

**Lower Big Blue NRD 2023 Annual Report to the
Blue River Compact Annual Meeting on May 9, 2023, at Manhattan, KS**

The Lower Big Blue Natural Resources District (LBBNRD) measures 171 wells across the district to monitor groundwater levels. Many of these are active irrigation wells that have been measured each spring and fall for the past 41 years. An additional 46 dedicated monitoring wells have been installed since 2016, many of those in conjunction with the public water supply wells of the District's communities. While the NRD's monitoring well network has been expanded over the years, the data have served to further illustrate recent groundwater declines. Spring 2023 static water level measurements are down 1.24 feet districtwide from last spring, as well as down 2.32 feet from baseline. Those Blue River Compact wells are down 0.90 feet from the previous Spring (see Appendix 1).

Those findings, along with continued drought conditions in the district and concerns over the sustainability of groundwater supplies prompted the LBBNRD Board of Directors to enact an immediate 180-day moratorium, or stay, on the construction of new wells and the expansion of irrigated acres at its December 2022 monthly board meeting. During the stay, District officials have been working with a consultant to better understand the hydrogeology of the district, as well as how best to manage and regulate further development of groundwater resources. Since weather conditions have not improved so far this spring, the Board will hold a public hearing to take comments on extending the stay until such time as the District has completed its work with the consultant.

The LBBNRD is responsible for the maintenance and operation of 270 flood control and grade stabilization structures in thirteen watersheds. The oldest flood control project in the District was completed in the 1950s and the newest just a few years ago. As part of these flood control projects the District also maintains 10 public use areas. The effect age has had on many of these structures coupled with the budgetary limitations of local governance has inspired the pursuit of creative solutions. The LBBNRD has extended the life of thirteen structures through principal spillway tube insert projects to date. These projects are effective and efficient to install, so it is the intent of the District to continue their implementation as funding allows.

Through a community-based planning process, the District has worked with the landowners and stakeholders of 3 public use area watersheds to install conservation practices and complete in-lake improvements to address water quality concerns such as sedimentation, phosphorus, Atrazine and E. coli over the past twenty years. The latest of these – the Cub Creek 12-A rehabilitation project – was completed this spring (see Appendix 2). Through the community-based approach, the NRD has been able to assist landowners in the watershed with implementing land treatment practices to improve water quality in the lake. This project included sediment removal, installation of jetties to increase travel time of water to the beach area, the creation of wetlands and shoreline stabilization.

The collaborative effort between basin NRDs and the Nebraska Department of Natural Resources (NeDNR) to develop a Blue Basin Groundwater Model is nearing completion.

The Lower Turkey Creek National Water Quality Initiative (NWQI) project is moving to the implementation phase. The area includes water quality impairments of E. coli, Atrazine and Nitrates (see Appendix 3). So far, there are 17 different producer EQIP applications to combat these impairments in the 75,000-acre watershed; eight have evolved into active contracts or soon will be and nine more are pending assessment and ranking.

