

WSF 2017 Annual Report # 4140

PROJECT: *P-MRNRD Sarpy County Aquifer Mapping –WSF*
Application #4140 (awarded April 2016)

DATE: APRIL 1, 2017
(FIRST ANNUAL REPORT DUE ON
OR BEFORE APRIL 1, 2017)

See Application 4140 Section D #2 For Project Scope Summary and Timeline

PROJECT PROGRESS APRIL 2016 TO APRIL 2017:

- The P-MRNRD Airborne Electromagnetic Survey (AEM) flights were flown between July 27, 2016 and August 2, 2016 (approximately 623 linear miles). Aqua-geo Frameworks LLC (AGF) conducted the AEM flights and associated preliminary quality control data inversions on behalf of P-MRNRD in accordance with their subcontractor agreement with P-MRNRD dated May 12, 2016. Flight line refinement activities were conducted in April through June 2016. Additionally, AGF was able to get a better than anticipated per line mile rate for the flights allowing the district to fly an additional 39 line miles (tighter spaced lines and adding in Gretna transect lines). The preliminary image file deliverables for each flight line summarizing the initial AEM survey results were provided August 2, 2016. The final P-MRNRD Report from AGF was provided ahead of schedule on March 1, 2017. The final report summarized the AEM survey results and included finalized hydrogeologic framework segment images and datasets and 3-D block area views. The attached pdf depicts the 2016 survey are flown for the P-MRNRD project (report cover page and Figure 1-2 "as flown" lines in light blue).

ANTICIPATED ACTIVITIES FROM NOW UNTIL NEXT ANNUAL REPORT DUE APRIL 1, 2018:

- The P-MRNRD will continue to disseminate and evaluate the final report from AGF and use the report findings and datasets to locate new monitoring wells, conduct recharge monitoring, and refine groundwater management activities based on the new understandings and recommendations.

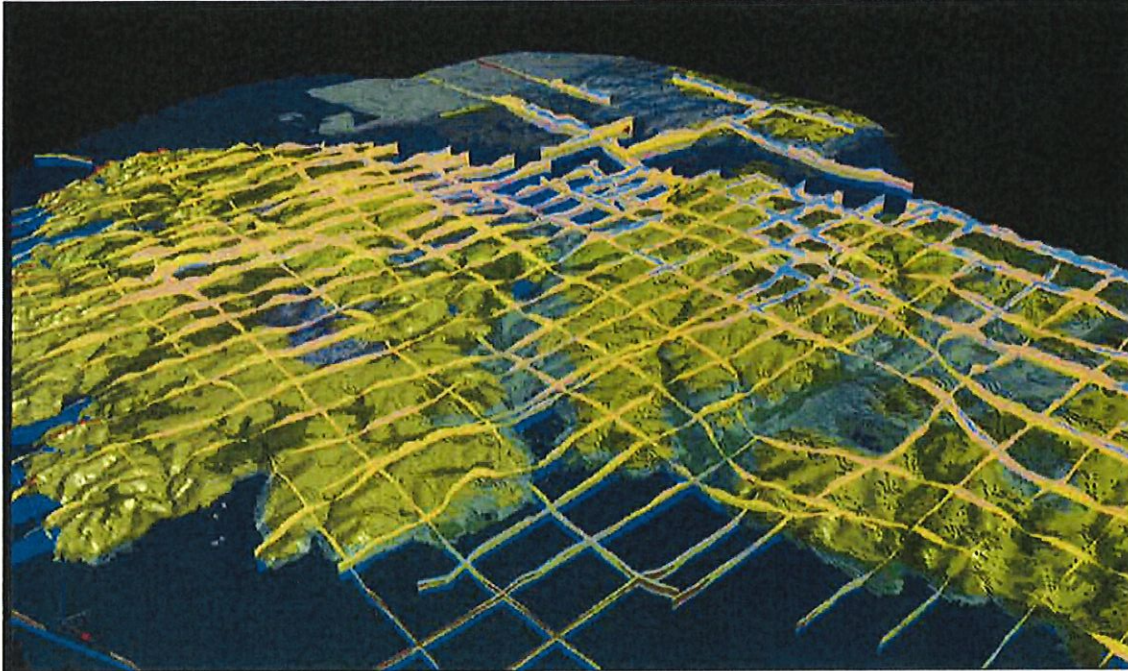
ANTICIPATED CASH FLOW FOR REMAINDER OF THE PROJECT:

- The final invoice from AGF for **\$80,000** is was paid by the P-MRNRD on March 10, 2017 and is enclosed. The last and final reimbursement Claim, claim #2 is anticipated on or before April 1, 2017 and will be requesting **\$48,000 from WSF (60% of final invoice, closing out WSF#4140)**. **The total cost of the project paid by the P-MRNRD was \$400,000 with \$240,000 reimbursed from WSF.**

LIKELIHOOD THAT BENEFITS PROJECTED IN APPLICATION 4140 WILL BE REALIZED:

