

## **Agenda Item #2, April 5, 2013 – ICM Procurement Recommendations for Data, USGS Support**

Background: The services of the Larry Walker Associates Team (“LWA Team”) were procured to execute the CV-SALTS Initial Conceptual Model (ICM) project. To date Tasks 1 through 5 have been completed. Tasks 6 and 8 are nearing completion. The project team recently began implementing ICM Task 7: *Salt and Nitrate Analyses in Selected Subareas of the Central Valley*. The purpose of Task 7 is to develop prototype templates for the use of the data analysis methods developed under ICM Task 5 to characterize salt and nitrate at a finer scale than Task 6. The prototype templates are being developed for two areas (a) Stanislaus/Merced [Modesto Regional]; and (b) Kings Subbasin.

The project Workplan (scope, budget, and schedule) for this task was based on two key data and model availability assumptions. The LWA team has been informed that obtaining the data and modeling tools needed for this task will require funding outside the scope of the LWA contract. The LWA Team has prepared estimates of the costs required. The specific needs identified and the pros and cons associated with funding or not funding these efforts are described below.

Procurement Requests: The following sections provide the background, implications and budget request for two procurement requests:

1. *Request No. 1:* Obtain relevant GIS shapefile and water budget data to support comparisons between ICM model-derived findings for the Kings Subbasin area to existing Integrated Surface Groundwater Model (IGSM).

*Background:* An IGSM was previously developed for the Kings River Conservation District (KRCRD). It was assumed that the model files would be made available by KRCRD and the LWA Team could do the comparison between the IGSM water budget and the water budget components for the CVHM-based Kings Subbasin model developed under ICM Task 7. It was assumed that KRCRD could make the data files available at no cost; therefore, no budget was included in the project Workplan for acquiring the data.

Based on communications with KCRD staff, it was determined that to obtain the data, a request would need to be made to RMC/WRIME to prepare the data for use by CV-SALTS. Preparation of the data will incur costs. To keep these costs as low as possible, the LWA Team met with KRCRD staff and RMC/WRIME to refine the data request, which will include relevant GIS shapefiles and water budget data for the 1983-2003 time period.

*Implications If No Funding Provided:* Development of the ICM model for the Kings Subbasin under Task 7 does not require that the LWA Team obtain the IGSM data files. The sole purpose of the use of the IGSM data files is to provide an opportunity to compare the ICM modeling results with the existing local model. This analysis will be informative to Conceptual Model development, but is not required.

*Estimated Cost:* The cost for RMC/WRIME to prepare the data is estimated to be \$5,000 to \$7,000.

2. *Request No. 2:* Provide budget to fund USGS technical support during use of a beta test version of MODPATH-OBS.

*Background:* To identify the transport patterns of the major sources and sinks of salt and nitrate in each subarea, Task 7.5 of the Workplan proposed the use of a new model code (MODPATH-OBS)

developed by the USGS. This new code advances the particle tracking capabilities of the existing MODPATH module, allowing chemical concentrations to be tracked with flow. The use of particle tracking with concentrations will allow for identification of areas within a given subarea that either contribute or remove salt and nitrate from groundwater as well as the rate of salt and nitrate transport from these areas. Considering results from a twenty-year simulation period of surface water/groundwater quality along with an estimated rate of transport, it will be possible to determine what areas are improving in quality, degrading in quality, or remaining stable at a finer scale, i.e., as compared to the level of analysis being completed for each IAZ.

All USGS software is free and can be downloaded from the USGS web site upon publication of the documentation. At the time of Workplan preparation, it was assumed that this software would be publicly available in sufficient time to allow the LWA Team to obtain the software and develop an understanding of its use. Instead, at this time, the modeling code can only be shared by USGS as a beta test file. To expedite the use and implementation of the new MODPATH-OBS module, USGS staff recommends that staff support be provided to assist with the application of the new modeling tool. Recommended support includes: (a) conduct a half-day WebEx teleconference where USGS staff will illustrate application of the MODPATH-OBS module (including benefits/limitations), explain data input/preparation requirements, and discuss recommended sensitivity analyses and other testing approaches; (b) provide support to LWA Team during preparation of ICM data input files (including exchange of files for review); and (c) provide support to address questions related to simulation results following model runs and provide an agreed upon level of troubleshooting, where needed.

*Implications If No Funding Provided:* Task 7 involves the completion of two groundwater flow and transport models (one for each subarea) and each involves application of the MODPATH-OBS module for the purposes described above. Based on the current schedule, the Task 7 modeling work is planned for completion by the end of April/early May 2013. However, the lack of publicly available documentation and model code impacts this schedule, which provides the basis for this request to “buy” USGS staff time to facilitate the utilization of the new MODPATH-OBS module. This will allow the team to work collaboratively and effectively with the creators of the model, which will support efforts to meet the ICM Task 7 schedule. Without USGS staff support, the LWA Team estimates about a one month time period (delay) to work with the beta test version to ensure proper use of the new modeling module and interpretation of modeling results.

*Estimated Cost:* The cost to provide USGS technical support to this project element is estimated at \$15,000.

Recommendation: Approve funds not to exceed \$22,000 to support both funding requests – funds would be taken from the existing budget set aside for Phase 2 of the Conceptual Model. The deliverables from Task 7 of the ICM project provide a first look at modeling outcomes at a more detailed or refined level than is being completed at the IAZ level of analysis. This type of work is anticipated to be continued to some degree under Phase 2. Accordingly, the Task 7 deliverables will provide an example of Phase 2 level modeling. Funding Request No. 1 will provide insight regarding the relationship between the ICM model and an existing model – insight that may be valuable in other areas where there are existing models. Funding Request No. 2 will expedite completion of Task 7. USGS staff has been very supportive of CV-SALTS efforts to date, providing their time to answer CVHM modeling questions at no cost (including serving on the ICM Project Committee). Purchasing their services for this activity ensures that we will get the critical block of time needed to complete Task 7 in a timely manner, especially if it becomes necessary to troubleshoot issues that develop during use of the beta test code.