



FROM: Ann Dimmitt – TPNRD – IMP Manager

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RE: WSF 2023 Annual Report #5319

This report for the WSF #5319 – “Driving Water Savings Through Advanced Data Collection and Modeling in the Twin Platte Natural Resources District – Phase 2.” The first phase of this project began in 2019 and developed an amazing tool for the growers of the Twin Platte Natural Resources District (TPNRD), which allowed them to have water use data via a mobile application or through a web browser. This gave the growers access to daily and cumulative totals of water applied for their irrigated fields.

Phase 2 of this project involves additional tasks that supplement the tasks of Phase 1. While working on the tasks of Phase 1, two gaps were discovered in the process: (1) the TPNRD needs a better way to track and maintain the hundreds of Ethos (formerly known as Paige Wireless) devices deployed across the district; (2) a new evapotranspiration (ET) data product is available to incorporate into the modeling and close the water budget from 2011-2020 and beyond.

Funding for Phase 2 will contribute to the validity of the overall project. Phase 2 includes work that is vital to completing the 2023 Robust Review and will add exponential value to the work being completed under Phase 1. Phase 2 will display field-by-field data in the Groundwater Manager’s Platform, providing statistical summaries and visualizations of water usage data so that the TPNRD can observe the state of water use in the district at a glance. Also included in Phase 2 are improvements to the sensor network page to view device diagnostics like signal strength and battery life. A system will be implemented in the platform to create and track work orders for device maintenance. Additionally, Phase 2 will enhance the overall user experience in the Platform with customizable settings and training materials. Finally, new ET data available from OpenET will provide consumptive use during the 2011-2020 period, for which no actual water use data is available. Beyond 2020, OpenET data will be accessed through an application programming interface (API) which will allow automated data retrieval for all irrigated acre parcels in the TPNRD.

Phase 2 will provide benefits to the overall project objective of measuring water use across the TPNRD. Both the TPNRD and the irrigator will be working together to strike the appropriate balance between maximum beneficial consumptive use and limiting adverse impacts to the aquifer and streamflow. This will provide a true paradigm shift to irrigators and managers in the TPNRD, empowering them to make

proactive water management decisions by understanding how an action can affect the aquifer and stream before they take it.

This project will be Phase 2 of the development and delivery of a software solution that will allow the TPNRD to track agricultural groundwater use in their NRD. Phase 2 will be completed over the course of two years. Phase 2 includes two major tasks: 1) adding functionality to the Groundwater Manager's Platform; 2) integrating ET data for the 2011-2020 time period and beyond.

Groundwater Manager's Platform Improvements:

Functionality will be added to the Groundwater Manager's platform in four different areas during Year 1:

1. Sensor network dashboard: providing additional visual features of Ethos devices and implementing a system to track maintenance work.
2. Model scenario analysis: continuing to build out integration with groundwater models for use in the 2023 Robust Review (initiated in Phase 1 of this project).
3. Detailed water usage dashboard: creating a dynamic field inventory for visualizing water usage.
4. Enhanced application user experience: adding ability for customizing text and definition with the application, including a place to host training materials.

Integrating New ET Data:

New ET data available from the OpenET team will be used to complete the water budget for modeling the 2011-2020 time period. This task will be completed during Years 1 and 2. This task involves bringing in field-level ET and precipitation data for the TPNRD field boundaries from 2011-2020 and forging the connection to the OpenET API for data after 2020.

The estimated total cost of the ET data task is \$100,000. Year 1 costs, summarized in the table below, are to generate and deliver OpenET data on a parcel-by-parcel basis. Year 2 costs are to provide technical support, stakeholder engagement, and a data summary.

Major project task costs and timeline:

Tasks	Year 1	Year 2	Total \$ Amount
Groundwater Manager's Platform	\$120,150	\$0	\$120,150
OpenET Integration	\$75,000	\$25,000	\$100,000
		Total	\$220,150

Cost:

The total project cost after two years is estimated to be \$220,150, of which the TPNRD will cover 40% of the cost and the WSF would cover 60%.