- Based on an evaluation of the results provided by AGF in March 2017, the project is on target for achieving the benefits as described in the application. The Project improved the overall understanding of the Dakota Aquifer and the understanding of the interrelationships of use, recharge, and discharge. The Project identified areas most susceptible surface contaminants and those that are more protected from surface-related contaminants. The P-MRNRD's ability to provide tailored approaches to management to ensure the long-term conservation and protection of the water resources are expected to be realized as a result of the project findings and associated recommended actions in the final report. The P-MRNRD is in the process of implementing several of the recommended actions in the report at this time: locating new monitoring wells, recharge monitoring, test holes, and refining management activities based on the new understanding of aquifers from the project. As a result, management will likely be able to both prioritize continued use and development and limit total groundwater withdrawals resulting in economic development driven by the water resource. The P-MRNRD plans to provide the results to the public well cooperators in the survey area (municipalities, sanitary improvement districts etc.) so they can evaluate future well system expansion or replacement locations for the likelihood to be impacted by the migration of high nitrates or well interference issues. The full report deliverable will also be provided to the NDNR for incorporation into the existing models as the "best available" information in the annual *FAB Report*.

Hydrogeologic Framework of Selected Areas in Sarpy County, Nebraska



Prepared for:

Papio-Missouri River Natural Resources District

**8901 S 154th St
Omaha, NE 68138**

March 1, 2017



Aqua Geo Frameworks, LLC.

followed a progressive, long-term plan spanning nearly 10 years. This body of work shows continuing advancements in the science and application of AEM to support groundwater management.

In addition to the AEM and Magnetic Total Field data acquired during this investigation, multiple resources were used to develop the presented hydrogeologic framework and subsequent recommendations for potential recharge areas and well locations. Data and findings from previous studies, along with geologic descriptions and geophysical data were utilized to develop the hydrogeologic framework presented herein. A location map showing the Sarpy County AEM survey flight area and flight lines is presented in [Figure 1-2](#). A Google Earth kmz of the "As-Flown" flight lines is also included in Appendix 3/KMZ.

1.3 Description of the Sarpy County Project Area

The project area is in eastern Nebraska near the towns of Springfield and Gretna and lies within the Valleys, Bluffs and Escarpments, and Rolling Hills topographic regions of Nebraska ([Elder, 1951](#)). The area investigated by the AEM reconnaissance surveys within northwest Sarpy County in eastern Nebraska spans approximately 44 square miles (mi²) or 28,262 acres ([Figure 1-2](#)). The larger, more detailed, block-like survey in Sarpy County covered approximately 85 mi² or 54,486 acres. The total area of the study was 129 mi² or 82,747 acres.

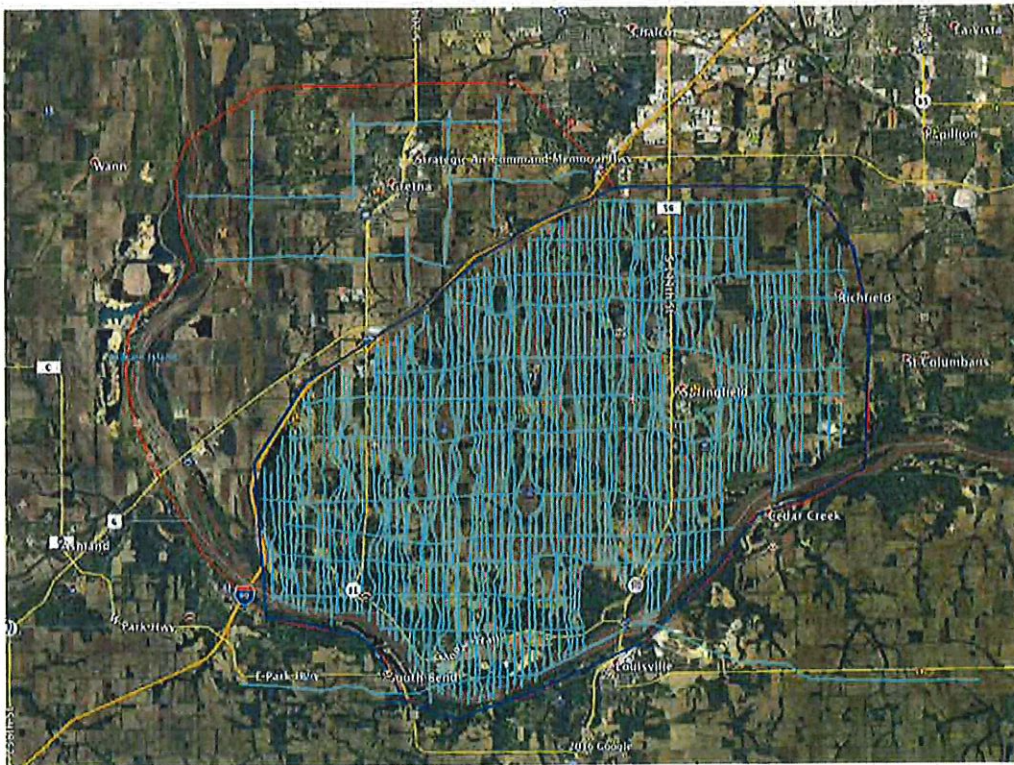


Figure 1-2. Outline of the Sarpy County AEM survey area including county lines and major roads (Interstate 80). The Sarpy County AEM survey area is outlined in red. The block flight area is outlined in dark blue. The "As-flown" flight lines are in light blue.