



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

**RECOMMENDATION OF ACTING CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 8928-3, Promises Kept LLLP**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Acting Chief Engineer, Water Rights Program, Department of Agriculture and Natural Resources concerning Water Permit Application No. 8928-3, Promises Kept LLLP, 46884 267th Street, Sioux Falls SD 57106.

The Acting Chief Engineer is recommending APPROVAL of Application No. 8928-3 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing domestic water uses and water rights, 3) the proposed use is a beneficial use and 4) it is in the public interest as it pertains to matters of public interest within the regulatory authority of the Water Management Board with the following qualifications:

1. The well approved under Water Permit No. 8928-3 is located near domestic wells and other wells which may obtain water from the same aquifer. The well owner, under this Permit must control withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. Based on the proximity of the well approved under this Permit to wells authorized for nearby senior water right holders and declining water levels in observation well HN-2016A, the Water Management Board retains jurisdiction of Water Permit No. 8928-3 to manage use of water from this aquifer. If water use under this Permit begins to unlawfully impair senior water right holders or domestic water users with adequate wells, then either a shutoff order or curtailment of water use under this Permit may be necessary.
3. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

See report on application for additional information.

Mark Mayer, PE
Director of Office of Water
April 10, 2025

Report to the Chief Engineer

On Water Permit Application No. 8928-3

Promises Kept LLLP

April 11, 2025

Water Permit Application No. 8928-3 proposes to divert water at a maximum instantaneous diversion rate of 1.97 cubic feet per second (cfs) from one well completed into the Prairie Coteau aquifer (230 feet deep) located in the NW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 17 for the irrigation of 240 acres located in the E $\frac{1}{2}$ of Section 17; all in T114N-R51W. The site of interest is located in Hamlin County approximately three miles southeast of Castlewood, SD.

AQUIFER: Prairie Coteau (PCO)

HYDROGEOLOGY:

The DANR-Water Rights Program recognizes buried glacial outwash deposits that are not in contact with bedrock or surficial materials between the approximate altitudes of 1,550 to 1,800 feet on the Prairie des Coteau, as the Prairie Coteau aquifer (Thompson, 2001; Water Rights, 2025a, 2025b, and 2025c). Hanson (1994) delineated an approximate Prairie Coteau aquifer boundary in Grant and Codington Counties, and Thompson (2001) studied the aquifer in Roberts County and within the former boundaries of the Lake Traverse Reservation. Thompson (2001) concluded the Prairie Coteau aquifer is not a continuous aquifer but instead consists of many disconnected glacial outwash deposits of sand and gravel, of which the depth and thickness can vary widely (SDGS, 2025; Thompson, 2001; Water Rights, 2025c). These outwash deposits have been collectively grouped under a single aquifer name due to their similarities (Thompson, 2001; Water Rights, 2025b, 2025c, and 2025d).

In Deuel and Hamlin Counties, the discontinuous outwash deposits of the Prairie Coteau aquifer collectively underlie approximately 698,880 acres and contains an estimated 5,000,000 acre-feet of recoverable water in storage in total (Kume, 1985). The Prairie Coteau aquifer ranges from 4 to 144 feet thick, with an average thickness of 47 feet (Kume, 1985). In Hamlin County, the Prairie Coteau aquifer commonly overlies the Altamont aquifer and underlies the Big Sioux aquifer or other local glacial outwash aquifers (Kume, 1976). The Prairie Coteau aquifer is generally under confined conditions (Kume, 1985; Water Rights, 2025d).

Near the existing well site, this outwash deposit of the Prairie Coteau aquifer is generally overlain by glacial till and the Brookings management unit of the Big Sioux aquifer and generally underlain by glacial till and the Altamont aquifer (Kume, 1976 and 1985; Hedges et al., 1982; Water Rights, 2025b, 2025c, and 2025d).

