TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): New Hampshire DOT

INSTRUCTIONS:
Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.

Transportation Pooled Fund Program Project # *(i.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX)* TPF-5(230)	**Transportation Pooled Fund Program - Report Period:** ☐ Quarter 1 (January 1 – March 31) ☑ Quarter 2 (April 1 – June 30) ☐ Quarter 3 (July 1 – September 30) ☐ Quarter 4 (October 1 – December 31)	
Project Title: Evaluation of Plant-Produced High-Percentage RAP Mixtures in the Northeast		
Name of Project Manager(s): Jo Sias Daniel	**Phone Number:** 603-862-3277	**E-Mail** jo.daniel@unh.edu
Lead Agency Project ID:	**Other Project ID (i.e., contract #):**	**Project Start Date:** 8/11/2010
Original Project End Date: 12/31/2013	**Current Project End Date:** 12/31/2013	**Number of Extensions:** 0

Project schedule status:

☐ On schedule ☐ On revised schedule ☐ Ahead of schedule ☑ Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Percentage of Work Completed to Date
781,706	164,859	25%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
	48,430	

Project Description:
Research Objectives

The objectives of this research project are to:
1. evaluate the performance in terms of low temperature cracking, fatigue cracking, and moisture sensitivity of plant produced RAP mixtures in the laboratory and field
2. establish guidelines on when it is necessary to bump binder grades with RAP mixtures
3. provide further understanding of the blending that occurs between RAP and virgin binder in plant-produced mixtures
4. refine fatigue failure criteria for RAP mixtures that can be used in the Simplified Viscoelastic Continuum Damage (S-VECD) model

Research Plan

The research plan is broken down into two phases. Phase I will focus on evaluating the effects of binder grade and plant type on the properties of mixtures with various percentages of RAP. Phase II of the study will be geared towards evaluating the amount of blending that occurs between the virgin and RAP binders. Phase I mixtures will be used to refine the fatigue failure criteria in the S-VECD model.

The following tasks will be required to achieve the research objectives for both phases of this project:
1. Producing Plant Mixtures
2. Testing and Analysis of Asphalt Binders and Mixtures
3. Construction and Evaluation of Field Test Sections
4. Reporting

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):
A. Binder Testing

PG Grading has been completed on the following binders:
a. Pike (Portsmouth, NH) extracted 64-28 0, 20, 30, and 40% RAP
b. Pike (Williston, VT) extracted 64-28 0, 20, 30, 40% RAP
c. Pike (Williston, VT) extracted 52-34 0, 20, 30, 40% RAP
d. Callanan (Cordell Rd) extracted 64-22 0, 20, 30, 40% RAP
e. Callanan (Cordell Rd) extracted 58-28 30, 40% RAP
f. Pike (Williston, VT) 64-28 and 52-34 tank
g. Pike (Portsmouth. NH) 64-28 tank
h. Callanan (Cordell Rd) 64-22 and 58-28 tank

Critical cracking analysis of extracted and recovered asphalt binders were conducted for the binders below. Critical cracking was determined using the procedure outlined in AASHTO R49-09, Determination of Low-Temperature Performance Grade (PG) of Asphalt Binders. The software program TSAR developed by Abatech is being used to generate the critical cracking temperatures of the asphalt binder.
a. Pike (Portsmouth, NH) PG64-28
i. 0% RAP: -28.3oC
ii. 20% RAP: -29.6oC
iii. 30% RAP: -28.5oC
iv. 40% RAP: -28.2oC

All extracted binder have been tested in the DSR at multiple temperatures and multiple frequencies. Also, they have

Anticipated work next quarter:
A. Binder Testing

PG Grading will be completed done for the remaining Phase I binders.

Critical cracking analysis of extracted and recovered asphalt binders will be conducted for the remaining Phase I binders and the Phase II mixtures received to date

Binders will be aged and tested to construct the master curves for the aged binders.

B. Mixture Testing

Finishing preparing and testing required for the asphalt mixture performance tester (AMPT) temperature study and dynamic modulus (|E*|) testing.

Completing the dynamic modulus testing for the Phase I loose Mix-Lab compacted samples.

Overlay Tester has to be conducted for the Pike (Williston, VT) mixtures.

Continue the Creep and Low Temperature Strength testing on the Phase I mixtures.

Start testing of Phase II mixtures

Significant Results:
The research team is putting together a paper for submission to AAPT based on the Phase I testing results. This will be shared with the technical committee once the draft is submitted.

Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).

The breakdown of the UNH Instron has caused delays in the low temperature creep and strength testing of the Phase I mixtures. The equipment is now up and running.

Potential Implementation: