

## Memorandum

**To:** Programs, Projects and Operations Subcommittee

**Re:** Additional Professional Services for Papio Reservoir 1 and 3C Preliminary Design/Study

**Date:** March 2, 2007

**From:** Paul Woodward, Water Resources Engineer

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In December 2005, the NRD Board approved a professional services contract with HDR Engineering, Inc. (HDR) to provide a preliminary study of Papio Dam Sites 1 and 3C for a total cost of \$621,907. Since that time, HDR has completed a majority of the services it was tasked to perform. A total of \$543,946.48 has been billed as of February 3, 2007, leaving \$77,960.52 remaining under the contract. These completed tasks include putting together a Public Involvement Plan, analyzing flood control needs, comparing alternatives, and evaluating costs and benefits. As the study has progressed, several of these tasks have required additional study and additional meetings.

HDR has submitted the enclosed memo dated March 1, 2008 which identifies services which have been or will be provided and were not included within the original contract and scope. These out-of-scope services include additional steering committee and public meetings, more detailed hydrologic analysis, one additional flood control alternative, and more detailed land value assessments. These added services were discussed with Management prior to proceeding and were determined necessary to facilitate the most comprehensive and complete study possible.

At this point, this information is being provided for your review. As with past professional services contracts, there may be opportunities prior to completion to offset some of the costs (\$94,649) of these added services. Within the next couple months, HDR and District staff will review services yet to be provided and determine if efficiencies can be realized which would help offset additional services necessary.

In conclusion, HDR has or will be providing professional services not originally scoped in order to successfully complete the Papio Reservoir Site 1 and 3C Preliminary Study. Future tasks within the contract will be closely monitored for ways to conserve costs; however, an amendment to the contract may be brought to the subcommittee and Board for their consideration in order to cover the costs for additional services.

To: Paul Woodward, P-MRNRD	
From: John Engel, Project Manager	Project:
CC: File	
Date: March 1, 2007	Job No:

**RE: Study of Reservoir Sites 1 and 3C  
Additional Services Update**

The purpose of this memo is to provide an update on the status of additional services performed to date in the Study of Reservoir Sites 1 and 3C (Study). Additional services beyond the original contract, and associated costs, for these additional services are identified below and referenced to the original contract scope items dated January 31, 2006. Attachment A documents the costs associated with these additional services.

**TASK 200 PUBLIC INVOLVEMENT**

Due to the level of public interest in the Study, there have been substantial additions to the public involvement scope task. These additional efforts have been necessary and beneficial in reaching a broad range of stakeholders and providing information to the public on the purpose and need for the Study, the methodologies and process being employed, and to provide a means of two-way communication. Specific additions include:

Subtask 210.2 Communication and Meetings - A total of 6 meetings were originally planned with the Project Steering Committee. A total of 8 meetings have been conducted through January 19, 2007, and an additional 2 are planned.

Subtask 230.5 Final Public Meeting (Task Added)

An additional public meeting was added to the project. The first public meeting was an introduction to the project and a means to identify potential impacts that needed to be considered in the study. The second public meeting presented the results of the analysis of project need and alternatives. The third and final public meeting, currently scheduled for May 2007, will present the findings of the impact analysis of Sites 1 and 3C. Prior to the public meeting, the P-MRNRD will be briefed on the Study findings. This final public meeting will include the preparation of presentation materials along with boards. It is assumed that the materials, labor, etc., for the final public meeting will be equivalent to the December 5, 2006 meeting.

**TASK 400 HYDROLOGY/HYDRAULICS ANALYSES**

Refinements to the hydrologic and hydraulic models were necessary to better reflect current conditions and accurately determine the existing flood control needs, as well as accurately predict the benefits of the flood control alternatives. For example, the converted FEMA regulatory hydraulic models do not reflect existing topographic conditions. Better topographic data was available which enabled us to predict more realistic water surface elevations in addition to serving as the basis for the flood damage assessment.

Task 420 Hydrologic Model Development - The hydrologic model resolution was increased for flexibility during analysis of flood control alternatives, to allow analysis of regional detention structures alternatives, and for consistency of results with the upcoming hydrologic modeling to be completed during the flood hazard remapping of the Big Papillion Creek. The following activities were beyond those identified in the original scope of work:

- Modified the HEC-HMS model prepared for the Stage I Papillion Creek Watershed study to refine the hydrologic parameters for the Big Papillion Creek Watershed in Washington and Douglas

Counties to approximately 1 square mile basin areas down to the confluence with Little Papillion Creek (Stage I model typically had 3 to 5 square mile basins). The model resolution was increased for flexibility during analysis of flood control alternatives, to facilitate analysis of regional detention facilities, and for consistency with the upcoming hydrologic modeling to be completed during the remapping of the Big Papillion Creek. Hydrologic parameters were verified by comparing timing, runoff volume, and discharge with the calibrated model prepared for the Stage I hydrologic modeling.

- Multiple storm centerings (approximately 10) according to USACE and FEMA methodology were used to accurately determine peak discharges along Big Papillion Creek from Nebraska Highway 36 to the confluence with Little Papillion Creek for “with” and “without” project conditions for the 10-, 25-, 50-, and 100-year storm events.

Task 440 Hydraulic Model Development - The existing regulatory hydraulic model consisted of various parts of 4 different HEC-2 models, all containing outdated topography. A new HEC-RAS model using current topography was developed for increased accuracy of flood control alternative analyses and to ensure consistency of results with the upcoming hydraulic modeling to be completed during the flood hazard remapping of the Big Papillion Creek. The following activities were beyond those identified in the original scope of work:

- Developed a new HEC-RAS model for the reach of Big Papillion Creek from Nebraska Highway 36 to the confluence with Little Papillion Creek. Utilized 2004/2005 LiDAR topographic and aerial photographic data for defining the channel geometry, floodplain parameters, and associated hydraulic parameters including Manning's 'n' values, obstructions, and ineffective flow areas.
- Performed reconnaissance level field measurements of approximately 30 bridges along Big Papillion Creek. Used field measurements along with existing regulatory Flood Insurance Study hydraulic model data, CLOMR and LOMR data to incorporate bridge information and associated hydraulic parameters into HEC-RAS model.

## **TASK 700 ENVIRONMENTAL EVALUATION**

Task 760 Flood Control Alternatives Analyses - During the flood control alternative analyses an additional alternative of full implementation of conservation measures was requested by the Steering Committee and included in the analysis. The impact of conservation measures was also a question raised often during the public meetings. This alternative was beyond the four listed below that were included in the original scope of work:

- Multiple small detention cells
- Flood conveyance improvements
- Floodplain acquisition – evaluated regulatory, existing and future land use conditions.
- Reservoir Sites 1 and 3C scenarios

## **TASK 800 PROJECT ECONOMICS**

Subtask 820.1 Flood Control Benefits - The following activities were beyond those identified in the scope of work:

- Floodplain parcel evaluation – a parcel by parcel evaluation was used in the flood control benefit analysis as assessed values were developed rather than a per acre metric. This was necessary to more accurately depict alternative costs and flood control benefits.
- Land value assessment – The costs associated with each alternative were evaluated based on an evaluation of each individual parcel assessment that may be impacted. In addition, additional research and analysis on recent comparable sales data was conducted based on public concern and to obtain a better land valuation estimate over the assessor's records.

