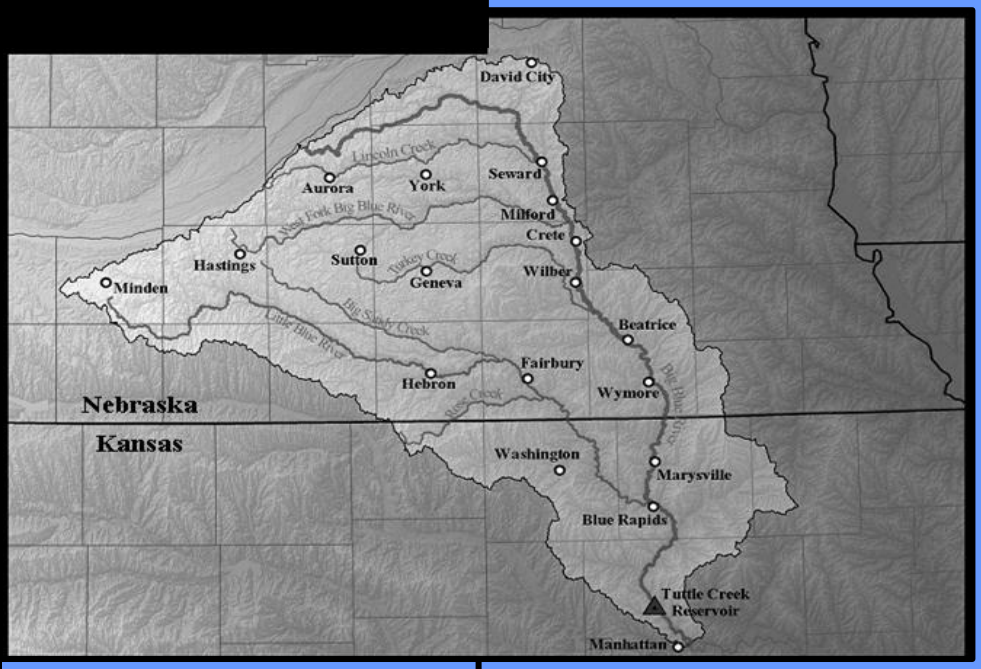
KANSAS-NEBRASKA
BIG BLUE RIVER COMPACT

FIFTIETH
ANNUAL REPORT



FISCAL 2023

Manhattan, KS
May 9, 2023

KANSAS – NEBRASKA BIG BLUE RIVER

COMPACT ADMINISTRATION

May 8, 2024

The Honorable Joseph R. Biden, Jr.
President of the United States of America

The Honorable Laura Kelly
Governor of Kansas

The Honorable Jim Pillen
Governor of Nebraska

Pursuant to Article VIII, Section 1 of the Rules and Regulations of the Kansas-Nebraska Big Blue River Compact Administration, I submit the Fiftieth Annual Report. The report covers the activities of the Administration of the Compact for the Fiscal Year 2023 while I was the presiding Federal Chair.

Respectfully,

W. Don Nelson

Federal Compact Chair

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1320 Research Park Drive
Manhattan, KS 66502
785-564-6700
www. agriculture.ks.gov

Kansas
Department of Agriculture

900 SW Jackson, Room 456
Topeka, KS 66612
785-296-3556

Mike Beam, Secretary

Laura Kelly, Governor

April 25, 2023

W. Don Nelson, Federal Chair
Kansas-Nebraska BBRCA
2430 S. Canterbury Lane
Lincoln, NE 68512

Tom Riley, Nebraska Commissioner
Kansas-Nebraska BBRCA
301 Centennial Mall South
Lincoln, NE 68509

Hannah Birge, Kansas Advisor
Kansas-Nebraska BBRCA
2110 Walnut Drive
Manhattan, KS 66502

Larry Moore, Nebraska Advisor
Kansas-Nebraska BBRCA
2240 A Road
Ulysses, NE 68669

Dear Compact Members:

The 2023 annual meeting of the Kansas-Nebraska Big Blue River Compact Administration will be hosted by Kansas on Tuesday, May 9, 2023, at 9:00 A.M. The meeting will be held at the Kansas Department of Agriculture (1320 Research Park Drive, Manhattan, KS, 66502).

A tentative agenda is enclosed with this meeting notice.

Sincerely,

Earl D. Lewis Jr.
Kansas Commissioner

Enclosures or Attachments (1)

cc: Budget Committee – Bob Robles, Lizzie Hickman
Legal Committee – Emily Rose, Stephanie Kramer
Engineering Committee – Jeremy Gehle, Lizzie Hickman
Water Quality Committee – Tom Stiles, Craig Romary, Dan Howell, Sarah Starostka
NRD Managers – Scott Nelson, Scott Sobotka, David Eigenberg, John Thorburn
Add'l – Jim Macy, Jason Lambrecht

Kansas-Nebraska Big Blue River Compact Administration
50th Annual Meeting

May 9, 2023, 9:00 A.M.
Kansas Department of Agriculture
1320 Research Park Drive
Manhattan, KS 66502

AGENDA

1. Call to Order
2. Introductions and Announcements
3. Minutes and Report of the 49th Annual Meeting
4. Chair's Report
5. Kansas Report
    a. State Overview Report
    b. Topeka Field Office Report
    c. Compact Advisor Comments
6. Nebraska Report
    a. State Overview Report
    b. Water Administration Report
    c. Reports of the NRDs
    d. Compact Advisor Comments
7. Secretary's Report
8. Treasurer's Report and Budget
9. US Geological Survey Report
10. Legal Committee Report
11. Engineering Committee Report
12. Water Quality Committee Report
13. Old Business
14. New Business
15. Committee Membership and Special Assignments
16. Adjournment

MINUTES OF THE FIFTIETH ANNUAL MEETING
OF THE
KANSAS-NEBRASKA BIG BLUE RIVER COMPACT ADMINISTRATION

Call to Order

The Fiftieth Annual Meeting of the Kansas-Nebraska Big Blue River Compact Administration (Administration) was held on May 9, 2023, at the Kansas Department of Agriculture in Manhattan, KS. The meeting was open to the public.

The meeting was called to order at 9:00 AM CDT by W. Don Nelson, Federal Compact Chair. Mr. Nelson introduced himself and asked those in attendance to introduce themselves, beginning with the Compact Commissioners and Advisors. Following introductions, Mr. Nelson welcomed attendees and thanked them for their participation. He invited attendees to raise their hands if they had a question or comment at any point during the proceedings.

Introductions

Those confirmed in attendance were:

W. Don Nelson	Federal Compact Chair
Earl Lewis	Kansas Compact Commissioner; Chief Engineer, Kansas Department of Agriculture, Division of Water Resources
Tom Riley	Nebraska Compact Commissioner; Director, Nebraska Department of Natural Resources
Hannah Birge	Kansas Compact Advisor; The Nature Conservancy
Larry Moore	Nebraska Compact Advisor
Lizzie Hickman	Compact Secretary; Kansas Department of Agriculture, Division of Water Resources
Bob Robles	Compact Treasurer; Nebraska Department of Natural Resources, Assistant Director
Jeremy Gehle	Compact Engineering Committee Chair; Nebraska Department of Natural Resources, Water Administration Division Head
Stephanie Kramer	Kansas Department of Agriculture, Chief Counsel
Tyler Smith	Kansas Department of Agriculture, Division of Water Resources, Topeka Field Office
Lane Letourneau	Kansas Department of Agriculture, Division of Water Resources, Water Appropriation Program Manager
Chris Beightel	Kansas Department of Agriculture, Division of Water Resources, Water Management Services Program Manager
Tom Stiles	Kansas Department of Health and Environment, Division of Environment, Bureau of Water Director
Kent Askren	Kansas Farm Bureau, Advocacy Division, Director of Public Policy
Nick Levendofsky	Kansas Farmers Union, Executive Director
Jackie Garagiola	Kansas Livestock Association, Associate Counsel
Daniel Howell	Kansas Watershed Restoration and Protection Strategy, Tuttle Creek Project
Scott Nelson	Little Blue Natural Resources District, General Manager
Tyler Weishahn	Lower Big Blue Natural Resources District, Assistant Manager
Scott Sobotka	Lower Big Blue Natural Resources District, General Manager

Jennifer Swanson	Nebraska Association of Resources Districts, Director of Water Quality Initiatives
Sarah Starostka	Nebraska Department of Environment and Energy, Planning and Aid Division Manager
Dan Ross	Nebraska Department of Environment and Energy, Water Planning Section Supervisor
Tara Anderson	Nebraska Department of Environment and Energy, Water Quality Standards Coordinator
Emily Rose	Nebraska Department of Natural Resources, Agency Legal Counsel
Isabella Peterson	Nebraska Department of Natural Resources, Legal Counsel
Justin Hladik	Nebraska Department of Natural Resources, Lincoln Field Office Supervisor
Madeline Johnson	Nebraska Department of Natural Resources, Water Planning Division
Jeff Long	Nebraska Department of Natural Resources, Water Planning Division
Andy Pedley	Nebraska Department of Natural Resources, Water Planning Division
Connor Nichols	Nebraska Department of Natural Resources
Jake Wessel	Office of US Senator Jerry Moran, State Agriculture Representative
Clara Ebert	Pottawatomie County
John Miller	Upper Big Blue Natural Resources District, Director
Marie Krausnick	Upper Big Blue Natural Resources District, Assistant General Manager
David Eigenberg	Upper Big Blue Natural Resources District, General Manager
Terry Julesgard	Upper Big Blue Natural Resources District, Water Department Manager
Brandon Wilson	US Department of Agriculture, Farm Services Agency, Marshall County Executive Director
Payton Doramus	US Department of Agriculture, Farm Services Agency, Pottawatomie County Executive Director
Dani Belville	US Department of Agriculture, Farm Services Agency, Riley-Geary County Executive Director
Kristie Nutsch Fulton	US Department of Agriculture, Farm Services Agency, Washington County Executive Director
Jason Lambrecht	US Geological Survey, Nebraska Water Science Center, Deputy Director of Hydrologic Observations
Michelle Oehm	General Public

Approval of the Minutes of the Forty-Ninth Annual Meeting

Lizzie Hickman, Compact Secretary, reported that an electronic copy of the draft minutes of the Forty-Ninth Annual Meeting was provided to the Administration and to Kansas and Nebraska staff on May 2, 2023. No corrections had been returned as of the meeting. As the draft minutes had only been available for review for about one week, Ms. Hickman asked whether the Administration had any corrections to submit or wanted the draft minutes to undergo a longer review period. Otherwise, she would submit the draft minutes to the Administration for approval.

Earl Lewis, Kansas Compact Commissioner, moved to approve the Minutes of the Forty-Ninth Annual Meeting as submitted. Tom Riley, Nebraska Compact Commissioner, seconded the motion. There was no discussion. The motion passed unanimously.

Chair's Report

W. Don Nelson, Federal Compact Chair, noted that the December 2022 Keystone Pipeline rupture and subsequent crude oil spill had occurred within the Compact area. Mr. Nelson stated that he had not been approached in his capacity as Federal Compact Chair regarding this incident and that he was unsure what role the Administration might play, especially as it occurred entirely within Kansas, with little to no

impact on Nebraska. However, he invited attendees who might have questions or comments regarding the event to share their thoughts.

Kristie Nutsch Fulton, US Department of Agriculture (USDA) Farm Services Agency (FSA), noted that the company responsible for the pipeline, TC Energy, had cooperated well with the community to clean up the affected area. Cleanup efforts were in the final phase and had succeeded in preventing contamination from traveling further downstream in Mill Creek. Mr. Nelson thanked Ms. Nutsch Fulton for the update.

Kansas Report

State Overview Report

Earl Lewis, Kansas Compact Commissioner and Chief Engineer of the Kansas Department of Agriculture, Division of Water Resources (KDA-DWR), began the Kansas report (Attachment A).

Mr. Lewis continued from the Chair's Report, adding that KDA-DWR had a small permitting role in the Keystone Pipeline spill cleanup, in remediation of Mill Creek and installation of dams and control structures. He agreed that TC Energy had been very responsive and cooperative. Mr. Lewis also acknowledged the efforts of local, state, and federal emergency management personnel, thanking them for the coordination and speed of their incident response, which controlled contamination within four miles of the initial spill. He concurred with Ms. Nutsch Fulton that cleanup efforts appeared to be in the final phase and, while the timeline for completion would be determined based on future testing, recent reports were promising.

The remainder of Mr. Lewis's report was dominated by drought in Kansas, especially western and south-central Kansas. At the time of the meeting, Kansas was experiencing some of the most extreme drought conditions in the nation. Slight relief had been received immediately prior, with the hope of additional rainfall to come. Much more would be needed to alleviate drought conditions from KDA-DWR's perspective, as they continued to deal with compliance issues brought on by intense drought, including water users who pumped more than they were authorized under their water rights.

The 2023 session of the Kansas Legislature had just ended, and it had been a more active session for water issues than had been seen in some time, with three water-related bills passed. The first was Senate Bill 205, which applied primarily to south-central Kansas. This bill was sponsored by KDA-DWR to clarify conflicting language between the statutes for the Central Kansas Water Bank and multi-year flex accounts. House Bill 2279 dealt with Kansas's groundwater management districts (GMDs), which are in south-central and western Kansas, providing additional financial reporting, accountability, and transparency requirements for the GMDs. The bill also implemented a timeline in which the GMDs must identify high priority areas of concern (in water quality, groundwater declines, etc.) and develop action plans to address those issues. High priority areas must be identified and reported to KDA-DWR by July 2024, and action plans for those areas must be submitted by July 2026. In both cases, KDA-DWR must forward the submitted materials on to the legislature for review during the next session. Finally, House Bill 2302 added $35 million in funding per year, for the next five years, to the State Water Plan Fund. Historically, when fully funded, the State Water Plan Fund had received about $20 million per year; this was the largest increase since the fund was established in 1989. $17 million of these funds are dedicated to technical and infrastructure grant assistance for small municipalities and local water districts. That leaves about $18 million per year to fund other state water programs.

Regarding water conservation, two Local Enhanced Management Areas (LEMAs) in northwest Kansas had recently been renewed. The Sheridan County 6 (SD6) LEMA had been in place for ten years, and a LEMA spanning much of Northwest Kansas GMD No. 4 had just finished its first five-year period. Both were renewed for an additional five-year period. Both LEMAs had proven successful in that producers in these areas had exceeded their conservation goals despite the intense drought of the last few years. In

2021, a LEMA was established in Wichita County in west-central Kansas, and KDA-DWR was in the process of establishing another that would cover another four counties in west-central Kansas.

In the 1990s, the Cities of Hays and Russell purchased property about 70 miles south in Edwards County. In 2018, they began working with KDA-DWR through a two-step permitting process to allow them to use water rights on that land as municipal supply. First, the water rights had to be changed from irrigation to municipal use. This was approved a few years ago, but a local group opposed to the transfer had filed suit, most recently appealing to the Kansas Supreme Court to overturn KDA-DWR's decision. Next, the transfer of water over such a distance must be approved by a process which involves a hearing before a panel, who must decide whether the transfer is in the public interest. The water transfer hearing was to begin in July 2023.

The US Fish and Wildlife Service owns a 1957 water right on Rattlesnake Creek in south-central Kansas which supplies water to Quivira National Wildlife Refuge. In early 2023, they filed a Request to Secure Water with KDA-DWR, requesting that their water right be protected. KDA-DWR began developing a plan to address their water right impairment, to be implemented in 2024.

Returning to the Compact area, one project which had been fully funded and on which progress would be expected soon was a water injection dredging pilot project, the first of its kind in the nation, in Tuttle Creek Reservoir. Essentially, sediment at the bottom of the reservoir would be fluidized to see if it could be passed through the outlet gates and ultimately into the Kansas River. Project funding had come from both state and federal sources, and the project was a collaboration between the Kansas Water Office and the US Army Corps of Engineers. 2023 would be devoted to design and testing, with implementation of the pilot project to begin in 2024.

Tom Riley, Nebraska Compact Commissioner, asked Mr. Lewis about the scope of the Tuttle Creek Reservoir pilot project and where the dredging would take place. Mr. Lewis replied that the project was still in the design phase. In terms of timing, the project would probably operate over shorter periods to allow for analysis and adjustment in between and would test the effectiveness of the project at different durations and seasons of the year. The dredging would take place quite close to the dam, initially, and more removed locations could be tested if the initial design proved successful. Mr. Lewis commented that there was a lot of interest in the success of this project across the Midwest, where many reservoirs experience similar sedimentation issues that affect water quality and reservoir life.

Topeka Field Office Report

Lane Letourneau, Water Appropriation Program Manager for KDA-DWR, continued the Kansas Report (Attachment B). He thanked the KDA-DWR staff who prepared the Topeka Field Office Report.

Mr. Letourneau began with an overview of climate conditions in the Big Blue River basin in Kansas. Precipitation was mostly uniform across the basin in 2022, but was only 70 to 95 percent of normal, indicating drought conditions. Temperatures in the basin in 2022 ranged from normal to 2.5 degrees cooler than normal. So far in 2023, temperatures had ranged from normal to one degree warmer than normal. The Standardized Precipitation Index (SPI) for the basin had entered a drought trend in 2022, which was becoming more significant in 2023.

In Kansas, the minimum desirable streamflow (MDS) statute requires administration of water rights and permits with a priority date junior to the statute (April 12, 1984) when streamflow at specific US Geological Survey (USGS) gages falls below statutorily defined monthly thresholds. 21 surface water rights junior to MDS in the Little Blue River basin above the USGS gage near Barnes, Kansas were under MDS administration from September 2022 to March 2023, and again beginning in April 2023. However, streamflow at the USGS gage on the Big Blue River at Marysville, Kansas had remained sufficient to avoid MDS administration above that gage.

Mr. Letourneau went on to discuss KDA-DWR compliance and enforcement activities in the Big Blue River basin. In 2022, five formal Cease and Desist (CD) Orders were issued in the Compact area. These CDs were not issued due to new compliance issues, but rather to water users who had previously chosen not to use their water rights rather than install a totalizing water flow meter when that became a requirement for active water rights. KDA-DWR had previously issued Notices of Non-Compliance (NONCs) to these water users, but issuing a CD allows KDA-DWR to pursue enforcement actions should that become necessary. No other compliance issues had been identified or civil penalty orders issued in the Compact area since the previous meeting.

Regarding new water right development in the Compact area, 18 new applications were received in 2022, 13 for regular water rights and five for temporary permits. Of the water right applications, 12 were for irrigation use and one was for stockwatering use. Of the temporary permit applications, four were for dewatering use and one was for industrial use. One of the temporary permit applications was for permission to reroute Mill Creek around the four-mile reach which had been contaminated in the Keystone Pipeline oil spill, so that streamflow could be delivered to downstream water users.

Following Mr. Letourneau's report, Lizzie Hickman, KDA-DWR, offered the clarification that while the Big Blue River basin had avoided MDS administration above the USGS gage at Marysville, Kansas, administration in Nebraska had occurred in 2022 when the Big Blue River failed to meet Compact state line target flows. Ms. Hickman noted that there were currently 397 water rights and permits under MDS administration across Kansas due to the ongoing drought.

Kansas Compact Advisor Comments

Hannah Birge, Kansas Compact Advisor, introduced herself to attendees as a resident of Manhattan, Kansas who was working in Nebraska for a global nonprofit, The Nature Conservancy (TNC), which operated on both the global and local scales to discover effective solutions for both people and nature. Their local efforts were done in collaboration with producers to facilitate conservation practices which producers had been unable to implement due to risk or financial, technical, or labor needs. TNC's programs also facilitated experimental conservation and sustainability practices on a global scale. Ms. Birge was working primarily with food, beverage, and agriculture companies to develop more sustainable global supply chains following the disruptions of the past few years. Companies had realized that sustainable supply chains and supply bases were not an optional benefit but a critical competitive advantage and had begun to question how water-related circumstances such as drought or water administration would impact their supply chains. Large retail corporations such as Walmart or Target were increasingly requiring assurance of supply before contracting to sell products in their stores. This required companies to understand how the producers supplying their raw materials might adapt to climate conditions and government regulation. Ms. Birge stated that she believed interstate collaboration and mechanisms such as the Compact would become increasingly important to ensure that markets remain open for producers.

Larry Moore, Nebraska Compact Advisor, provided an example from within the Compact area of a seed company, in partnership with Pheasants Forever, working with local hybrid seed growers to promote wildlife conservation and cover crops.

Nebraska Report

State Overview Report

Tom Riley, Nebraska Compact Commissioner and Director of the Nebraska Department of Natural Resources (DNR), began the Nebraska report. He noted that this was the fiftieth annual meeting of the Administration, though the Compact is one of the newest in either Nebraska or Kansas. It is also one of the only interstate river compacts in the nation to have a water quality component. Mr. Riley thanked the Kansas Department of Agriculture for hosting the meeting.

Mr. Riley began by discussing water supply, noting that there was some hope that precipitation would begin alleviating drought conditions soon. Though El Niño had recently begun, Kansas and Nebraska would be among the last states to receive the impact of any increased precipitation, perhaps not until the fall. While the Big Blue River basin does not receive supply from snowmelt, other basins with mountain headwaters had received promising snowpack, with hope for relief from drought conditions in those basins as spring continued into summer. Mr. Riley noted that later reports would present some of the lowest stream gage discharge values on record for the Big Blue River basin.

Mr. Riley noted Nebraska's unique approach to water management, with DNR permitting and administering surface water and their Natural Resources District (NRD) partners responsible for groundwater. DNR and the NRDs collaborate on development of Integrated Management Plans (IMPs), including within the Big Blue River basin. A groundwater model for the basin with predictive capabilities was nearing completion. DNR solicits water use reports from Nebraska water users on a voluntary basis. Mr. Riley stated that while he already considered the program a success, further electronic avenues for reporting could increase convenience and adoption even further.

The Nebraska Legislature was still in session as of the meeting. There was one bill of interest to DNR: LB 723, which would give DNR design-build contracting capacity statewide, an authority DNR had never had before. Other Nebraska agencies already had this authority, including the NRDs, the Game and Parks Commission, and the Department of Transportation. DNR could then enter design-build contracts for appropriate projects, allowing them to engage with the contractor earlier in the process, accelerate project completion, and reduce costs. The legislature had also just completed the first of three rounds in the state's budget approval process. The budget included $1.2 million over the next two years for DNR data collection efforts. Mr. Riley noted that Nebraska no longer collected as much streamflow and other data as they had at one time, though data collection in the present was crucial for good decision-making in the future. He pointed out climate change and increasing reliance on artificial intelligence as particular needs for robust and reliable historical datasets. DNR had begun to plan how to use that data collection funding over the next few years. Finally, Nebraska had a large project in the works related to the South Platte River Compact with Colorado. Nebraska planned to exercise their right for winter streamflow from the South Platte River, which first involved construction of diversion works and a canal and reservoir system in western Nebraska. It appeared that project would be fully funded by the legislature as well.

The Water Sustainability Fund (WSF) was created by the Nebraska Legislature in 2014 and usually has about $11 or 12 million available each year. The annual application cycle had closed about six weeks before the meeting. DNR was in the process of evaluating applications to ensure they met program qualifications before sending them on to the state's Natural Resources Commission, who were responsible for scoring applications and awarding funds. In 2022, a few notable projects in the Big Blue River basin received funding. Little Blue NRD received $85,000 for a hydrogeologic assessment. Lower Big Blue NRD received about $1.8 million for the Little Indian Creek watershed flood prevention and operations project. Lower Big Blue NRD also received funding for airborne electromagnetic hydrogeologic mapping (AEM), which produces valuable information about the underlying structure of soils and bedrock. Any 2023 projects in the Compact area would be revealed in a few more weeks.

Regarding dam safety, there were 617 jurisdictional dams in the Big Blue River basin in Nebraska (second only to the Nemaha River basin), representing a substantial number of dams requiring DNR review. DNR had developed and invested in a new product called DSS-WISE Lite, a hydraulic modeling software which allowed DNR to quickly evaluate dam breaches, especially when paired with Nebraska's robust available LiDAR dataset. In the basin, DNR had been able to model flood inundation in case of a dam breach for 459 jurisdictional dams, providing important information for the state's floodplain mapping and flood insurance programs. Many of the dams had been designed by the US Department of Agriculture, Natural Resources Conservation Service (NRCS) with corrugated metal pipes. The NRDs

had been working over the years to install sliplines in those pipes to extend the life of dams throughout the basin.

Earl Lewis, Kansas Compact Commissioner, asked whether the $1.2 million in data collection funding was one-time or a new annual appropriation. Mr. Riley replied that it was not currently an annual appropriation, but two years of $1.2 million, for a total of $2.4 million, from the American Rescue Plan Act. However, Mr. Riley also expressed hope that if DNR could demonstrate the benefits of robust data collection, there was a good chance the legislature would appropriate annual funds for data collection in the future. There had once been a regular appropriation for data collection, but DNR had lost significant funding over the last decade. However, the floods of 2019 and the current drought had emphasized the need for large and reliable datasets for water management decision-making. DNR hoped to use the funds to deploy data collection tools or systems across the state.

Water Administration Report

Justin Hladik, DNR Lincoln Field Office Supervisor, continued the Nebraska report, covering water administration activities (Attachment C).

Mr. Hladik reported that 2022 was a fairly average year for precipitation, with the Big Blue and Little Blue River basins receiving 80 to 90 percent of average rainfall. However, due to the timing of that rainfall, the basin was very dry by July 2022, and DNR administered junior irrigators on both rivers.

The Little Blue River basin in Nebraska is 2,752 square miles, with 491 active natural flow irrigation water rights and 142 storage rights. On July 25, 2022, streamflow fell below the Compact state line target flows at the USGS gage at Hollenberg, Kansas, and administration began. Administration ceased after a few days, but resumed on August 1, 2022, for a total of 64 days of administration in 2022. DNR made 292 field observations in the Little Blue River basin during administration and found 134 irrigation systems diverting water. Many sites were visited more than once, and DNR made their presence in the area known to irrigators. Each time field staff came across an active irrigation system, they measured pipe flow using a meter and developed a pump schedule for that irrigator which dictated the timing, duration, and amount of pumping they were allowed. Mean streamflow at the Little Blue River gage at Hollenberg, Kansas was 178 cubic feet per second (cfs) in 2022 compared to an average annual mean streamflow of about 485 cfs.

The Big Blue River basin in Nebraska is about 4,500 square miles, with 1,088 active natural flow irrigation water rights and 384 storage rights. The Big Blue River basin was only under administration for Compact state line target flows for 18 total days in 2022, over two separate periods in mid to late August. Administration ceased for the year on September 6, 2022. DNR made just under 1,000 field observations in the Big Blue River basin and found 405 irrigation systems diverting water. DNR field staff put in significant effort to ensure compliance in this basin, including working overtime and weekends. Mean streamflow at the USGS Big Blue River gage at Barneston, Nebraska was about 440 cfs in 2022 compared to an average annual mean streamflow of about 855 cfs. The period of record of the Barneston, Nebraska gage is from 1933 to 2022.

Scott Nelson, Little Blue NRD, thanked DNR field staff for their hard work in the basin during the administration periods and for their good communication with the NRDs.

Upper Big Blue Natural Resources District (NRD) Report

David Eigenberg, General Manager of the Upper Big Blue NRD (District), began the District report (Attachment D). Mr. Eigenberg thanked John Miller of the District Board of Directors for attending the meeting. He introduced two other District staff in attendance: Marie Krausnick, Assistant General Manager, and Terry Julesgard, Water Department Manager. Mr. Eigenberg noted that District staff were organized into multiple departments.

Mr. Julesgard continued the District report, noting that there had been 66 new irrigation or livestock well permits over the past year: 37 new wells and 29 replacement wells. There were over 12,000 total irrigation wells in the District. The District had just completed their spring static water level measurements, which revealed a 2.21 foot decline over the past year, though this was still 6.68 feet above the District's allocation threshold. The District requires that all irrigated acres be certified. As of January 1, 2023, there were over 1.2 million irrigated acres in the District, with an increase of 967 acres over the past year. The District mandates well metering and water use reporting. During the 2022 irrigation season, the average withdrawal was 7.53 inches per system.

The most pressing water quality issue in the District is nitrates. The District is divided into 12 groundwater quality management areas based on median groundwater nitrate concentration (see Attachment D). Three of the areas were in phase two management status, and three were in phase three management status. Producers in these areas were required to attend training sessions on fertilizer and irrigation best management practices (BMPs). Approximately 1,100 irrigators are required to take these training courses each irrigation season. The District was also monitoring other groundwater contaminants, including arsenic, selenium, and uranium.

The District worked with the University of Nebraska Medical Center on a collaborative study to determine seasonal variations in groundwater contaminants. Groundwater quality samples were taken in April and May (pre-irrigation), June and July (during irrigation) and October and November (post-irrigation). Initial sample collections did show seasonal fluctuations in groundwater contaminants. District staff were preparing for the next pre-irrigation sample collection.

The District collaborates with the City of York, Nebraska on Project GROW. York owns the land where their municipal supply wellfield is located, where the District farms 140 acres to demonstrate proper rotation and use of cover crops. The project was in its sixth year (the first year of their second five-year interlocal agreement). Community garden plots were also available for York residents.

The District collaborated with TNC on a three-year cover crop interseeding project to demonstrate interseeding during the growing season. Following the successful completion of that project, TNC transferred ownership of the equipment to the District, who planned to continue renting it to producers who want to try this practice on their own land. The District also collaborates with the Nebraska Agricultural Water Management Demonstration Network to sell Etgages and Watermark sensors to producers at reduced cost, to be used to determine crop water requirements.

DNR and several NRDs – Upper Big Blue, Lower Big Blue, Little Blue, and Tri-Basin – were developing a transient Big Blue River basin groundwater model to be completed June 2023. The District collaborates with communities within the District on source water protection planning for their municipal supply systems. Finally, the District had partnered with the University of Nebraska on a vadose zone sampling project to gain a better understanding of groundwater recharge and transport, including contaminant transport.

Ms. Krausnick continued the District report. In spring 2020, the District's Water Quality Management Plan (WQMP) was accepted by the US Environmental Protection Agency (EPA). The WQMP identified two priority areas and one special priority area. One of the priority areas was the Recharge Lake watershed near York, Nebraska. Recharge Lake was constructed by the District in the 1990s to measure aquifer recharge. Primary contaminants in Recharge Lake were mercury and phosphorous. The other priority area was the adjacent Beaver Creek watershed, where the primary contaminants were E. coli and atrazine. The special priority area represented the wellhead protection areas of communities with improved wellhead protection plans. During the stakeholder engagement portion of the planning effort, buffer strips and cover crops were identified as the BMPs that stakeholders would be most willing to implement. Implementation of the WQMP involved the engagement of a smaller stakeholder group within the priority areas. The District eventually launched what they believed to be a robust BMP incentive

program with sufficient funding. However, during the initial campaign, only a few producers in the special priority area expressed interest, and little to no interest was found in the priority areas. Over the past year, District staff developed new strategies with the intent to present the incentive program to producers in the priority areas again.

During implementation of the WQMP, the District also established a plan for the Lake Hastings watershed. Lake Hastings is located within the City of Hastings, Nebraska. The north side of the lake featured extensive development, while the south side was devoted to parks and other public use areas. However, the lake had experienced significant sedimentation, with accompanying contamination. The City of Hastings spearheaded plan development with the District and the Little Blue NRD (as the NRD boundary passes through the watershed) to engage stakeholders and develop a BMP incentive program. Ms. Krausnick remarked that some Hastings residents felt unsafe swimming or boating on the lake, and the District hoped to help improve lake water quality for the community.

Building upon earlier partnerships, TNC approached the District and the Central Platte NRD to collaborate on an NRCS Resource Conservation Partnership Program (RCPP) funded by Cargill, Target, McDonald's, and the Ecosystem Services Market Consortium. The program provides incentives for no-till, cover crops, or diversified crop rotation, with the goal of increasing soil health. The project was half funded by the private sector and half funded by the NRCS for a total of $8 million. 19 contracts had been awarded over the first two enrollment periods within the District alone, with a third enrollment period to begin in the fall.

The District continued to administer the Nebraska Department of Agriculture's buffer strip program. The District hoped to maximize incentives by pairing the funding from the WQMP incentive program to generate further buffer strip adoption in the WQMP priority areas. The District continued its private dams cost-share program. Interest in the program had waned in recent years due to changes in NRCS policy but had now revived to the point that there was a waiting list, as contractor availability had become the limiting factor. Over the life of the program, the District had assisted with the repair of 20 dams, with an average cost to the District of about $27,000 per dam.

