

Environmental Effects Of Deicing And Anti Icing Chemicals

"TRB's National Cooperative Highway Research Program (NCHRP) Synthesis 449 : Strategies to Mitigate the Impacts of Chloride Roadway Deicers on the Natural Environment documents the range of methods, tools, and techniques used by transportation agencies to minimize the environmental impact of chloride-based roadway deicers"--Publisher's description.

Presents quantitative nat. est. of the magnitude of transport's. impacts on the environ. It is the most comprehensive compilation of environmental and transport. data to date. Addresses all primary modes of transport. (highway, rail, aviation, and maritime transport) and all environ'l. media (air, water, and land resources), and covers the full "life-cycle" of transport., from construction of infrastructure and mfg. of vehicles to disposal of vehicles and parts. The impacts of transport. extend beyond the air quality impacts of vehicle travel. Presents a framework for developing various types of indicators and for categorizing transport. activities that affect the environ. Illustrated.

**Guidelines for the Selection of Snow and Ice Control Materials to Mitigate Environmental Impacts
Highway Deicing**

**Study of Environmental Effects of De-icing Salt on Water Quality in the Twin Cities Metropolitan Area, Minnesota
Enhanced Biological Attenuation of Aircraft Deicing Fluid Runoff Using Constructed Wetlands
An Overview of Social, Economic, and Environmental Implications**

"For decades the United States has relied on application of road deicers for the purpose of winter road maintenance to provide safe transportation for the majority of U.S. commuters in northern states. Road deicers are a necessity but are linked to contamination of surrounding environments, including effects on water systems, vegetation, and soil quality. While sodium chloride is the most common road deicer, a variety of alternatives have been implemented. Each deicer alternative has different deicing abilities and a range of environmental impacts that, thus far, have primarily been compared during their application phase. This research conducts an environmental lifecycle analysis of four road deicers in order to incorporate the manufacturing, processing, transportation, and distribution phases along with the effects associated with the product's end-of-life application. The four road deicers that are investigated include sodium chloride, calcium chloride, magnesium chloride acetate, and beet juice molasses (OBPE). They are evaluated based on a case study performed in Rochester, New York. This case study is used to represent population densities and environmental composition in regions where this research would be most applicable. This paper offers a framework to holistically compare environmental effects of road deicers pre- and post- application."--Abstract.

The deicing and anti-icing of airfield surfaces is required by the Federal Aviation Administration to ensure the safety of passengers; however, when performed without discharge controls in place, airport deicing operations can result in environmental impacts.

A Literature Review

Deicing Planning Guidelines and Practices for Stormwater Management Systems

Deicing Practices in Iowa

Chemical Deicers and the Environment

The Use of Deicing Salts in Minnesota

A literature review is presented which covers chemical transformation of urea, aquatic toxicity, nitrogeous oxygen demand and entrophication. Several feasible control technologies for urea runoff are examined, including source control, land application, trickling filter, breakpoint chlorination, and ammonia stripping. (Author).

Environmental Impact of Highway Deicing

Technical Characteristics and Environmental Impacts of Deicing Chemicals

Preliminary data summary airport deicing operations (revised).

Indicators of the Environmental Impacts of Transportation

Review of Literature on the Environmental Impact of De-icing Compounds and Snow Disposal

Aircraft Deicing/anti-icing Fluid Performance, Toxicity, and Environmental Impact

Deicing agents for removal of ice and snow from highways and streets are essential to wintertime road maintenance in most areas of the U.S. Due to the ever-increasing use of highway deicing materials, there has been growing concern as to environmental effects resulting from these practices. The state-of-the-art report critically reviews the available information on methods, equipment and materials used for snow and ice removal; chlorides found in rainfall and municipal sewage during the winter; salt runoff from streets and highways; deicing compounds found in surface streams, public water supplies, groundwater, farm ponds and lakes; special additives incorporated into deicing agents; vehicular corrosion and deterioration of highway structures and pavements; and effects on roadside soils, vegetation and trees. Highway deicing can cause injury and damage across a wide environmental spectrum. Recommendations describe future research, development and demonstration efforts necessary to assess and reduce the adverse impact of highway deicing.

Chemical Deicers and the Environment provides a complete discussion of chemical deicer technology and history in the United States and Canada. The book describes engineering applications, maintenance procedures, economic evaluations, in addition to environmental problems and concerns relative to the use of chemical deicing. It also provides a technical appraisal of the latest technology to stimulate further research and discussion directed toward achieving a more integrated approach for the application of new deicers that will protect motor vehicles, highways and infrastructures, and the environment. Chemical Deicers and the Environment will be a useful reference volume for scientists, legislators, transportation engineers, environmentalists, consultants, and concerned individuals interested in

Read Book Environmental Effects Of Deicing And Anti Icing Chemicals

learning about the economic and environmental advantages and disadvantages of today's chemical deicers.
Comparing Salt and Calcium Magnesium Acetate

An Economic Analysis of the Environmental Impact of Highway Deicing. Final Report
Pavement Deicing

Environmental Impact of Highway Deicing

An Environmental Lifecycle Comparison of Road Deicers Using Hybrid Modeling Techniques to Capture
Effects During Early Processing Stages