A water well completion report was submitted with Water Permit Application No. 8928-3 for the existing well proposed to be used. The report lists, "Topsoil" from 0 to 1 foot below the ground surface, "Clay, brown, hard" from 1 to 50 feet, "Clay, blue, hard" from 50 to 76 feet, "Clay, blue, sticky/hard" from 76 to 190 feet, "Sand/gravel, brown, med" from 190 to 229, and "Clay, blue, hard" from 229 to 237 feet (Water Rights, 2025d). The well was screened in "Sand/gravel,

brown, med” from 190 to 230 feet and had a static water level of approximately 37 feet below the ground surface at the time of the well completion (November 19, 2024). This indicates there was approximately 150 feet of artesian head pressure in the well at the time of the completion. The elevation of the ground surface at the existing well site is approximately 1,733 feet above mean sea level (fmsl) (NGVD29) and the top of Prairie Coteau outwash deposit is at approximately 1,543 fmsl (USGS, EROS, 1999). Based on the submitted well completion report, and the well completion reports and lithologic logs on file for nearby observation wells with the DANR-Water Rights Program, the Prairie Coteau is confined at the existing well site (SDGS, 2025; Water Rights, 2025d).

The existing well is completed into an outwash deposit of the Prairie Coteau aquifer that was analyzed by looking at nearby test hole and water well completion reports on file (Water Rights, 2025d), historical lithologic logs from the South Dakota Geological Survey (SDGS) (SDGS, 2025), and elevation data (NGVD29) (USGS, EROS, 1999). Within one mile of the applicant’s well, this outwash deposit ranges from approximately 1,530 to 1,550 fmsl and varying from approximately 30 to 40 feet thick (SDGS, 2025; USGS, EROS, 1999; Water Rights, 2025d). This thickness agrees with the areal extent and thickness of the Prairie Coteau aquifer in Deuel and Hamlin Counties map in Kume (1985). The potentiometric surface elevation or static water level in this outwash deposit generally ranges from approximately 25 to 35 feet below the ground surface (Water Rights, 2025d).

Limited subsurface information is available to complete a reasonable delineation of this particular deposit of the Prairie Coteau aquifer. There is likely a hydrogeologic connection between the aquifer deposit used by Water Right No. 7988-3 (located in Section 9-T114-R51W approximately 1.2 miles east of the existing well site) and this application’s outwash as the wells are withdrawing from the Prairie Coteau aquifer at a similar elevation and the aquifer performance test performed for Water Right No. 7921-3, as discussed below, shows the likely extent of this aquifer extends at least that far. However, the limited information on file (well completion reports, test hole logs, and lithologic logs) between the wells makes it problematic to determine the aquifer extent with certainty (SDGS, 2025; Water Rights, 2025d).

An aquifer performance test was completed and submitted with Water Right No. 7921-3 around July of 2014 (Water Rights, 2025c). Given a series of wells that Summit Envirosolutions, Inc. contends are completed into the same portion of the Prairie Coteau aquifer, a seven-day aquifer pump test was conducted at a continuous flow rate of 730 gallons per minute (gpm) with measurement of water levels in these wells. The wells used for drawdown observations were located 100, 6,025, and 10,480 feet from the proposed production well (PW1 for 7921-3) and are referred to in the text as TW1, JC1, and CC4, respectively. The production well used for pumping is referred to as PW1 and is within 100 feet of TW1. TW1, PW1, and JC1 are approximately 100 to 12,450 feet away from this application’s (8928-3) existing well site (as shown in Figure 1).