The District had been awarded funding from the Nebraska Emergency Management Agency (NEMA) to install emergency warning sirens at recreational areas for campers and day users. NEMA had also funded an update to the District's Multi-Jurisdictional Hazard Mitigation Plan covering the counties of Seward, Hamilton, and York, which were the last counties in the District with individual hazard mitigation plans. The update included twenty-five additional communities. The District was exploring funding options to continue that work, which began in 2019. Ms. Krausnick finished the District report by encouraging attendees to explore the District's website to learn more about their ongoing programs and about recreation opportunities within the District area.

Larry Moore, Nebraska Compact Advisor, added that at the previous meeting, he had been asked what he knew about the poultry industry in the District. He provided an update on the industry within Butler County, where 120 buildings could house about five million birds at any given time, and commented on the exponential growth of the industry within the Compact area. Ms. Krausnick mentioned that the District had begun to collect some data on the poultry industry. Development appeared to be slightly less than had been predicted based on guidelines provided by the University of Nebraska. Mr. Moore commented that the buildings also used evaporative cooling, which might create a significant water demand during hot summers.

Little Blue Natural Resources District (NRD) Report

Scott Nelson, General Manager of the Little Blue NRD (District), presented the District report (Attachment E). Average rainfall in the District was 19.2 inches, with average irrigation use of 9.4 inches per acre. There are three major aquifers in the District (see Attachment E), including the Ogallala Aquifer

(2022 groundwater level decline of 1.43 feet) and a paleo valley aquifer (2022 groundwater level decline of 0.58 feet). The District's IMP requires flow metering, so the District spends about $60,000 annually assisting District water users with meter maintenance and repair. The District began monitoring groundwater levels in 1974. Mr. Nelson remarked that if declines continued as they had been, the District may be about three years from implementing irrigation allocations, which occurs when groundwater levels remain at least one foot below the 2016 baseline for two consecutive years. Irrigation allocations would allow 13 inches per year over a five-year period. Mr. Nelson noted that, considering groundwater trends and current use, groundwater declines would continue if irrigation allocations were implemented, so the District may need to revise the allocations. The District was third in the state for certified irrigated acres, with 680,000 irrigated acres.

Water quality remained a pressing issue within the District. The District offered many cost-share programs aimed at water quality improvements. However, 2022 monitoring showed that municipal supply wells in the District continued to be contaminated with nitrate, and some communities had begun investigating alternative water sources.

Several watershed projects were ongoing within the District. A federally funded $8 million community flood control project near Hastings, Nebraska had just entered a two-year planning process. Producers within the Big Sandy Creek project area had recently been more responsive to District efforts to incentivize precision chemical application and atrazine alternatives. There were six contracts in that project as of the meeting, with more applications under evaluation. The District wanted to extend that five-year project another year. Near Hubble, Nebraska, the District had repaired three flood control structures (dams) in 2022 for about $112,000.

The Little Blue Valley Water Project (Project) is a rural water system serving 400 locations (including 89 in Kansas) or a population of about 1,500 people. The Project had been purchasing water from the City of Fairbury, Nebraska, who frequently raised their rates and whose municipal supply wells were contaminated with nitrate. The Project had secured land rights to a wellfield of their own, where groundwater nitrate levels were less than one-tenth what they were in Fairbury's wellfield, and were now seeking $10 million in construction funding.

Mr. Nelson received questions about the Project wellfield. The wellfield would be located north of Gladstone, Nebraska. Other than the need to construct a new pipeline from the wellfield, existing Project infrastructure could be used for water delivery to customers.

Lower Big Blue Natural Resources District (NRD) Report

Scott Sobotka, General Manager of the Lower Big Blue NRD (District), presented the District report (Attachment F). He began by mentioning that the District considered themselves the watershed capital of Nebraska, being responsible for the operation and maintenance of 270 flood control and grade stabilization structures representing about 110,000 acre-feet of flood storage. These structures provide flood control and sediment storage for a combined drainage area of over 400,000 acres, or about 38 percent of the Big Blue River basin. The first of these structures were completed in the 1950s. The District conducted maintenance work to extend the life of these structures as funding allowed. District staff had become very efficient in plastic slipline installation. However, in the thirteen dams where sliplines had been installed just the previous week in collaboration with the Nemaha NRD, fiberglass liners hardened with ultraviolet light had been used.

The Little Indian Watershed and Flood Prevention Operations (WFPO) project was at the post-90 percent plan phase, with the final meeting with the NRCS scheduled for the week following the Compact meeting. The District continued to meet with NRCS officials to complete preliminary investigation and feasibility reports in other eligible watersheds. Many WFPO projects in the District had received federal funding during the first decade of the program, resulting in the creation of Watershed Conservancy

Districts. Mr. Sobotka mentioned that there were seven flood control structures in the Nebraska portion of the Mission Creek watershed, and that the District would be open to discussing a joint WFPO application with Kansas partners.

In addition to flood control structures, the District maintains 10 public use areas. The District had rehabilitated three of these areas through a community-based planning process, working with local stakeholders to address water quality concerns such as sedimentation, phosphorous, atrazine, and E. coli. Mr. Sobotka described the most recent rehabilitation work, which had been done at the Cub Creek 12A site (see Attachment F).

The District had continued work on the Lower Turkey Creek National Water Quality Initiative (NWQI) project. The lower Turkey Creek watershed has an area of about 75,000 acres (see Attachment F). As of the meeting, there were 17 active or pending Environmental Quality Incentives Program (EQIP) contracts totaling about $786,000. The project allows for numerous crop and grassland practices.

The District completed its IMP in April 2022. The IMP mandates certification of irrigated acres, installation of water flow meters on all new and replacement wells, and permitting of high-capacity wells. Through the WSF, the District received funding for an AEM project in southern Gage County to help delineate aquifer formations. In the 2023 award cycle, the District submitted an application for another AEM project, which would attempt to gather data near DeWitt and Plymouth, Nebraska.

Due to ongoing drought conditions, the District Board of Directors issued a temporary, 180-day stay on the expansion of irrigated acres and drilling of new high-capacity wells at their December 22, 2022 meeting. The stay would expire on June 6, 2023, but the Board had proposed an extension. The District also hired the Olsson engineering firm to examine the District's hydrology and suggest focused management solutions.

The District had monitored groundwater levels for 41 years and currently measured 171 wells. 46 dedicated monitoring wells had been added, mostly in public water supply areas. Spring 2023 static water level measurements showed a 1.2 foot District-wide decline since spring 2022. Water levels were now 2.32 feet above the District's 1982 baseline. Water levels in the Compact wells had declined 0.9 feet since spring 2022. Mr. Sobotka also mentioned the joint effort of the Big Blue River basin NRDs and DNR to develop the basin groundwater model, thanking the partners for their cooperation.

Earl Lewis, Kansas Compact Commissioner, asked about the cost and geographic scope of the AEM project. Tyler Weishahn, Assistant Manager of the District, replied that the project covered 391 square miles, at about $1,000 per square mile, in the southern part of the District. The potential second AEM project would cover 415 square miles, but at a cost of only about $430 per square mile, as the aquifer in that area was much shallower.

Nebraska Compact Advisor Comments

Larry Moore, Nebraska Compact Advisor, had no additional comments.

Secretary's Report

Lizzie Hickman, Compact Secretary, presented the Secretary's report.

Ms. Hickman explained the process of developing the annual reports. She thanked Chris Beightel, KDA-DWR, for recording the meeting and assisting in the preparation of the minutes of the Forty-Ninth Annual Meeting. Ms. Hickman noted that the 2021 Report had been finalized, and a limited number of print copies were available. She requested that electronic copies of all written reports presented during the meeting be sent to her, as well as any written reports from the 2022 meeting that she had not yet received. She reminded all attendees to sign the sign-in sheet.

Treasurer's Report and Budget

Bob Robles, Compact Treasurer and Assistant Director of DNR, presented the Treasurer's report (Attachment G).

The current balance in the Compact fund as of the Treasurer's report was $22,167.60. 2023 Kansas dues had been received but had not yet been deposited into the fund. The Administration paid $16,809 to the USGS for operation of the state line gages and $680 to the Lower Big Blue NRD for their observation wells. The only outstanding Fiscal Year (FY) 2023 obligation was $1,500 to be paid to Dana Cole for a financial review, which had not occurred.

Mr. Robles went on to present the proposed FY 2024 budget (Attachment G). He proposed that the budget for the USGS state line gage expense be set at $17,000, considering the actual 2023 expense and any possible increase. Similarly, he proposed that the budget for the Lower Big Blue NRD observation wells be set at $700.

Following months of non-response from the accountant, Dana Cole, contracted to perform financial reviews of the Compact fund. Mr. Robles located another accounting services provider, RG Associates of Omaha, who were interested in providing this service to the Administration for $1,500 per financial review. Tom Riley, Nebraska Compact Commissioner, moved that RG Associates be contracted to perform financial reviews of the Compact fund. Earl Lewis, Kansas Compact Commissioner, seconded the motion. Mr. Riley confirmed that Mr. Robles would be able to enter a contract with the provider on behalf of the Administration. The motion passed unanimously.

Mr. Robles continued presenting the proposed FY 2024 budget. He proposed a new $500 line item for meeting expenses to cover refreshments and meeting venue rentals. This would allow meetings of the Administration to be held in new places throughout the Big Blue River basin. Mr. Lewis moved that the FY 2024 budget be approved as presented. Mr. Riley seconded the motion. There was no discussion. The motion passed unanimously.

Lizzie Hickman, Compact Budget Committee member for Kansas, asked whether the Administration would consider modernizing access to the Compact fund from checks only to something such as a debit card, especially if the fund was to be used to pay for items such as food and drink, as many establishments no longer accept checks. She described her experiences using a debit card as Treasurer of the Kansas-Oklahoma Arkansas River Commission. Chris Beightel, KDA-DWR, suggested that an assignment to the Legal Committee be made to explore how this might be done. Mr. Riley moved that the Legal Committee be assigned a task to evaluate whether this proposed change to the Compact fund meets the conditions of the Compact. Mr. Lewis seconded the motion. There was no discussion. The motion passed unanimously.

US Geological Survey (USGS) Report

Jason Lambrecht, USGS Nebraska Water Science Center, presented the USGS report (Attachment H).

The USGS operates six stream gages on the Big Blue River, including the Compact state line gage at Barneston, Nebraska, which had just reached 90 years of record. The USGS operates five stream gages on the Little Blue River, including the Compact state line gage at Hollenberg, Kansas, which has 48 years of record. Just upstream, the Little Blue River gage near Fairbury, Nebraska had just reached 100 years of record. Mr. Lambrecht explained the process of stream gage data collection, transmission, revision, and web publication.

Mr. Lambrecht went on to summarize conditions in the Big Blue River basin during Water Year 2022 (WY 22) (October 2021 through September 2022). He referred to the USGS report (Attachment H), where summaries of conditions at individual stream gages could be found. In WY 22, the USGS made 11 discharge measurements at the Barneston gage and 15 at the Hollenberg gage, though they were only

funded for 10 measurements at each gage. The extra measurements were mostly taken during low flow conditions, when streamflow approached the Compact state line target flows, to ensure that streamflow values were being computed accurately and the Compact could be appropriately enforced by the states.

Streamflow on the Big Blue River at the Barneston gage remained above the historical median until July 2022 and remained low for the rest of WY 22. Streamflow on the Little Blue River at the Hollenberg gage was below the historical median for much of WY 22. At both Barneston and Hollenberg, annual mean discharge for WY 22 was about 1.5 times less than WY 21, and at Hollenberg, it was about three times less than the historical average annual mean discharge. Annual mean discharge at Hollenberg was the second lowest in that gage's 48 years of record. On September 5, 2022, the Hollenberg gage experienced its lowest daily discharge in the entire period of record at 22.6 cfs. Hollenberg also set records in WY 22 for lowest annual seven-day minimum flow and lowest seven-day average flow. As of the meeting date, current streamflow in the Big Blue River at the Barneston gage was about half of the historical median, while streamflow in the Little Blue River at the Hollenberg gage was about one-third of the historical median.

Mr. Lambrecht finished his report by describing some recent changes to the USGS website and data delivery tools, including the Water Data for the Nation stream gage webpages, National Water Dashboard, and Hydrologic Imagery Visualization and Information System (HIVIS). The HIVIS program places live cameras at stream gages for better observation of current stream conditions. DNR, the NRDs, and other partners had funded 12 HIVIS cameras in Nebraska; there were none yet in Kansas. Tom Riley, Nebraska Compact Commissioner, described the benefits of the HIVIS program for both monitoring and public education.

Legal Committee Report

Emily Rose, Compact Legal Committee member for Nebraska, reported that the Legal Committee had nothing to report and had received no assignments in the past year, though they had noted the task assigned during the Treasurer's report.

Engineering Committee Report

Jeremy Gehle, Compact Engineering Committee (Committee) Chair, presented the Committee report (Attachment I). He began by noting that the Committee had received no assignments and that much of the material in the Committee report had already been presented in the USGS report and the Nebraska Water Administration report. 2022 administration for Compact state line target flows was in effect for 18 days on the Big Blue River and 64 days on the Little Blue River. Mr. Gehle thanked the USGS for their efforts in taking field measurements to ensure that the states had the most accurate data available for Compact enforcement decisions, to be as fair as possible to water users in both Kansas and Nebraska. Other materials in the Committee report included groundwater level data provided the Lower Big Blue NRD and both a list and a map of wells in the regulatory reaches.

Tom Riley, Nebraska Compact Commissioner, asked how often the rating curves for the state line stream gages needed adjustment. Jason Lambrecht, USGS, explained that the rating curves for the Big Blue and Little Blue Rivers are quite reliable and are only shifted temporarily based on discharge measurements, and that even those shifts usually follow a predictable seasonal pattern.

Water Quality Committee Report

Tara Anderson, Water Quality Committee (Committee) member for Nebraska and Water Quality Standards Coordinator for the Nebraska Department of Environment and Energy (NDEE), and Tom Stiles, Committee member for Kansas and Bureau of Water Director for the Kansas Department of Health and Environment (KDHE), presented the Committee report. The Committee met on April 20, 2023 (Attachment J). Ms. Anderson and Mr. Stiles began by discussing staffing changes at their agencies.

Kansas's Integrated Report had been approved by the EPA. Much of Kansas's work on Total Maximum Daily Loads (TMDLs) focused on determining reasonable in-stream phosphorous levels. Other major impairments include biology and total suspended solids (TSS). Both states were engaged in regional efforts to better understand biological data and its links to various stressors (such as water quality, habitat loss, flow regime changes, etc.). KDHE was working with a contractor to analyze macroinvertebrate data. Several Kansas water bodies had been delisted for TSS, possibly due to the work of various soil health initiatives.

Nebraska's draft Integrated Report would remain in the public notice phase until the week following the Compact meeting, when it would begin EPA review (Attachment K). Proposals contained in the draft report included delisting the Little Blue River for atrazine, delisting the Big Blue River for lead, and listing the West Fork Big Blue River for atrazine. Ms. Anderson briefly described NDEE's ambient water quality monitoring network and monthly sampling schedule. More intensive surface water data collection would take place within the Big Blue River basin in 2024, to be included in the 2026 Integrated Report.

Ms. Anderson briefly explained Nebraska's nutrient criteria for lakes. Nebraska first proposed lake nutrient criteria in its triennial review of water quality standards in 2005. The EPA deferred action, and a Technical Advisory Committee was convened to further develop state-specific criteria, which were adopted in 2011. Nebraska lakes were classified into three categories: eastern, western, and sandhills, each with different criteria. In the Big Blue River basin, 23 lakes were impaired for total nitrogen and total phosphorus, nine lakes had been assessed as not impaired, and 11 lakes had not yet been assessed. Nebraska was investigating the possibility of developing similar criteria for streams. Preliminary analysis of macroinvertebrate and fish data had not revealed a strong correlation to nutrients. Analysis of potential correlation to chlorophyll-A was ongoing.

Mr. Stiles noted that Nebraska was the first state in EPA Region Seven to adopt nutrient criteria. Nebraska also prohibited point sources from discharging into lakes. Kansas had chosen to use TMDLs rather than nutrient criteria. Many of the point sources in Nebraska were mechanical plants, while those in Kansas were mostly wastewater treatment systems. However, water quality in both states was largely dictated by land use, which was nonpoint source and therefore outside the regulatory power of the EPA. Mr. Stiles noted that it was much more complex and difficult to develop nutrient criteria for streams than for lakes and reservoirs. Using a TMDL approach shifted the focus to load reduction and away from attaining specific numeric concentrations. The states had discussed point source management, including working with point sources to reduce nutrient output without major capital expenses.

The EPA Section 319 Program had been the predominant vehicle for addressing nonpoint sources in both states. Soil health practices such as those being incentivized by the NRDs were the most effective way to reduce sediment and nutrient exports from agricultural land. Streambank stabilization projects were effective at reducing large sediment influxes into reservoirs, but land management practices had more of an impact on water quality, both surface water and groundwater. Nitrate contamination was the primary groundwater quality concern for both states. Mr. Stiles stated that pesticide (including atrazine) contamination was also a function of producer behavior, especially application rate and timing.

Ms. Anderson noted that the NRDs had already mentioned many of Nebraska's nonpoint source management projects. NDEE partnered with the University of Nebraska on an interseeder demonstration project which began in 2022 and which planned to establish demonstration plots in the Compact area in 2023. NDEE was working with the municipalities of Aurora, Beatrice, and Fairbury on drinking water protection management plans. NDEE created a water quality subcommittee to the NRCS's State Technical Committee to provide input on their programs and recommend NRD projects for collaborative NRCS support.

NDEE had set-aside funding from their State Revolving Fund (SRF) for optimization of point sources within the basin and was currently developing an agreement and program. The Drinking Water SRF also

had a set-aside for source water protection grants. The invitation for proposals would be open until June 1, 2023. Municipalities with a population less than 10,000 with financial hardship were eligible to apply for that funding. There were two source water protection projects in the basin currently funded by NDEE through such grants.

Mr. Stiles noted that despite all the funding now available through the Bipartisan Infrastructure Law, the accompanying rules were so complicated that it was difficult for states to develop programs to use those funds that could satisfy the federal government's requirements regarding environmental justice, disadvantaged communities, and principal forgiveness. The EPA strongly encouraged states to use Clean Water SRF for nonpoint source programs, but it was difficult to convince potential applicants to take out a loan to incorporate BMPs in to agricultural operations, especially as municipal involvement was essentially necessary for application acceptance. Approaching funding programs from a technical assistance angle, or using set-aside funding, could be more viable.

The Administration had previously encouraged the Committee to explore the possibility of a joint project, but NDEE and KDHE did not have the resources to develop or pursue funding for such an endeavor. Both agencies had recently experienced significant staffing transitions. Efforts should also be made to establish a clear purpose and goals for an interstate water quality project before funding was sought. Mr. Stiles noted, however, that the EPA favored interstate cooperation, which would work to their advantage whenever the agencies did have the resources to pursue a joint project.

Mr. Stiles mentioned the Keystone Pipeline rupture and oil spill and acknowledged the work of KDA-DWR in quickly permitting containment dams on Mill Creek and the diversion of Mill Creek around the impacted area. Due to the drought, streamflow in Mill Creek since December 2022 had been mostly sourced from baseflow: around 12 cfs and easily manageable by the diversion works. This had created a steady state situation ideal for TC Energy to conduct cleanup and reclamation efforts. While TC Energy had anticipated that the matter would be closed after the initial cleanup, KDHE intended to pursue long-term intermittent follow-up, especially regarding biological monitoring for subtle impacts of petroleum contamination. The situation provided an example of the capabilities of public-private cooperation, including in the regulatory realm, to contain a contamination event in a timely manner. Mr. Stiles added that the Kansas Water Office and US Army Corps of Engineers were preparing to begin their hydraulic dredging pilot project in Tuttle Creek Reservoir.

Mr. Stiles then mentioned that public water suppliers were faced with a pressing need to determine how to conform to the EPA's standards for PFAs, including how to remove PFAs from wastewater and manage the resulting waste sludge and biosolids, which could introduce new liabilities for producers who would otherwise use it as a nutrient source. Ms. Anderson added that NDEE had funded public water system PFAs sampling for small municipalities and expected to finish data collection within a year. They had also partnered with the University of Nebraska to collect samples from wastewater treatment facilities throughout Nebraska.

Following the Committee report, Dan Howell, Committee member for Kansas, commented on changes in land ownership and production practices in Kansas. Many family-owned farms were now being operated by tenants, who generally needed to be offered higher incentives to adopt conservation practices and often were not using any at all, with a significant impact on water quality and soil erosion. Mr. Howell suggested that the FSA county offices focus on producer education and emphasize that there were still requirements to remain in compliance with the farm program.

Old Business

There was no old business.

New Business

There was no new business.

Committee Membership and Special Assignments

W. Don Nelson, Federal Compact Chair, instructed Lizzie Hickman, Compact Secretary, to record the assignment given to the Legal Committee. The Committee membership was as follows:

Budget Committee – Bob Robles (NE), Lizzie Hickman (KS)
Legal Committee – Emily Rose (NE), Stephanie Kramer (KS)
Engineering Committee – Jeremy Gehle (NE), Lizzie Hickman (KS)
Water Quality Committee – Dan Howell (KS), Tara Anderson (NE), Sarah Starostka (NE), Tom Stiles (KS)

Adjournment

Tom Riley, Nebraska Compact Commissioner, moved that the meeting be adjourned. Earl Lewis, Kansas Compact Commissioner, seconded the motion. There was no discussion. The motion passed unanimously, and the meeting was adjourned.

Earl D. Lewis Jr., Kansas Commissioner

Tom Riley, Nebraska Commissioner

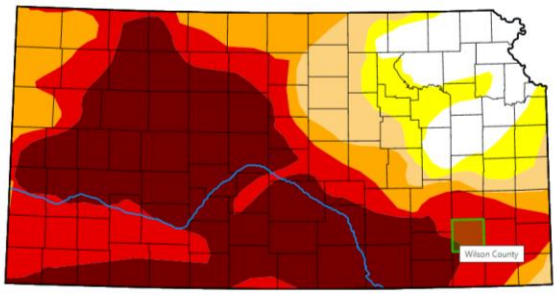
W. Don Nelson, Compact Chair

Attachment A

Kansas Report to
Kansas-Nebraska Big Blue River Compact Meeting
May 9, 2023

Drought

Much of Kansas continues to experience significant drought conditions. Western Kansas, and in particular Southwest Kansas, is entering the third consecutive year of drought.



Map released: Thurs. May 4, 2023
Data valid: May 2, 2023 at 8 a.m. EDT

Intensity
None
D0 (Abnormally Dry)
D1 (Moderate Drought)
D2 (Severe Drought)
D3 (Extreme Drought)
D4 (Exceptional Drought)
No Data

Authors
United States and Puerto Rico Author(s):
Brad Pugh, NOAA/CPC
Pacific Islands and Virgin Islands Author(s):
Brad Rippey, U.S. Department of Agriculture

2023 Legislative Session

The 2023 Kansas Legislature adjourned in early May. It was a fairly active session regarding water policy and funding.

SB 205 – Senate Bill 205 passed and addressed issues related to the state's water banking and multi-year flex account programs. Both programs are available in South Central Kansas and the Attorney General identified a conflict in which both programs could not legally operate at the same time, but were doing so until recently. The bill clarifies the law and authorizes the activities that had taken place up until 2022.

HB 2279 – House Bill 2279 is focused on the state's groundwater management districts. The bill requires greater financial transparency and reporting. It also requires that all districts identify "high priority areas of concern" by July 1, 2024 and develop action plans to deal with issues in those areas by July 1, 2026. Both have to be submitted to the chief engineer by the deadline and to the legislature during the following session.

HB 2302 – House Bill 2302 adds $35 million more each year to the state water plan fund. It directs that $5 million be used in a grant fund to provide technical assistance to local units of government to design, develop, and seek funding for infrastructure projects. There is also $12 million set aside in a grant fund for infrastructure projects for local units of government with an

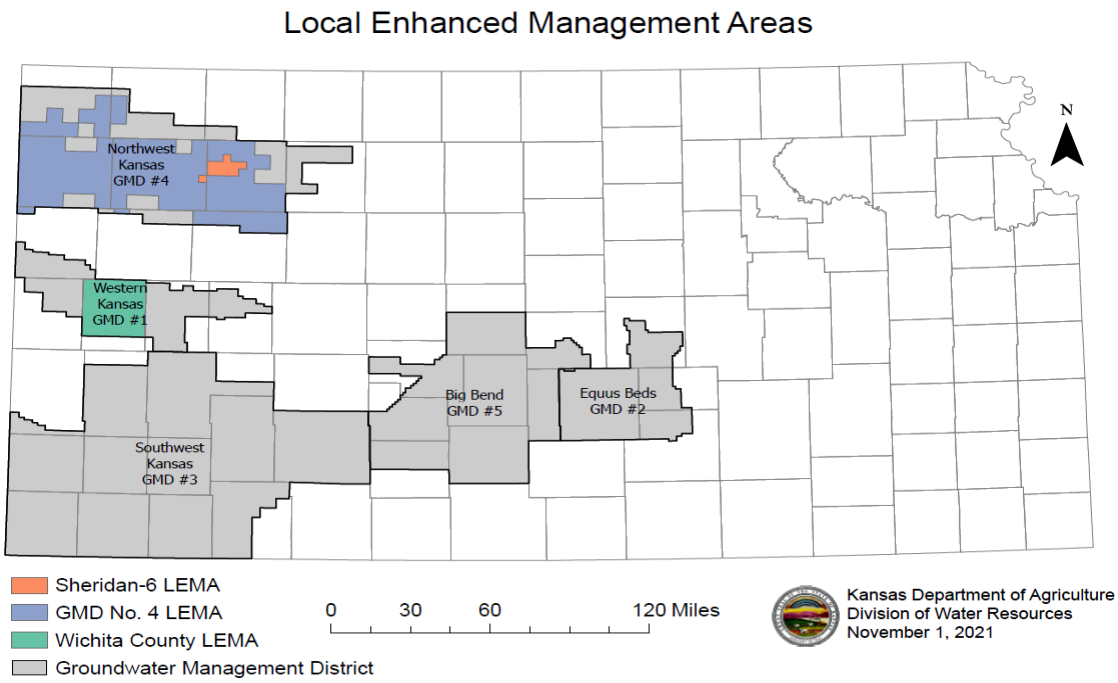
emphasis on small municipalities. The remaining $18 million will be used for implementation of the Kansas Water Plan.

Local Enhanced Management Areas

In 2022, renewal hearings were held for the two local enhanced management areas (LEMAs) in Northwest Kansas. Both were renewed for another five years starting January 1, 2023 and running through December 31, 2027.

Wichita County LEMA in West Central Kansas began in 2021 and is in its third year.

In April of 2023, the remaining four counties in Western Kansas GMD 1 were approved for a LEMA which started in January of this year and ends in 2027.



Results from the two LEMAs (in NW Kansas) that have completed at least their first five year period continue to show that producers continue to conserve more than originally targeted. In Sheridan County, users saved 24% versus pre-LEMA usage even during the recent drought period.

Hays/Russell Water Transfer

The cities of Hays and Russell are seeking to transfer water from Edwards County, approximately 70 miles to the south. Under Kansas law the transfer must be permitted under both normal water right process and an additional transfer hearing process.

In 2018, the chief engineer approved changing the existing water rights from irrigation to municipal with some additional limitations to ensure the water supply is sustainable. A local group is opposed to the changes and challenged the decision in district court. In June of 2022 the district court judge found that the change was completed appropriately and ruled primarily for the state. The issue has been appealed to the Kansas Supreme Court with briefings underway.

The second part of the process was started in October of 2022 with the initiation of the hearing panel to evaluate the public interest of approval or denial of moving the water. A hearing officer has been selected and the hearing is scheduled to proceed in July 2023.

Rattlesnake Creek/Quivira National Wildlife Refuge

In February of this year, U.S. Fish and Wildlife Service requested that their senior water right to serve the refuge be protected and upstream rights administered. We have informed the USFWS and local stakeholders that administration will not take place in 2023, but we will have a durable solution in place starting in 2024. There are over 1,400 upstream junior wells with a significant number of them depleting streamflow which supports the senior surface water right.

Water Injection Dredging of Tuttle Creek Lake

The Kansas Water Office (KWO), in partnership with the Corps of Engineers, plans to implement a Water Injection Dredging (WID) demonstration project at Tuttle Creek Lake to promote sustainable long-term reservoir sediment management. WID is a process in which large volumes of water are injected at low pressure into the sediment bed near the bottom of the reservoir through the use of pumps and a series of nozzles located on a horizontal pipe positioned above the sediment bed. The injected water effectively fluidizes the sediment creating a ‘density current’ that allows the sediment to flow by gravity to deeper areas. In the case of Tuttle Creek Lake, the proposed WID demonstration project would be aimed at moving the sediment toward the existing low level outlet in the dam and monitoring the flow of the density current through the outlet during controlled discharges.

Funding has been set aside at both the state and federal side to support the project. Project design will take place in 2023 with a goal of testing and implementation in 2024.

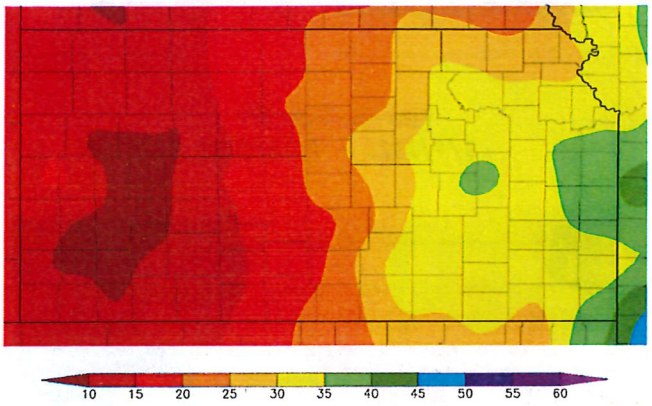
Attachment B

Kansas-Nebraska Big Blue River Compact Meeting, May 9, 2023
Report by Kansas Department of Agriculture, Division of Water Resources
Topeka Field Office

Climatic Conditions - Precipitation & Temperatures

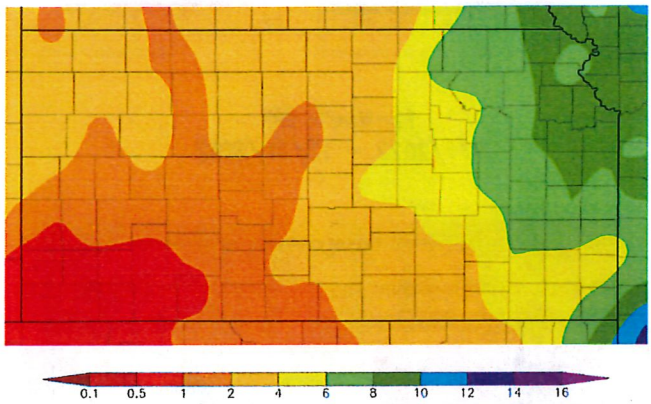
Precipitation was mostly uniform across the Big Blue River basin during the 2022 calendar year, although there was rather less than normal. The High Plains Regional Climate Center reported between 20 and 35 inches of precipitation in calendar year 2022 across the entire Big and Little Blue River basin area in Kansas, including the tributary basins. This represents 70 to 95% of normal precipitation for the year. 2022 precipitation ranged from about normal to 8 inches below normal. In 2023 so far, the Kansas portion of the basin has received 2 to 8 inches of precipitation, which is 3 inches below to 1 inch above normal precipitation.

