**TRANSPORTATION POOLED FUND PROGRAM**

**QUARTERLY PROGRESS REPORT**

Lead Agency (FHWA or State DOT): FHWA

**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.*

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| **Transportation Pooled Fund Program Project #**TPF-5(339) | **Transportation Pooled Fund Program - Report Period:**□Quarter 1 (January 1 – March 31)X Quarter 2 (April 1 – June 30)□Quarter 3 (July 1 – September 30)□Quarter 4 (October 1 – December 31) |
| **Project Title:**Contaminant Release from Storm Water Culvert Rehabilitation Technologies: Understanding Implications to the Environment and Long-Term Material Integrity |
| **Name of Project Manager(s):**Bridget Donaldson | **Phone Number:**434-293-1922 | **E-Mail**Bridget.donaldson@vdot.virginia.gov |
| **Lead Agency Project ID:** | **Other Project ID (i.e., contract #):** | **Project Start Date:**3/2/2016 |
| **Original Project End Date:**2/28/2016 | **Current Project End Date:**2/28/2016 | **Number of Extensions:**0 |

Project schedule status:

X On schedule □ On revised schedule □ Ahead of schedule □ Behind schedule

Overall Project Statistics:

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|  **Total Project Budget** |  **Total Cost to Date for Project** |  **Percentage of Work**  **Completed to Date** |
| $630,000.00 | $118,371.98 | 20% |

***Quarterly*** Project Statistics:

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| **Total Project Expenses****and Percentage This Quarter** | **Total Amount of Funds****Expended This Quarter** | **Total Percentage of****Time Used to Date** |
| $31,447.62 | $31,447.62 | - |

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| **Project Description**:Studies by a subset of DOTs have discovered that the installation of advanced polymeric materials such as spray-on coatings and cured-in-place lining (CIPP) processes can release toxic chemicals into the water conveyed by the culverts. Numerous additional anecdotal accounts from the U.S and other countries have been reported regarding adverse effects to the environment and wastewater facilities. DOTs lack information on the degree that chemical leaching affects polymeric material long-term structural performance. Recent studies have shown some of the chemicals released into the environment by culvert rehabilitation polymeric materials are product ingredients intended to promote material strength and durability.The primary project objectives are to determine the following: (1) The scope of the problem across DOTs (i.e., the extent of use of these technologies and the scale of their impacts to water quality); (2) The effectiveness of existing construction specifications at minimizing contaminant release from rehabilitated culverts; and (3) The degree to which the structural integrity and longevity of rehabilitated culverts are compromised by chemical leaching. Results of this project will enable DOTs to make informed decisions with regard to culvert rehabilitation selection and specification development. |

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| **Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):***Task 1: The problem scope across DOTs (i.e., the extent of use of these technologies and the scale of their impacts to water quality)** Queried Pooled Fund partners about their culvert repair technologies in use, CIPP was most common
* Some participating states have provided construction specifications, others plan to provide them soon

*Task 2: The effectiveness of existing construction specifications at minimizing contaminant release from rehabilitated culverts* * The PI attended the 1.5 day NASSCO CIPP Construction Inspector training course. This training enabled the team to understand the knowledge CIPP Contractors are providing states about their technology and specifications. In addition, typical challenges associated with CIPP installations, how to resolve them, how to test materials, and oversee CIPP construction sites were presented. This information is being compared against construction specifications being obtained from State DOTs during the literature review being conducted in parallel.

Partner Contacts* CALTRANS enabled the project team to collect resin and cured CIPP sample at their pilot field test site. The project team is analyzing samples for this project.
* KSDOT wanted the team to sample, but CIPP contractor did the work without alerting the KSDOT project contact. KS may not have a CIPP site in 2017 depending on budgets.
* NCDOT volunteered to have us come sample a cement mortar lining pipe site, but we are looking for CIPP. NCDOT is continuing to look for CIPP DOT sites.
* NYSDOT has offered and is looking to find a CIPP test site. NYSDOT has proposed having the project team visit as part of their routine maintenance contract which can be planned in advance.
* CIPP culvert repair construction specifications were requested from partner DOTs, but not all provided information. Project team will re-engage DOTs and request CIPP construction specifications.
* VDOT tentatively plans for a field site in late summer/fall 2017.
* Some DOTs asked about CML water quality issues so we will include that in our survey (and do not plan to include this addition in field or lab work).

Field and Lab-Scale Testing* Developed methods to standardize CIPP site comparisons
* Developed methods for extracting uncured resin tube and water samples
* Developed methods for characterizing/extracting exhumed CIPP pipes
* Test results from the uncured resin and 5 CIPPs examined in California will help states better understand what chemicals could be released from CIPP sites. This includes styrene and non-styrene based CIPP resins. Similar results will be helpful to states who wish for understanding if their specifications need to be upgraded and how.
* Planned studies will also examine if the degree of curing influences leaching.

*Task 3: The degree to which the structural integrity and longevity of rehabilitated culverts are compromised by chemical leaching** Developing methods for characterizing CIPPs removed from the field

Travel Activity * The project team traveled to CA to collect uncured resin tubes and CIPP samples for method development.
* Travel was conducted in TX to complete the NASSCO CIPP Inspector Training course February 2017.
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| **Anticipated work next quarter**:*Task 1: The problem scope across DOTs (i.e., the extent of use of these technologies and the scale of their impacts to water quality)** Obtain construction specifications from remaining states
* Correspondence with another state with a confirmed and significant CIPP related contamination incident that affected water supplies

*Task 2: The effectiveness of existing construction specifications at minimizing contaminant release from rehabilitated culverts* * Prepare field sampling plan for CIPP sites
* Continue to work with DOTs to setup CIPP site visits
* Interpret extraction results for uncured resin and 5 CIPPs from California

*Task 3: The degree to which the structural integrity and longevity of rehabilitated culverts are compromised by chemical leaching** Finalize methods for characterizing CIPP’s cured in the lab
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| **Significant Results:**A variety of compounds released during CIPP installation processes have been tentatively identified. This included styrene based resin and low VOC resins. Once additional characterization is complete, the project team will have confidence in reporting the actual compounds present. |
| **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).**It is important that the participating DOTs notify Dr. Whelton (540-230-6069, awhelton@purdue.edu) about CIPP installations where the project team can conduct field work in 2017. If scheduling is a challenge, DOT’s should notify Dr. Whelton as well. Alternative approaches can be instituted to support DOTs on this project if needed. The project team has obtained CIPP resin for bench-scale testing to compliment the field work. This material will be used to create composites that will be tested in the laboratory in 2017. |

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| **Potential Implementation:** Specifications from multiple states are being reviewed. The project team plans to compare the components of the specifications across one another. This will provide states awareness about how their specifications compare to others. Some states not involved in this project are being contacted who have had stormwater contamination incidents associated with CIPP. Lessons learned from their experiences will be drawn into this project to benefit the partner states.Testing results from the uncured resin and 5 CIPPs examined in California will help states better understand what chemicals could be released from CIPP sites. This includes styrene and non-styrene based CIPP resins. Similar results will be helpful to states who wish for understanding if their specifications need to be upgraded and how.Planned studies will also examine if the degree of curing influences leaching.  |