The aquifer performance test identified a domestic well (acknowledged as CC4) (located 12,370 feet or 2.3 miles northeast from the existing well site) that is completed into the outwash deposit of the Prairie Coteau aquifer. The total drawdown in CC4 at the end of the aquifer pump test was

approximately 9 feet at a distance of two miles from the production well for Water Right No. 7921-3. Given the measured drawdown and recovery in each of these wells, Summit calculated the cone of depression or radius of influence to be approximately 11.4 miles. Given the lack of inflections in the declining water level curve measured during the pump test, it was presumed that the boundaries of the outwash deposit were not encountered during this test in the direction of nearby domestic well (CC4). Assuming the outwash deposit is at least as large as a circle with an 11.4-mile radius (261,300 acres) and using Hedges and others' (1985) recharge rate for confined aquifers of 0.15 to 0.6 inches per year, an average annual recharge rate range of 3,266 to 13,065 ac-ft/yr was calculated. During the test, water was pumped from this portion of the aquifer at a rate of 730 gallons per minute (gpm) for seven days, totaling approximately 7,358,400 gallons or 22.6 acre-feet of water. The engineering analysis completed for the pump test contends that under normal conditions, the pumping for Water Right No. 7921-3 would not be expected to occur for more than four days of each week for the 16-week growing season. Under these conditions, the average annual withdrawal rate would be approximately 311 acre-feet per year. This rate equates to 11.79 inches per acre applied annually over the entirety of the 316.5 acres authorized to be irrigated. When analyzing the irrigation questionnaires (from 1980 to 2023) for the region, it is reasonable to assume that the amount of water applied per acre will be less than one acre-foot per year (Water Rights, 2025a), an estimate of 311 acre-feet per year for the entire 316.5 acres is reasonable, if not conservative. Water Right No. 7921-3 proposed to divert water at a rate of 2.44 cfs (1,100 gpm). Given that the recovery time of three weeks was significantly longer than any period of non-pumping on an average year during the irrigation season, and that four days of continuous pumping at 1,100 gpm withdraws approximately 86% of the amount of water withdrawn during the test, it is possible that water levels will steadily decline in this portion of the aquifer during the growing season as a result of pumping. However, well logs submitted with the initial report show that artesian head is approximately 166 feet above the top of the water bearing formation. It was noted it was not expected that water levels will decline at this magnitude during a single growing season.

The conclusions of this test include, there was an 'adequate groundwater supply' to supply the proposed appropriation for Water Right No. 7921-3 at that time, well interference with domestic wells should not occur in excess of that observed during the test based on the aquifer test data, and an observation well was installed near the production well in 2016 to monitor groundwater withdrawals from this outwash deposit of the Prairie Coteau aquifer (Water Rights, 2025b and 2025c). There appears to be over 180 feet of available drawdown at CC4, where almost 9 feet of drawdown (or 5% of the available drawdown) was observed during the test in a well located approximately two miles northeast of the pumping well. If observed in the future, well interference may need to be mitigated by lowering pumps in affected wells.

Figure 1 displays a map of the existing well site with the nearby Prairie Coteau aquifer water rights/permits and observation well, and the well completion reports on file (Water Rights, 2025b, 2025c, and 2025d).

availability of unappropriated water and the potential for unlawful impairment of existing domestic water uses and water rights within the Prairie Coteau aquifer.

WATER AVAILABILITY:

Water Permit Application No. 8928-3 proposes to appropriate water from the Prairie Coteau aquifer. The probability of unappropriated water being available from the aquifer can be evaluated by considering SDCL 46-6-3.1, which requires “No application to appropriate groundwater may be approved if, according to the best information reasonably available, it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source. An application may be approved, however, for withdrawals of groundwater from any groundwater formation older than or stratigraphically lower than the greenhorn formation in excess of the average estimated annual recharge for use by water distribution systems.” The Prairie Coteau aquifer is not older than or stratigraphically lower than the Greenhorn Formation (Fahrenbach et al., 2010), and the applicant’s proposed use is not for use in a water distribution system as defined by SDCL 46-1-6(17). Therefore, the average annual recharge and average annual withdrawal rates to and from the Prairie Coteau aquifer must be considered.