Precipitation (in)
1/1/2022 – 12/31/2022



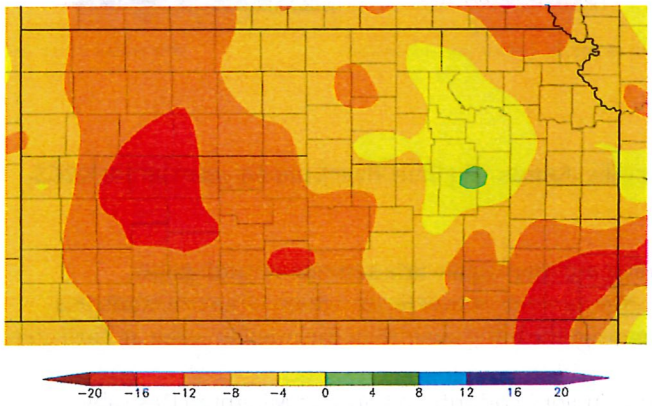
Generated 1/20/2023 at HPRCC using provisional data. NOAA Regional Climate Centers

Precipitation (in)
1/1/2023 – 4/25/2023



Generated 4/26/2023 at HPRCC using provisional data. NOAA Regional Climate Centers

Departure from Normal Precipitation (in)
1/1/2022 – 12/31/2022



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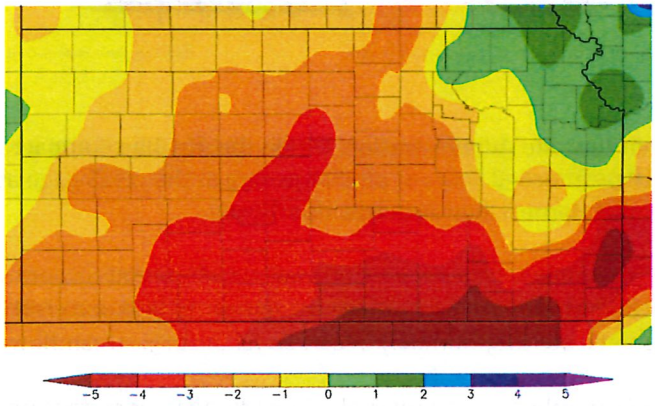
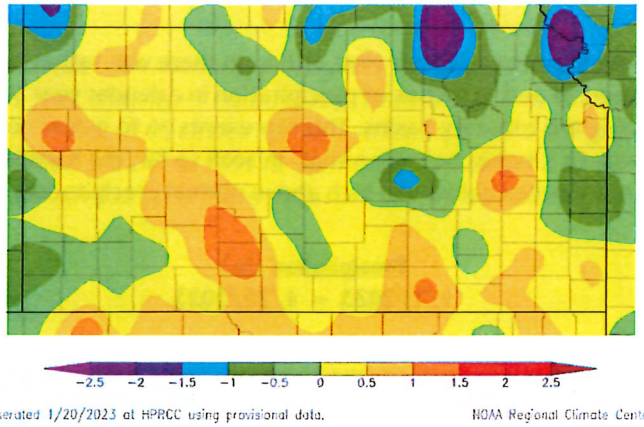
Departure from Normal Precipitation (in)
1/1/2023 – 4/25/2023



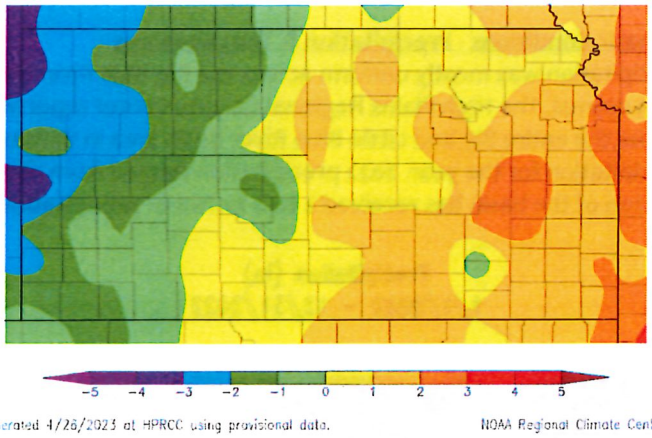
Generated 4/26/2023 at HPRCC using provisional data. NOAA Regional Climate Centers

Temperatures during calendar year 2022 ranged from normal to 2.5 degrees colder than normal. So far in 2023, temperatures have ranged from normal to 1 degree warmer than normal. We are seeing last year's trends continue, which is reflected in the Standardized Precipitation Index (SPI). The SPI fits precipitation data to a Gamma distribution and then transforms it to a normal distribution (bell curve), resulting in values independent of location and magnitude, allowing different seasons and climate areas to be compared. Ranges greater than 1 in either direction on the scale mark moderate drought and moderately wet conditions, respectively. In 2022, the SPI of the central Big Blue River basin was beginning to show a trend developing towards drought. That trend had become more significant in 2023 until the very recent precipitation event occurred.

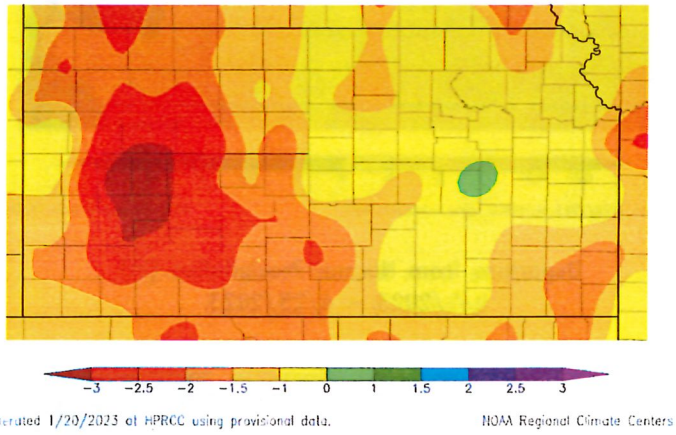
Departure from Normal Temperature (F)
1/1/2022 – 12/31/2022



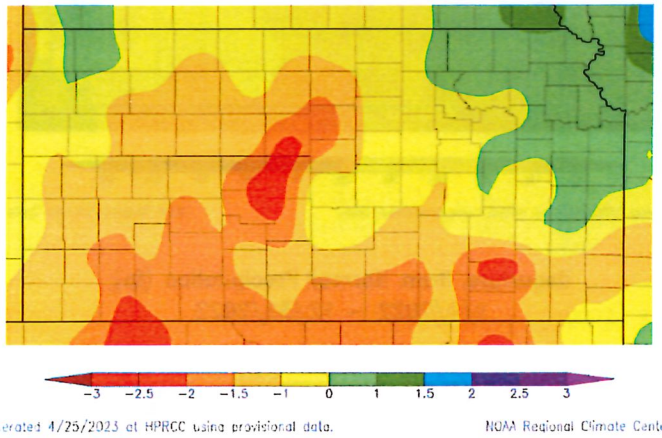
Departure from Normal Temperature (F)
1/1/2023 – 4/25/2023



12-Month SPI
1/1/2022 – 12/31/2022



Year-to-Date SPI
1/1/2023 – 4/24/2023



Streamflow and Administration Within the Big Blue Compact Basin

Statistics reflect 38 years of discharge data at the USGS gage at Marysville, Kansas (Big Blue River) and 64 years at the USGS gage near Barnes, Kansas (Little Blue River).

2022 streamflow data shows that peak runoff periods occurred in spring and then again late summer at both gages. Interestingly, the peak runoff events appear to have occurred later in the summer season in 2022 than when the statistical values indicate they normally occur. So far in 2023, streamflow has been significantly lower than the median value at both gages.

From September 9, 2022 through March 15, 2023, 21 surface water rights junior in priority to Kansas's Minimum Desirable Streamflow (MDS) Statute (K.S.A. 82a-703) were under administration in the Little Blue River basin upstream of the USGS discharge gage near Barnes, Kansas, including the tributary Mill Creek basin. Those same 21 surface water rights went under administration again on April 18, 2023 and remain under administration.

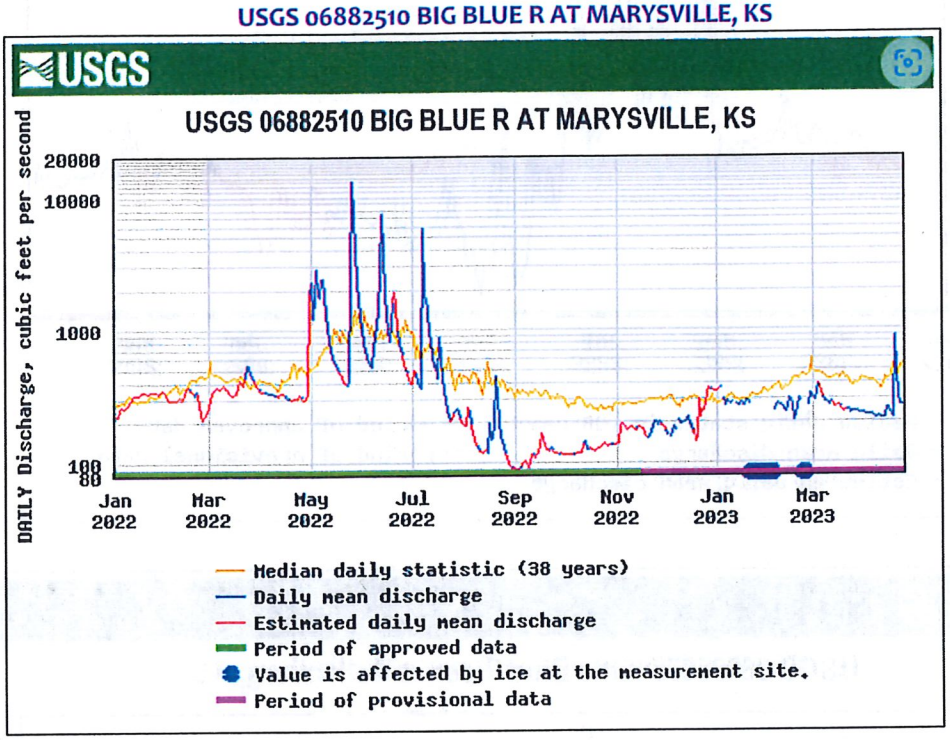
Streamflow at the USGS discharge gage on the Big Blue River at Marysville, Kansas has remained sufficient to avoid MDS administration of surface water rights in the Big Blue River basin upstream of that gage.

Minimum Desirable Streamflows (cfs)

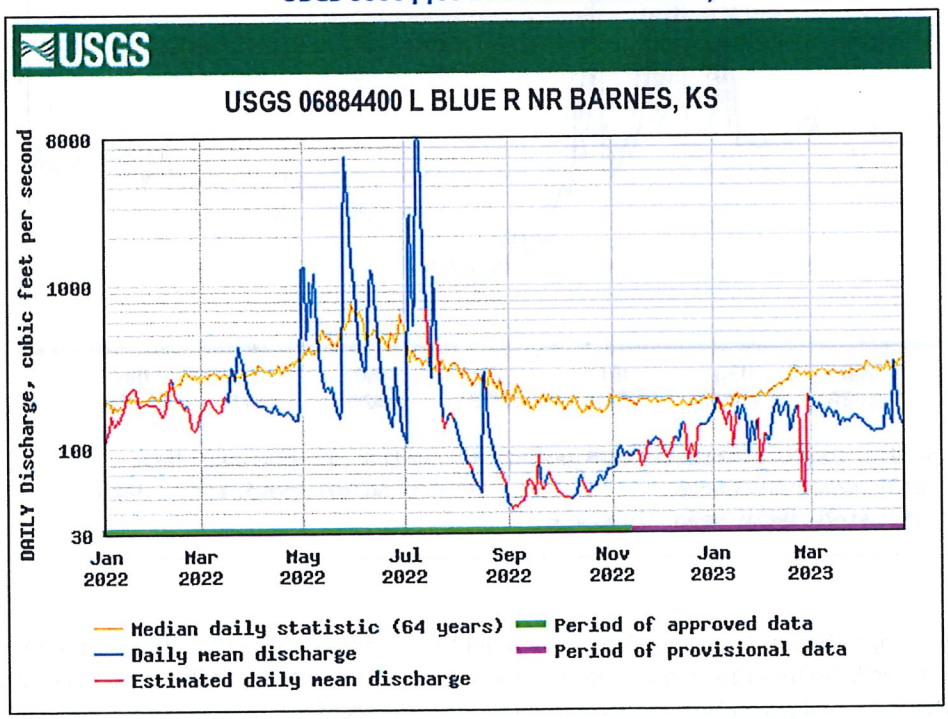
Watercourse	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Big Blue												
Marysville	100	100	125	150	150(d)	150(d)	80	90	65	80	80	80
Little Blue												
Barnes	100	100	125	150	150(d)	150(d)	75	80	60	80	80	80

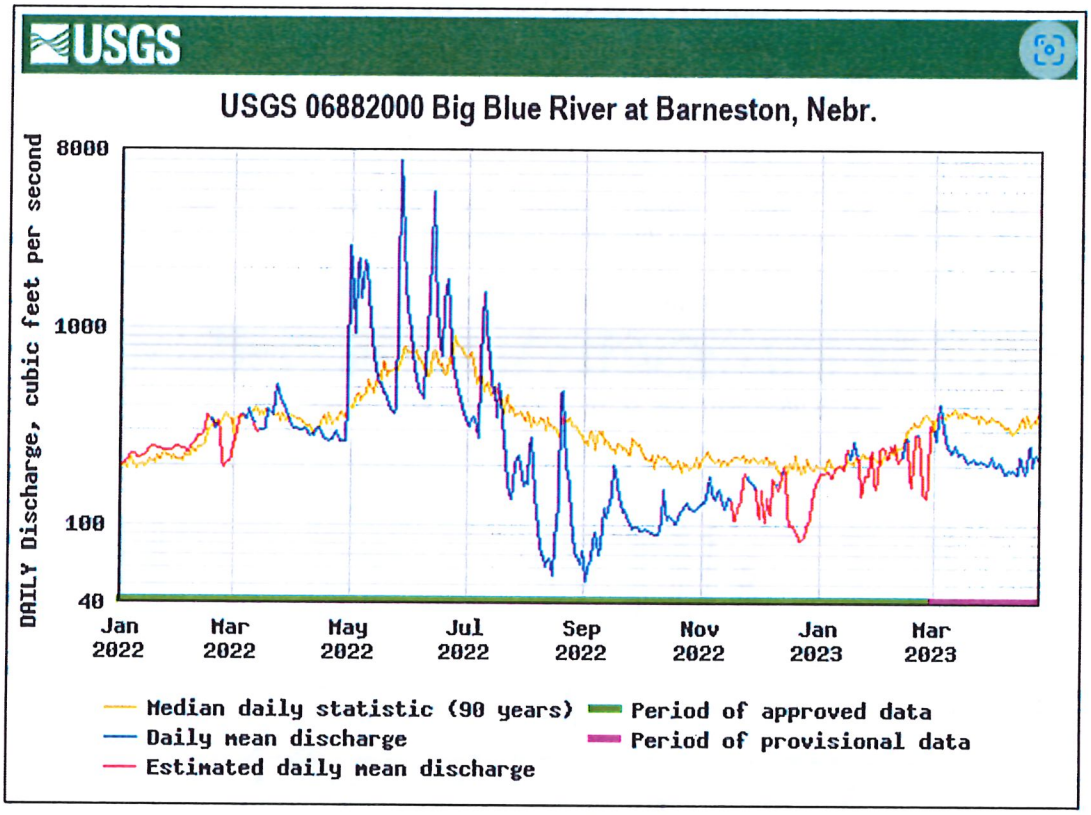
(d) Subject to the stateline flows contained in the Blue River Compact.

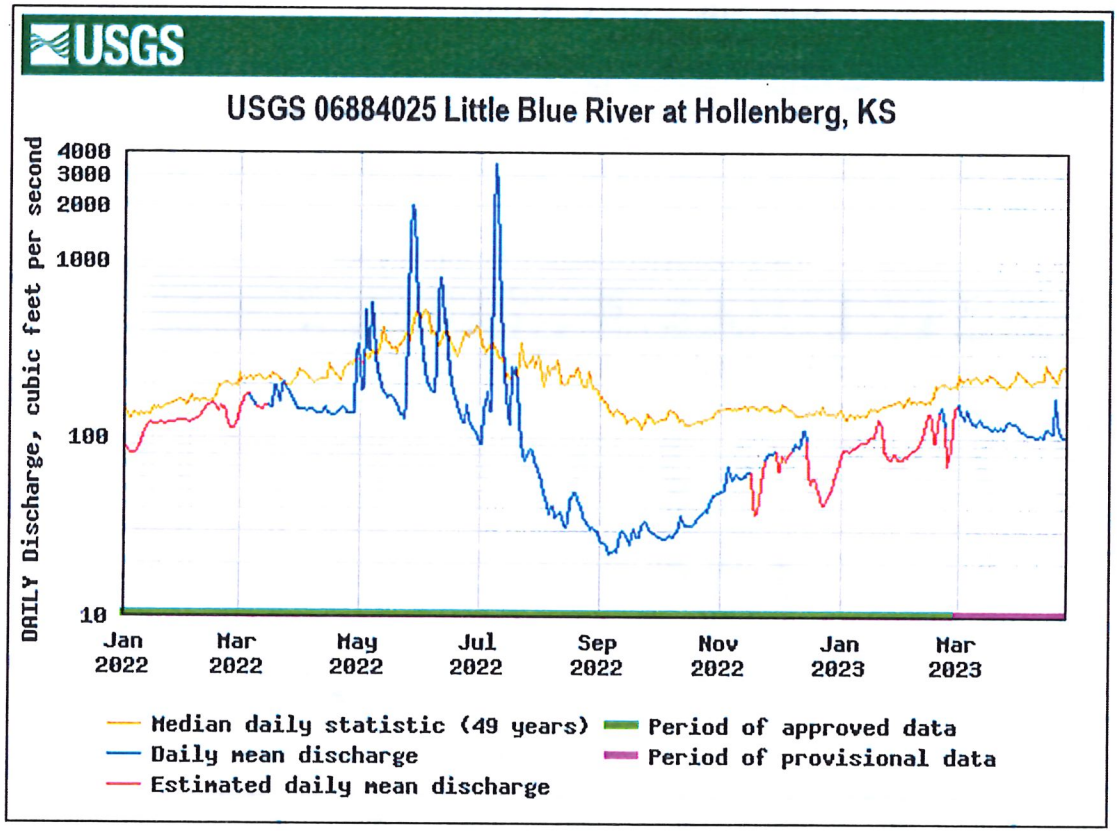
USGS 06882510 BIG BLUE R AT MARYSVILLE, KS



USGS 06884400 L BLUE R NR BARNES, KS







The Compact gages at Barneston, Nebraska (Big Blue River) and Hollenberg, Kansas (Little Blue River) experienced similar conditions throughout 2022 as well. So far in 2023, flows have remained below the median daily statistic. Little Blue River flows have been below the MDS threshold values and administration orders are in effect for surface water rights and permits in the

Little Blue River and Mills Creek basins. There has been no water right administration within the Big Blue River or Black Vermillion River basins.

Compliance and Enforcement Activities

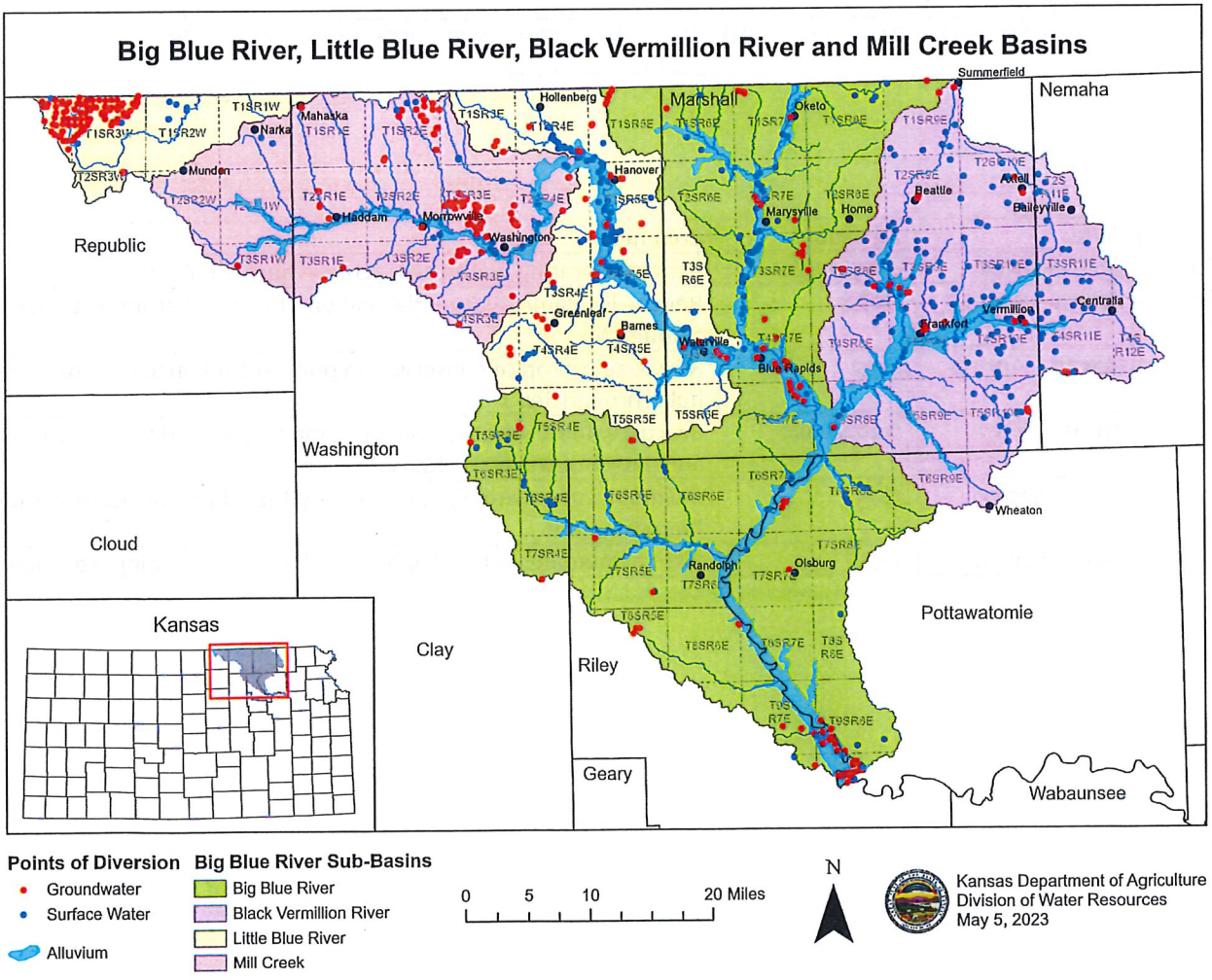
5 formal Cease and Desist (CD) Orders were issued in the Compact area in 2022. All 5 were issued to formalize Notices of Non-Compliance (NONC) – Cease Diversion which had been issued 5-10 years previously and do not indicate new compliance issues with these water rights. No NONCs or formal CD Orders have been issued in the Compact area in 2023 to date.

The Topeka Field Office did not issue any civil penalty orders to water users who exceeded their authorized quantity, or for any other compliance issues, within the Compact area in 2022. No civil penalty orders have yet been issued by KDA-DWR in 2023 to date.

New Development

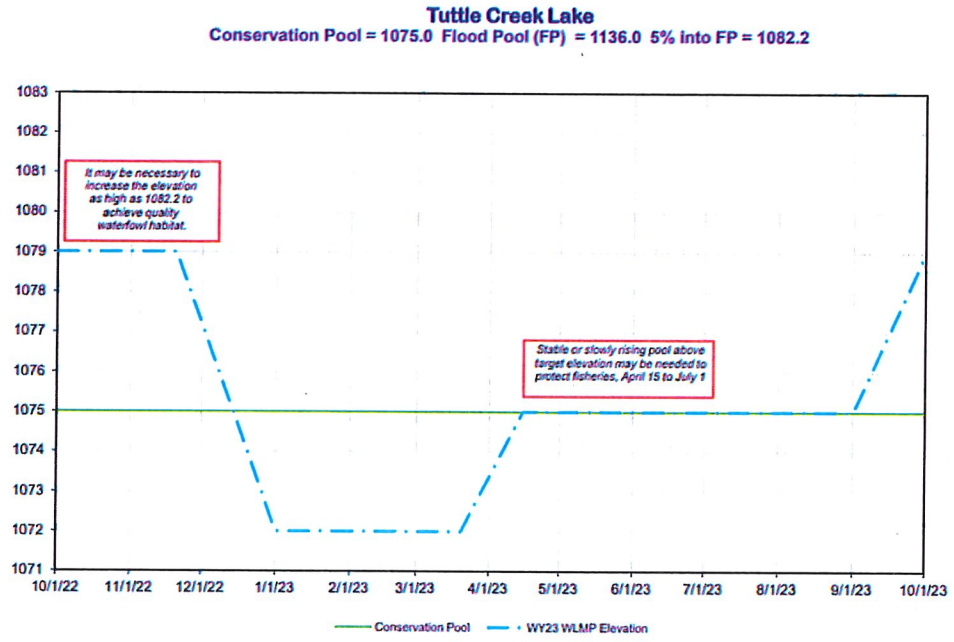
In 2022, KDA-DWR received 18 new applications (13 for appropriated water rights and 5 for temporary permits) within the Compact area. This is a decrease from the 21 applications received in 2021 (12 for appropriated water rights, 8 for temporary permits, and 1 for a term permit) within the Compact area. In 2023 to date, KDA-DWR has received 11 new applications (9 for appropriated water rights, 1 for a temporary permit, and 1 for a term permit) within the Compact area.

In 2022, KDA-DWR approved 12 applications (8 for appropriated water rights and 4 for temporary permits) within the Compact area. In 2021, KDA-DWR had approved 14 applications (5 for appropriated water rights, 8 for temporary permits, and 1 for a term permit) within the Compact area. In 2023 to date, KDA-DWR has approved 3 applications (1 for an appropriated water right and 2 for temporary permits) within the Compact area.



Tuttle Creek Reservoir

Lake Level Management plans were approved in fall of 2022 and are the same as the previous approved versions. The main focus is support of spawning fish and wildlife habitat.



	Time	Elevation	Comment
TUTTLE CREEK LAKE	Oct 1 – Nov 20	1079-1082.2	Attract migrating waterfowl, achieve quality habitat
	Nov 21 -- Mar 20	1072	Reduce ice damage potential and provide water storage, then hold through Mar 20
	Mar 20 – Apr 15	1075	Rise to reach top of conservation pool and enhance boating then hold through Sep 1
	Apr 15 – July 1	1082.2 max	Evacuate flood water to enhance crappie population. Protect tern and plover nests on the Kansas River
	July 1 – Sep 1	1075	Maintain conservation pool to re-vegetate shoreline. Consideration for navigation.
	Sep 1 – Sep 30	1079	Rise to inundate wetland habitat and attract migrating waterfowl

Attachment C

We had a fairly average year of moisture for the 2022 water year, most of the Little Blue and Big Blue basin was around 80-90% of average annual rainfall, although the rain didn't exactly come at the right time. The river stages really fell apart toward the end of July We ended up shutting off the junior irrigators on both the little blue and big blue due to target flows not being met at the state line. Ill break it down a little further and start with the Little Blue basin

Little Blue 1C

Area consists of approximately 2,752 square miles

491 Active Natural FLow (IR) water rights

142 Active Storage Right

Closed on July 25 (64 days total)

142 storage rights

124 natural flow junior rights

Opened on July 27

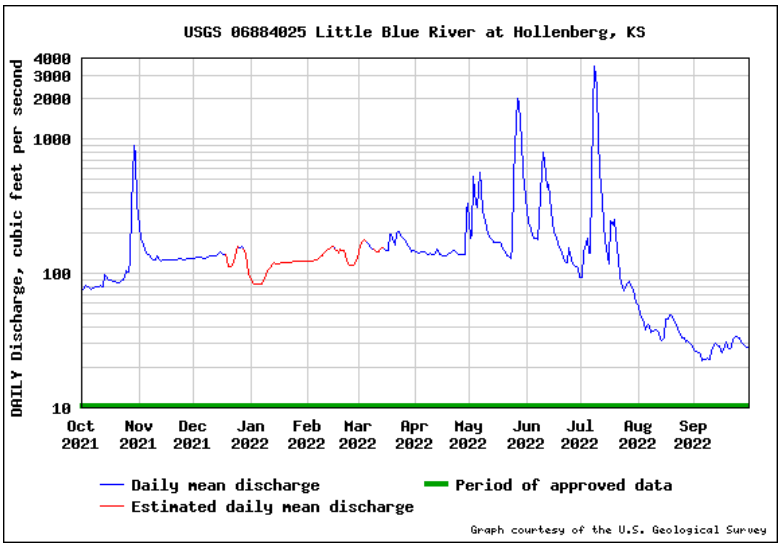
Closed on 8/1

Reopened on 10/1 due to end of compact/ beginning of water year

The WY 2022 Annual mean was 178.1cfs, and the average since 1974 is 484.2cfs. Throughout the course of the summer we documented 292 field observations on the Little Blue River Basin and found 134 pump sites set up. We used fuji meters to measure the flow each time we found a pump running and issued a pump schedule for the senior appropriators. We did not document each site visit once we had already visited a water right. We checked just about every water right in this basin once or twice a week in august and most of September

SUMMARY STATISTICS

	Water Year 2022		Water Years 1974 - 2022	
Annual total	65,000			
Annual mean	178.1		484.2	
Highest annual mean			1,891	1993
Lowest annual mean			172.9	2006
Highest daily mean	3,480	Jul 08	39,300	Jul 26, 1992
Lowest daily mean	22.6	Sep 05	22.6	Sep 05, 2022
Annual 7-day minimum	23.6	Sep 03	23.6	Sep 03, 2022
Maximum peak flow	4,230	Jul 08	59,200	May 07, 2015
Maximum peak stage	7.46	Jul 08	23.07	Oct 12, 1973
Annual runoff (cfsm)	0.065		0.175	
Annual runoff (inches)	0.878		2.38	
10 percent exceeds	242.8		802.0	
50 percent exceeds	130.0		188.0	
90 percent exceeds	33.1		96.0	



Big Blue 1-D

Area consists of approximately 4,447 square miles

Currently 1088 Active Natural Flow water rights

384 active Storage Rights

Closed 8/8 (18 days total)

384 storage permits

405 natural flow junior permits

8/18 opened up everything

8/29 closed

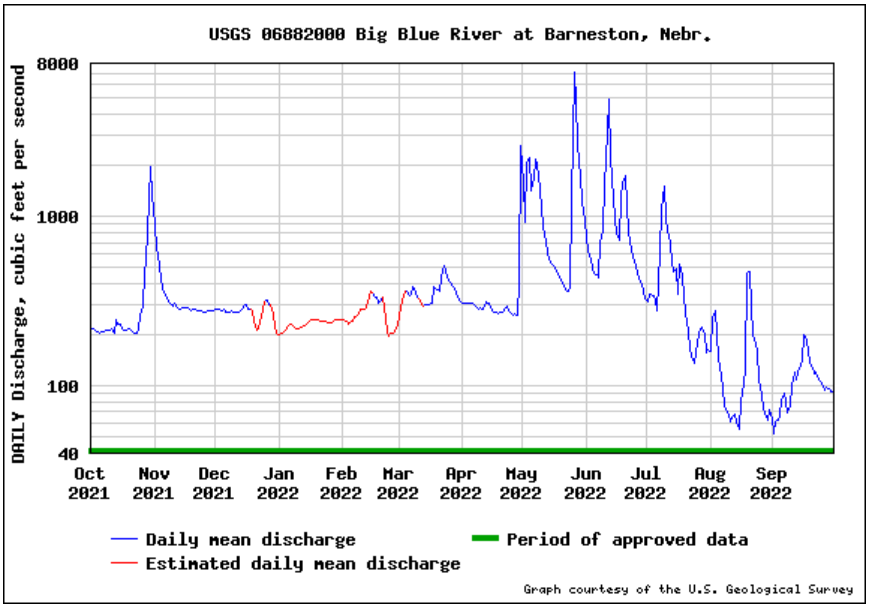
9/6 opened up everything

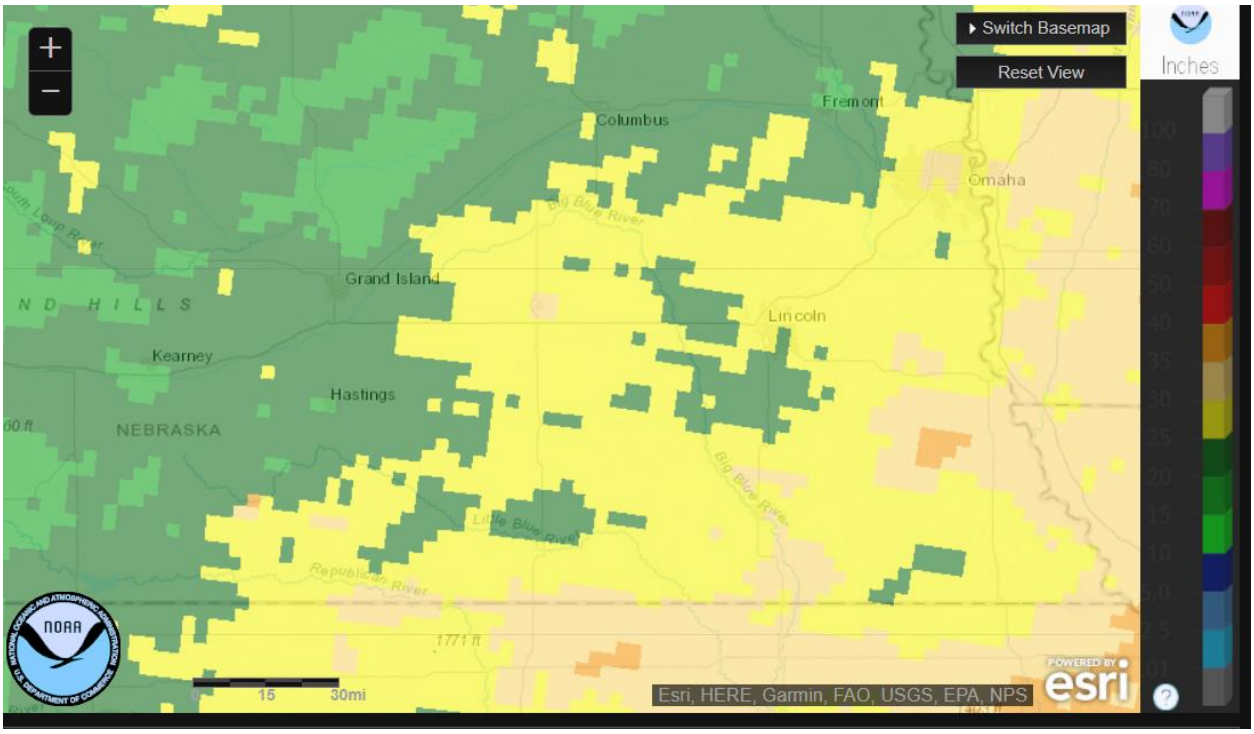
WY 2022 Annual Mean was 439.9 cfs, average from 1933-2022 is 855.6cfs. Throughout the course of the summer we documented 945 field observations on the Little Blue River Basin and found 405 pump sites set up. Just like in the Little Blue Basin we measured the intake of the irrigation system and issued pump schedules to all senior irrigators and did our best to come back and check to make sure they were being compliant.