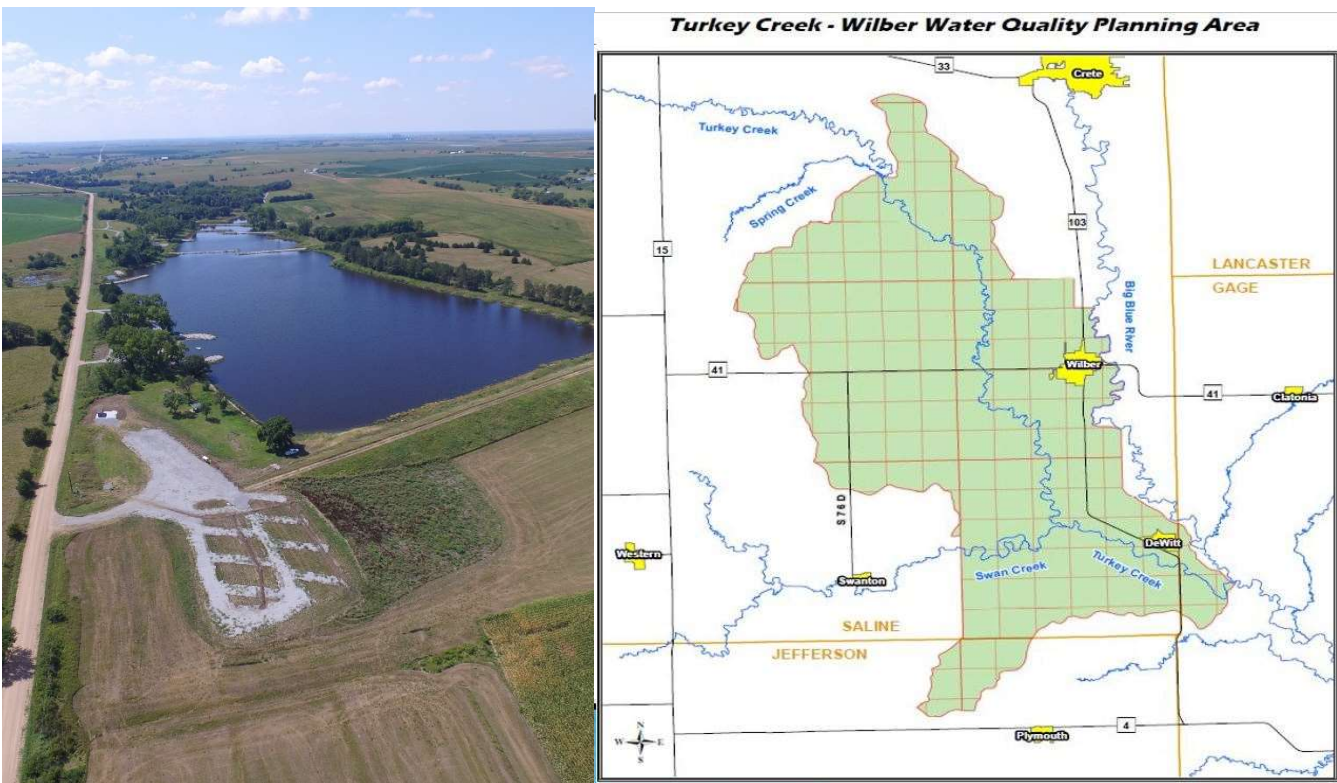
USDA Watershed and Flood Prevention Operations (WFPO) projects could provide the NRD unprecedented opportunity to improve many of its watersheds. Currently, the Little Indian WFPO project is at the post-90% plan phase, and the NRD is working with state NRCS officials to complete Preliminary Investigation Feasibility Reports (PIFRs) in other eligible watersheds in the district.

The NRD is also scheduled to begin its first Airborne Electromagnetic Hydrogeologic Mapping (AEM) project which will utilize resistivity to aid in delineating aquifer formations and developing a hydrogeologic framework in an area of the district with persistent groundwater level declines (see Appendix 4). Water Sustainability Funding (WSF) is being used to complete this project.

Groundwater Levels

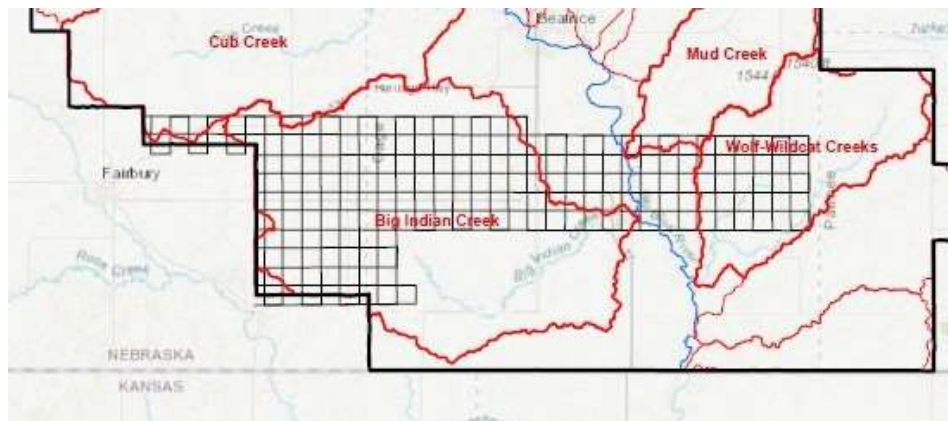
Wells	Number of Wells	Water Level Change From Spring 2022 to Spring 2023	Water Level From Baseline	Fall 2022 to Spring 2023 Recharge	Average Fall to Spring Recharge
Gage County	27	-1.91	-2.36	5.55	1.93
Jefferson County	24	-0.65	-5.60	5.58	3.05
Saline County	42	-1.07	-0.68	3.27	1.69
Dedicated Monitoring Wells	46	-1.65	-0.90	5.80	3.27
Blue River Compact Wells	32	-0.90	-2.05	2.10	1.32
District-Wide	171	-1.24	-2.32	4.46	2.25

Appendix 1 Spring Water Levels



Appendix 2 Cub Creek 12-A Rehab Project

Appendix 3 Lower Turkey Creek NWQI



Appendix 4 LBBNRD-AEM1 Project Area