HYDROLOGIC BUDGET:

Recharge

Recharge to the Prairie Coteau aquifer is primarily through direct infiltration of precipitation and subsequent percolation of rainfall and snowmelt where the aquifer is at or near the ground surface. Additional recharge may occur by leakage through the overlying till and the Brookings management unit of the Big Sioux aquifer, or other overlying smaller glacial aquifers (Hedges et al., 1982; Kume, 1976 and 1985).

From the aquifer performance test completed for Water Right No. 7921-3, assuming the outwash deposit is at least as large as a circle with an 11.4-mile radius (261,300 acres) and using Hedges and others' (1985) recharge rate for confined aquifers of 0.15 to 0.6 inches per year, an average annual recharge rate range of 3,266 to 13,065 acre-feet per year was calculated (Water Rights, 2025c).

Discharge

Discharge from the Prairie Coteau aquifer is primarily through well withdrawals (Water Rights, 2025d), and possibly through leakage to hydrologically connected aquifers (such as the underlying Altamont aquifer or the overlying Big Sioux: Brookings aquifer near the existing well site) (Kume, 1985). Currently, there are two water rights/permits authorized to appropriate water from this outwash deposit of the Prairie Coteau aquifer (as shown in Figure 1) – Water Right Nos. 7921-3 and 7988-3 both authorized for irrigation use (Water Rights, 2025c). Water Right No. 7921-3 is authorized for the irrigation of 267 acres from two wells completed into this outwash deposit of the Prairie Coteau aquifer. Irrigation water rights/permits have been typically required to report their annual usage on an irrigation questionnaire since 1979. The reported use for Water Right Nos. 7921-3 and 7988-3 is shown and averaged from 2020 to 2024 once the

wells were being utilized on Table 1 (Water Rights, 2025a). The average annual withdrawal rate for these water rights is approximately 352.6 acre-feet per year based on the permit holders reported use (Water Rights, 2025a).

Table 1. Reported historic irrigation use for Water Right Nos. 7921-3 and 7988-3 (Water Rights, 2025a)

Year	7921-3 Reported Pumpage (acre-feet/year)	7988-3 Reported Pumpage (acre-feet/year)
2019	0	0
2020	171.43	124.11
2021	263.13	145
2022	236.98	169.13
2023	189.1	168.48
2024	171.43	124.11
Avg (2020 to 2024)	206.4	146.2

Generally, irrigators in South Dakota apply less than one foot of water per acre per year. However, to account for the fluctuation in wet and dry cycles from year to year, the one foot of water per acre per year application rate will be used to somewhat overestimate the annual withdrawal rate for this application - Water Permit Application No. 8928-3 proposing to irrigate 240 acres.

From Figure 1, nearby Water Right No. 7923-3 currently identified as withdrawing from the Prairie Coteau aquifer, is expected to either be withdrawing from another outwash deposit at a separate elevation from the proposed outwash for this application, or the Big Sioux: Brookings aquifer (USGS, EROS, 1999; Water Rights, 2025c and 2025d).

In the outwash deposit of the Prairie Coteau aquifer being considered for this application, there are no domestic wells on file with the DANR-Water Rights Program (Water Rights, 2025d); however, the aquifer performance test identified one domestic well (acknowledged as CC4) (not on file with the Water Rights Program) that is completed into the outwash deposit of the Prairie Coteau aquifer. Since the introduction of rural water systems, many domestic wells are likely no longer in use or are not being used as primary water sources. Due to their relatively low diversion rates and the availability of rural water, withdrawals from domestic wells are generally not considered to be a significant portion of the hydrologic budget for the Prairie Coteau aquifer.

Hydrologic Budget Summary

The estimated average annual recharge rate to this outwash deposit of the Prairie Coteau aquifer ranges between approximately 3,266 to 13,065 acre-feet per year. The mid-range of the average annual recharge rate to this outwash deposit of the Prairie Coteau aquifer is approximately 7,987.5 acre-feet per year. Currently, there are two water rights/permits authorized to appropriate water from this outwash deposit of the Prairie Coteau aquifer (Water Rights, 2025c). The average annual withdrawal rate for these water rights is approximately 352.6 acre-feet per year based on the permit holders reported use (Water Rights, 2025a). If approved, and assuming one

foot of water per authorized acre, the estimated average annual withdrawal rate for Water Permit Application No. 8928 -3 is approximately 240 acre-feet per year.