SUMMARY STATISTICS

	Water Year 2022		Water Years 1933 - 2022	
Annual total	160,600			
Annual mean	439.9		855.6	
Highest annual mean			2,781	1993
Lowest annual mean			115.0	1934
Highest daily mean	7,030	May 26	50,000	Jun 09, 1941
Lowest daily mean	52.0	Sep 01	1.00	Nov 30, 1945
Annual 7-day minimum	62.9	Aug 29	15.1	Aug 03, 1934
Maximum peak flow	7,930	May 26	57,700	Jun 09, 1941
Maximum peak stage	13.51	May 26	34.30[a]	Jun 09, 1941
Annual runoff (cfsm)	0.099		0.192	
Annual runoff (inches)	1.34		2.61	
10 percent exceeds	842.6		1,750	
50 percent exceeds	280.0		288.0	
90 percent exceeds	109.0		110.0	

[a] Gage height at different site and(or) datum





	A	B	C	D
1	Year	2022		
2				
3	**Row Labels**	**Count of Obsern**	**Sum of Total Acres**	**Count of Is Pumpsite Set Up?**
4	**1C: Little Blue River**	**292**	**18316.97**	**134**
5	IR: Irrigation from Natural Stream	289	18051.77	132
6	SI: Supplemental Irrigation (irrig. from reservoir on lands also covered by a n	1	160.8	1
7	SO: Stor-only (irrigation from a reservoir on lands not covered by a natural fl	2	104.4	1
8	**1D: Big Blue River**	**945**	**59862.81**	**405**
9	DO: Domestic	7	7.4	
10	IR: Irrigation from Natural Stream	865	54321.11	368
11	SI: Supplemental Irrigation (irrig. from reservoir on lands also covered by a n	24	1562.6	14
12	SO: Stor-only (irrigation from a reservoir on lands not covered by a natural fl	49	3971.7	23
13	**Grand Total**	**1237**	**78179.78**	**539**
14				
15				

Attachment D

Blue River Compact (BBRC) Annual Meeting
Blue River Compact Report - Upper Big Blue NRD (UBBNRD)
Terry Julesgard, Water Department Manager
Jack Wergin, Projects Department Manager
May 9, 2023

Well Drilling Activities

Sixty-six permits were issued for irrigation and livestock wells (37 new & 29 replacements) during the 2022 calendar year. In January 2023, there were 12,223 irrigation wells in the District.

Groundwater Level Changes

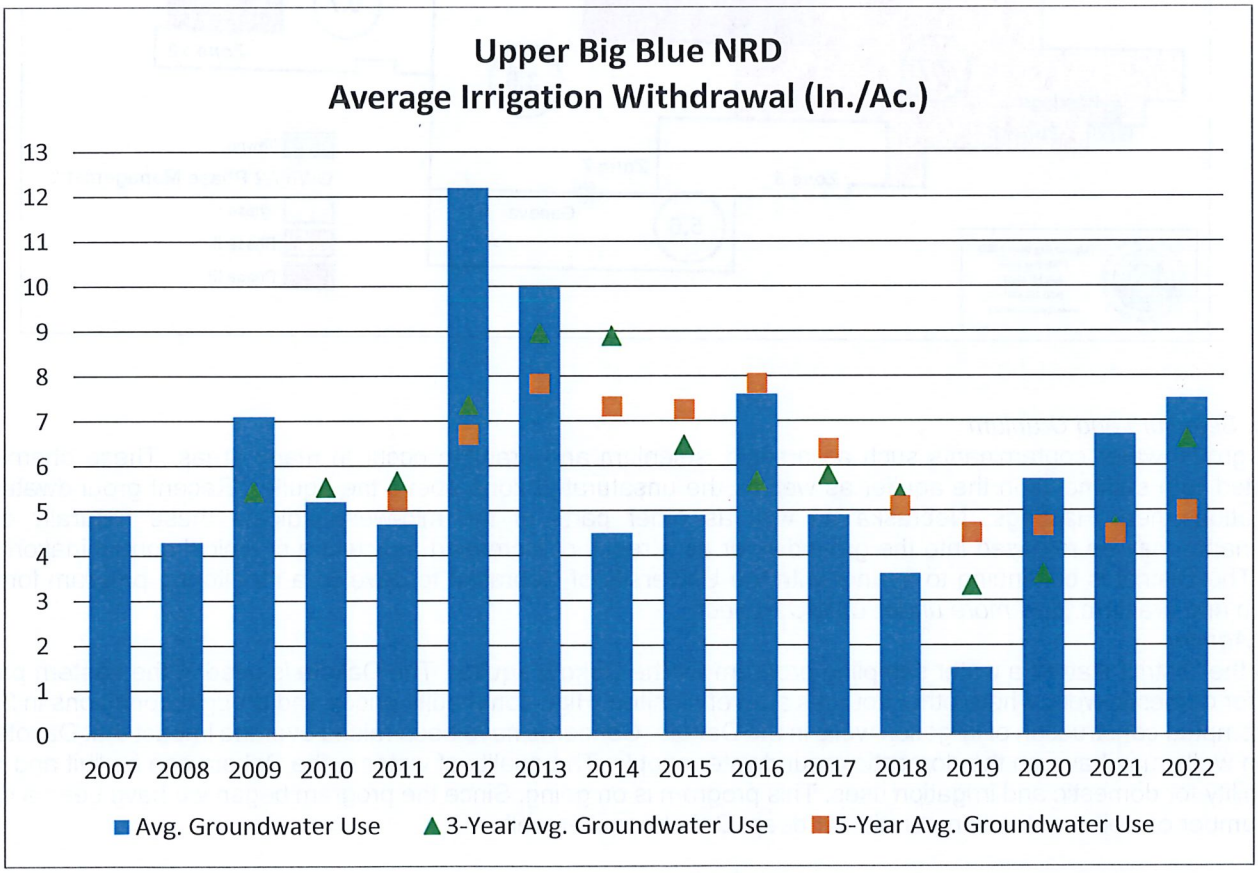
The average groundwater level change for the District from spring 2022 to spring 2023 was a decline of -2.21 feet. The spring 2023 groundwater level is 6.68 feet above the District's allocation trigger level.

Certified Irrigated Acres

Mandatory reporting of irrigated acres and other water uses began in 2006. As of January 1, 2023, there were 1,244,830 groundwater irrigated acres certified by the NRD. This represents an increase of 967acres since January 1, 2022.

Groundwater Withdrawal

Mandatory reporting of groundwater withdrawal began in 2007. 2022 was the 15th year that groundwater withdrawal reports were required in the District. Metering became mandatory on all wells effective January 1, 2016. The staff has inventoried all flowmeter installations and are now conducting routine inspections as needed. The average groundwater withdrawal for irrigation in 2022 was 7.53 inches per acre. The graph below shows the average annual withdrawal for irrigation over the past fifteen years.

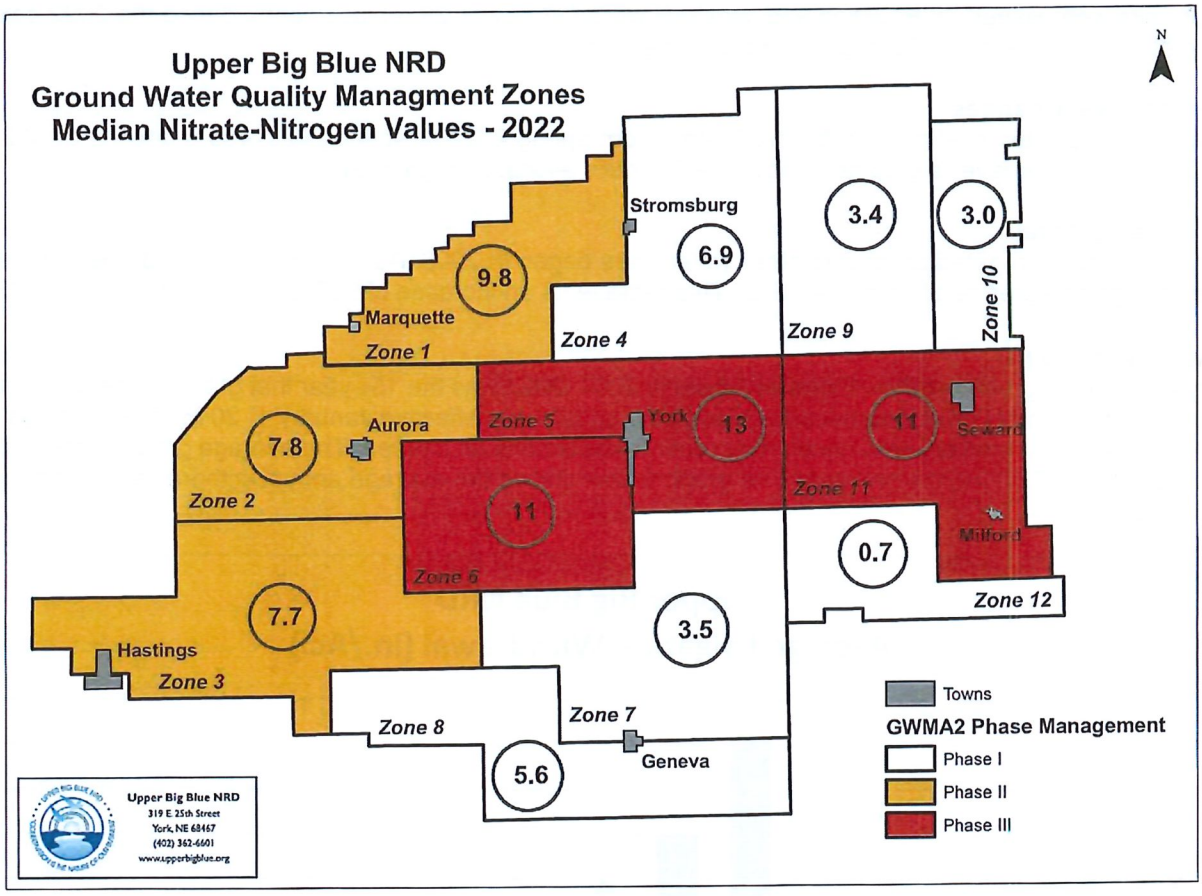


Groundwater Quality

Nitrate

The District is divided into twelve management zones for groundwater quality management. The primary groundwater quality management concern is nitrate. Three zones (1, 2, and 3) are currently designated Phase II Management Areas and three (Zone 5, 6, and 11) designated as Phase III Management Area. Phase II & III Management Areas require farm operators to attend a training session on best management practices related to fertilizer and irrigation management. It also requires deep

soil sampling, irrigation scheduling and annual BMP reports. Farm operators in Phase II & III must schedule irrigation using soil moisture sensors in at least one field. In a Phase III Management Zone anhydrous ammonia fertilizer applied from November 1st through February 29th must include a nitrification inhibitor. The timing of application of nitrogen fertilizers is restricted District wide. There are currently over 1,147 farm operators in the District required to attend nitrogen management training. The District is also working with the City of Hastings and the Little Blue NRD on a special water quality management area to address nitrate contamination in the Hastings Wellhead Protection Area.



Arsenic, Selenium and Uranium

Natural groundwater contaminants such as arsenic, selenium and uranium occur in many areas. These chemicals are associated with sediments in the aquifer as well as the unsaturated zone above the aquifer. Recent groundwater quality investigations near Hastings, Nebraska as well as other parts of the mid-west indicate these naturally occurring contaminants may be released into the groundwater as a result of increased agriculture chemical contamination such as nitrate. The District is continuing to partner with the University of Nebraska to develop a monitoring program for arsenic, selenium and uranium. *See more under UNMC Project.*

Dakota Aquifer

In 2016 the District started a water sampling program for the Dakota aquifer. The Dakota is used in the eastern part of the District for domestic wells where other sources are very limited. High commodity prices and drought conditions in 2012 and 2013 prompted construction of irrigation wells in the Dakota. Concerns have been raised over the impact that Dakota aquifer irrigation wells may have on the domestic groundwater supply. The quality of water in the Dakota can be "hit and miss" as to suitability for domestic and irrigation uses. This program is on going. Since the program began we have seen a decrease in the number of well construction permits for deep, Dakota aquifer wells.

University of Nebraska Medical Center (UNMC) Project

Over a minimum of two years, the District, in partnership with UNMC, will periodically collect drinking water samples to determine seasonal variability in contaminant concentrations which may be impacted by fluctuations in the water table due to irrigation. Samples were taken in April/May (pre-irrigation), June/July (during irrigation) and October/November (after irrigation) at up to 50 locations selected on the basis of proximity to known cases of pediatric cancer and the willingness of the homeowner to provide access to collect seasonal samples. Along with the collection of samples a survey was taken to learn about the occupants, well history, well construction if known, and any radon measurements collected in the home. UNMC will evaluate the water samples for conventional water quality parameters (conductivity, solids, pH, etc.) as well as nitrate, atrazine, arsenic, uranium and uranium decay products.

The first sample collection took place in the fall of 2021, followed by the spring, summer and fall of 2022. District staff are currently coordinating for the next spring sampling event.

Project Grow
Project GROW is a collaborative demonstration project between the City of York and the UBBNRD. It focuses on three areas of interest: a soil health demonstration, an awareness of the importance of pollinator habitat and a community garden for the citizens of York. The District is farming 140 acres of the City wellfield with crop rotation which includes cover crops and alfalfa to promote soil health. This is the sixth growing season, and the first of a second five-year interlocal agreement for the project. Not only is the District seeing success in GROW, but the City and citizens are taking notice of our work to protect groundwater quality, promote soil health practices, all while maintaining profitability.

The Nature Conservancy Cover Crop Interseeding Project
The UBBNRD, the Nature Conservancy, and University of Nebraska Extension have partnered on a project demonstrating soil health/sustainable agriculture practices. The partners worked with local producers from all corners of the District to interseed cover crops into growing cash crops to improve soil organic matter, increase water infiltration, provide weed suppression, and to improve overall soil health. In 2022, ten producers participated in this demonstration. We completed year three of this three-year project. The Nature Conservancy, and their partners, were the primary funding source for this project. The project partners agreed this is a valuable project and have transfer the ownership of the equipment to the District. The District will continue to promote soil health by make the interseeder available to producer who want to test this practice on their own land.

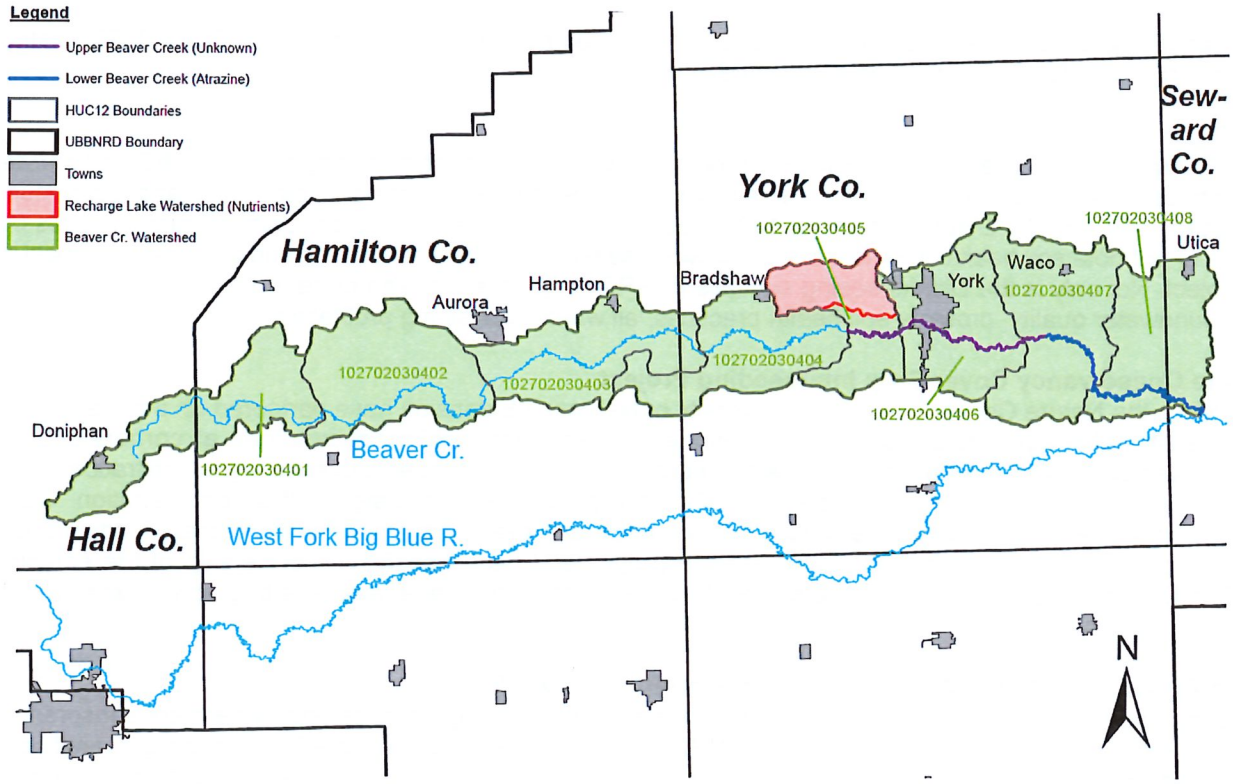
Nebraska Agricultural Water Management Demonstration Network
This program encourages producers to improve irrigation scheduling using Etgages and Watermark sensors to determine crop water needs. This program began in the UBBNRD in 2005 with a collaborative effort with the University of Nebraska Extension and 18 collaborators. The program is now being implemented in several NRDs and coordination has been taken over by the University of Nebraska. The District still sells this equipment to irrigators at a reduced cost to encourage adoption of irrigation scheduling practices.

Groundwater Modeling
The District, in cooperation with the Lower Big Blue, Little Blue, Tri-Basin NRDs and the Department of Natural Resources are partnering in the development of a transient Blue River Basin Groundwater Model that can not only answer the question of interconnection between surface and groundwater, but other management questions NRDs ask when reviewing their groundwater management plans. This project is wrapping up and should be completed by June 2023.

Source Water/Wellhead Protection Planning
The District continues to partner with communities to develop Source Water/Wellhead Protection Area (WHP Area) Plans. The District also assists communities with implementation of some plan components. These include BMP incentives, water sample collection, analysis from rural wells, and soil samples collected from the unsaturated zone for nitrates.

GWMA#2 Vadose Zone Study
The District has partnered with the University of Nebraska Water Center to look at nitrate movement and groundwater recharge throughout the District. This project will focus on investigation of the vadose (unsaturated) zone and groundwater nitrate and agrichemical contaminant occurrence and transport in the Upper Big Blue Natural Resources District (UBBNRD) using several shallow (15') and deep (to the top of the aquifer) soil samples collected from the water quality management zones. This is a four-year project which started the fall/winter of 2022.

Water Quality Management Plan
In March of 2020, the UBBNRD District Wide Water Quality Management Plan (WQMP) was accepted by Environmental Protection Agency (EPA) and the UBBNRD Board of Directors. The District completed Phase I of the WQMP process to further identify priority conservation practices utilizing a target area stakeholder group comprised of landowners and other interests from both the Recharge Lake and Beaver Creek watersheds. Similar to the NRD wide WQMP stakeholder group, the target area stakeholder group identified filter/buffer strips and cover crops as the most acceptable practices.



WQMP – Implementation Program

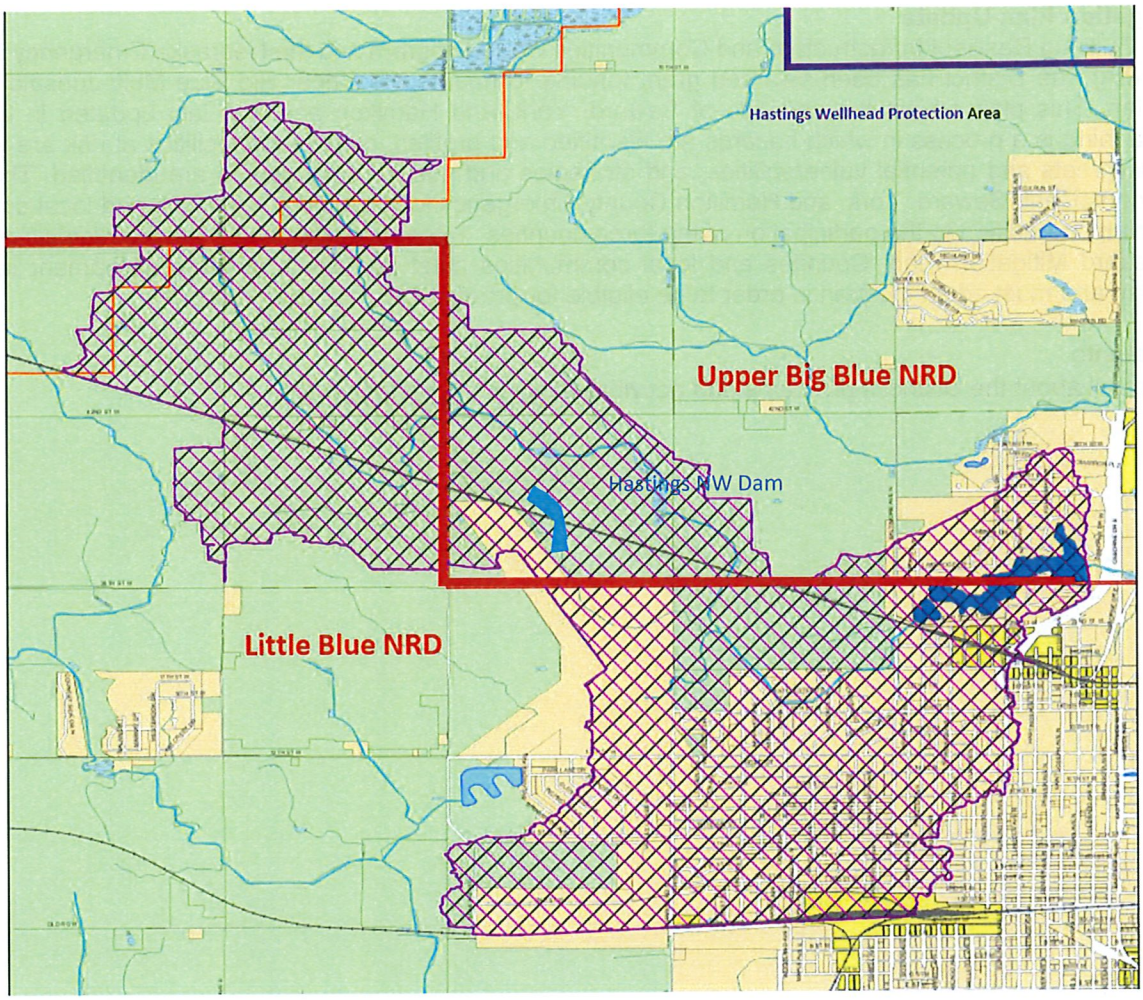
The Upper Big Blue NRD Board approved WQMP implementation programs that provide incentives for conservation practices in the priority areas. Initial programs utilized available NRD funding with plans to apply for the Clean Water Act Section 319 Grant funding as these programs develop.

The WQMP Cover Crop Program offers landowners cost share assistance to install cover crops in specific high-risk areas of the Beaver Creek watershed and within the well head protection areas of communities with approved wellhead protection plans. High risk areas were identified using the Agricultural Conservation Planning Framework (ACPF) program which identifies very high risk and high-risk areas based on topography and soil type. This program provides landowners with a tiered cost share with a 5-year commitment. The District also offers a 50% annual incentive payment (over the Nebraska Buffer Strip Program Rate) for new or re-newed buffer strip contracts within the Beaver Creek watershed. In addition, the District offers an increased cost share rate and maximum funding assistance limit for land treatment projects within the high-risk areas of the Beaver Creek watershed.

Lake Hastings – Water Quality Management Plan

The City of Hastings, the Little Blue NRD, and the Upper Big Blue NRD are working together to address sediment and pollutants in Lake Hastings. Through a contract with JEO Consulting and a Grant from the Nebraska Department of Environment and Energy and Region VII Office of the U.S. Environmental Protection Agency, a Lake Hastings Watershed Management Plan will be developed and added to the Upper Big Blue NRD's District Wide Water Quality Management Plan. A local stakeholder group will be selected to study existing conditions and contributing causes, as well as identify best management practices (BMPs) that will improve conditions in the watershed.

Lake Hastings Watershed
CITY OF HASTINGS, NE



Resource Conservation Partnership Program (RCPP)
In 2020, the Nature Conservancy was awarded RCPP funds for the 'Nebraska Soil Carbon Project'. The project is a collaboration with the Natural Resources Conservation Service, Upper Big Blue NRD, Central Platte NRD, Ecosystem Services Market Consortium, Cargill, Target, and McDonald's. The goal is to partner with 100 producers to install soil health practices on 100,000 acres of central Nebraska cropland over five years. Farmers who enroll will be compensated for adopting cover crops, no-till, and/or diverse rotations. For the second enrollment period, NRCS has offered 12 contracts to farmers for a total cost of $639,236.34. We are still awaiting confirmation on which farmers have accepted the contracts.

Nebraska Buffer Strip Program
Through the Nebraska Department of Agriculture, the District administers the Nebraska Buffer Strip Program. This program provides cost share funds for landowners to establish vegetative buffer strips along shorelines of wetlands, streams, and lakes. Funding comes from a fee assessed on all pesticides registered for use in Nebraska. In FY2023 the District administered 26 buffer strip contracts which provided a total cost share of $31,322.04.

Private Dams Program
Through District's Private Dams Program, the District provides planning, design, and financial assistance for the construction or reconstruction of dams located on private property. In FY2023 the District is providing cost share assistance for 4 dams with a total $163,620.06 of District funds. Through the first seven years of the program the District has provided assistance for 20 dams with an average cost share of $27,200 per dam.

NRD Recreation Area Warning Sirens
Working with the Nebraska Emergency Management Agency and local county emergency management agencies, the District has received Hazard Mitigation Grant Program funds to install warning sirens at four of the NRD's recreation areas. Through this assistance, warning sirens will be installed at Pioneer Trails Recreation Area near Aurora, Bruce Anderson Recreation Area near York, Smith Creek Recreation area south of Utica, and Oxbow Trail Recreation Area near Ulysses.

Siren installations will be coordinated with the Hamilton, York, Seward, and Butler County Emergency Management Agencies.

Hazard Mitigation Plan Update

Through the Building Resilient Infrastructure and Communities Grant Program and the Nebraska Emergency Management Agency (NEMA), the District has been awarded grant funding to update the Upper Big Blue Multi-Jurisdictional Hazard Mitigation Plan. This plan covers the counties of Seward, York, and Hamilton and was last updated in 2019. Hazard mitigation planning is a process in which hazards are identified and profiled, people and facilities at risk are identified and assessed for threats and potential vulnerabilities, and strategies and mitigation measures are identified. The District will work with a consultant, Seward, York, and Hamilton County Emergency Management Agencies, and local communities to update this plan. In addition to the participation of the three counties, 25 communities and 3 special districts participated in the 2019 Hazard Mitigation Plan. Counties and local communities must participate in the development in the Hazard Mitigation Plan and must adopt the plan in order to be eligible for pre-disaster mitigation funds.

Visit our Website

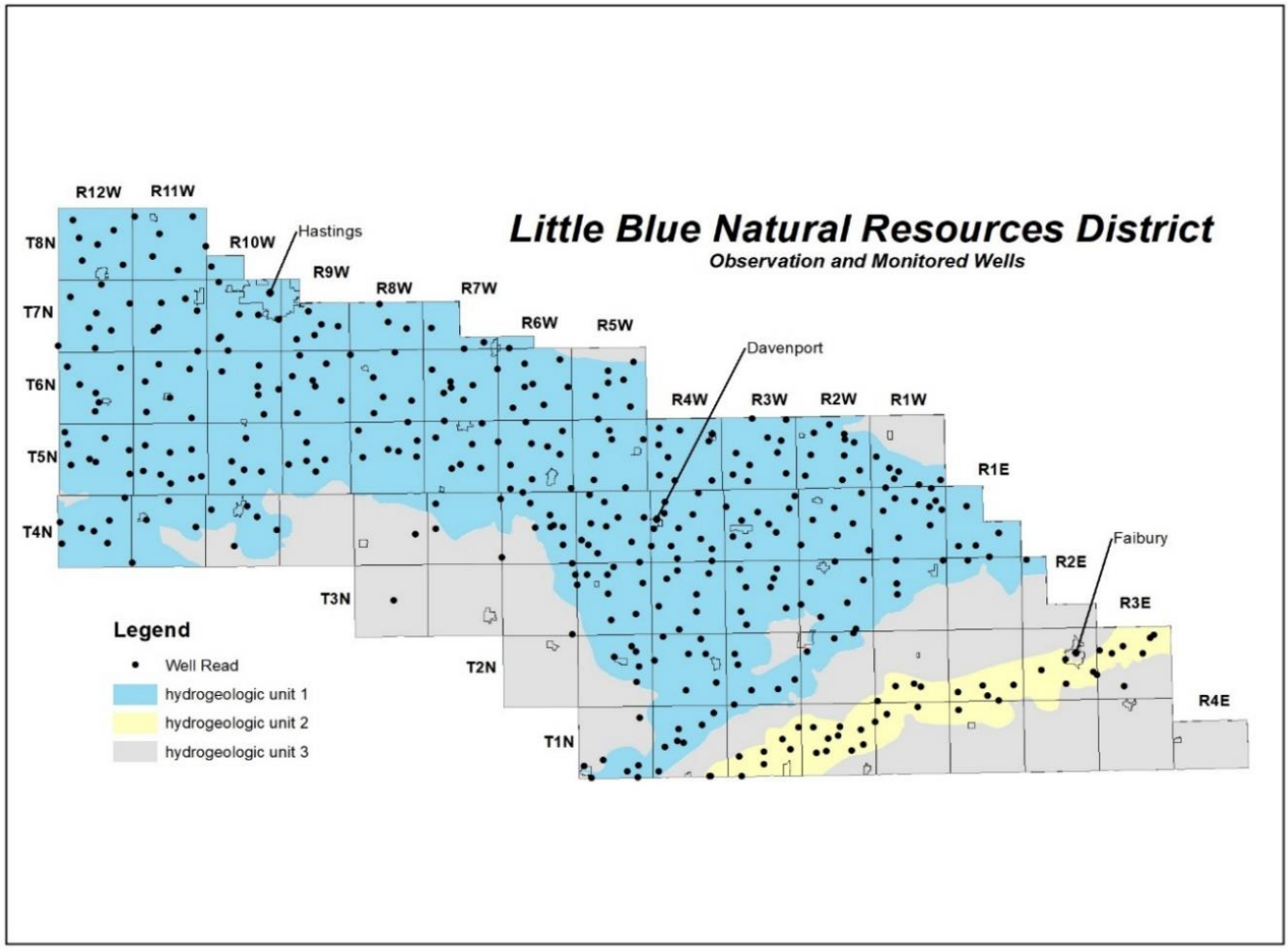
You can learn all about the District's programs and activities at www.upperbigblue.org.