This work has been selected by scholars as being culturally important, and is part of the knowledge base of civilization as we know it. This work was reproduced from the original artifact, and remains as true to the original work as possible. Therefore, you will see the original copyright references, library stamps (as most of these works have been housed in our most important libraries around the world), and other notations in the work. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. As a reproduction of a historical artifact, this work may contain missing or blurred pages, poor pictures, errant marks, etc. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

The Naval Facilities Engineering Service Center partnered with Wetland Solutions Inc., Anteon Inc., University of Western Washington and University of Colorado have demonstrated the ability of a constructed subsurface flow (SSF) treatment wetland to reduce the negative environmental effects of aircraft deicing operations. The field-scale, 0.6 acre SSF wetland was designed to treat runoff from the application of aircraft deicing fluid (ADF) at Westover Air Reserve Base in Springfield, Massachusetts. While exact chemical composition of ADFs are proprietary, ADF consists of approximately 80 percent propylene or ethylene glycol, 18 percent water, and 2 percent of additives for improved functionality. Environmental impacts of ADF usage are the potential of high five-day biochemical oxygen demand (BOD) and low dissolved oxygen (DO) in receiving waters. Extreme conditions could create eutrophication, algal blooms, acute fish die-off, and ecological risks from both low DO and toxic additives in the ADF. The SSF wetland demonstrated the ability to reduce ADF discharge concentrations by 80 percent. The technology is safe for use at air facilities because it does not produce a desirable bird habitat since all flow is below ground surface.

An Environmental Model for Predicting Impacts from Deicing Salts

Environmental Effects of Chemical De-icing

A Review of Snow and Ice Removal Management Practices, Salt Use Effects, and Alternatives

Facts You Should Know about Effects of Deicing Salt on the Environment

Aviation and the environment : results from a survey of the nation's 50 busiest commercial service airports : report to Representative James L. Oberstar, Ranking Democratic Member, Committee on Transportation and Infrastructure, House of Representatives

Examines the total cost of salt and calcium magnesium acetate (CMA), including the indirect

cost of application and indirect costs to the environment, infrastructure, and motor vehicles. This report focuses on defining the true cost of salt, which is the most popular deicer and the standard of comparison for most other deicing products.

Growth in the Denver-metro area has led to an increased impact on the environment due to winter maintenance activities. According to the Regional Air Quality Council, the use of sand as a traction aid contributes up to 45% of the particulate air pollution (PM sub 10) in the Denver area. The Environmentally Sensitive Sanding and Deicing Practices at the University of Colorado at Denver investigated literature and current practices from a wide variety of sources to arrive at a document which summarizes the current state of knowledge about deicing practices and their effect on human health and the environment. Topics include: properties of snow and ice, roadway traction, anti-skid materials, air quality impacts of anti-skid materials, water quality impacts of deicing chemicals, deicing chemicals, equipment to apply deicers, snow and ice management practices, and current practices obtained from interviews and site visits. Topics for further research are also discussed. This report recommends that the use of sand be reduced, that sand be swept up as soon as practical, that the use of alternative deicers be considered, that winter maintenance activities be timed for optimal efficiency, and that the Colorado Department of Transportation conduct technology transfer seminars around the State to increase awareness of environmental impacts.

Evaluation of the Environmental Impacts and Alternative Technologies of Deicing/anti-icing Operations at Airports

The Environmental Impact of 4(5)-methylbenzotriazole from Aircraft Deicing Operations

Strategies to Mitigate the Impacts of Chloride Roadway Deicers on the Natural Environment

Airport Deicing Operations

Effects of Highway Deicing Chemicals on Shallow Unconsolidated Aquifers in Ohio--final Report

A study was conducted to generate knowledge on the environmental effects of de-icing salt, particularly sodium chloride (NaCl), on water quality in Minnesota, especially the Twin Cities Metropolitan Area (TCMA). The Mississippi River receives substantial sodium chloride inputs from the Minnesota River and waste water treatment plants as it passes through the TCMA. In addition, road salt applications in the TCMA use about 350,000 short tons of NaCl every year. A chloride budget

at the scale of the TCMA and on individual sub-watersheds in the TCMA indicates that about 70% of the road salt applied in the TCMA is not carried away by the Mississippi River. Rates of seasonal road salt use are correlated with snowfall, road miles and population. Salinity in TCMA lakes increases in winter and decreases in summer. Ionic composition of dissolved substances in lakes of the TCMA suggests unnaturally high sodium and chloride concentrations compared to lakes and other water bodies in the Midwestern U.S. Data indicate a rising trend in urban lake water salinity over the last 30 years. Shallow groundwater in the TCMA, especially near major roadways, has started to show increasing chloride concentrations. Salinity trends in lakes and shallow aquifers of the TCMA are of concern.

Highway, Rail, Aviation and Marine Transport

Environmental Impact of Highway Deicing - Scholar's Choice Edition

Environmental Effects and Treatment Alternatives for Urea Runoff from Airfield De-Icing Operations

Final Environmental Impact Report

Preliminary Data Summary