OBSERVATION WELL DATA:

Administrative Rule of South Dakota (ARSD) 74:02:05:07 requires that the Water Management Board shall rely upon the record of observation well measurements in addition to other data to determine that the quantity of water withdrawn annually from the aquifer does not exceed the estimated average annual recharge of the aquifer.

Observation wells provide data on how the aquifer reacts to regional climatic conditions and local pumping. The DANR-Water Rights Program monitors one observation well completed into this outwash deposit of the Prairie Coteau aquifer (Water Rights, 2025b). The observation well is HN-2016A (located approximately 0.05 miles (280 feet northwest) from the existing well site) (as shown in Figure 1) (Water Rights, 2025b). The hydrograph for this observation well is displayed in Figure 2 (Water Rights, 2025b). The data points utilized to construct the hydrograph are measurements of the static water level in the observation wells from the top of the well casing.

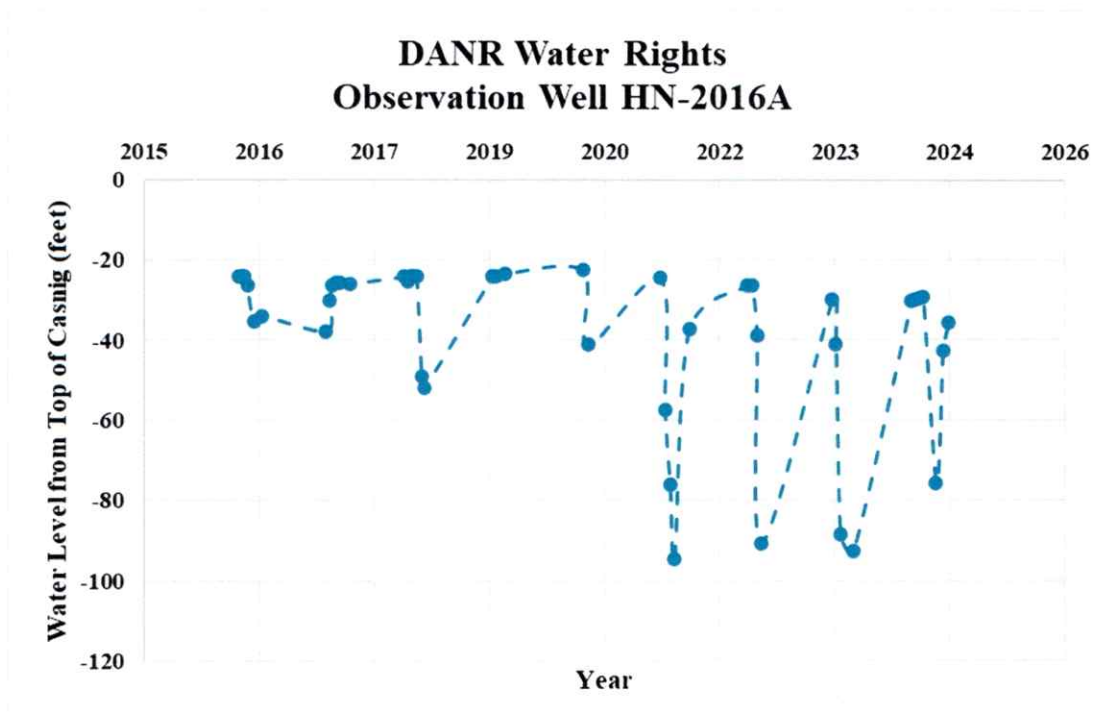


Figure 2. Hydrograph for observation well HN-2016A (Water Rights, 2025b)