Attachment E

Little Blue Natural Resources District
Blue River Basin Compact Meeting
Annual Report – May 9, 2023

Spring 2022 to Spring 2023 Ground Water Levels

Spring 2023 water levels were completed during the month of April. The map below shows two geologic areas and observation wells that are monitored twice per year. Geologic Area 1 shown in blue was down -1.43 feet on average. Geologic Area 2 shown in yellow was down -0.58 feet on average. Average District precipitation for 2022 was 19.2 inches with average irrigation use of 9.4 inches per acre.

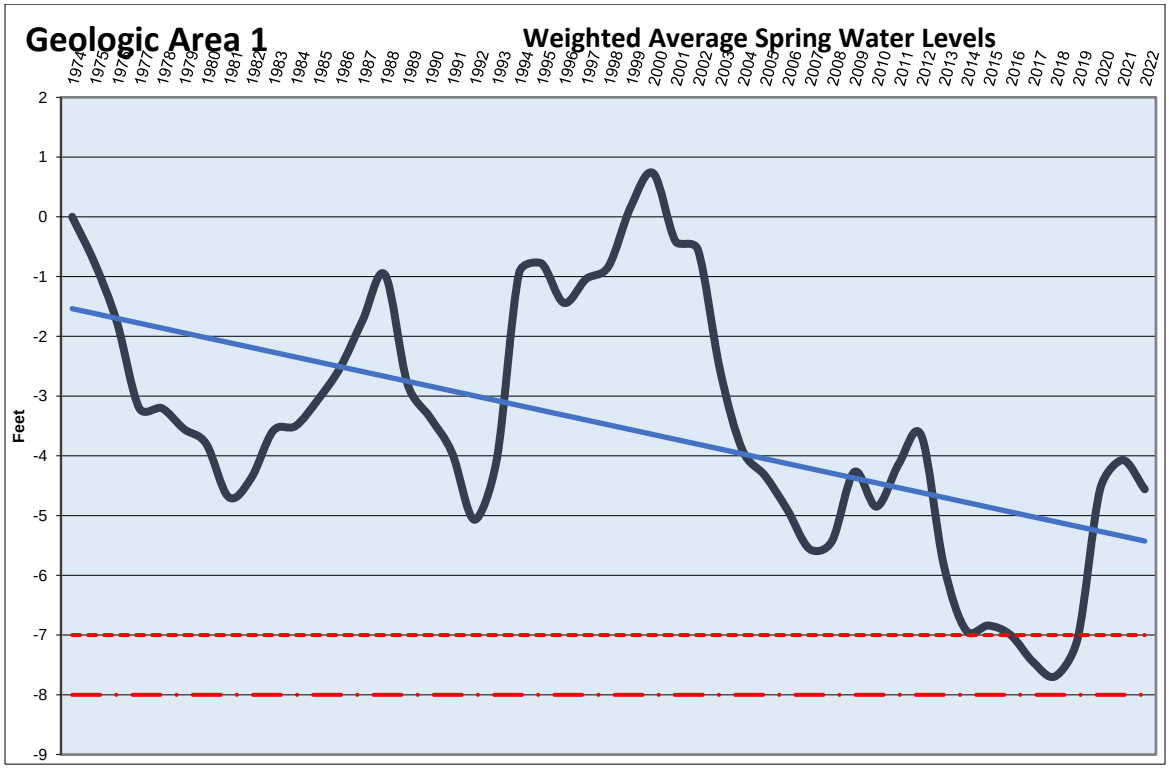


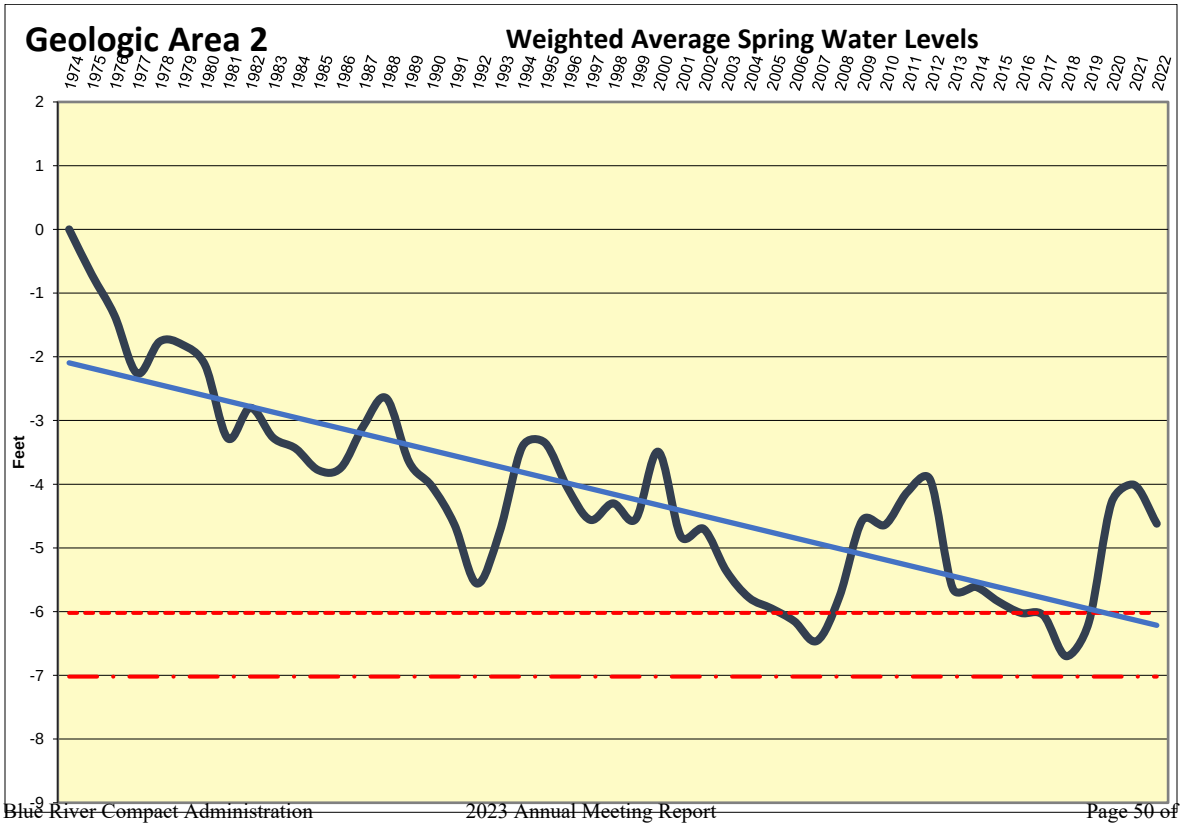
Irrigation Flow Meters

Per our Voluntary Integrated Management Plan (IMP), the District requires that every high capacity well have a working, accurate flow meter. To ensure accuracy and good water use records, each year the District inspects and maintains 800 irrigation flow meters during September, October and November. This schedule allows each meter to be inspected and maintained at least once every seven years. The annual cost for inspecting and maintaining meters is approximately $60,000.

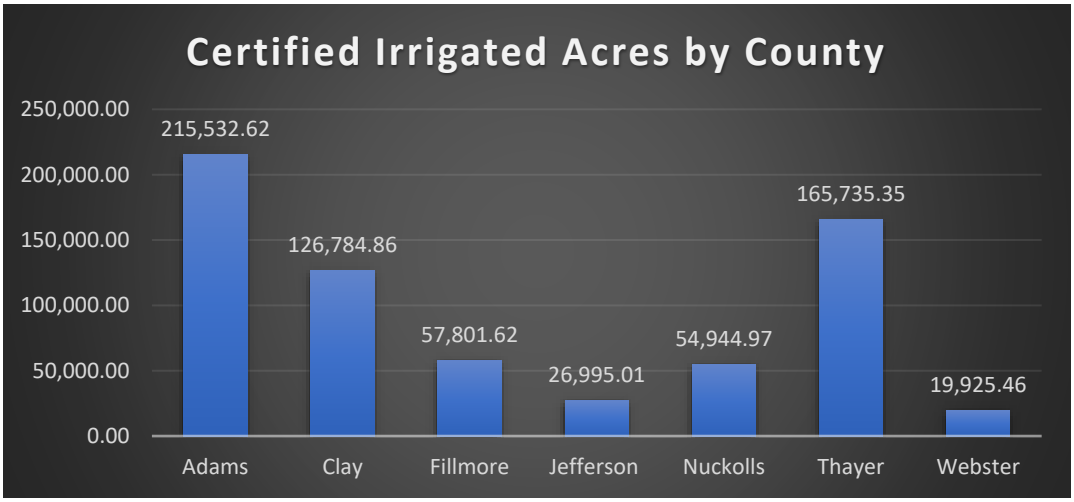
Irrigation Allocations

The District has adopted an allocation system that uses weighted average graphs for tracking water levels for each aquifer. If levels fall one foot below 2016 baseline levels for one-year, there is a stay on irrigation well drilling and expansion of irrigated acres within the respective area. If levels fall one foot below the 2016 baseline for 2 consecutive years allocations of groundwater for irrigation are implemented. Allocations are set at 5 years and 13 inches per year.





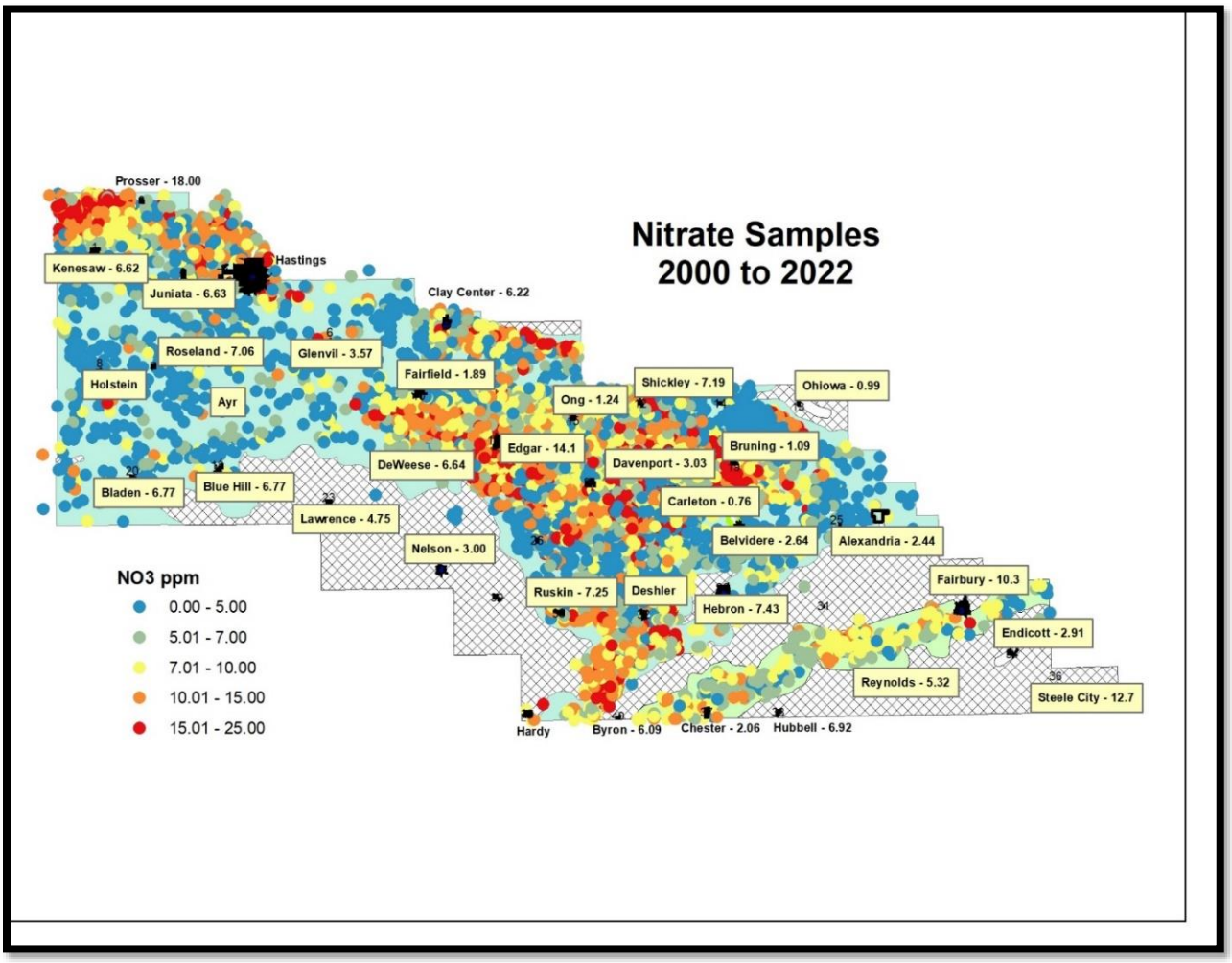
Certified Irrigated Acres – 667,720 Total Acres



Water Quality

The District is committed to protecting both surface and groundwater quality. The District offers many cost share programs to implement BMPs aimed at reducing nitrates in groundwater.

- Crop Rotation
- Irrigation Scheduling
- Continuous No-till
- Chemigation Incentives
- Nitrogen Management
- Nitrification Inhibitors

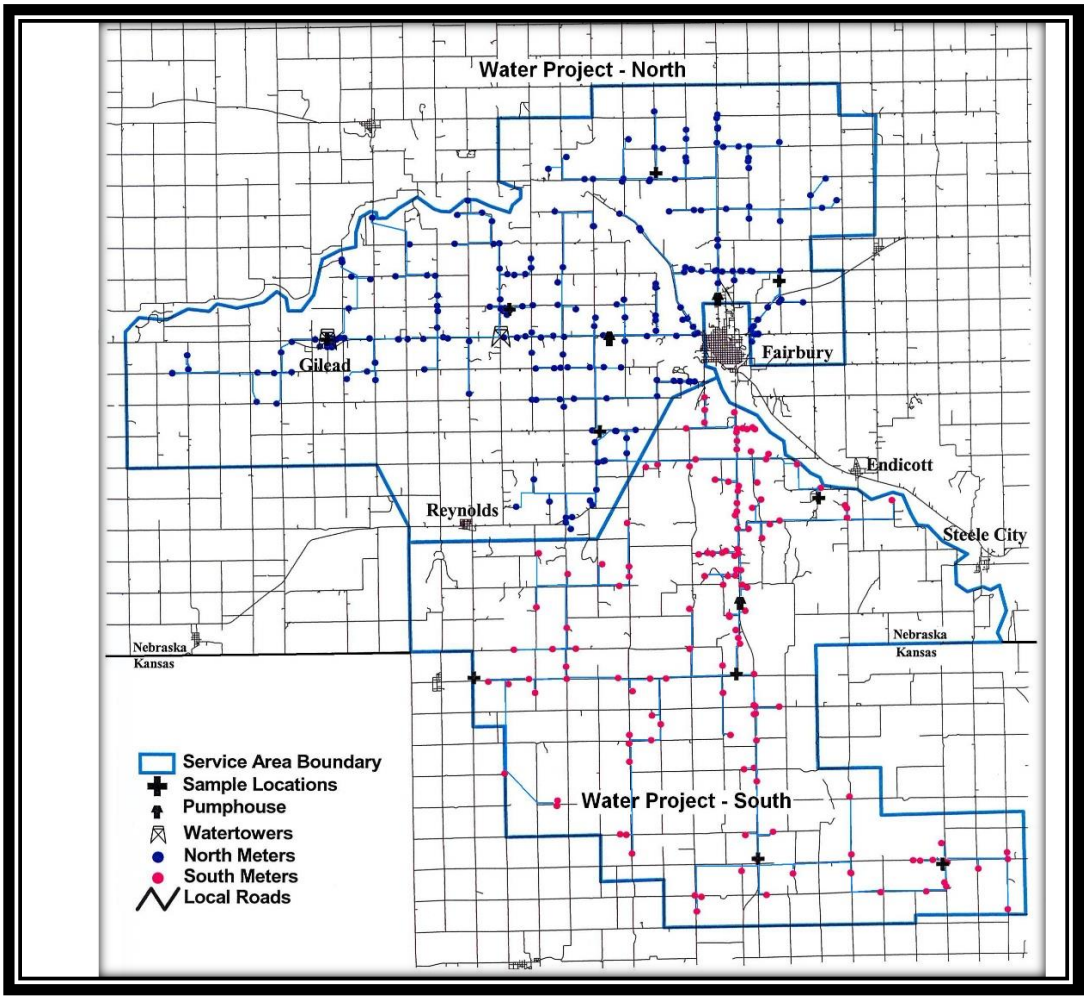


Watershed Projects

- **32-Mile Creek Watershed WFPO Project** – This project has been approved for federal funding and is currently in a 2-year planning phase. The project involves the construction of eight structures that will provide flood protection to the Villages of Kenesaw and Juniata. The project will also improve surface water quality throughout the watershed. Total construction cost is estimated at $7.8 million dollars.
- **Big Sandy Creek National Water Quality Initiative (NWQI) Project** – Area of this project includes the Villages of Bruning, Belvidere and Carleton and is aimed at reducing E-Coli and Atrazine in Big Sandy Creek. Due to a recent surge of landowner interest involving precision chemical application and using an alternative herbicide to atrazine, plans are being discussed to possibly extend the project beyond the original 5-year timeframe, which is set to expire in September 2023.
- **Bowman-Springs Ranch Watershed** – This past year, the District completed repairs on three PL-566 watershed flood control structures in this watershed which is located near the Kansas-Nebraska State line. Repairs included adding rip rap to mend face erosion and installing new outlet sections to principal spillway pipes. The total cost of repairs was $112,000.

Little Blue Valley Water Project

The Little Blue Valley Water Project is a rural water system that includes 400 service locations, of which 89 are located in the State of Kansas and provides potable water to 1,500 people. Due to rising water rates and elevated nitrate levels from the current source (City of Fairbury), an alternative water source was sought out and located. The District secured a 640-acre wellfield site where two 400 gallon per minute wells will be constructed. Nitrate water quality samples collected from 8 test wells on this property ranged from 0.5 to 2.63 parts per million. The cost to construct 2 wells and install 14 miles of pipeline is estimated to be $10 million dollars.



Attachment F

Lower Big Blue
Natural Resources District

805 Dorsey Street, P.O. Box 826
Beatrice, NE 68310
P:402-228-3402
F:402-223-4441
www.lbbnrd.net

Established in 1972 for the development and conservation of soil and water resources

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.

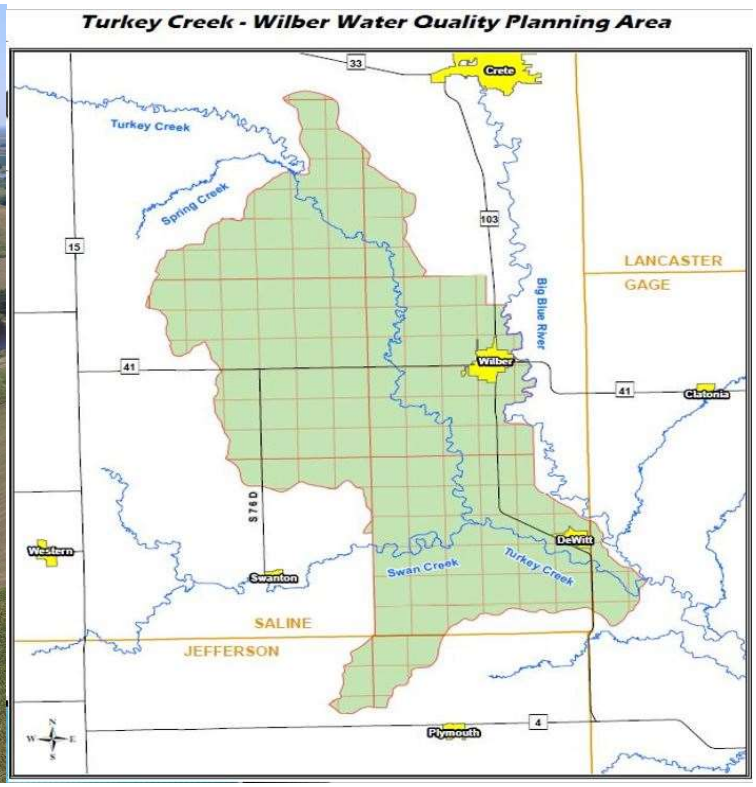
The NRD is also scheduled to begin its first Airborne Electromagnetic Hydrogeologic Mapping (AEM) project which will utilize resistivity to aid in delineating aquifer formations and developing a hydrogeologic framework in an area of the district with persistent groundwater level declines (see Appendix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

Groundwater Levels

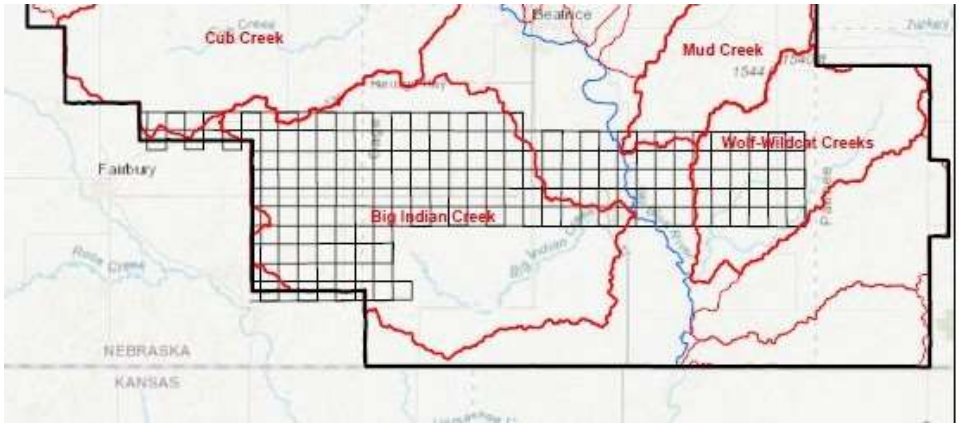
Wells	Number of Wells	Water Level Change From Spring 2022 to Spring 2023	Water Level From Baseline	Fall 2022 to Spring 2023 Recharge	Average Fall to Spring Recharge
Gage County	27	-1.91	-2.36	5.55	1.93
Jefferson County	24	-0.65	-5.60	5.58	3.05
Saline County	42	-1.07	-0.68	3.27	1.69
Dedicated Monitoring 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

Attachment G

Current State of Finances as of April 25, 2023

Current balance is $22,167.60.

As shown in Table 1, revenue is comprised of Kansas and Nebraska dues totaling $19,000, and interest income is currently at $151.73.

Current expenses are comprised of USGS state line gages at $16,809 and Lower Big Blue Natural Resources District observation wells at an expected expense of $680. Outstanding obligations are the annual financial review at a budgeted expense of $1,500.

Proposed Budget for July 2023 to June 2024

The Budget Committee met on Monday, May 8, 2023. We propose making a new addition to the budget to cover meeting expenses (venue, refreshments, and other related expenses). In other business, Dana Cole has not returned calls or answered emails regarding a request to perform annual reviews. The treasurer has met with RG Associates in Omaha regarding financial reviews. They are interested in becoming the Compact's services provider at the budgeted amount moving forward. We propose moving forward with RG Associates as the Compact's financial review service provider.

Table 1
KANSAS-NEBRASKA BIG BLUE RIVER COMPACT ADMINISTRATION
As of April 25, 2023

BEGINNING BALANCE: July 1, 2022			$ 29,322.17
INCOME			
	State Assessments	$ 19,000.00	
	Interest Income	$ 151.73	
	TOTAL INCOME		$ 19,151.73
EXPENSES			
	USGS - Stateline Gages	$ 16,809.00	
	Lower Big Blue Natural Resources District - Observation Wells	$ 700.00	
	Printing Annual Report	$ 0	
	Dana Cole - Review	$ 0	
	TOTAL EXPENSES		$17,509.00
BALANCE ON HAND:			$ 30,964.90
ESTIMATED EXPENDITURES THROUGH JUNE 30, 2023			
	Financial Review	$ 1,500.00	
	Printing Annual Report	$ 0	
	Postage and Office Supplies	$ 0	
	Miscellaneous	$ 0	
	TOTAL ESTIMATED ADDITIONAL EXPENDITURES		$ 1,500.00
ESTIMATED INCOME THOUGH JUNE 30, 2022			
	Interest Income (May and June)		$ 32.00
ESTIMATED BALANCE AS OF JUNE 30, 2023			$ 29,496.34

Table 2
BIG BLUE RIVER COMPACT
BUDGET ANALYSIS

	FY 2020 - 2021	FY 2021 - 2022	FY 2022 - 2023	FY 2023-2024
	Actual 07/1/20- 6/30/21	Actual 07/01/21 - 6/30/22	Partial 07/01/22 - 4/25/23	Proposed Budget
EXPENDITURES				
Operations				
USGS - Stateline Gages	$ 16,252.00	$ 16,459.00	$ 16,809.00	$ 17,000.00
LBBNRD - Observation Wells	$ 680.00	$ 680.00	$ 700.00	$ 700.00
Water Quality Committee	$ 0	$ 0	$ 0	$ 0
Annual report - Printing	$ 0	$ 0	$ 0	$ 0
Annual Financial Review	$ 950.00	$ 1,800.00	$ 1,500.00	$ 1,500.00
Postage and Office Supplies	$ 0	$ 0	$ 0	$ 0
Meeting Expenses	$ -	$ -	$ -	$500.00
Miscellaneous Expenses	$ 0	$ 0	$ 0	$ 0
Total Expenses	$ 17,882.00	$ 18,939.00	$ 19,009.00	$ 19,700.00
INCOME & CARRY OVER				
Assessments (Both States)	$ 19,000.00	$ 19,000.00	$ 19,000.00	$ 19,000.00
Interest earned	$ 34.78	$ 9.43	$ 183.73	$ 120.00
Carry Over from Prior Year	$ 26,028.12	$ 27,180.90	$ 27,251.33	$ 27,426.06
Total Income and Carry Over	$ 45,062.90	$ 46,190.33	$ 46,435.06	$ 46,546.06
Balance End of Year	$ 27,180.90	$ 27,251.33	$ 27,426.06	$ 26,846.06

Attachment H

KANSAS-NEBRASKA BIG BLUE RIVER COMPACT REPORT
U.S. Geological Survey—Water Year 2022

The U.S. Geological Survey (USGS) continues to operate two streamflow gaging stations for the Compact Administration—Big Blue River at Barneston, NE (06882000), and Little Blue River at Hollenberg, KS (06884025). An electronic data logger (EDL) at each station automatically records streamflow stage every 15 minutes. Every hour, these instantaneous values are transmitted via satellite to USGS offices, where they are used to compute preliminary values of instantaneous and daily discharge that are immediately posted to the USGS National Water Information System (NWIS) website (addresses shown below). Before the data are finalized, updates and revisions are made as needed, based on a series of quality checks and reviews. Finalized values of daily discharge and daily gage height, along with associated summary statistics are published annually on a site-by-site basis on the NWIS web page (address shown below).

During water year (WY) 2022 (October 1, 2021, to September 30, 2022), periodic visits were made to the stations to maintain and calibrate the sensing and recording equipment, make discharge measurements, and download the data directly from the EDLs, as a backup to the satellite-telemetered data. The discharge measurements were used to determine shifts from the stage-discharge relations (rating curves) that were then used to convert stage values to corresponding values of discharge.

For each of the State delegations and the Compact chairman, copies of the WY 2022 published data (manuscript, discharge daily values, statistics tables, and daily discharge hydrograph) from the NWIS web page are attached for each station. These water-year summaries (PDF files) are available online within the NWIS site page for each of the streamgages, along with data for other streamgages for the Nation. Also attached are plots of the annual mean discharges for the periods of record, and plots of the daily discharges for WY 2022 compared to those for the median daily statistic for each day of the year.

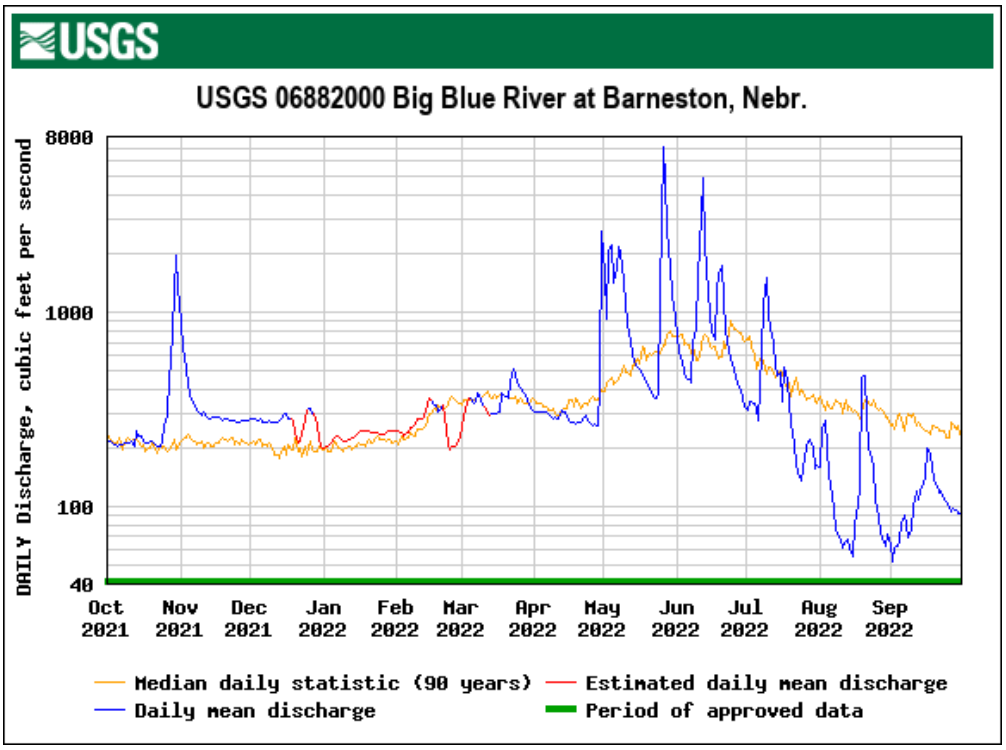
Current (real-time) and historical data on surface water, groundwater, and water quality for the Nation can be accessed and downloaded via the Water Resources of the United States website (https://www2.usgs.gov/water/) or from the Nebraska Water Science Center website (https://www.usgs.gov/centers/ne-water). All unit values and daily values of discharge can be accessed using the NWIS web, as well as all unit values and daily values of gage height since October 2007.

