

Agenda Item: 12

Memorandum

To: Papio-Missouri River Natural Resources District
Programs Projects and Operations Subcommittee
From: Brian L. Henkel, Groundwater Management Engineer
Date: May 11, 2010
Re: Farm Process Pilot Groundwater Flow Model

District staff contacted Lower Platte South and Lower Platte North Natural Resources Districts to request funding for a cooperatively created pilot groundwater flow model utilizing MODFLOW and the Farm Process Package (FMP). The pilot model would cover a portion of the Platte River valley near Ashland, Nebraska (Attachment 1) and include portions of both Lower Platte NRD's and the Papio NRD. Both Lower Platte NRD's agreed to contribute \$10,000 toward the cost of developing the pilot model, pending final budget approval (Attachments). The following is a review of the pilot study.

The study area was selected based on the availability of highly detailed topographic and geologic data collected through other cooperative efforts of the District. The Eastern Nebraska Water Resources Assessment (ENWRA) completed a pilot study in the same area which resulted in the collection and processing of detailed, three-dimensional, hydrogeologic information. Additionally, the area is included in the planned LiDAR collection area scheduled for this spring through the Nebraska-Iowa Regional Orthophoto Consortium and Lower Platte River Corridor Alliance. The LiDAR collection will provide highly accurate and detailed topographic information for inclusion in the pilot model. These two detailed datasets, combined with other existing information, will improve the pilot models ability to effectively assess the benefits of using FMP in the Platte River system.

The completed pilot model could be utilized to assess current and proposed District programs related to water conservation measures, on farm conservation practices or controls on invasive species. The level of detail of the model and the advanced tools of FMP would afford a greater understanding of the alluvial system than that available with more standard approaches. This would give the District the opportunity to better understand the benefits of ongoing and proposed programs as they relate to the overall water budget in the Lower Platte River Basin.

A pilot scale model can also guide the Districts continued data collection and future river and basin analyses. The Annual Evaluation of Availability of Hydrologically

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Connected Water Supplies, completed by the Nebraska Department of Natural Resources (Department), is an assessment of available supplies. The compiled report is the basis for the Department's determination of 'fully appropriated' and is comprised of water budget analysis, extrapolations of current levels of development and comparisons to historic conditions. A more complete understanding of the interactions of the various components of the water budget in the Lower Platte can assist the District with the additional steps needed in assisting the Department's evaluation.

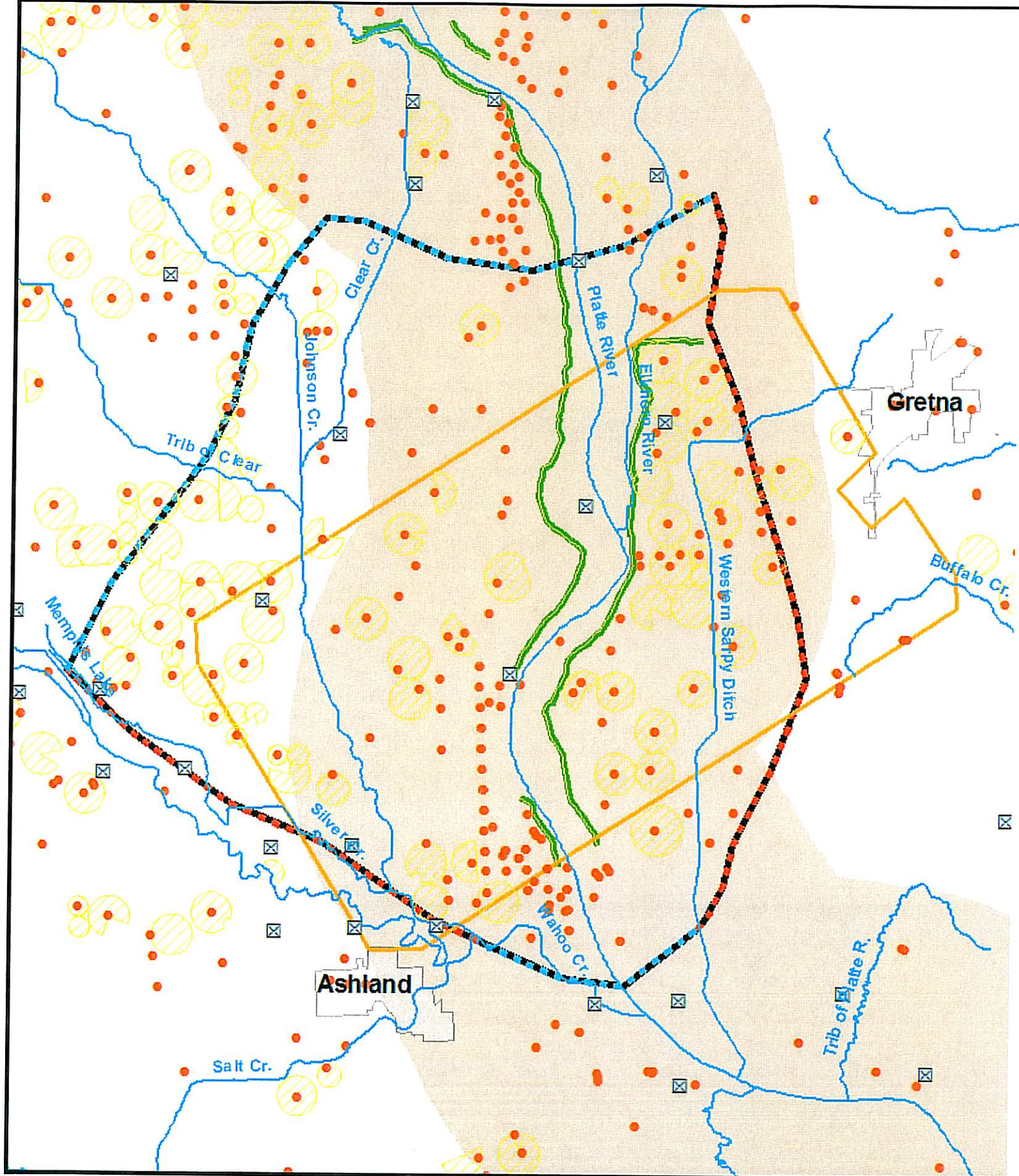
The proposed pilot model would be a cooperative effort involving the District, the Lower Platte South and Lower Platte North NRDs, the USGS Nebraska and California Water Science Centers and ENWRA. The total project cost and the agency contributions are listed in the following table:

Agency	Cost
USGS	\$25,000
LPSNRD	\$10,000
LPNNRD	\$10,000
ENWRA	\$10,000
P-MRNRD	\$63,000
Total	\$118,000

Staff recommends that the subcommittee recommend to the Board of Directors that the General Manager be authorized to execute an interlocal agreement with Lower Platte South and Lower Platte North NRDs and a Joint Funding Agreement with the USGS for the development of a pilot model for a maximum fee of \$63,000, subject to changes deemed necessary by the General Manager and approval as to form by District Legal Council.

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|----------------------|---------------------|--------------------------------|
| Draft Model Boundary | — Ashland HEM Area | • Registered Wells |
| — constant head | ■ CIS Coverage Area | ⊗ Surface Water Appropriations |
| — no flow | — Streams (DNR) | |
| | — 1996 Levees | |



Henkel, Brian

From: Glenn Johnson [gjohnson@lpsnrd.org]
Sent: Thursday, April 22, 2010 5:01 PM
To: Henkel, Brian
Cc: Petermann, Marlin; Dan Schulz; Dick Ehrman; Paul Zillig; Glenn Johnson
Subject: RE: Farm Process Pilot Model

Brian:

This request was discussed at the NRD's Water Resources Subcommittee meeting on Wednesday, April 21, 2010. The Subcommittee was positive about the project and the NRD's involvement and it will be included in the FY 2011 Budget Recommendations and in the update of the Long Range Implementation Plan. We look forward to working with the Lower Platte NRDs and USGS on this Project.

Glenn D. Johnson
General Manager
Lower Platte South Natural Resources District
402-476-2729
402-432-6833 Cell
gjohnson@lpsnrd.org

From: Henkel, Brian [mailto:bhenkel@papiornrd.org]
Sent: Monday, April 19, 2010 4:22 PM
To: Glenn Johnson
Cc: Marlin Petermann; Dan Schulz; Dick Ehrman
Subject: Farm Process Pilot Model

Glenn,

I have been working with the USGS to develop a pilot model to look at the applicability of the Farm Process Package of MODFLOW to the alluvial aquifer system of the Platte River. I was directed by my Board of Directors to request cost share from the other NRD's included in the pilot model area. I have included a scanned copy of the request letter for cost share on the pilot model. The original letter has been mailed to you at your District. The letter details the need for the model and the anticipated application of the model to management decisions as well as the requested amount. I have discussed the funding request with staff members at the Lower Platte South. Dan Schultz has agreed to present the request to subcommittee for funding in fiscal year 2011. I am anticipating returning to my board's subcommittee meeting on May 11. I would like to report whether LPS would be willing to participate, pending final approval of the LPS budget. Please let me know if you have any questions.

Thank you,

Brian L. Henkel, PE

Groundwater Management Engineer
Papio-Missouri River Natural Resources District
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402-444-6222 Ext. 272

Henkel, Brian

From: John Miyoshi [jmiyoshi@pnrd.org]
Sent: Friday, April 23, 2010 4:31 PM
To: Henkel, Brian
Subject: RE: Farm Process Pilot Model

Brian,

We will take this to Water Committee on Wednesday and Board on May 10. I do not see any reason we would not approve the \$10,000, it seems like a bargain to me.

John

From: Henkel, Brian [mailto:bhenkel@papionrd.org]
Sent: Monday, April 19, 2010 4:26 PM
To: John Miyoshi
Cc: Petermann, Marlin; Larry Angle
Subject: Farm Process Pilot Model

John,

I have been working with the USGS to develop a pilot model to look at the applicability of the Farm Process Package of MODFLOW to the alluvial aquifer system of the Platte River. I was directed by my Board of Directors to request cost share from the other NRD's included in the pilot model area. I have included a scanned copy of the request letter for cost share on the pilot model. The original letter has been mailed to you at your District. The letter details the need for the model and the anticipated application of the model to management decisions as well as the requested amount. I have discussed the funding request with staff at the Lower Platte [North](#). Larry Angle has already discussed the funding request with the appropriate LPN subcommittee. I am anticipating returning to my board's subcommittee meeting on May 11. I would like to report whether LPN would be willing to participate, pending final approval of the LPN budget. Please let me know if you have any questions.

Thank you,

Brian L. Henkel, PE

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