The hydrograph for this observation well displays a decreasing water level over the respective period of record. While aquifer recovery is occurring after pumping has ceased for the irrigation season from this outwash deposit of the Prairie Coteau aquifer, there is still approximately ten feet of decline from when the observation well was drilled in 2016 to the most recent seasonal reading measured in the observation well on October 29, 2024. There is approximately five feet

of decline for the first reading of the year, May and early June, across the available years, 2016 to 2024. The first measurement of the year is typically before the start of the irrigation season and generally represents the static conditions of the aquifer when there is minimal pumping and especially minimal appropriative pumping. Lower water levels throughout the year are representative of the fact that nearby pumping lowers the artesian head pressure of the aquifer within the respective drawdown cones of the pumping wells and not representative of over pumping the aquifer. One of the wells for Water Right No. 7921-3 is approximately 110 feet away from HN-2016A and thus, has significant impacts on the water level in HN-2016A while the irrigation well is pumping (Water Rights, 2025b and 2025c).

The recent decline in water level could be caused by a number of factors or a combination of the factors: 1) artesian head pressure decline to account for increased pumping that has yet to stabilize into equilibrium; 2) recent predominantly drought conditions in this area (2021 to present) lowering water levels in the last few years (Hamlin County Conditions, 2025); and/or 3) average annual withdrawals exceeding average annual recharge. While there is a limited period of measured readings from this observation well, the decline in yearly first measurement started becoming noticeable in 2021 when regular drought conditions began occurring in Hamlin County.

WATER AVAILABILITY SUMMARY:

Review of water availability based on the hydrologic budget is dependent on the “areal extent” as determined using information from the aquifer performance test conducted for Water Right No. 7921-3 and estimated recharge based on a broad estimate of recharge to buried-confined aquifers, 0.15 to 0.6 inches per year, from Hedges and others (1985). Considering there is limited lithologic data directly supporting the distance-drawdown data and thus the “areal extent” of this deposit of the Prairie Coteau aquifer as determined by the aquifer performance test conducted for Water Right No. 7921-3, significant weight should be given to the observation well data (Water Rights, 2025b and 2025c).

Observation well HN-2016A was installed as a qualification requirement of approval for Water Right No. 7921-3 to allow the Water Rights Program to monitor and evaluate this particular deposit of the Prairie Coteau aquifer (Water Rights, 2025b and 2025c). The hydrograph for observation well HN-2016A (see Figure 2) shows an approximate five-foot decline in recent years, 2021 to present, for the first measurement of the year. The first measurement of the year, if taken before irrigation pumping starts, is generally representative of the static conditions in the aquifer. As stated above, there are a number of possibilities. The most likely cause of the recent declines is the recent drought conditions (Hamlin County Conditions, 2025).

Based on the available information, it appears there is a reasonable probability that unappropriated water may be available from this outwash deposit of the Prairie Coteau aquifer for the proposed appropriation. However, due to the significant number of estimates and assumptions in the hydrologic budget, it may be prudent to defer this application for at least two years to continue monitoring the water levels in HN-2016A to determine if the water levels, particularly the earliest measurements, are stabilizing or if there is continued decline.

POTENTIAL FOR UNLAWFUL IMPAIRMENT OF EXISTING WATER RIGHTS:

Currently, there are two water rights/permits authorized to appropriate water from this outwash deposit of the Prairie Coteau aquifer (as shown in Figure 1) – Water Right Nos. 7921-3 and 7988-3 (Water Rights, 2025c). The diversion points for Water Right No. 7921-3 are located approximately 0.06 miles (350 feet) north-northwest and 0.6 miles (3,050 feet) north-northwest respectively of the existing well proposed to be used for this application (Water Rights, 2025c). The diversion point for Water Right No. 7988-3 is located approximately 1.25 miles (6,575 feet) northeast of the existing well proposed to be used for this application (Water Rights, 2025c).