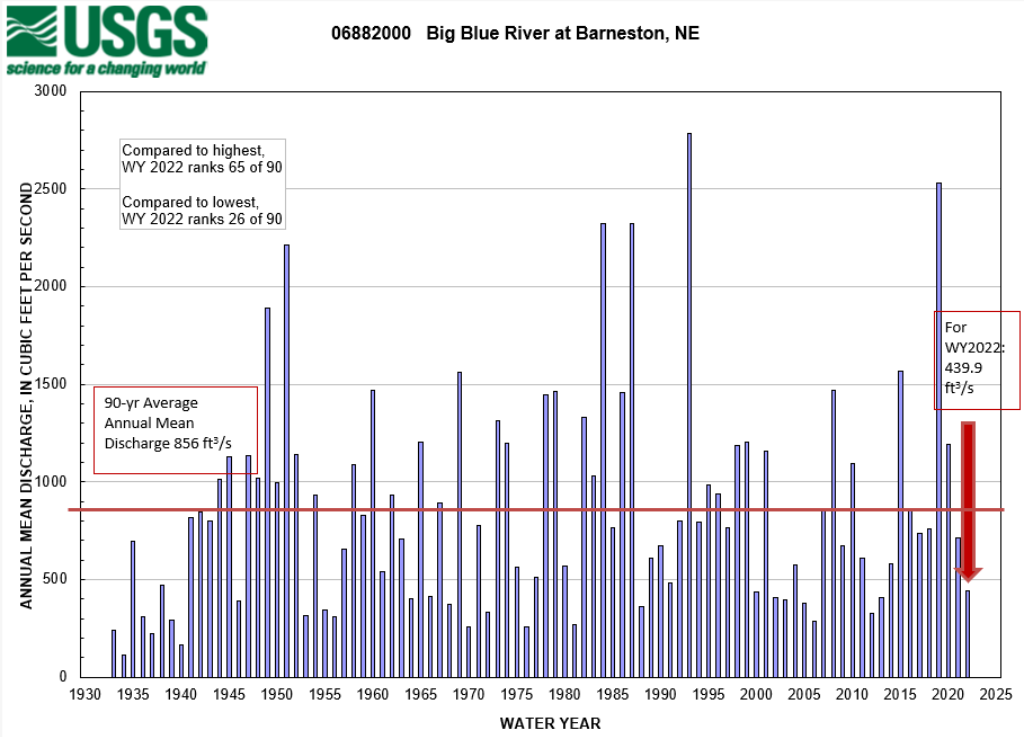
Jason Lambrecht
Deputy Director, Hydrologic Observations Chief

U.S. Geological Survey, Nebraska Water Science Center
5231 S. 19th St., Lincoln, NE 68512-1271
(jmlambre@usgs.gov)
402-328-4124 (office), 402-416-2363 (mobile)

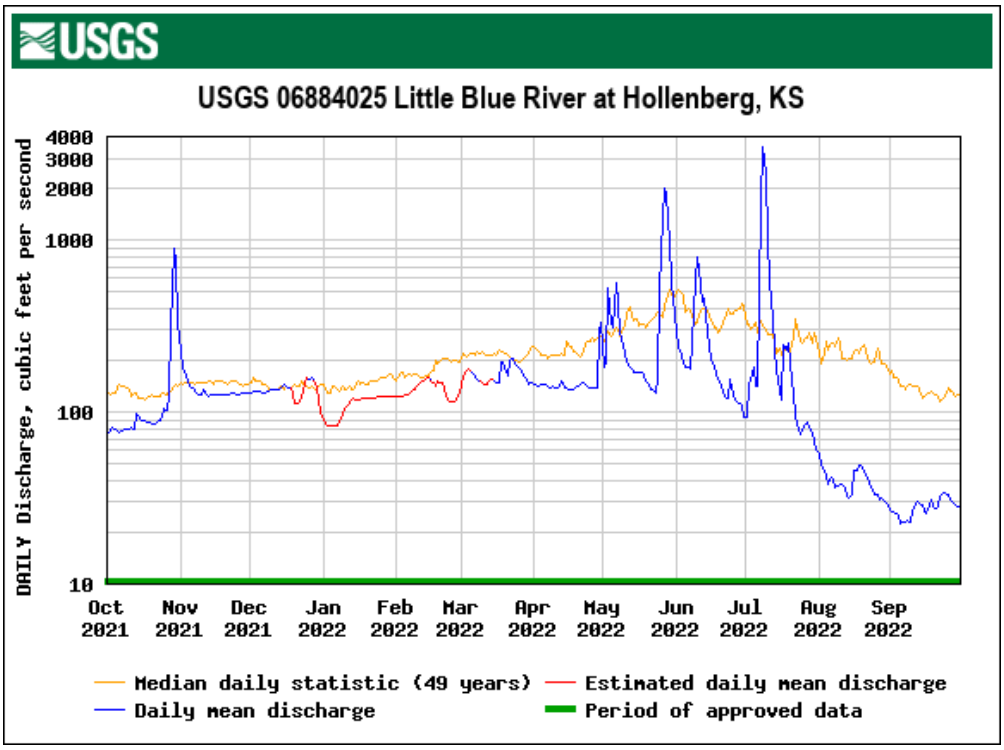
May 9, 2023

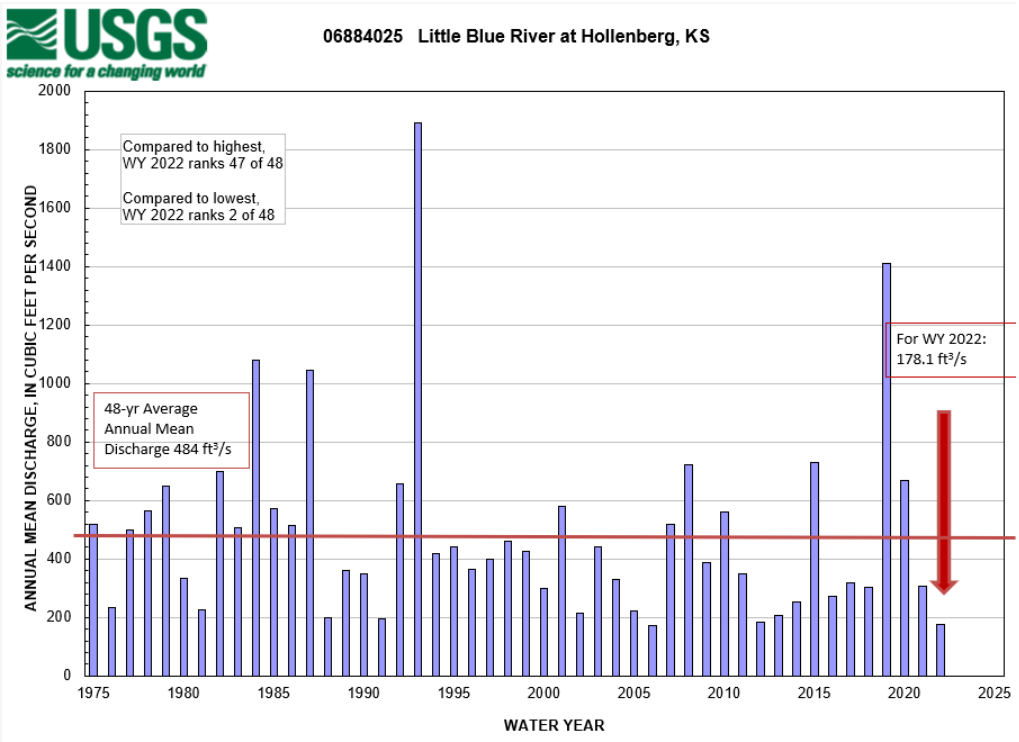
For station **06882000 Big Blue River at Barneston**, 11 discharge (and stage) measurements, ranging from 73.1 ft^3/s (3.14 ft stage) to 1,130 ft^3/s (5.51 ft stage), were made during WY 2022. The annual mean discharge of 439.9 ft^3/s was 1.6 times less than that of the WY 2021 mean of 712.6 ft^3/s; and 1.9 times lower than the new historical mean of 856 ft^3/s for WYs 1933–2022 (90 years of record). The maximum and minimum daily discharges were 7,030 ft^3/s on May 26, 2022 (peak of record daily mean was 50,000 ft^3/s on June 9, 1941); and 52.0 ft^3/s on September 1, 2022.





For station **06884025 Little Blue River at Hollenberg**, 15 discharge (and stage) measurements, ranging from 23.1 ft^3/s (1.47 ft stage) to 2,740 ft^3/s (6.23 ft stage), were made during WY 2022. The annual mean discharge of 178.1 ft^3/s was 1.7 times less than that of the WY 2021 mean of 306.9 ft^3/s; and 2.7 times lower than the new historical mean of 484 ft^3/s for WYs 1975–2022 (48 years of record). The maximum and minimum daily discharges were 3,480 ft^3/s on July 8, 2022 (peak of record daily mean was 39,300 ft^3/s on July 26, 1992); and 22.6 ft^3/s on September 5, 2022 (new record low).





USGS Water-Year Summary 2022

06882000 Big Blue River at Barneston, Nebr.

LOCATION - Lat 40°02'41", long 96°35'14" referenced to North American Datum of 1983, in NE 1/4 NW 1/4 sec.24, T.1 N., R.7 E., Gage County, NE, Hydrologic Unit 10270202, on right bank just downstream of bridge on State Highway 8, 0.6 mi southwest of Barneston, 1.3 mi upstream from Plum Creek, and 4.3 mi upstream from Nebraska-Kansas State line.

DRAINAGE AREA - 4,447 mi² of which 77 mi² probably is noncontributing.

REVISIONS HISTORY - WSP 896: 1932, 1935. WSP 1919: Drainage area.

SURFACE-WATER RECORDS

PERIOD OF RECORD - May 1932 to current year.

GAGE - Water-stage recorder with satellite telemetry. Datum of gage is 1,162.20 ft above sea level. Prior to June 9, 1941, water-stage recorder at site 0.3 mi downstream at datum 1.56 ft higher. June 9 to Nov. 17, 1941, non-recording gage, and Nov. 18, 1941 to Sept. 30, 1979, water-stage recorder at site 0.7 mi upstream at datum 2.0 ft higher.

REMARKS - Accuracy of records for water years prior to 2014 are noted in the individual Annual Data Reports for those water years. For water years 2014 onward, records fair to good except for estimated daily discharges, which are poor, unless otherwise noted.

EXTREMES FOR PERIOD OF RECORD - Maximum peak flow, 57,700 ft³/s, June 9, 1941, gage height, 34.30 ft, at site datum then in use.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2023, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [May 1, 2023], https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&93783&adr_begin_date=2021-10-01&adr_end_date=2022-09-30&site_no=06882000&agency_cd=USGS

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2021-10-01 to 2022-09-30
DAILY MEAN VALUES
[e, Value has been estimated.]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2021	2021	2021	2022	2022	2022	2022	2022	2022	2022	2022	2022
1	217	890	280	e201	e245	e255	306	1,570	743	315	160	52.0
2	216	650	281	e202	e245	e292	309	926	623	346	248	60.7
3	212	512	283	e205	e242	e338	304	2,090	553	347	275	62.4
4	208	425	279	e211	e231	362	304	2,210	495	338	199	65.9
5	205	379	281	e219	e234	359	304	1,420	466	310	144	81.9
6	207	343	272	e225	e242	342	306	1,680	452	277	114	91.1
7	210	324	271	e229	e253	346	298	2,180	438	619	95.3	80.4
8	212	312	272	e227	e257	383	291	1,990	706	1,080	75.8	69.7
9	212	298	275	e219	e265	352	283	1,460	819	1,510	69.7	75.9
10	213	293	274	e217	e281	336	291	1,100	1,580	989	66.9	100
11	217	304	272	e216	e285	325	284	872	2,150	823	61.2	121
12	206	286	272	e220	e282	e302	293	714	4,890	688	65.9	109
13	247	282	278	e224	e291	295	311	616	2,230	533	67.5	121
14	231	285	284	e228	e310	299	309	549	1,290	470	61.2	129
15	230	289	302	e234	e362	300	288	520	969	495	55.6	141
16	215	289	301	e242	353	303	275	515	782	349	79.8	201
17	211	286	284	e246	333	307	271	467	719	522	105	183
18	213	280	284	e247	334	382	273	466	1,310	444	124	160
19	215	278	e273	e247	309	377	265	437	1,570	338	459	135
20	219	280	e240	e244	317	369	271	407	1,750	271	475	128
21	209	281	e211	e241	335	359	272	381	1,180	207	293	117
22	203	276	e217	e240	e288	434	287	372	805	163	199	119
23	205	276	e235	e239	e208	508	296	364	634	141	178	109
24	219	276	e284	e238	e195	468	276	385	576	135	156	106
25	261	272	310	e237	e202	430	265	1,220	515	156	108	98.6
26	292	273	319	e236	e206	409	262	7,030	462	202	89.1	94.9
27	459	278	301	e236	e210	394	267	4,820	429	213	72.0	97.3
28	538	276	298	e239	e224	377	262	2,680	395	223	69.9	96.6
29	1,250	277	e267	e245		350	410	1,690	363	200	62.5	92.3
30	1,970	275	e222	e247		333	2,600	1,240	325	157	72.7	92.7
31	1,340		e202	e246		314		949		163	64.0	
Total	11,260	10,040	8,424	7,147	7,539	11,000	11,030	43,320	30,220	13,020	4,366	3,191
Mean	363	335	272	231	269	355	368	1,397	1,007	420	141	106
Max	1970	890	319	247	362	508	2600	7030	4890	1510	475	201
Min	203	272	202	201	195	255	262	364	325	135	55.6	52.0
Ac-ft	22,340	19,920	16,710	14,180	14,950	21,820	21,880	85,920	59,940	25,829	8,660	6,330

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1933 - 2022, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	586	309	288	302	592	1,279	805	1,411	2,076	1,218	693	699
Max	7,451	1,526	2,731	1,596	2,876	10,560	5,280	5,207	10,460	12,270	5,227	3,420
(WY)	(1974)	(1999)	(2019)	(1973)	(1984)	(1979)	(1984)	(1995)	(1951)	(1993)	(1954)	(1989)
Min	61.5	77.5	87.4	67.6	116	137	132	96.0	69.3	30.7	21.1	50.6
(WY)	(1941)	(1937)	(1977)	(1937)	(1940)	(1968)	(1934)	(1934)	(1934)	(1934)	(1934)	(1939)

SUMMARY STATISTICS

	Water Year 2022		Water Years 1933 - 2022	
Annual total	160,600			
Annual mean	439.9		855.6	
Highest annual mean			2,781	1993
Lowest annual mean			115.0	1934
Highest daily mean	7,030	May 26	50,000	Jun 09, 1941
Lowest daily mean	52.0	Sep 01	1.00	Nov 30, 1945
Annual 7-day minimum	62.9	Aug 29	15.1	Aug 03, 1934
Maximum peak flow	7,930	May 26	57,700	Jun 09, 1941
Maximum peak stage	13.51	May 26	34.30[a]	Jun 09, 1941
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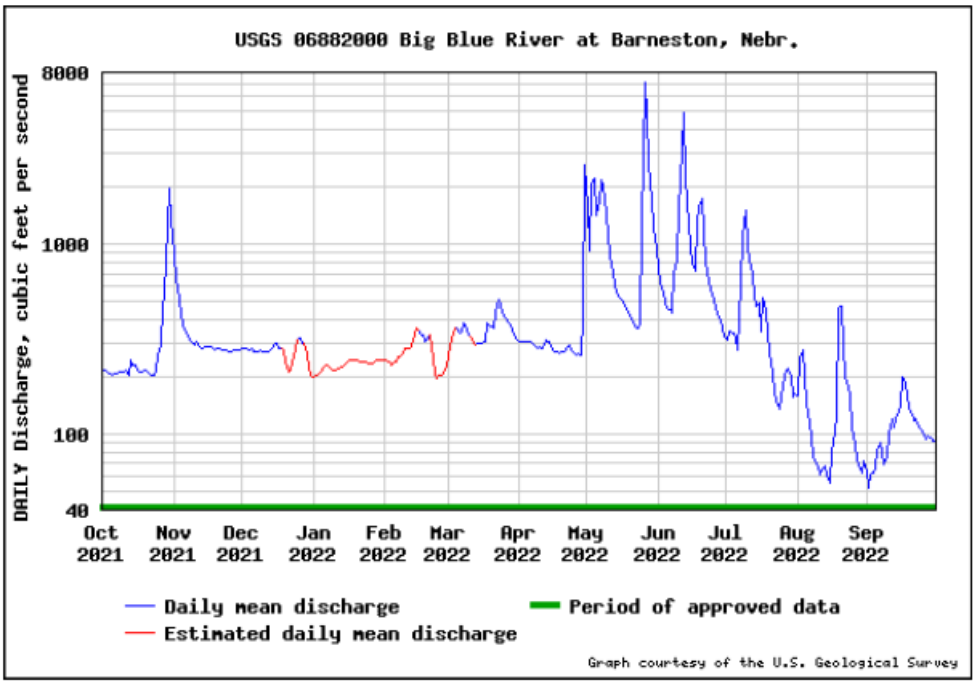


USGS Water-Year Summary 2022

06884025 Little Blue River at Hollenberg, KS

LOCATION - Lat 39°58'49", long 97°00'17" referenced to North American Datum of 1983, in NE 1/4 SW 1/4 sec.8, T.1 S., R.4 E., Washington County, KS, Hydrologic Unit 10270207, on right bank just downstream from bridge on county road, 0.6 mi west of Hollenberg, 1.8 mi downstream from Nebraska-Kansas State line, and at mile 43.1.

DRAINAGE AREA - 2,752 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD - March 1973 to February 1974 (discharge measurements only), March 1974 to current year.

GAGE - Water-stage recorder with satellite telemetry. Datum of gage is 1,216.10 ft above sea level.

REMARKS - Accuracy of records for water years prior to 2014 are noted in the individual Annual Data Reports for those water years. For water years 2014 onward, records good except for estimated daily discharges, which are poor, unless otherwise noted. Discharge measurements made prior to 1974 water year are published in table of miscellaneous sites in WDR NE-73.

EXTREMES OUTSIDE PERIOD OF RECORD - A gage height of 23.07 ft, present datum, from floodmark, discharge not determined, occurred October 12, 1973.

EXTREMES FOR PERIOD OF RECORD -

Maximum peak flow, 59,200 ft³/s, May 7, 2015, gage height, 22.97 ft, site and datum then in use.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2023, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [May 1, 2023], https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&93795&adr_begin_date=2021-10-01&adr_end_date=2022-09-30&site_no=06884025&agency_cd=USGS

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2021-10-01 to 2022-09-30
DAILY MEAN VALUES
[e, Value has been estimated.]

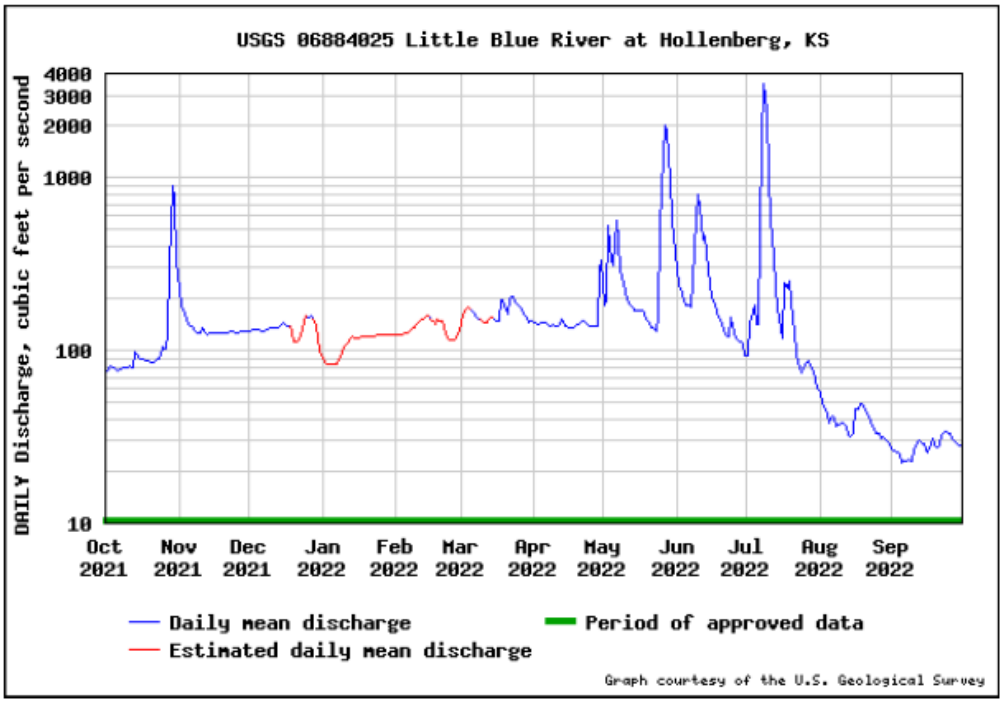
Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2021	2021	2021	2022	2022	2022	2022	2022	2022	2022	2022	2022
1	76.1	225	130	e88.4	e124	e146	145	184	286	93.0	57.3	26.0
2	77.6	184	131	e84.4	e123	e163	144	190	240	145	48.6	26.2
3	80.6	161	132	e83.0	e123	e173	143	522	212	151	46.2	25.6
4	79.3	148	131	e82.5	e124	e178	145	321	193	181	42.2	24.3
5	77.4	142	132	e83.1	e125	175	146	312	184	143	38.0	22.6
6	76.8	137	130	e83.2	e127	165	145	571	181	141	41.6	23.1
7	77.8	132	129	e83.6	e130	160	141	424	180	1,620	41.1	23.1
8	78.8	129	131	e88.0	e133	154	139	291	253	3,480	36.2	23.5
9	79.0	126	132	e96.7	e136	150	140	244	592	2,490	36.8	22.9
10	80.4	126	134	e104	e141	e148	139	215	795	1,010	37.8	26.3
11	82.2	134	135	e108	e146	e145	138	196	672	578	38.2	29.6
12	80.3	125	136	e113	e151	e146	142	181	437	344	36.1	29.9
13	97.6	123	136	e118	e153	e153	150	179	456	233	32.2	29.6
14	95.6	126	138	e121	e155	154	139	169	298	175	31.8	28.7
15	88.8	126	144	e119	157	152	137	171	242	132	33.4	26.4
16	89.0	127	143	e118	153	149	136	171	203	118	46.0	25.6
17	88.5	127	139	e119	e147	149	135	169	183	248	45.8	28.3
18	87.9	125	138	e120	e142	195	136	162	168	230	49.4	31.0
19	86.5	125	e127	e121	e152	194	138	153	154	249	49.5	27.9
20	85.3	125	e112	e121	147	171	142	144	142	193	46.0	27.7
21	84.8	125	e112	e120	148	162	145	136	131	125	42.6	28.2
22	86.4	125	e115	e120	e134	198	148	134	123	95.2	41.6	32.2
23	89.5	128	e124	e121	e118	204	146	130	121	78.3	36.0	33.5
24	93.7	128	e144	e122	e114	191	140	157	154	74.5	34.8	33.7
25	105	126	157	e122	e114	186	137	517	126	78.0	33.3	32.8
26	103	127	156	e122	e115	179	138	1,350	119	85.3	32.8	30.8
27	125	128	157	e123	e119	169	138	2,020	115	87.2	30.6	30.0
28	307	128	150	e124	e130	160	137	1,820	112	82.2	31.4	29.1
29	900	129	e142	e124		153	291	974	107	75.5	29.9	28.4
30	741	130	e114	e124		146	336	560	93.2	66.9	29.8	28.0
31	334		e100	e124		147		374		60.7	26.8	
Total	4,635	4,047	4,131	3,401	3,781	5,115	4,576	13,139	7,272	12,860	1,204	835
Mean	150	135	133	110	135	165	153	424	242	415	38.8	27.8
Max	900	225	157	124	157	204	336	2020	795	3480	57.3	33.7
Min	76.1	123	100	82.5	114	145	135	130	93.2	60.7	26.8	22.6
Ac-ft	9,193	8,027	8,194	6,746	7,500	10,140	9,076	26,060	14,420	25,510	2,388	1,656

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 2022, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	341	209	202	183	285	649	439	841	950	808	475	359
Max	2,163	1,113	1,646	577	1,059	3,816	2,379	2,638	4,654	9,014	2,572	1,696
(WY)	(1987)	(1997)	(2019)	(1984)	(1993)	(1993)	(1987)	(2015)	(2015)	(1993)	(1985)	(2018)
Min	45.3	81.1	87.2	74.0	89.1	118	117	103	151	68.1	38.8	27.8
(WY)	(1992)	(1992)	(2013)	(2018)	(2018)	(1981)	(2018)	(2018)	(1981)	(2013)	(2022)	(2022)

SUMMARY STATISTICS

	Water Year 2022		Water Years 1974 - 2022	
Annual total	65,000			
Annual mean	178.1		484.2	
Highest annual mean			1,891	1993
Lowest annual mean			172.9	2006
Highest daily mean	3,480	Jul 08	39,300	Jul 26, 1992
Lowest daily mean	22.6	Sep 05	22.6	Sep 05, 2022
Annual 7-day minimum	23.6	Sep 03	23.6	Sep 03, 2022
Maximum peak flow	4,230	Jul 08	59,200	May 07, 2015
Maximum peak stage	7.46	Jul 08	23.07	Oct 12, 1973
Annual runoff (cfsm)	0.065		0.175	
Annual runoff (inches)	0.878		2.38	
10 percent exceeds	242.8		802.0	
50 percent exceeds	130.0		188.0	
90 percent exceeds	33.1		96.0	



Water Year 2022 Discharge Measurements

Site #	Meas. #	Meas. Date & Time	Meas. Used	Meas. Party	Meas. Agency	Discharge	Gage Height	Meas. Rating	Control Condition
06882000	1514	10/21/2022 11:27	Yes	bhi	USGS	116	3.36	Fair	Clear
06882000	1513	9/6/2022 10:07	Yes	bhi	USGS	90.5	3.22	Fair	Clear
06882000	1512	8/26/2022 9:30	Yes	bhi	USGS	90.1	3.22	Fair	Clear
06882000	1511	8/8/2022 11:22	Yes	kek	USGS	73.1	3.14	Fair	Clear
06882000	1510	7/26/2022 9:10	Yes	bhi	USGS	210	3.65	Fair	Clear
06882000	1509	6/24/2022 12:28	Yes	bhi	USGS	588	4.54	Fair	Clear
06882000	1508	5/10/2022 11:34	Yes	bhi/kek	USGS	1130	5.51	Fair	Clear
06882000	1507	3/29/2022 12:23	Yes	bhi	USGS	347	4.07	Fair	Clear
06882000	1506	2/16/2022 7:32	Yes	bhi	USGS	352	3.98	Fair	Clear
06882000	1505	1/7/2022 14:27	Yes	bhi	USGS	230	4.30	Poor	IceCover
06882000	1504	11/17/2021 11:52	Yes	bhi	USGS	283	3.90	Fair	Clear
06882000	1503	10/5/2021 9:31	Yes	bhi	USGS	211	3.64	Fair	Clear
06884025	636	10/21/2022 9:39	Yes	bhi	USGS	36.1	1.56	Fair	Clear
06884025	635	9/6/2022 11:50	Yes	bhi	USGS	23.1	1.47	Fair	Clear
06884025	634	8/26/2022 11:05	Yes	bhi	USGS	34.3	1.56	Fair	Clear
06884025	633	8/8/2022 13:27	Yes	kek	USGS	36.3	1.58	Fair	DebrisModerate
06884025	632	8/1/2022 10:12	Yes	bhi	USGS	59.7	1.70	Fair	Clear
06884025	631	7/26/2022 10:41	Yes	bhi	USGS	85.1	1.86	Fair	Clear
06884025	630	7/13/2022 13:52	Yes	bhi	USGS	226	2.44	Fair	Clear
06884025	629	7/8/2022 11:40	Yes	bhi	USGS	2740	6.23	Fair	Clear
06884025	628	6/24/2022 10:39	Yes	bhi	USGS	167	2.20	Fair	Clear
06884025	627	5/12/2022 10:28	Yes	bhi	USGS	182	2.30	Fair	Clear
06884025	626	3/29/2022 10:25	Yes	bhi	USGS	158	2.16	Fair	Clear
06884025	625	2/16/2022 9:10	Yes	bhi	USGS	160	2.19	Fair	Clear
06884025	624	1/7/2022 12:17	Yes	bhi	USGS	82.4	2.38	Poor	IceCover
06884025	623	11/17/2021 10:01	Yes	bhi	USGS	124	2.08	Fair	Clear
06884025	622	10/5/2021 11:29	Yes	bhi	USGS	79.2	1.84	Fair	Clear

Attachment I

REPORT OF THE ENGINEERING COMMITTEE
TO THE
KANSAS-NEBRASKA BIG BLUE RIVER COMPACT ADMINISTRATION

May 9, 2023

The engineering committee was not given any special assignments from the Compact Administration and did not meet during the past year. The United States Geological Survey (USGS) and the Lower Big Blue Natural Resources District (LBBNRD) provided the 2022 data for this report.

Review of Streamflow Data

The Compact sets forth the following streamflow targets at the Stateline gaging stations:

	Big Blue River	Little Blue River
May	45 cfs	45 cfs
June	45 cfs	45 cfs
July	80 cfs	75 cfs
August	90 cfs	80 cfs
September	65 cfs	60 cfs

During the May through September time period of the 2022 water year (October 1, 2021 through September 30, 2022) there were extended shortages for Compact target flows. The mean daily streamflow at the Barneston gage on the Big Blue River (Exhibit A) was below target flows for 18 days and the Hollenberg gage (Exhibit B) on the Little Blue River was below target flows for 64 days.

Real-time and historical data for these gaging stations can be found at the following websites:
Big Blue River – https://waterdata.usgs.gov/monitoring-location/06882000/
Little Blue River – https://waterdata.usgs.gov/monitoring-location/06884025/

Review of Groundwater Data

The Lower Big Blue Natural Resources District provided the groundwater levels (Exhibit C) for the Big Blue Basin near Beatrice.

Review of Wells in the Regulatory Reaches

Exhibit D is a listing of the active irrigation wells within the regulatory reaches. There were no new wells drilled in the Big Blue River regulatory area and no new wells drilled in the Little Blue River regulatory area during this reporting period.

