Course

Bonded surface course is more protective than unbonded. Unbonded results will apply.

Application Locations

- Road shoulders, farm lanes, rural driveways, parking lots
- Roadways and airport runways

Proposed Code Restrictions

- Must meet DOT specifications for use (see below).

DOT Info

DOT refers to this as “seal coat” or “chip seal” and requires an aggregate of ¾ inch with no more than 2% passing P200 (silt and clay). The current application rate is 18 lbs. per square yard of roadway, which translates into 1.98 tons per 100 linear feet of a 20-foot wide roadway. Often the aggregate is 100% coal slag.

~~NR538.10 (12): Decorative Stone – Deleted~~

NR 538.10(13): Winter Road Abrasive

Application Locations

- State and federal roads and highways
- City/ municipal roads
- Industrial park roads or industry owned parking lots
- Residential sub-division roads (if have ditches)
- Would not be applied on Private residential driveways

Current Code Restrictions

- Winter-time applications only.
- Only allowed on roads with a rural cross-section (meaning roads without curbs or gutter and that have wide ditches. Presence of ditches mean that industrial byproduct doesn't run off into sewers, houses tend to be further set back from road and therefore reduce exposure to residents.)
- Must follow specs and application rates recommended in state highway maintenance manual

DOT Info

Particles must be smaller than ¼ inch, the majority must be medium to coarse sand, no more than 30% fine sand, and 5% or less silt to clay size particles. Application rate has changed since 1996. DOT recommends an application rate of no more than 600-1000 lbs. per lane mile with a 5% salt mixture. Coal slag is typically mixed at no more than a 50% mix with sand, but a 100% mix would be conservative. Use of coal slag is typically restricted to limited problem areas such as sharp curves and at the base of steep inclines since sand is cheaper and easier to obtain.

NR 538.10(14): Blasting Grit Abrasives

Proposed New Code Language:

Blasting grit or abrasives produced through the crushing, washing and sieving of granular industrial byproducts such as coal bottom ash and foundry slag.

Potential Exposure:

Very limited potential for public exposure. Byproduct material would be processed at an industrial facility subject to OSHA limits for occupational exposure and bagged for sale and industrial use at facilities that need to clean or remove paint from metal surfaces.

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