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August 25, 2003

Richard Webb  
Reclamation District 784  
256 Anderson Avenue  
Marysville, CA 95901

**Subject: Scope of Work for Project Management and Hydraulics Analysis for the Problem Identification Study of the Bear River and UP Interceptor Canal Levees**

Dear Mr. Webb:

The following is a cost proposal for project management and hydraulic analysis for the problem-identification study of issues related to FEMA certification of the Bear River and UP Interceptor levees.

#### **Project Management**

This task would involve overseeing technical analysis and report development including oversight of the technical team and coordination with DWR and Corps staff on project-related issues. Coordination with DWR and the Corps will be critical to try and avoid FEMA mapping RD 784 into the regulatory 100-year floodplain. The goal of this coordination would be to try and either avoid FEMA involvement by completing construction in 2004 or convincing the Corps to certify our effort to FEMA, if required.

#### **Hydraulics**

The following is a cost proposal to develop stage-frequency curves for the Bear River/UP Intercept system. In order to develop these curves, it is necessary to use a hydrologic model which will predict the stages throughout the system. For this, we propose using the UNET model the U.S. Army Corps of Engineers has developed for the Lower Feather River FEMA Analysis. As this work is not scheduled to be completed by the Corps until the end of the year, the modeling work is incomplete at this time. Unfortunately, this adds some uncertainty in estimating the expected cost of portions of this work. Wherever this uncertainty is present, more detail has been added to describe the presumed work under these tasks.

The first part of the proposed work is to verify the assumptions and results of the hydrologic modeling done by the Corps. This is done by verifying the accuracy of the model's representation of the physical system and making sure the model results are consistent with

historical observations. Specifically, the items requiring review in this process are: synthetic hydrology, reservoir operations, channel geometry, channel roughness characteristics, and levee geometry. This review process will require interaction with the Corps via technical discussion and meetings and may require making refinements or changes to the model as determined during the review process. The incomplete status of the Corps' work makes it difficult to estimate a cost associated with model refinement. This scope assumes the refinement will be limited to the existing geographic area covered by the model. In other words, it is not anticipated that river and stream reaches will need to be added or extended in the model. Based on discussions with the Corps regarding the model, we believe we will be able to work within the existing model framework, and such additions or extensions will not be necessary.

This model has only been formulated by the Corps to run at some of the frequencies required for the stage-frequency curves in the R&U analysis. Therefore, it will be necessary to extend the hydrology of the model to cover the required missing frequencies for the R&U analysis. Since developing this hydrology can be quite labor intensive, to the extent possible, this effort will rely on previous hydrology work in the basin. This scope assumes these resources will be sufficient to extend the hydrology to the necessary frequencies.

An alternative to evaluate the hydraulic benefit of the lower Feather River setback levee will be modeled. A variation from the Supplemental Flood Study Alignment will be evaluated. This alternative will look at the benefits to water surface elevation reduction on the Bear River and UP Interceptor Canal if the downstream alignment for the setback levee ties into the Bear River levee near Feather River Boulevard.

Once the modeling work has been verified and the model hydrology extended to cover the proper frequencies, the remaining effort of the proposed work will involve working to develop the stage-frequency curves. These curves will be developed at key index points within the system. This part will require coordination with the consultant conducting the R&U analysis to ensure the stages are properly represented at the index locations, which will likely be at different locations than the model cross-sections.

<b>Task</b>	<b>Estimated Cost</b>
<b>Project Management</b>	\$ 35,000.00
<b>Hydraulics</b>	
Coordination with Corps	\$ 1,580.00
Model Review	\$ 920.00
Model Refinements	\$ 3,880.00
Model Extension	\$ 1,840.00
Model Setback Levee	\$ 3,000.00
Stage-Frequency Curve Development	\$ 1,980.00
R&U Team Coordination	\$ 1,440.00
Prepare Technical Memorandum	\$ 2,400.00
Presentation of Results	\$ 980.00
Miscellaneous Expenses	\$ 300.00
<b>Subtotal</b>	<b>\$ 18,320.00</b>
<b>Total Cost</b>	<b>\$ 53,320.00</b>

Mr. Richard Webb

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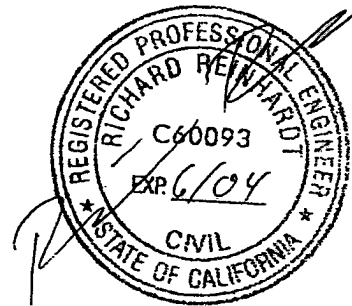
This work will be performed on a time and materials basis not to exceed \$53,320. The schedule for this effort would be to complete the hydraulic analysis within 60 days of contract approval. Project management would be for the duration of all of the consultant's efforts in addition to post-project coordination with the Corps. The goal would be to complete the Problem Identification Study within 90 days of contract approval.

Please call if you have any questions.

Sincerely,  
MBK ENGINEERS

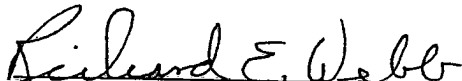


Ric Reinhardt, P.E.



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4140/SCOPE 07.25.03.DOC

***My signature below authorizes MBK Engineers to proceed with the work described in this letter.***

  
Richard Webb

8-29-2003  
Date