In the outwash deposit of the Prairie Coteau aquifer being considered for this application, there are no domestic wells on file with the DANR-Water Rights Program (Water Rights, 2025d). There could potentially be domestic wells completed into the Prairie Coteau aquifer near the well the applicant proposes to use that are not on file with the DANR-Water Rights Program, such as, the domestic well referenced in the aquifer performance test for Water Right No. 7291-3. The location of the domestic wells in the well completion report database maintained by the Water Rights Program is based on the location listed by the driller on the well completion report.

The Prairie Coteau aquifer is under confined conditions at the existing well site based on the submitted well completion report, and the water well and lithologic logs on file with the DANR-Water Rights Program (SDGS, 2025; Water Rights, 2025b and 2025d). Since the Prairie Coteau aquifer is confined near the existing well site, drawdown can extend some distance from the pumping well but the exact drawdown behavior of a well cannot be known without an aquifer performance test. There has been an aquifer performance test conducted for nearby Water Right No. 7921-3 but not for the applicant's well (Water Rights, 2025c). Furthermore, the observation well completed into this outwash deposit of the Prairie Coteau aquifer near permitted/licensed diversion points can provide some insight on how the aquifer responds to pumping (Water Rights, 2025b).

Observation well HN-2016A (approximately 280 feet northwest of the existing well site has one high-yield well (assumed to be a well with an authorized diversion rate greater than 0.2 cfs) within approximately 250 feet of it (Water Rights, 2025b and 2025c). The lithologic log on file for HN-2016A noted the well was drilled 228 feet deep below the ground surface, had a casing stick up height of approximately 1.5 feet above the ground surface, and the top of aquifer at approximately 199 feet below the ground surface (SDGS, 2025; Water Rights, 2025b). The lowest recorded static water level on the hydrograph (displayed in Figure 2) is approximately 95 feet below the top of the well casing, which indicates there was still approximately 100 feet of artesian head pressure in HN-2016A even during drier periods when high-yield wells are expected to be pumping more water and when water levels are generally naturally lower in response to drier conditions (Water Rights, 2025b).

Additionally, from the aquifer performance test for Water Right No. 7291-3, there appears to be over 180 feet of available drawdown at CC4, where almost 9 feet of drawdown (or 5% of the available drawdown) was observed during the test in a well located approximately two miles

northeast of the pumping well. If observed in the future, well interference may need to be mitigated by lowering pumps in affected wells.

Within a half mile of the existing well site, the Prairie Coteau aquifer has a saturated aquifer thickness ranging from approximately 30 to 40 feet (Water Rights, 2025d). This would generally allow for enough thickness for a pump inlet to be placed 20 feet below the top of the aquifer, which is required for the well to be considered adequate under ARSD 74:02:04:20(6). In Grant and Hamlin Counties, there have been no substantiated complaints submitted to the DANR-Water Rights Program regarding well interference for adequate wells completed into the Prairie Coteau aquifer (Water Rights, 2025e). There have been several complaints of potential well interference in Codington County, one in Day County, and one in Roberts County (Water Rights, 2025e). These complaints were primarily due to several large-capacity wells pumping in a small area resulting in a cone of depression around the diversion points, creating localized drawdown during times of pumping. However, investigations of these complaints by Water Rights staff engineers concluded only the artesian head pressure was impacted due to pumping and that there was no unlawful impairment of adequate wells (Water Rights, 2025e).

The Water Management Board recognizes that putting water to beneficial use requires a certain amount of drawdown to occur. The Board has developed rules to allow water to be placed to maximum beneficial use without the necessity of maintaining artesian head pressure for domestic use. The Water Management Board defined an “adversely impacted domestic well” in ARSD 74:02:04:20(7) as:

“A well in which the pump intake was set at least 20 feet below the top of the aquifer at the time of construction or, if the aquifer is less than 20 feet thick, is as near to the bottom of the aquifer as is practical and the water level of the aquifer has declined to a level that the pump will no longer deliver sufficient water for the well owner’s needs.”

