

***'Performance of Recycled Asphalt Shingles (RAS) in Hot Mix Asphalt'***

**National Pooled Fund Study TPF-5(213)**

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April 15, 2010

During the second quarter, January 1, 2010 through March 31, 2010, the TPF-5(213) team achieved the following components on the project:

1. The subcontracts with the Minnesota DOT and Debra Haugen were completed during the reporting period. ISU is working with the University of Minnesota on finalizing its subcontract agreement and will be completed in the next quarter.
2. ISU hosted the second TPF-5(213) technical advisory committee (TAC) on February 4-5, 2010, in Overland Park, Kansas. Partners from Indiana DOT, Minnesota DOT and Wisconsin DOT were not able to attend the meeting, however, Roger Olson and Jim McGraw from the Minnesota DOT participated by Web Conferencing. Iowa DOT participated by Web Conferencing on February 4<sup>th</sup> and attended the meeting on February 5<sup>th</sup>. John Bukowski, FHWA, attended the meeting on February 4<sup>th</sup>. The meeting included a review of completed state demonstration projects and up-coming demonstration projects for the 2010 construction season. A draft literature search was distributed to TAC members and reviewed. Iowa State University (ISU) in partnership with the Illinois Tollway, under the EPA Region 5 Resource Conservation Challenge Grant, held a workshop on March 12<sup>th</sup> to share results of the RAS demonstration project completed in August/September 2009. The workshop was well attended and was seen by the Illinois Tollway as a critical tool to keeping tabs on the source and quality of the RAS used in projects. The final literature review will be completed over the next quarter. ISU has a proposal under review with EPA Headquarters Environmental Education Grant Program to develop instructional materials for a short course and guidance documents on asbestos inspection, sampling and air monitoring protocols at post consumer asphalt shingle recycling facilities. The grant would address the environmental concerns for post consumer recycling facilities at a national level and be completed on a parallel timeline as TPF-5(213). Training workshops are being developed to provide more in-depth training for post consumer RAS facility personnel and end market partners to address OSHA, asbestos and other enforcement issues. The information and training workshops are something that could be provided to participating states if interested. The meeting minutes were completed and distributed to all participating state committee members. The Web Conferencing worked well and it was decided that an interim meeting by Web Conferencing would be scheduled for

May 2010 to discuss 2010 demonstration projects. The next TAC meeting will be scheduled for fall of 2010.

3. Updates on partner state demonstration projects completed and for the 2010 construction season are summarized below:
  - a. **CalTrans** joined the pooled fund study. Chris Williams will be contacting CalTrans to discuss project goals and potential demonstration projects for the upcoming 2010 construction season.
  - b. **IaDOT** will be completing a few demonstration projects utilizing tear-off shingles and warm mix. They will put a test matrix together on warm mix vs. hot mix with RAS and play with the quantities – 2% and 5%.
  - c. **InDOT** completed two demonstration projects: Demonstration Project 1 was completed in September 2009 utilizing 3% post consumer RAS with no RAP in foamed asphalt at both 260°F and 300°F and Demonstration Project 2 was completed in November 2009, utilizing 2.2% post consumer RAS with 15% RAP in foamed asphalt. Splitting and subsequent testing of the mixtures and materials began in the quarter.
  - d. **MnDOT** will be collecting core samples from their 2009 demonstration projects utilizing pre-consumer and post-consumer RAS only in mainline shoulders and transition areas placed on MnRoads Research cells (5, 6, 13, 14, 15-23). The core samples will be provided to ISU in the upcoming quarter.
  - e. **MoDOT** will be completing a demonstration project to compare mixes using tear-off recycled asphalt shingles (RAS) at different grind sizes. They will be using a finer grind (¼” minus) and courser grind (½” minus). The project will cover a 10 mile, two lane medium traffic level road and is scheduled to be completed in Spring 2010. The Tollway is currently working with Iowa State University (ISU) on a project titled *‘Performance of Fractionated Recycled Asphalt Pavement and Recycled Asphalt Shingles In Hot Mix Asphalt’*, and has been invited to share research results and expertise.
  - f. **WisDOT** will be contacted by Chris Williams to discuss potential demonstration projects for the upcoming 2010 construction season.
4. ISU will be creating a website for posting information on the demonstration projects and research results. The website will be completed in the next quarter.
5. ISU is currently looking at three different grind sizes of RAS to identify the effects of the different grind sizes on the mix designs and volumetric properties (e.g. asphalt content, VMA, VFA, etc). Iowa State has developed multiple mix designs using different grind sizes of RAS in two different aggregate gradations and will be conducting dynamic modulus and flow number testing of the laboratory mixes. This is not part of the pooled fund study but will be made available as supplemental information.

6. The next steps for the study include:

- 1) Completion of the literature review;
- 2) May Web Conference call to finalizing state demonstration projects for 2010 (this will be scheduled for June at this point as the research team is working on completing this key aspect);
- 3) Development of TPF-5(213) website;
- 4) Missouri will be completing their demonstration project;
- 5) Conduct pavement distress surveys on placed pavements (*Indiana/Minnesota in June*); and
- 6) Possible partnering with the EPA on asbestos research (proposal by Iowa State is pending review).

The above accomplishments will be discussed at the Web Conference call in June 2010.