

# Memorandum

To: Programs, Projects, and Operations Subcommittee  
From: Philip Paitz, Groundwater Management Engineer  
Date: February 6, 2025  
Re: Cooperative Agreement with UNL Conservation and Survey Division

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This agreement is a continuation of a cooperative agreement between the University of Nebraska Conservation Survey Division (CSD) and the Papio NRD for test-hole drilling, monitoring, and geophysical work. The agreement is for a three-year term through June 30, 2028 and will include work including drilling 9 to 12 test-hole/monitoring locations, replacing the monitoring well ASH01-109R at Fairview Road and the Platte River, and one or more ground-based geophysical surveys across the P-MRNRD using new tTEM geophysical equipment. The location number of test holes and surveys will be coordinated between the CSD and Papio NRD.

The total cost of the work will not exceed \$77,750. This includes 1,100 feet of test-hole drilling, all the personnel cost, and geophysical data collection and analysis. The cost of a tTEM survey is roughly equal to the cost of the test-hole work and may be substituted should the District find a location where the geophysical properties of the underlying strata need to be better understood or to verify previously analyzed Airborne Electromagnetic (AEM) information, test-holes and bore logs. This data can also aid in the development of and verify results from the Three District Modular finite-difference flow (MODFLOW) model being constructed by the Papio NRD, Lower Platte River South NRD, Lower Platte River North NRD, and Nebraska Department of Natural Resources. A breakdown of the cost per year is included in Attachment #1 of the Cooperative Agreement.

**Management recommends that the subcommittee recommend to the Board of Directors that the General Manager be authorized to execute the proposed Cooperative Agreement with the UNL Conservation and Survey Division, subject to changes deemed necessary by the General Manager and approval as to form by District Legal Counsel.**

**COOPERATIVE AGREEMENT**  
**between the**  
**PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT**  
**and**  
**THE BOARD OF REGENTS OF THE UNIVERSITY OF NEBRASKA ON BEHALF OF**  
**THE UNIVERSITY OF NEBRASKA-LINCOLN THROUGH ITS**  
**CONSERVATION AND SURVEY DIVISION,**  
**SCHOOL OF NATURAL RESOURCES**

THIS AGREEMENT, is entered into the \_\_\_\_\_ day of \_\_\_\_\_, 2025, by the Papio-Missouri River Natural Resources District (hereinafter referred to as the P-MRNRD) and the Conservation and Survey Division, School of Natural Resources of the University of Nebraska-Lincoln (hereinafter referred to as the CSD).

The P-MRNRD and the CSD, in accord with their ongoing program responsibilities, desire to participate in a CSD test-hole drilling, monitoring, and geophysical program to (1) Provide test-hole drilling equipment, supplies and expertise for obtaining subsurface geologic and hydrogeologic information within the P-MRNRD boundaries; (2) Provide bore-hole geophysical logging equipment, supplies and expertise for obtaining measurements of physical, chemical and electrical properties within test-holes drilled at each site; (3) Provide well designs for potential contract(s) associated with the installation of monitoring wells including well construction oversight training to P-MRNRD staff (if applicable); and (4) Provide equipment, supplies and expertise for obtaining field-scale geophysical measurements (if applicable).

**THEREFORE, IT IS MUTUALLY AGREED THAT:**

- (1) **COOPERATION:** The P-MRNRD and the CSD desire to cooperate and collaborate to accomplish the study objectives mutually agreed upon.
- (2) **PERIOD:** This agreement shall begin upon approval by P-MRNRD and will continue for a period of three (3) years through June 30, 2028.
- (3) **STATEMENT OF WORK:** Certain portions of the study require a significant level of technical expertise and interpretation from the CSD. These include elements as listed in the attached proposal, herein referred to as Attachment #1.
- (4) **P-MRNRD CONTRIBUTIONS:** As hereinafter limited, the P-MRNRD shall contribute such of its funds, facilities, equipment, materials and personnel as it deems suitable and appropriate to accomplish the objectives of the study. The P-MRNRD shall provide funds to the CSD to support costs directly related to test-hole drilling, monitoring and geophysical program expenditures. The 3 year costs include CSD logging services for approximately 9 to 12 test-hole/monitoring locations, one monitoring well replacement and one or more ground-based geophysical surveys across the P-MRNRD. The 3 year costs will not exceed the amount of seventy seven thousand seven hundred fifty dollars (\$77,750). A breakdown of estimated costs is included in Attachment #1.
- (5) **CSD CONTRIBUTION:** The CSD shall utilize funds provided by the P-MRNRD and such of its own funds for facilities, equipment, materials and personnel as it deems suitable to

conduct the investigation and analysis called for in this Agreement. The CSD will provide hydrogeological expertise and results associated with the test-hole drilling, monitoring, and geophysical program to the P-MRNRD.