Respectively Submitted,

Jeremy F. Gehle, Chair
Nebraska

Elizabeth Hickman, I.E.
Kansas

Exhibit A

Water-Data Report 2022
06882000 Big Blue River at Barneston, Nebr. -- Continued

SUMMARY STATISTICS

	Water Year 2022		Water Years 1933 - 2022	
Annual total	160,600			
Annual mean	439.9		855.6	
Highest annual mean			2,781	1993
Lowest annual mean			115.0	1934
Highest daily mean	7,030	May 26	50,000	Jun 09, 1941
Lowest daily mean	52.0	Sep 01	1.00	Nov 30, 1945
Annual 7-day minimum	62.9	Aug 29	15.1	Aug 03, 1934
Maximum peak flow	7,930	May 26	57,700	Jun 09, 1941
Maximum peak stage	13.51	May 26	34.30[a]	Jun 09, 1941
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10 percent exceeds	842.6		1,750	
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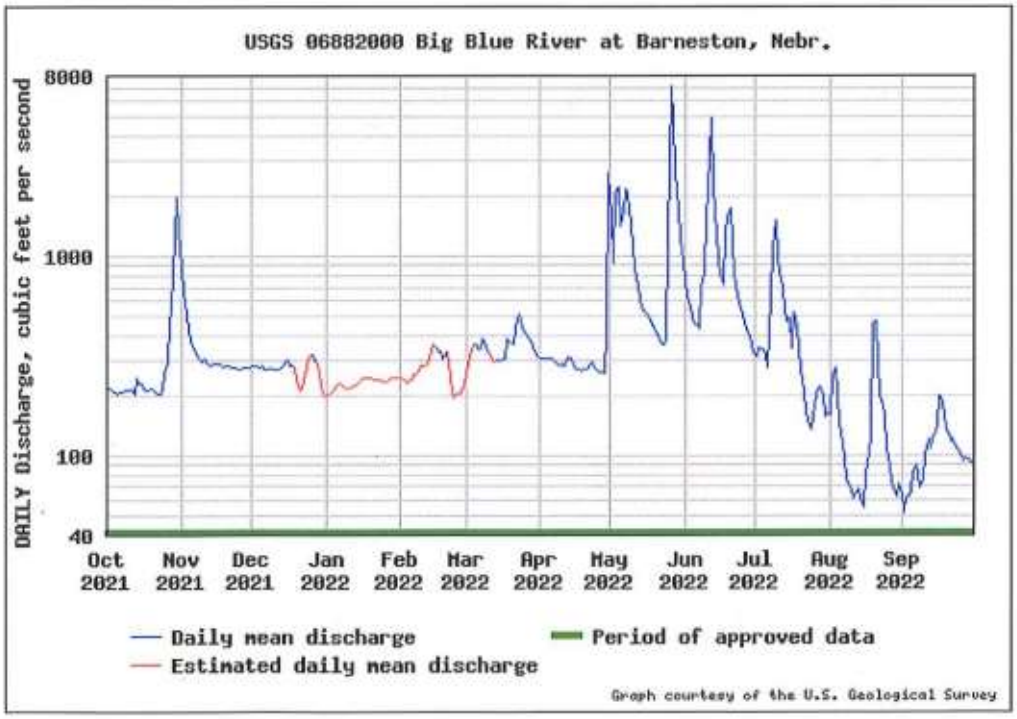

Exhibit B

Water-Data Report 2022
06884025 Little Blue River at Hollenberg, KS -- Continued

SUMMARY STATISTICS

	Water Year 2022		Water Years 1974 - 2022	
Annual total	65,000			
Annual mean	178.1		484.2	
Highest annual mean			1,891	1993
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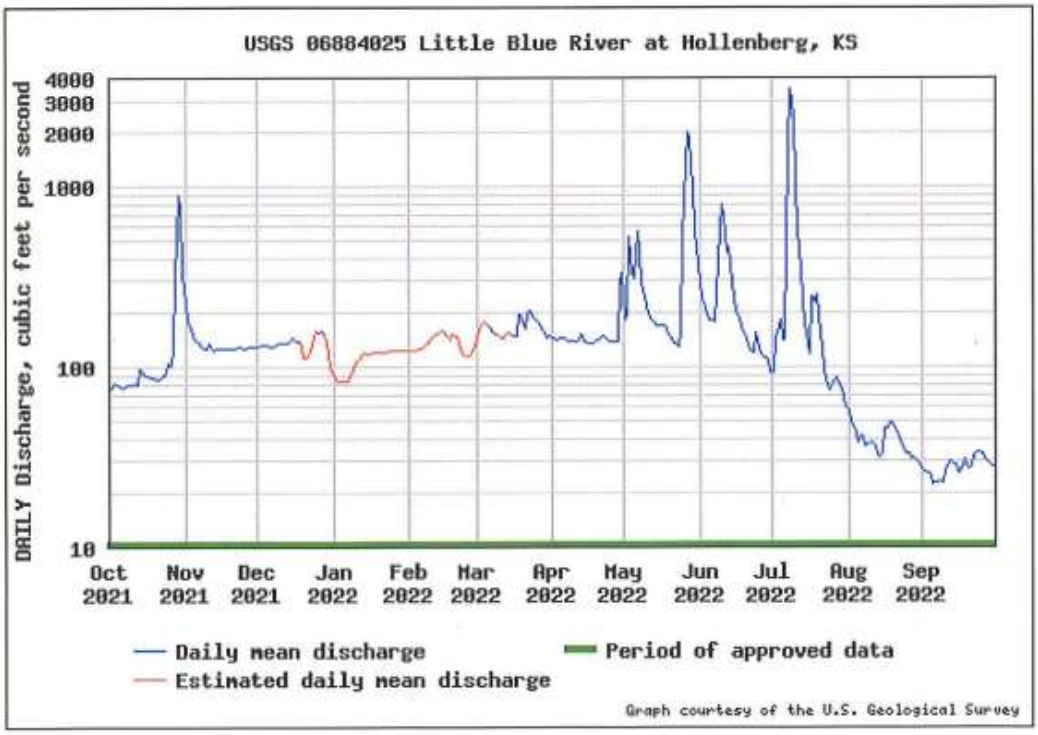


Exhibit C

BIG BLUE RIVER COMPACT STATIC WATER LEVELS 2022

LEGAL	SECT	SITE	TYPE	SPRING 2022	FALL 2022
4N-5E	2	AAAA	OW	92.71	96.02
4N-5E	2	DDAA	IW	18.01	21.02
4N-5E	4	BBBC	IW	19.75	22.59
4N-5E	9	CBCC	IW	72.69	75.10
4N-5E	10	DDAA	IW	26.15	30.26
4N-5E	11	DACA	IW	16.21	18.34
4N-5E	14	ABBB	IW	15.14	18.30
4N-5E	25	AACD	IW	18.70	18.53
5N-4E	12	ABBA	IW	18.99	20.49
5N-4E	13	BADD	IW	16.95	17.18
5N-4E	23	BABB	IW	17.46	18.48
5N-4E	24	AACD	IW	19.08	19.72
5N-5E	7	CADD	IW	61.44	65.82
5N-5E	20	BCCD	IW	19.68	21.54
5N-5E	21	DDBB	IW	55.11	63.87
5N-5E	29	CBBB	IW	13.70	16.37
5N-5E	33	AADD	IW	19.71	21.33

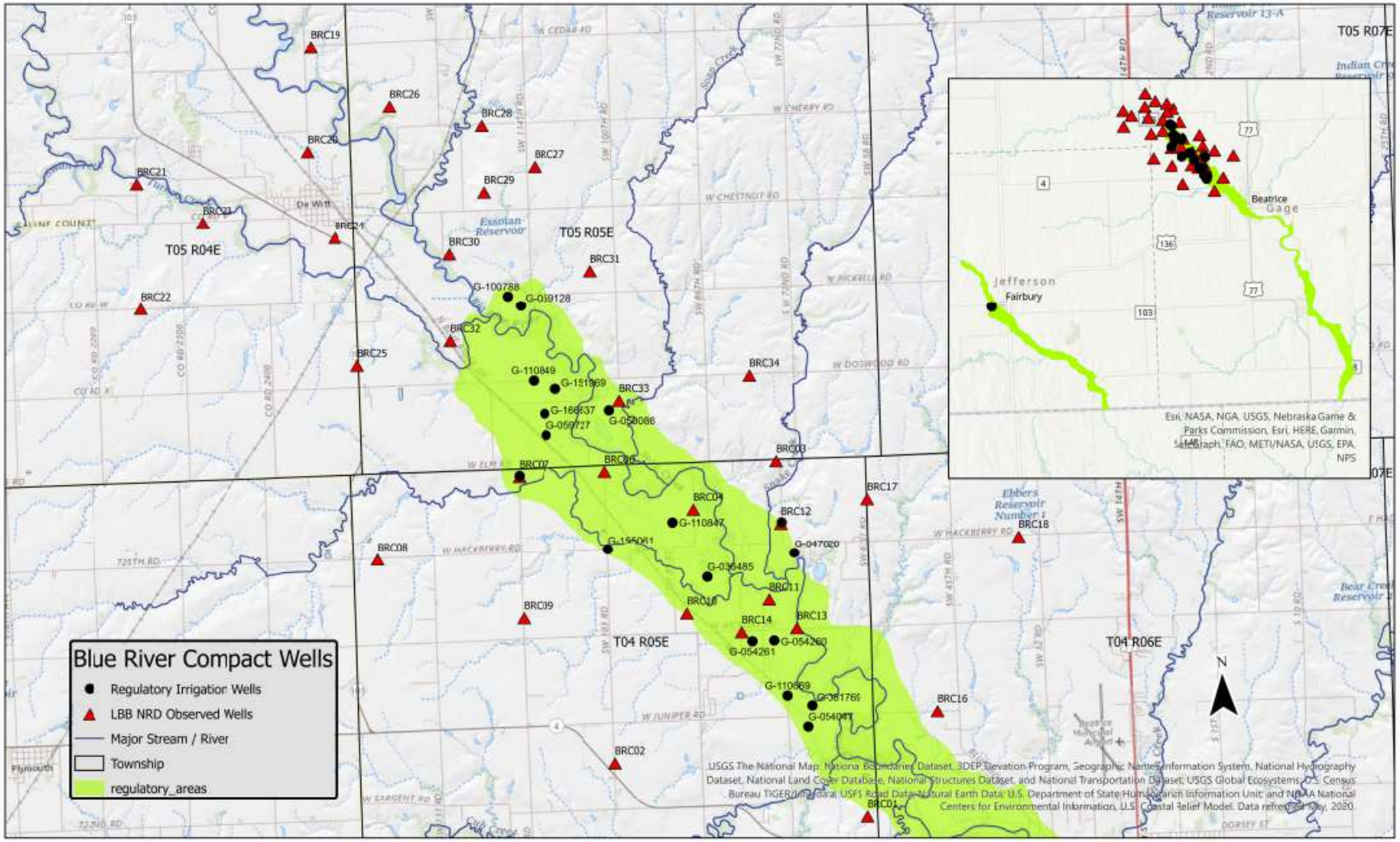
OW - OBSERVATION WELLS IW - IRRIGATION WELLS

Exhibit D

Big Blue River Regulatory Area Wells					
Registration Number	Location T-R-S	Completion Date	Depth (FT)	Registration Pumping Capacity (GPM)	Filing Date
G-036485	4N-5E-11BC	3/28/1972	82	750	4/24/1972
G-038314	4N-5E-2DD	1/16/1973	188	1,300	1/29/1973
G-047820	4N-5E-12BB	11/1/1975	117	1,200	12/4/1975
G-050086	5N-5E-33AD	5/26/1976	123	800	6/9/1976
G-054047	4N-5E-24BB	3/1/1976	84	800	1/6/1977
G-054260	4N-5E-14AA	6/1/1974	70	800	1/14/1977
G-054261	4N-5E-14AB	5/2/1970	70	800	1/14/1977
G-056152	4N-5E-4BB	4/14/1977	91	1,000	5/11/1977
G-059128	5N-5E-29AA	4/25/1977	60	400	1/4/1978
G-059727	5N-5E-33CB	4/19/1978	91	1,200	4/20/1978
G-081769	4N-5E-13CD	4/22/1994	65	250	6/24/1994
G-100788	5N-5E-29AB	3/19/1999	65	500	6/2/1999
G-110669	4N-5E-13CC	7/12/1995	64	375	6/29/2001
G-110847	4N-5E-3DA	5/4/1979	82	800	7/2/2001
G-110849	5N-5E-29DD	4/30/1983	102	800	7/2/2001
G-151969	5N-5E-33BB	12/11/2008	112	800	1/20/2009
G-155061	4N-5E-10BB	12/4/2009	98	800	1/27/2010
G-166637	5N-5E-33BC	03/20/2013	120	1,200	3/28/2013

Little Blue River Regulatory Area Wells					
Registration Number	Location T-R-S	Completion Date	Depth (FT)	Registration Pumping Capacity (GPM)	Filing Date
G-058158	2N-2E-16AD	8/15/1977	29	650	9/6/1977

Compact Monitoring and Regulatory Irrigation Wells in the Big Blue River Basin



NEBRASKA
Good Life. Great Water.
DEPT. OF NATURAL RESOURCES

Attachment J

Big Blue Compact - WQ Subcommittee Virtual Meeting
Apr 20, 2023, 12:30 PM Central Time (US and Canada)

Present: W. Don Nelson-Big Blue River Compact Chairman, Tom Stiles-KDHE, Dane Boring-KDHE, Michael Beezhold-KDHE, Craig Romary-Nebraska Dept of Ag, Jennifer Swanson-NARD, Sarah Starostka-NDEE, Tara Anderson-NDEE, Brian Barnes-NDEE, Brandon Beethe-NDEE, Elbert Traylor-NDEE, Dan Ross-NDEE, Alicia Boss-NDEE, Tyler Goeschel-Little Blue NRD, Scott Nelson-Little Blue NRD, Tyler Weishahn-Lower Big Blue NRD, Scott Sobotka-Lower Big Blue NRD, Marie Krausnick-Upper Big Blue NRD

1. Introductions and Staff Updates
   KDHE
   Tom Stiles – Overall not much change. Dane has a new water quality standards coordinator, and they have another TMDL writer. Most changes have been in the 319 section.
   Mike Beezhold - 319 has had a complete changeover. They have a new 319 manager, and he has four project mgrs. Out of these the most experienced has only been there a year. It's been a whole new changeover of people. The manager is helping the new project officers get the lay of the land.
   NDEE
   Sarah Starostka - Sarah was at last year's subcommittee meeting and has been in this admin division position for two years now. The water planning section is led by Dan Ross. He took over for Ryan Chapman who many have worked with in the past. Dan gave updates on current staff positions. We have one vacant position and are interviewing for another soon. They hope to be able to hire 2nd open position at the same time. One of those will move from 50/50 (joint 319 position and surface water staff) to a full-time project mgr. and they will hopefully be fully staffed in a couple of weeks.
   Little Blue NRD – They have not had a whole lot of staff changes and have been consistent.
   Upper Big Blue NRD – Have had some change in staffing and board of directors. Assistant Director position moved, and Terry Julesgard is new and will be attending next month. Director is a replacement. Larry Moore the blue basin rep has left the board of directors and is replaced by Kevin Peterson. Larry is still planning on coming in May for the meeting.
   Lower Big Blue NRD
   Scott Sobotka– They've had no changes in past year. A couple of years ago they had a manager retire that had been there for 40 years. They have had a few new board members, but that is it.

2. A quick recounting of main impairments in the basin and any changes that came forth from the Draft 2022 listings and reactions to the IR guidance for 2024.
   a. Nebraska's 2022 Integrated Report is on public notice and the EPA will then review it. Major changes from the draft are not expect, but may be possible.
   b. It is proposed that the Little Blue River (LB1-10000) will be delisted for atrazine
   c. It is proposed that the Big Blue River (BB1-10000) will be delisted for lead.
   d. It is proposed that the West Fork Big Blue River (BB3-10000) will be listed for an atrazine impairment.
   e. See report (look at maps)
   f. Craig gave an overview on some updates at the Federal Level. NE is going to try to submit some comments. This leads into a bigger label to potential label

changes for general WQ and species. Within the state we still have state management plan for pesticides and WQ. The intent is to meet with NDEE, health, NRD, DNR to visit about the status of pesticides in water quality. KS: atrazine not much of an issue. Not a lot of interaction between the State Department of Ag.

The topic of atrazine registration review and registrant water quality monitoring was brought up. It has been several years since anyone has met with Syngenta, the main registrant of atrazine, on the surface water sampling required by EPA as part of the last registration process (2003). Water quality data collected for this project is available through 2017. In 2016, an atrazine risk assessment determined that a much lower level of concern for protecting aquatic plant communities was warranted for surface water, and in June 2022, EPA opened comment on a proposed interim registration review decision which proposed major product label changes based on these risk assessments.

All of the registration review material for atrazine, including links to the docket, past decisions and background information, and all of the monitoring data collected can be found at Atrazine | US EPA.

3. A discussion on any anticipated water quality standard changes, especially what has been the impact of Nebraska establishing lake nutrient criteria some years ago.

Tom asked about triennial review: Tara stated that Nebraska is in the process of updating our standards. We are waiting for the end of the legislative session to end to propose changes. Discussed the processes of updating.

Kansas is playing with nutrient criteria on lakes but working with EPA. Kansas states it takes 18 months, explained the steps needed to do updates. Governor weighs in through the department of administration. They get that from internal legal review. Some added time with AG review.

Nitrate Phosphorus Chlorophyll-a. Kansas is willing to look at it for their reservoirs that don't have any point sources and have grass drainage. P and N makes sense to place limits on them. Every other reservoir has them on the 303d list.

Kansas asked) What has been NE experience with nutrient criteria on lakes? Has it changed anything in terms of 319 types of projects, Point Source Limits or 303 delisting process? Tara gave an overview of the past efforts. Nebraska first adopted numeric nutrient criteria in the 2005 triennial review. EPA deferred action and a Technical Advisory Committee was formed to refine Nebraska specific criteria. The current lake numeric nutrient criteria were adopted in 2011. A final report is available on how the criteria were developed. Through that effort it was determined that we there are 3 different classifications of lakes in NE (eastern, western, sandhills). Tara noted Title 117 does not allow for point source discharges to lakes or impoundments (some exceptions for stormwater and dewatering dischargers). They can discharge into flowing streams, but not directly into lake or impoundment. Tara explained the Total Nitrogen and Total Phosphorus impairment map in the handout. We didn't have time to look at how our assessments have changed since criteria were adopted, so we are unable to make that comparison. Big Indian Lake has a phosphorus TMDL. Elbert explained that the 319 program funded the Big Indian / Cub Creek project which focused on Nutrients and that the Recharge Lake project in 2005 was completed to address atrazine and nutrients. If impaired for

WQS then a priority for 319 project. All PL566 lakes. 40-120 acres. They all have public access or recreation features.

Kansas: with all the push with numeric criteria has R7 asked what is next? Tara believes they are pushing for numeric criteria for streams. One of our teammates is working on a process to identify a Nebraska specific level. Looking at nutrients in relation to fish and bugs. So far, the data has been inclusive and noisy. The effort is continuing and to be determined. Kansas stated that EPA wants it on Lakes. KS has attacked it by developing nutrient TMDL's to address this. It has been a change for both NE and KS with the data.

4. Reports from our respective 319 programs on activities in the watershed.

KS (Michael Beezhold): EPA directed them to look at priority TMDL and how to best spend 319 dollars. Active WRAPS projects are where KS focuses the majority of the 319 dollars. Gray shaded watersheds work with Natural Resources for projects.
Focused on the Blue explained the work done in that area. Real focus has been soil structure and removal of nutrients. Tuttle creek, working with conservation district. CD has targeted areas as stream areas they are using KRPI. They are paying better for acre/lb. of removal. 100,000 acre signup all above Tuttle.

NE: Elbert discussed projects in the basin (see handout).
KS: Do you get the GPS acreages? Highboy: NE we contracted with UNL and have contracted operators.

KS: TMDL is a combination of pt and nps.

NE: Elbert gave an overview of the Water Quality Subcommittee for the NRCS State Technical Committee. The WQ Subcommittee originally focused on source water but this year it's been expanded to include surface water. The subcommittee is open for anyone to join and includes NRCS, NRD's, NDEE, Department of Ag, commodity boards and others to come up a specific plan. The committee was formed to get technical feedback and recommendations about water quality projects in Nebraska. Recently the committee recommended NWQI projects for either planning or implementation phases.

KS: Asked about DWMP. We follow a 319 9 element plan. Gave a general overview. Once developed anyone can come in and use that plan. Typically, they are limited to irrigation nutrient management practices and a lot of outreach.

DWPP - KS initiative comes for PWS when they are trending towards 10 mg/l. KS offers them a watershed protection approach before getting them below system. Usually around 6 and trending upwards.

5. Impacts of elevated nitrate and liberated uranium in ground water seen in some Nebraska areas/ Kansas experience with uranium along the Arkansas River.

2022 Nebraska Groundwater Quality Report (page 16-17)
https://nebraskalegislature.gov/FloorDocs/107/PDF/Agencies/Environment_and_Energy__Nebraska_Department_of_/702_20221201-103843.pdf

Several recent studies considered the relationship of nitrate leaching into the subsurface and uranium concentrations found in groundwater. Research indicates that natural uranium in the

subsurface may be oxidized and mobilized as the nitrate (in many forms) moves through the root zone and eventually to groundwater. Uranium is found naturally in sediment deposited mainly by streams and rivers.

Some public water supply systems treat not only nitrate, but also arsenic and uranium. The MCL for arsenic is 0.010 mg/L and uranium is 0.030 mg/L. Figure 16 shows the location of active community public water systems with arsenic, nitrate, and uranium requirements.

KS: is seeing a lot of this in SW KS concentrations of 60 ppb. A few areas of uranium in NW part of the state. Only has one city on AO Waterville. Nebraska can give an update of those in this region.

6. Update on Kansas plans for hydrodredging at Tuttle Creek Lake
    a. Moving closer to being a reality as a pilot effect. USGS, Corp of Engineers to see if it's feasible to reclaim conservation storage. KS will share information with NE.

7. Plans to use SRF for NPS projects

Technical Assistance (2%) – Up to an amount equal to 2% of the annual capitalization grant may be used to aid nonprofit organizations or state, regional, interstate, or municipal entities to provide technical assistance to rural, small, and tribal POTWs. The Department intends to use this assistance in SFYs 2023, 2024, and 2025 to conduct baseline sampling to determine the presence, if any, of Per- and Polyfluoroalkyl Substances (PFAS/PFOA) at mechanical WWTFs under 10k people.

NDEE funded Source Water Protection Grants through the DWSRF 2% set-a-side in Exeter (2022) and Aurora (2021)

2023 Invitation for Proposals open until June 01, 2023. Political subdivisions under 10k people with financial hardship, less than or equal to the State MHI ($75k)

NE: not much luck on using SRF for NPS.

8. Impacts from Fed BIL and IRA funding

NDEE has applied for or anticipates applying for approximately $245 million in IRA/IIJA grants over the next year or so. This includes, but not limited to, grants for water infrastructure, energy efficiency and resiliency, and Superfund. We are carefully evaluating federal grants to see if the purpose/intent fits with our mission and that there is a need for the funds in Nebraska, but we have to balance that with staff resources to efficiently manage and oversee the grant requirements.

9. Discussion on what a joint KS/NE NPS project would do/look like

NDEE is open to developing ideas to a joint NE/KS NPS effort using lessons learned from past efforts. The stuff that got the ground was good but wasn't very focused in regard to how the funding flows. Should be tightly focused and things we can't do on existing programs. NE has 4 active NWQI's soon to be 5. KS has 3, looking at a state line effort on the upper arc. CRPP existing mechanism for interstate. There will be a lot of money coming into the conservation programs this year if they are normally. What is hard to get funding to do? Maybe we focus on that. Streambank work, usually hard to fund through other programs. Then we could tie in other

BMPS with the normal programs. Corridor focus. KS would be supportive of a bi-state effort that benefits Nebraskans? Reconcile and come up a project that satisfies both states interests.

Who owns water? Tara explained for NE.

Tom gave an update on the Pipeline spill in KS. The company believes they are in the home stretch. KS has not had any hits on hydrocarbon currently.

Attachment K

Nebraska's Water Quality Report for the Big Blue Compact

April 20, 2023

Assessment categories for waterbodies in the Draft 2022 Integrated Report:

Category 1 – Waterbodies where all designated uses are met.

Category 2 – Waterbodies where some of the designated uses are met but there is insufficient information to determine if all uses are being met.

Category 3 – Waterbodies where there is insufficient data to determine if any beneficial uses are being met.

Category 4 – Waterbody is impaired, but a TMDL is not needed. Sub-categories 4A-C and R outline the rationale for the waters not needing a TMDL:

> ***Category 4a*** – Waterbody assessment indicates the waterbody is impaired, but all of the required TMDLs have been completed.
>
> ***Category 4b*** – Waterbody is impaired, but "other pollution control requirements" are expected to address the water quality impairment(s) within a reasonable period of time. Other pollution control requirements include, but are not limited to, National Pollutant Discharge Elimination System (NPDES) permits and best management practices.
>
> ***Category 4c*** – Waterbody is impaired but the impairment is not caused by a pollutant. This category also includes waters where natural causes/sources have been determined to be the cause of the impairment. In general, natural causes/sources shall refer to those pollutants that originate from landscape geology or climatic conditions. It should be noted, this definition is not inclusive.
>
> ***Category 4r***[1] – Waterbody data exceeds the impairment threshold however a TMDL is not appropriate at this time. The category will only be used for nutrient assessments in new or renovated lakes and reservoirs. Newly filled reservoirs usually go through a period of trophic instability – a trophic upsurge followed by the trophic decline (Holdren, et. al. 2001). Erroneous water quality assessments are likely to occur during this period. To account for this, all new or renovated reservoirs will be placed in this category for a period not to exceed eight years following the fill or re-fill process. After the eighth year monitoring data will be [assessed and the waterbody will be appropriately placed into category 1, 2, or 5.

Category 5 – Waterbodies where one or more beneficial uses are determined to be impaired by one or more pollutants and all of the TMDLs have not been developed. ***Category 5 waters constitute the Section 303(d) list subject to EPA approval/disapproval***.

> ***Category 5-Alt*** – Waterbody is impaired, but "other pollution control alternatives besides a TMDL" are expected to address the water quality impairment(s) within a reasonable period of time. Other pollution control alternatives include, but are not limited to, watershed management plan development, best management practice implementation and adaptive management strategies.

Table 1: Blue River Basin waterbodies by assessment category in the Draft 2022 NE Integrated Report*

Basin	Category								Basin Total
	1	2	3	4A	4B	4C	4R	5	
Big Blue Streams	5	16	19	7	0	0	0	16	63
Big Blue Lakes	2	5	4	0	0	0	0	20	31
Little Blue Streams	1	11	16	5	0	0	0	5	38
Little Blue Lakes	0	2	0	0	0	0	0	10	12

*The 2022 NE IR is currently on public notice and will be submitted to EPA for final review upon completion.

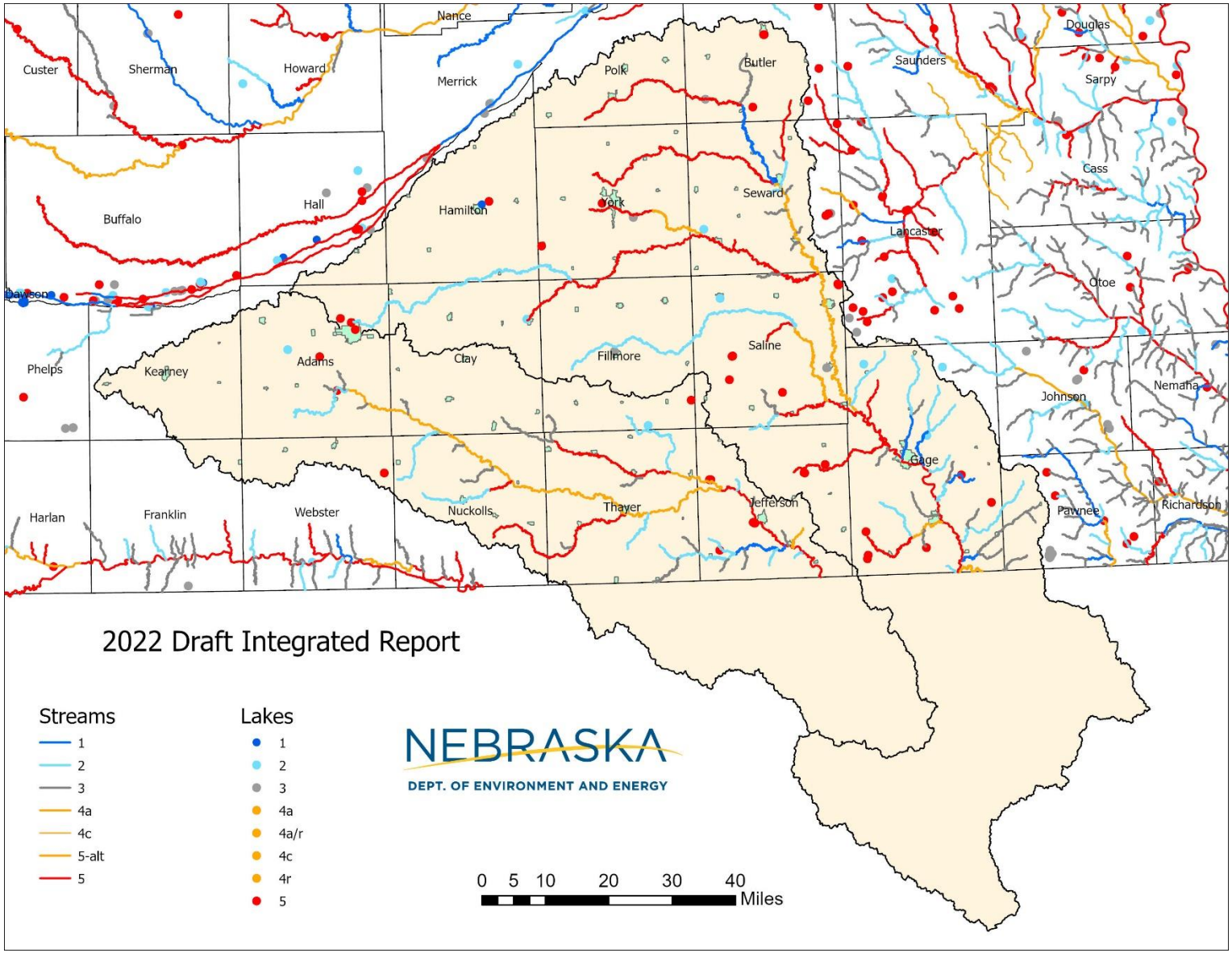


Figure 1: Assessment status of the Blue River Basin in the Draft 2022 NE Integrated Report

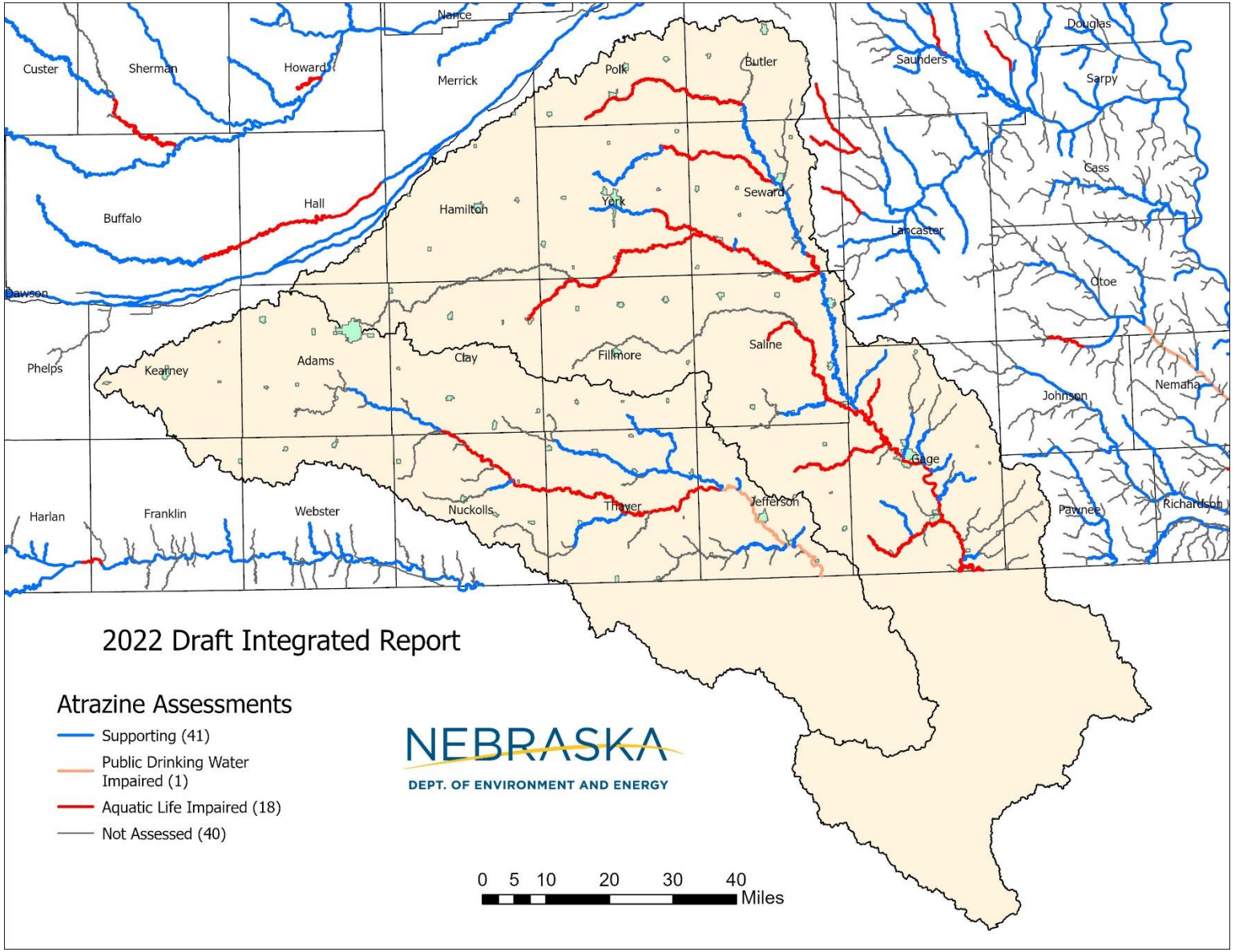


Figure 2: Blue River Basin streams assessments for atrazine in the Draft 2022 NE Integrated Report

