

Recommendations for Winter Traction Materials Management on Roadways Adjacent to Bodies of Water

by

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EXECUTIVE SUMMARY

Compliance with water quality regulations along with a desire to minimize adverse environmental impacts have led to the need for assessing practices to better manage winter traction materials on roadways adjacent to water bodies. Winter traction materials, if not handled properly, may have negative environmental effects on water bodies adjacent to roads. Highway runoff carrying chemicals and abrasives from winter maintenance activities has been identified as a source of non-point source pollution, and the Montana Department of Transportation is committed to minimizing the impacts of such activities. To further understand these impacts and identify ways to mitigate them, a literature review, a survey and consultations were conducted to produce this report.

Although salt and other chloride-based deicers are difficult to remove from highway runoff and can have negative impacts on water bodies, they are typically quickly diluted to concentrations for which there are little measurable effects. Sand and other suspended solids have a greater potential to cause negative impacts but are relatively easy to remove from highway runoff. As such, best management practices should focus on the reduction and removal of these particles from highway runoff.

Wherever possible, a combination of both structural and non-structural BMPs, or best management practices, should be employed to minimize the environmental impacts of winter traction materials. Structural BMPs treat or mitigate highway runoff after it goes off the roadways, and non-structural BMPs reduce the amount of traction materials applied on roadways while maintaining winter mobility and public safety. Strategies can be implemented in the domain of technology, management, or both. Strategies may vary, depending on the specific climate, site, and traffic conditions. The crux is selecting an appropriate suite of BMPs that can function most effectively for a given set of conditions.

This report focuses on the cold region and rural transportation perspective, and discusses the structural BMPs potentially applicable in Montana in greater detail, including the applicability, site criteria, engineering characteristics, safety concerns, maintenance issues, costs, effectiveness in the presence of snow, and sediment removal efficiency. Despite the challenges of winter conditions, structural BMPs such as ponds, wetlands, and vegetated swales and filter strips, can still remove high levels of sediment from runoff if designed, sited, installed, and maintained properly.

This report also summarizes the primary non-structural BMPs used to reduce the use and thus minimize the environmental impacts of winter traction materials, including: incorporating environmental staff into construction and maintenance, proper training of maintenance professionals, erosion control, snow fences, snow storage, street sweeping, improved anti-icing and de-icing practices, improved sanding practices, appropriate application rate, and snowplow technologies. Among these, anti-icing strategies, road weather information systems, the Maintenance Decision Support System, and advanced snowplow technologies are highly recommended for use in Montana.