- (6) **PRINCIPAL INVESTIVATORS:** Kathleen Cameron, Eastern Nebraska Water Resources Assessment (ENWRA) Coordinator/CSD Hydrogeologist shall be the principal investigator for the project (50%). Jesse Korus Associate Professor/Groundwater Geologist will be a co-principal investigator for the project (30%). Susan Lackey CSD Hydrogeologist and Matt Marxsen lead driller of CSD will also be co-principal investigators for the project (10% each).
- (7) **PUBLICATION:** Both parties shall have the right to announce and publish the results, facts, or conclusions of cooperative work under the terms of the Agreement, provided such announcement or publication shall expressly recognize the cooperation of the other party and provided such publication shall not indicate approval of the results, facts or conclusions by the other party. It is recognized that the CSD is obligated to maintain public access to data obtained in this study.
- (8) **LIABILITY:** Each party agrees that it will be responsible for its own acts and the results thereof and shall not be responsible for the acts of the other parties and the results thereof. Each party therefore agrees that it will assume all risk and liability to itself, its agents or employees, for any injury to persons or property resulting in any manner from the conduct of its own operations, and the operations of its agents or employees, under this Agreement, and for any loss, cost, damage, or expense resulting at any time from any and all causes due to any act or acts, negligence, or the failure to exercise proper precaution of or by itself or its own agents or its own employees while occupying or visiting the premises under and pursuant to this Agreement.
- (9) Attachment #1 is hereby incorporated in and made a part of this Agreement the same as if it had been specified herein verbatim.

PAPIO-MISSOURI RIVER  
NATURAL RESOURCES DISTRICT

By \_\_\_\_\_ Date \_\_\_\_\_

CONSERVATION & SURVEY DIVISION  
OF THE UNIVERSITY OF NEBRASKA

By \_\_\_\_\_ Date \_\_\_\_\_

THE BOARD OF REGENTS OF THE  
UNIVERSITY OF NEBRASKA, UNL

By \_\_\_\_\_ Date \_\_\_\_\_

## ATTACHMENT #1

### **Test-hole Drilling, Sampling, and Logging Program for the Papio-Missouri River Natural Resources District**

The Papio-Missouri River Natural Resources District (P-MRNRD) has a complex assemblage of aquifers which supply most of the water used for irrigation and drinking. The P-MRNRD has ongoing and future plans to drill test-holes, record down-hole data, construct monitoring wells, and collect geophysical measurements to establish baseline information about groundwater quality, quantity, and aquifer composition.

Conservation and Survey Division (CSD) scientists will perform preliminary hydrogeologic analyses for the drilling, monitoring and survey sites based on existing desktop information and background information provided by the P-MRNRD. These will be reviewed with the P-MRNRD staff that will be responsible for obtaining landowner permission for site access for test-hole drilling, monitoring well installation (if applicable) and geophysical measurements (if applicable).

CSD will drill the test-holes with mud rotary unless otherwise planned with P-MRNRD staff. Samples will be collected to adequately represent the types of material encountered during the drilling operation. These samples will be described both in the field and in the laboratory to determine the lithologic composition and stratigraphic nomenclature of the test hole. The P-MRNRD will provide staff on-site during drilling to interact with the public and assist the geologist(s) as needed. Once the interpretation phase is complete, the samples will be placed in CSD's test-hole repository for future use and the information obtained will be entered into the statewide test-hole database maintained by the CSD. Some locations may be wire-line cored in lieu of rotary drilling depending on schedule, budget and depth of drilling.

At the completion of drilling operation for each mud rotary test-hole, a geophysical log suite will be obtained using CSD's equipment and personnel. Measurements will include natural gamma, single-point resistance, spontaneous potential, 16- and 64-inch normal resistivity, lateral resistivity, fluid resistivity and fluid temperature. The geophysical log suite will aid in the interpretation of lithology and, in some instances, provide information on hydraulic properties of various units encountered within the test-hole. CSD will conduct ground-based field-scale geophysical measurements and interpretations (if applicable). CSD scientists will utilize desktop information, the test-hole logs and geophysical measurements to design the monitoring wells and define pumping and water level monitoring equipment specifications (if applicable). An additional CSD contribution to the project will be assisting the P-MRNRD to obtain accurate well completion logs for each monitoring well and conducting downhole geophysical logs for other hydrogeologic assessments (non-CSD drilling) planned in the P-MRNRD in the next three years that align with CSD's ongoing projects (if applicable).

## Budget

Year	Budget Category	Estimated Quantity	Cost
<b>One</b> (FY26)	Equipment (Test-hole Drilling and one Monitoring Well Replacement)	1,100 feet & one well	\$14,519.82
	Labor (Drill Crew)		\$3,150.00
	Expenses (Crew and Geologists' Travel)		\$1,100.00
	10% F&A (Office of Sponsored Programs)		\$1,876.98
	Subtotal		<b>\$20,646.80</b>

Year	Budget Category	Estimated Quantity	Cost
<b>Two</b> (FY27)	Equipment (Test-hole Drilling and Geophysical Measurements)	1,100 feet & one survey	\$12,146.00
	Labor (Drilling and Geophysics)		\$11,810.00
	Expenses (Crew and Geologists' Travel)		\$2,000.00
	10% F&A (Office of Sponsored Programs)		\$2,595.60
	Subtotal		<b>\$28,551.60</b>

Year	Budget Category	Estimated Quantity	Cost
<b>Three</b> (FY28)	Equipment (Test-hole Drilling and Geophysical Measurements)	1,100 feet & one survey	\$12,146.00
	Labor (Drilling and Geophysics)		\$11,810.00
	Expenses (Crew and Geologists' Travel)		\$2,000.00
	10% F&A (Office of Sponsored Programs)		\$2,595.60
	Subtotal		<b>\$28,551.60</b>

**Note:** CSD equipment, crew labor and personnel travel costs will be invoiced according to the actual quantities accomplished at current CSD rates. **Invoice amounts will not exceed \$77,750**