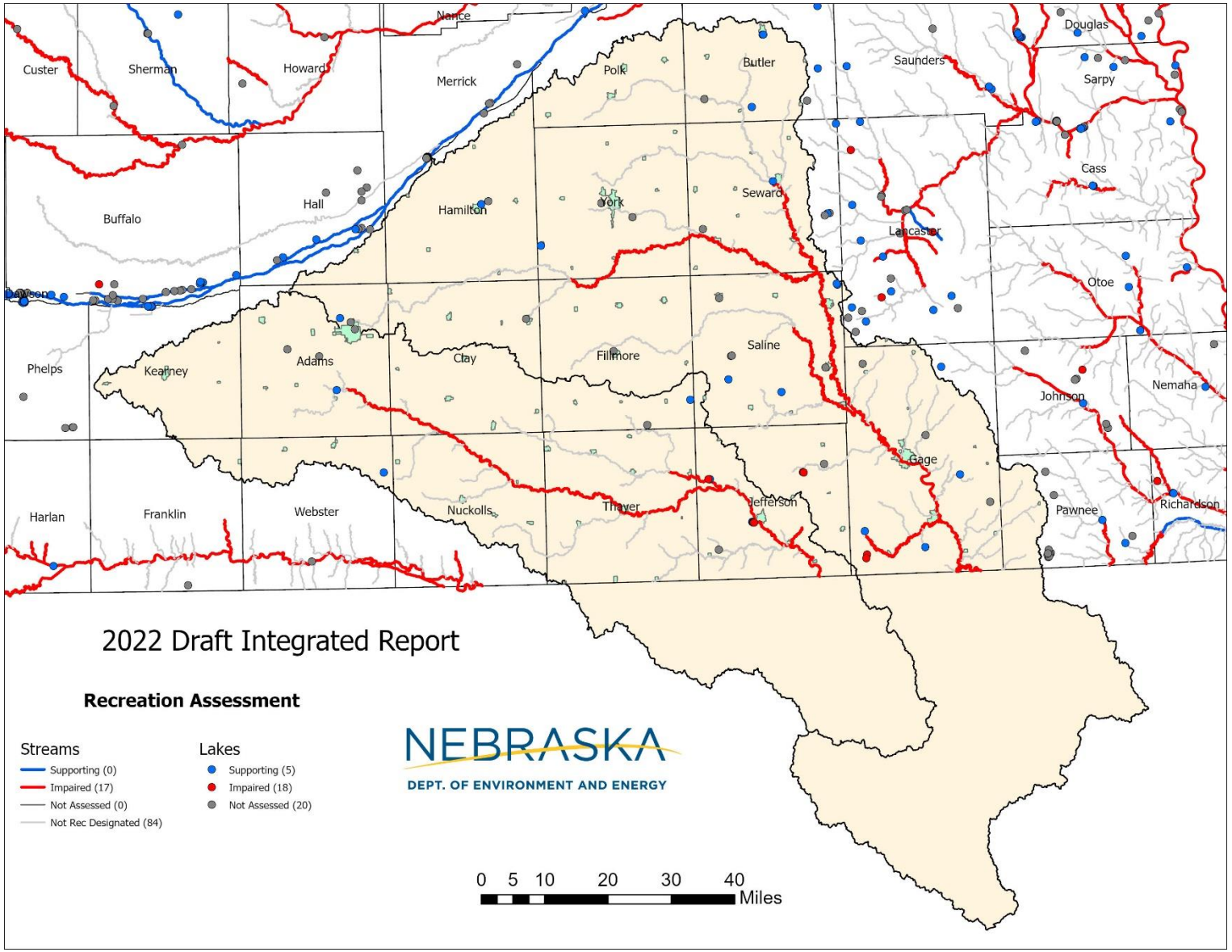


Figure 3: Blue River Basin streams assessments for *E. coli* in the Draft 2022 NE Integrated Report

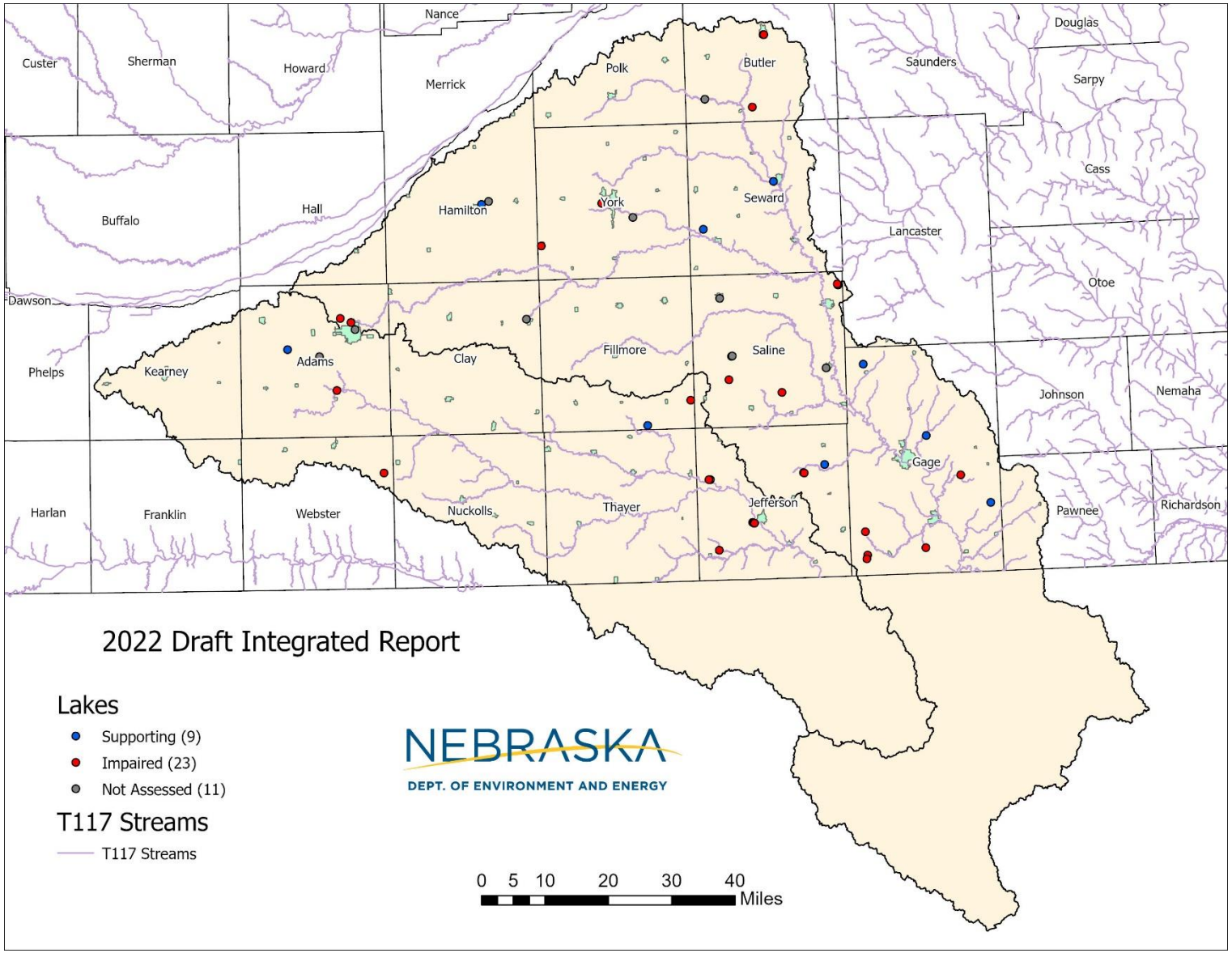


Figure 4: Blue River Basin lake assessment for Total Nitrogen and Total Phosphorus in the Draft 2022 NE Integrated Report

Table 2: Blue River Basin lake impairments in the Draft 2022 Integrated Report

Waterbody ID	Waterbody Name	Impairments (Causes)
BB1-L0010	Donald Whitney Memorial Lake	Recreation (*E. coli*), Aquatic Life - Dissolved Oxygen (Total Nitrogen, Total Phosphorus)
BB1-L0020	Diamond Lake South	Recreation (*E. coli*), Aquatic Life - Dissolved Oxygen (Total Nitrogen, Total Phosphorus)
BB1-L0030	Big Indian Lake (11A)	Aquatic Life - Fish Consumption Advisory (Mercury), (Total Nitrogen, Total Phosphorus)
BB1-L0040	Arrowhead Lake	Aquatic Life - Chlorophyll α, Dissolved Oxygen (Total Nitrogen, Total Phosphorus)
BB1-L0050	Wolf Wildcat Lake	Aquatic Life - Fish Consumption Advisory (Mercury)
BB1-L0060	Rockford Lake	Aquatic Life - Chlorophyll α, pH (Total Nitrogen, Total Phosphorus)
BB1-L0070	Leisure Lake	Aquatic Life - Fish Consumption Advisory (Mercury)
BB1-L0080	Cub Creek Lake	Recreation (*E. coli*), Aquatic Life (Total Nitrogen, Total Phosphorus)
BB1-L0100	Walnut Creek Lake (2A)	Aquatic Life - Fish Consumption Advisory (Mercury), pH (Total Nitrogen, Total Phosphorus)
BB2-L0005	Swanton Lake	Aquatic Life - Fish Consumption Advisory (Mercury), pH (Total Nitrogen, Total Phosphorus)
BB2-L0010	Swan Creek Lake (2A)	Aquatic Life - Dissolved Oxygen (Unknown)
BB2-L0020	Swan Creek Lake (5A)	Aquatic Life - Fish Consumption Advisory (Mercury), Chlorophyll α, pH (Total Nitrogen, Total Phosphorus)
BB3-L0040	Henderson Pond	Aquatic Life - Chlorophyll α (Total Nitrogen, Total Phosphorus)
BB3-L0050	Lake Hastings	Aquatic Life - Fish Consumption Advisory (Hazard Index Compounds*, Cancer Risk Compounds*), Chlorophyll α (Total Nitrogen, Total Phosphorus), Aesthetics (Sediment)
BB3-L0060	Hastings Northwest Dam Lake	Aquatic Life - Chlorophyll α, pH (Total Nitrogen, Total Phosphorus)
BB3-L0070	Heartwell Lake	Aesthetics-Algae Blooms (Unknown)
BB3-L0080	Recharge Lake	Aquatic Life -Chlorophyll α (Total Nitrogen, Total Phosphorus)
BB4-L0010	David City Park Lake	Aquatic Life - Chlorophyll α (Total Nitrogen, Total Phosphorus)
BB4-L0035	Oxbow Trail Reservoir	Aquatic Life - Fish Consumption Advisory (Mercury), Chlorophyll α, pH (Total Nitrogen, Total Phosphorus)
BB4-L0040	Pioneer Trails Lake	Aquatic Life - Fish Consumption Advisory (Mercury)
LB1-L0010	Buckley Reservoir (3F)	Aquatic Life - (Total Nitrogen, Total Phosphorus)
LB1-L0020	Crystal Springs Northwest Lake	Aquatic Life - Fish Consumption Advisory (Mercury), Chlorophyll α, pH (Total Nitrogen, Total Phosphorus)
LB1-L0030	Crystal Springs Center Lake	Aquatic Life - Chlorophyll α, pH (Total Nitrogen, Total Phosphorus)

Waterbody ID	Waterbody Name	Impairments (Causes)
LB1-L0040	Crystal Springs East Lake	Recreation (E. coli), Aquatic Life - Chlorophyll α (Total Nitrogen, Total Phosphorus)
LB1-L0050	Lone Star Reservoir	Aquatic Life - Fish Consumption Advisory (Mercury), Chlorophyll α, Dissolved Oxygen (Total Nitrogen, Total Phosphorus)
LB2-L0010	Alexandria Lake No. 1 & 2	Aquatic Life - pH (Unknown)
LB2-L0030	Alexandria Lake No. 3	Recreation - Algae Toxins (Microcystin), Aquatic Life - Chlorophyll α, pH (Total Nitrogen, Total Phosphorus)
LB2-L0050	Liberty Cove Lake	Aquatic Life - Fish Consumption Advisory (Mercury), Chlorophyll α, pH (Total Nitrogen, Total Phosphorus)
LB2-L0070	Crystal Lake (SRA)	Aquatic Life - Chlorophyll α, pH, Dissolved Oxygen (Total Nitrogen, Total Phosphorus)
LB2-L0080	Prairie Lake (32-Mile H)	Aquatic Life - pH (Unknown)

Table 3: Blue River Basin stream impairments in the 2022 Integrated Report

Waterbody ID	Waterbody Name	Impairments (Causes)
BB1-10000	Big Blue River	Recreation (*E. coli*), Aquatic Life (May-June Atrazine, Aluminum, ~~Lead~~)
BB1-10100	Mission Creek	Recreation (*E. coli*), Aquatic Life (May-June Atrazine)
BB1-10800	Big Indian Creek	Recreation (*E. coli*), Aquatic Life (May-June Atrazine)
BB1-10900	Big Indian Creek	Recreation (E. coli), Aquatic Life (May-June Atrazine)
BB1-11900	Cub Creek	Aquatic Life (May-June Atrazine)
BB1-12000	Soap Creek	Aquatic Life - Impaired Aquatic Community (Unknown), (May-June Atrazine)
BB1-20000	Big Blue River	Recreation (*E. coli*)
BB2-10000	Turkey Creek	Recreation (*E. coli*), Aquatic Life - Impaired Aquatic Community (Unknown), (May-June Atrazine)
BB2-10100	Swan Creek	Aquatic Life - Impaired Aquatic Community (Unknown)
BB2-20000	Turkey Creek	Recreation (*E. coli*), Aquatic Life (May-June Atrazine)
BB2-20100	Spring Creek	Aquatic Life (May-June Atrazine)
BB3-10000	West Fork Big Blue River	Recreation (*E. coli*), Aquatic Life - Impaired Aquatic Community (Unknown), (May-June Atrazine)
BB3-10200	Walnut Creek	Aquatic Life - Impaired Aquatic Community (Unknown)
BB3-10300	Beaver Creek	Aquatic Life (May-June Atrazine)
BB3-10400	Beaver Creek	Aquatic Life - Impaired Aquatic Community (Unknown)
BB3-20000	West Fork Big Blue River	Recreation (*E. coli*), Aquatic Life - Impaired Aquatic Community (Unknown), (May-June Atrazine)
BB3-20100	School Creek	Aquatic Life (May-June Atrazine)
BB4-10000	Big Blue River	Recreation (*E. coli*), Aquatic Life (May-June Atrazine)
BB4-20000	Big Blue River	Recreation (*E. coli*)
BB4-20700	Plum Creek	Aquatic Life - Impaired Aquatic Community (Unknown)
BB4-20800	Lincoln Creek	Aquatic Life - Impaired Aquatic Community (Unknown), (May-June Atrazine)
BB4-20900	Lincoln Creek	Aquatic Life - Impaired Aquatic Community (Unknown)
BB4-40000	Big Blue River	Aquatic Life - (May-June Atrazine), Dissolved Oxygen (Unknown)
LB1-10000	Little Blue River	Recreation (*E. coli*), Aquatic Life - Fish Consumption Advisory (Mercury), (~~May-June Atrazine~~, Lead, Aluminum), Public Drinking Water Supply (Atrazine, Arsenic, Aluminum)
LB1-10200	Rock Creek	Recreation (*E. coli*)
LB2-10000	Little Blue River	Recreation (*E. coli*), Aquatic Life (May-June Atrazine)

Waterbody ID	Waterbody Name	Impairments (Causes)
LB2-10100	Big Sandy Creek	Recreation (*E. coli*)
LB2-10200	Big Sandy Creek	Aquatic Life - Fish Consumption Advisory (Hazard Index Compounds*, Mercury)
LB2-10500	Spring Creek	Aquatic Life - Impaired Aquatic Community (Unknown)
LB2-10600	Spring Creek	Aquatic Life - Impaired Aquatic Community (Unknown)
LB2-20000	Little Blue River	Recreation (*E. coli*), Aquatic Life (May-June Atrazine)
LB2-20100	Elk Creek	Aquatic Life- Dissolved Oxygen (unknown)
LB2-30000	Little Blue River	Recreation (*E. coli*)

Table 4: Blue River Basin waterbodies with approved TMDLs

Basin	ID	Waterbody Name	Imapired Use	Impairment	WMP	Notes
BB	BB1-10000	Big Blue River	Primary Contact Recreation	E coli	Lower Big Blue River Basin	revised TMDL
			Aquatic Life	Atrazine	Lower Big Blue River Basin	
	BB1-10100	Mission Creek	Aquatic Life	Atrazine	Lower Big Blue River Basin	
			Primary Contact Recreation	E coli	Lower Big Blue River Basin	
	BB1-10800	Big Indian Creek	Aquatic Life	Atrazine	Lower Big Blue River Basin	
			Primary Contact Recreation	E coli	Lower Big Blue River Basin	
	BB1-10900	Big Indian Creek	Aquatic Life	Atrazine	Lower Big Blue River Basin	
	BB1-20000	Big Blue River	Primary Contact Recreation	E coli	Lower Big Blue River Basin	revised TMDL
			Aquatic Life	Atrazine	Lower Big Blue River Basin	
	BB1-L0030	Big Indian Lake	Aesthetics, Aquatic Life	T.Phosphorus	Big Indian Reservoir	
			Aesthetics, Aquatic Life	Sediment	Big Indian Reservoir	
	BB2-10000	Turkey Creek	Aquatic Life	Atrazine	Lower Big Blue River Basin	
			Primary Contact Recreation	E coli	Lower Big Blue River Basin	
	BB2-20000	Turkey Creek	Primary Contact Recreation	E coli	Lower Big Blue River Basin	
			Aquatic Life	Atrazine	Lower Big Blue River Basin	
	BB3-10000	West Fork Big Blue River	Primary Contact Recreation	E coli	None	revised TMDL
			Aquatic Life	Atrazine	None	
	BB3-10300	Beaver Creek	Aquatic Life	Atrazine	None	
	BB3-20000	West Fork Big Blue River	Primary Contact Recreation	E coli	None	
			Aquatic Life	Atrazine	None	
	BB4-10000	Big Blue River	Primary Contact Recreation	E coli	None	
			Aquatic Life	Atrazine	None	
	BB4-20000	Big Blue River	Primary Contact Recreation	E coli	None	
	BB4-20800	Lincoln Creek	Aquatic Life	Atrazine	None	
	BB4-40000	Big Blue River	Aquatic Life	Atrazine	None	
LB	LB1-10000	Little Blue River	Primary Contact Recreation	E coli	Draft Little Blue River Basin	revised TMDL
			Public Drinking Water Supply	Atrazine	Draft Little Blue River Basin	
			Aquatic Life	Atrazine	Draft Little Blue River Basin	
	LB1-10200	Rock Creek	Primary Contact Recreation	E coli	Draft Little Blue River Basin	
	LB2-10000	Little Blue River	Primary Contact Recreation	E coli	Draft Little Blue River Basin	revised
			Aquatic Life	Atrazine	Draft Little Blue River Basin	
	LB2-10100	Big Sandy Creek	Aquatic Life	Atrazine	Draft Little Blue River Basin	
	LB2-10100	Big Sandy creek	Primary Contact Recreation	E coli	Draft Little Blue River Basin	
	LB2-20000	Little Blue River	Aquatic Life	Atrazine	Draft Little Blue River Basin	
			Primary Contact Recreation	E coli	Draft Little Blue River Basin	
	LB2-30000	Little Blue River	Primary Contact Recreation	E coli	Draft Little Blue River Basin	

Nebraska's Lake Numeric Nutrient Criteria

Title 117

Chapter 4

003.05 Nutrient Criteria for Lakes and Impounded Waters.

The following criteria associated with various nutrient classifications apply to lakes or impounded waters according to codes listed in Chapter 6. Criteria are based on seasonal averages from April 1 through September 30. Eastern Lakes and Impounded Waters are located within the Big Blue, Little Blue, Elkhorn, Lower Platte, Missouri Tributaries, and Nemaha River Basins. Western Lakes and Impounded Waters are located within the Loup, Middle Platte, Niobrara, North Platte, Republican, South Platte, and White River-Hat Creek Basins. Natural Sandhill Lakes are not subject to these criteria as they exist in a relatively undisturbed condition.

Chlorophyll *a* represents the desired biological condition (response) and is generally influenced by the amount of phosphorus and nitrogen (cause). Thus, if the chlorophyll *a* criterion is met, total phosphorus or total nitrogen values above the listed values will not be considered to violate their respective criteria.

Lake or Impounded Waters Classification	Codes	Total Phosphorus (µg/L)	Total Nitrogen (µg/L)	Chlorophyll *a* (µg/L)
Eastern Lakes and Impounded Waters:	E	50	1000	10
Western Lakes and Impounded Waters:	W	40	800	8
Natural Sandhill Lakes:	SH	---	---	---

Nebraska first adopted numeric nutrient criteria in its 2005 triennial review. The EPA deferred action and a Technical Advisory Group was convened to develop criteria. The TAC included UNL and EPA Region 7. These criteria were adopted in the 2011 triennial review. The final report on how those criteria were developed is available if requested.

Nonpoint Source Activities in the Blue River Basin

Upper Big Blue NRD:

Beaver Creek-Recharge Lake Watershed Project.
Beaver Creek, including the sub-watershed of Recharge Lake near York, Nebraska, is a tributary of the Big Blue River. Section 319 funds were used to develop and initiate implementation of a watershed management plan to reduce Atrazine contamination of the lower segments of Beaver Creek. Conservation practices focus on abatement of Atrazine loads to Beaver Creek and Recharge Lake. Practices are selected that also contribute to the reduction of *E. coli*, nitrogen, phosphorus and sediment.

Lake Hastings Watershed Plan.
Lake Hastings lies in the headwaters of the West Fork Big Blue River. Section 319 funds were awarded to develop a watershed management plan for the Lake Hasting watershed. The plan will identify the conservation practices effective in reducing loading of nutrients (phosphorus, nitrogen) and sediment to Lake Hastings The plan also will develop concepts for renovation of the lake following completion of the watershed management efforts.

Inter-seeder Demonstration Project.
NDEE and University of Nebraska Extension initiated an inter-seeder demonstration project in 2021. The purpose of the project is to demonstrate the efficacy of sowing cover crops into standing corn. It also will document operating costs for the machine and the return-on-investment potential for private service providers. The primary objective is to encourage service providers to purchase inter-seeder to serve the cover crop market. Demonstrations will be initiated in the Upper Big Blue and Lower Big Blue NRDs in 2023.

Aurora Drinking Water Protection Management Plan – in the planning stage, is at EPA for review and approval.

Lower Big Blue NRD:

Cub Creek Watershed/Lake Renovation Project.
BMPs to reduce *E. coli*, sediment and nutrient runoff were implemented in the watershed of Cub Creek Reservoir followed by renovation of the reservoir. Cub Creek Reservoir is in the headwaters of Cub Creek, a tributary of the Big Blue River. Plans are in process to implement additional BMPs in the Cub Creek Reservoir watershed.

Turkey Creek-Wilber Watershed (NWQI) Project.
Turkey Creek is a tributary of the Big Blue River. A National Water Quality Initiative project is currently being implemented in the lower reach of Turkey Creek to abate *E. coli* and Atrazine runoff. Irrigation and nutrient management practices are being implemented in the wellhead protection areas of Wilber and DeWitt to reduce nitrate contamination of groundwater.

Indian Creek Watershed.
USDA is developing a Watershed EA plan for Indian Creek watershed near Beatrice, NE to address flooding.

Beatrice Drinking Water Management Plan – In the planning stage.

Little Blue NRD:

Big Sandy Creek Watershed (NWQI) Project.
Big Sandy Creek is a Tributary of the Little Blue River near Alexandria, Nebraska. A National Water Quality Initiative is currently being implemented in the lower reach of the watershed to reduce *E. coli* and Atrazine runoff.

Upper Little Blue Sub-Watershed Plan/Prairie Lake Watershed Project.
The Little Blue NRD is developing a watershed plan for the Upper Little Blue Sub-watershed. The plan will identify priority areas and waterbodies for treatment to abate nutrient, pesticide, bacteria and sediment runoff.

Groundwater Quality Awareness Project
The Little Blue NRD conducted a vadose zone sampling project and groundwater awareness campaign in the upper reaches of the Little Blue River bason. The focus was to provide data and interest in protecting drinking water sources for communities in the area.

Fairbury Drinking Water Protection Management Plan – in active status.

Impacts of elevated nitrate / uranium in Nebraska

2022 Nebraska Groundwater Quality Monitoring Report

Several recent studies considered the relationship of nitrate leaching into the subsurface and uranium concentrations found in groundwater. Research indicates that natural uranium in the subsurface may be oxidized and mobilized as the nitrate (in many forms) moves through the root zone and eventually to groundwater. Uranium is found naturally in sediment deposited mainly by streams and rivers.

Some public water supply systems treat not only nitrate, but also arsenic and uranium. The MCL for arsenic is 0.010 mg/L add uranium is 0.030 mg/L. Figure 16 shows the location of active community public water systems with arsenic, nitrate, and uranium requirements.

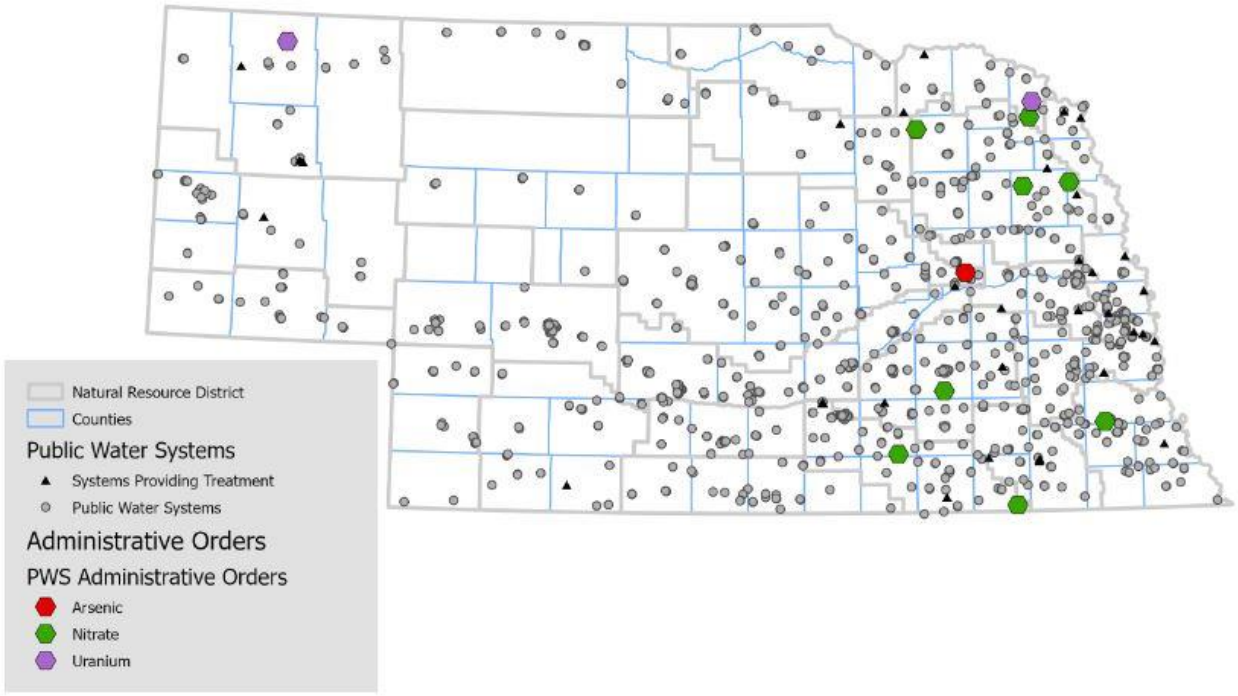
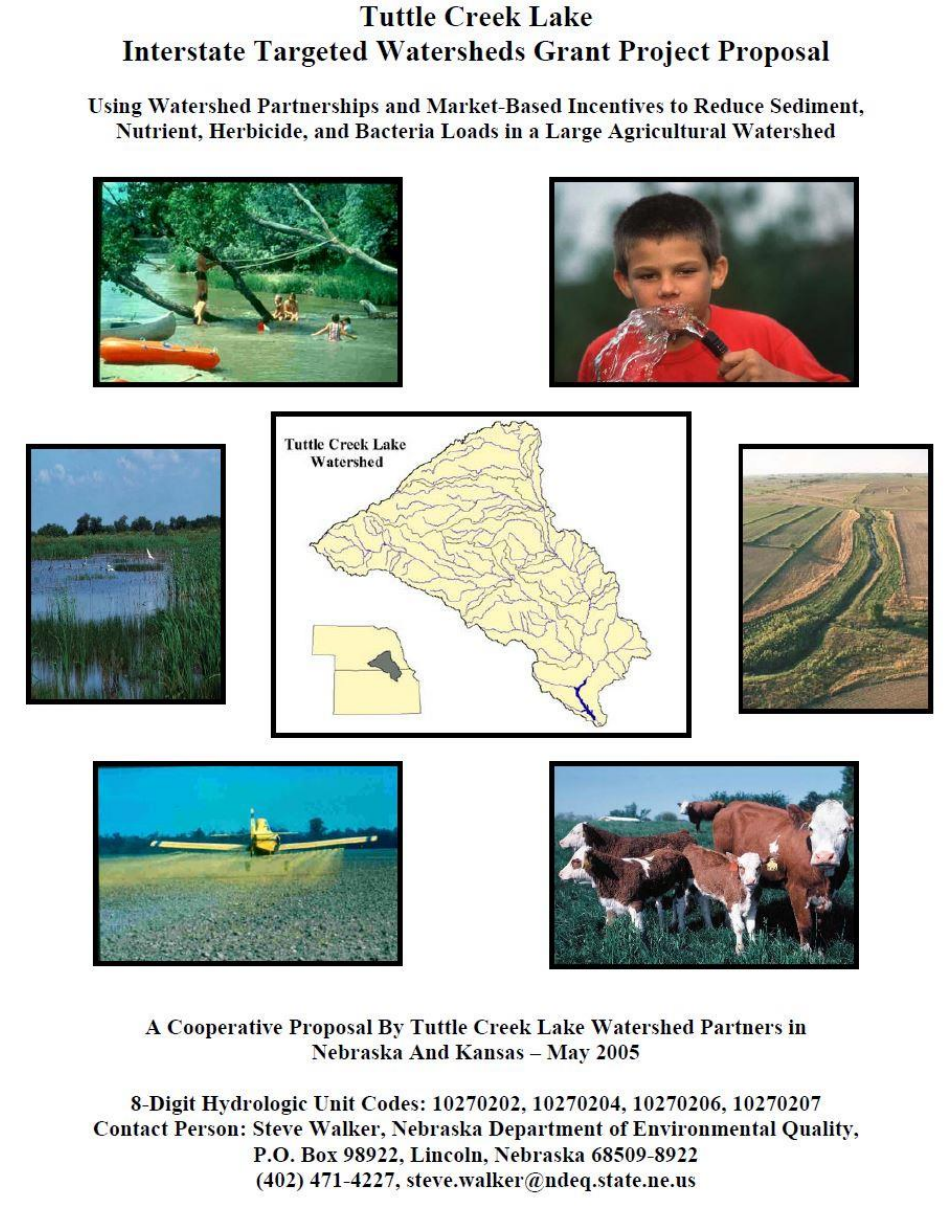


Figure 6: Community public water supply systems with requirements for arsenic, nitrate, and uranium. (Source: NDEE Drinking Water and Groundwater Division, 2022).

Impact of BIL / IRA Funding in Nebraska:

NDEE has applied for or anticipates applying for approximately $245 million in IRA/IIJA grants over the next year or so. This includes, but not limited to, grants for water infrastructure, energy efficiency and resiliency, and Superfund. We are carefully evaluating federal grants to see if the purpose/intent fits with our mission and that there is a need for the funds in Nebraska, but we have to balance that with staff resources to efficiently manage and oversee the grant requirements.

Previous Effort of a Joint Nebraska / Kansas Project:



Tuttle Creek Lake
Interstate Targeted Watersheds Grant Project Proposal

Using Watershed Partnerships and Market-Based Incentives to Reduce Sediment, Nutrient, Herbicide, and Bacteria Loads in a Large Agricultural Watershed

A Cooperative Proposal By Tuttle Creek Lake Watershed Partners in Nebraska And Kansas – May 2005

8-Digit Hydrologic Unit Codes: 10270202, 10270204, 10270206, 10270207
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Figure 7: Screenshot of the Cooperative Proposal – Tuttle Creek Lake Watershed Partners – May 2005 – This proposal is available upon request.