

## State Planning and Research Program Quarterly Report

**PROJECT TITLE:** *Understanding the Effectiveness of Non-Chloride Liquid Agricultural By-Products and Solid Complex Chloride/Mineral Products Used in Snow and Ice Control Operations*

**OBJECTIVES:** • Determine and document the effectiveness and impacts of non-chloride liquid agricultural by-products and solid complex chloride/mineral products used in snow and ice control operations; and  
• Unravel the mechanisms (if any) by which these products contribute to anti-icing, deicing, corrosion inhibition, etc.

**PERIOD COVERED:**

Oct. 1, 2014 – Dec. 31, 2014

**PARTICIPATING AGENCIES:**

Western Transportation Institute, Montana State University – Prime  
Monte Vista Associates LLC, Arizona - Subcontractor  
MLT Group LLC, Minnesota - Subcontractor

**PROJECT MANAGER:** Tom Peters

**SP&R PROJECT NO:**

**PROJECT IS:**

**LEAD AGENCY:** Mn/DOT

Planning  
 Research & Development

**PRINCIPAL INVESTIGATOR:**

Laura Fay

**ANNUAL BUDGET:**

\$188,718

**PROJECT EXPENDITURES TO DATE:**

\$154,096.36

**WORK COMPLETED:**

*Project Management*

A teleconference was held with the project panel in November 2014 to discuss progress and next steps specifically with regard to which products should be used for the final Task 4 deicer mechanism testing.

Task 1. Literature Review (100% completed)

The draft literature review was submitted and some minor comments were received from the panel. These comments (along with more recent literature) have been addressed and will be incorporated into the Task 5 manual and Task 6 final report.

Task 2. Identify Products (100% completed)

The team has identified the 10 products commonly for further investigation.

Task 3. Survey (100% completed)

The team surveyed experts at state and local agencies to gather their experience with the use and performance of such alternative deicing products. After approval by the Clear Roads panel, the survey questionnaire was distributed to the Clear Roads member State DOTs and APWA Subcommittee on Winter Maintenance. A total of 31 responses were received from 16 different states. The survey results have been summarized.

Task 4. Laboratory Testing (95% completed)

The lab work has made significant progress, with all ten selected products tested for eutectic curve, ice melting capacity, thermal properties (via DSC), corrosion to carbon steel (via both PNS/NACE test and electrochemical potentiodynamic polarization test), chloride concentration, etc. These have enabled the testing of at least three hypotheses. The products for the final deicer mechanism testing were identified by the Project Panel in the last quarter and testing of these products has begun.

Task 5. Development of a Best Practices Manual (10% completed)

Task 6. Final Report and Presentation (30% completed)

Task 7. Video (10% completed)

We have a meeting schedule for the month with the subcontractor The MLT Group to discuss winter footage to gather this winter for use in the Task 7 video.

**SUMMARY OF ACTIVITIES EXPECTED TO BE PERFORMED NEXT QUARTER:**

Work in the coming quarter will focus on finishing the Task 4 Laboratory Testing, developing content for the Task 5 Best Practices Manual, further developing the Task 6 Final Report with new information, and working with the subcontractor the MLT group in the development of the Task 7 Video.

**STATUS AND COMPLETION DATE:**

The project is on schedule and on budget. Completion date – Sept. 31, 2015