The Water Management Board considered the delivery of water by artesian head pressure versus maximum beneficial use during the issuance of Water Right No. 2313-2 for Coca-Cola Bottling Company of the Black Hills. The Board adopted the Findings of Facts and Conclusions of Law that noted the reservation of artesian head pressure for delivery of water would be inconsistent with SDCL 46-1-4 which states, “general welfare requires that the water resources of the state be put to beneficial use to the fullest extent of which they are capable...” (Water Rights, 1995). Furthermore, the Water Management Board found if increased cost or decreased production as a result of impacts on artesian head pressure by legitimate users is to be considered as an unlawful impairment, it would also conflict with SDCL 46-1-4 (Water Rights, 1995). With that in mind, some existing well owners may need to install or lower pumps depending on the specific characteristics of the Prairie Coteau aquifer at their location. When considering the statutes (SDCL 46-1-4 and 46-6-6.1), rules (ARSD 74:02:04:20(6) and (7)), the estimated saturated thickness of the Prairie Coteau aquifer near the well completion report submitted by the applicant, the artesian head pressure in observation wells and appropriate user’s wells completed into the Prairie Coteau aquifer near the existing well site, and the lack of substantiated well interference complaints from the Prairie Coteau aquifer in the area, any drawdown created

from the proposed diversion may not cause an unlawful impairment to existing water right/permit holders or domestic users with adequate wells. Due to the close proximity of the applicant's well to one of the wells authorized by Water Right No. 7921-3, approximately 350 feet, the potential the proposed appropriation may cause unlawful impairment is elevated (Water Rights, 2025c). However, development of this application is not expected to cause unlawful impairment to existing appropriative water rights with adequate wells or adequate domestic wells. This is primarily based on how observation well HN-2016A reacts to the pumping occurring under Water Right No. 7921-3 and how much artesian head pressure is left above the aquifer even during the late irrigation season (Water Rights, 2025b). Continued monitoring of HN-2016A is critical. It may be prudent to require installation of another observation well as part of deferment or approval of this application with the location of the observation well not between this existing well proposed to be used by this application and wells authorized by Water Right No. 7921-3.


CONCLUSIONS:

1. Water Permit Application No. 8928-3 proposes to divert water at a maximum instantaneous diversion rate of 1.97 cfs from one well completed into the Prairie Coteau aquifer (approximately 230 feet deep) located in the NW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 17 for the irrigation of 240 acres located in the E $\frac{1}{2}$ of Section 17; all in T114N-R51W. The site of interest is located in Hamlin County approximately three miles southeast of Castlewood, SD.
2. Based on the available information, it appears there is a reasonable probability that unappropriated water may be available from this outwash deposit of the Prairie Coteau aquifer for the proposed appropriation. However, due to the significant number of estimates and assumptions in the hydrologic budget, it may be prudent to defer this application for at least two years to continue monitoring the water levels in HN-2016A to determine if the water levels, particularly the earliest measurements, are stabilizing or if there is continued decline.
3. Due to the close proximity of the Water Permit Application No. 8928-3's existing well to one of the wells authorized by Water Right No. 7921-3, the potential the proposed appropriation may cause an unlawful impairment is elevated. However, development of this application is not expected to cause unlawful impairment to existing appropriative water rights/permits with adequate wells or adequate domestic wells. This is primarily based on how observation well HN-2016A reacts to the pumping occurring under Water Right No. 7921-3 and how much artesian head pressure is left above the aquifer even during the late irrigation season.

Nakaila Steen

Nakaila Steen
Natural Resources Engineer II
SD DANR - Water Rights Program

Reviewed by:


Adam Mathiowetz, PE
Natural Resources Engineer IV
SD DANR - Water Rights Program

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