QUARTERLY PROGRESS REPORT

January, 1 2014 to March, 31 2014

<u>General:</u>

State DOT's and practitioners noticed that the FHWA-FST2DH Model for Simulating Two-dimensional Depth-averaged Flow and Sediment Transport showed instabilities for some cases and therefore an improvement of the model was needed. FHWA decided to transition from the FHWA-FST2DH Model to a new two-dimensional hydraulic river modeling program, SRH-2D developed by the U.S. Bureau of Reclamation (Reclamation). The SRH-2D hydraulic modeling program has been used by Reclamation and other agencies for many years. It is recognized for its ability to achieve stable solutions to complex hydraulic problems quickly and effectively. FHWA hydraulic engineers have evaluated the current program's capabilities and see a significant potential benefit for future Department of Transportation (DOT) hydraulic related projects. However, the current version of the SRH-2D program does not include the analysis of key structural features that are often required for transportation related hydraulics projects. Reclamation does not have a need for analysis of these features but is interested in collaborating with FHWA to broaden the use of the model and make it more applicable to a wider range of projects. FHWA established an Interagency Agreement with the USBR using TPF-5(248) funds to incorporate modeling tools into SRH-2D needed for transportation related hydraulics projects. We expect to have the project completed in fall 2014.

There are two components to the SRH-2D development;

1) The addition of new hydraulic structure features into the SRH-2D model. These features include culverts, weirs, gates, bridge pressure flow, and a few other minor additions.

2) Development of a custom SMS interface for SRH-2D. Aquaveo is contracted to develop this interface.

The following work on Tasks 1 and 2 was performed in this performance period:

Task 1: Provide Technical Support during the Development of the SMS Interface for SRH-2D

- Task 1 is substantially complete. USBR has continued to provide support for SMS interface by posting latest changes to repository (for the pre-processor). Much coordination with Aquaveo on the interface and functionality still remains.

Task 2: Develop New Features in SRH-2D

Task 2.1 – Phase 1 Features

- With the exception of Culvert flow, the Task 2.1 Phase 1 Features have been completed, integrated into SRH-2D, and submitted to Aquaveo for integration into the SMS Interface. Once these features are integrated into the interface they will still have to be tested (by FHWA, Aquaveo and USBR)

Task 2.2 – Phase 2 Features

- Task 2.2 Phase 2 Features additions have been substantially completed, but have to be tested.

Task 3. Develop a SRH-2D User's Manual

- The task has not yet begun.