Rules

and

Regulations

for the

LOWER NIOBRARA

NATURAL RESOURCES DISTRICT

Integrated Management Plan

and

Groundwater Management Plan

Revised

April 25, 2016

Groundwater Management Plan

Original Adopted August 11, 1986

Revised May, 1992

Revised July 1, 1996

Revised December 12, 2005

Revised September 3, 2009

Revised September 14, 2011

Integrated Management Plan

Adopted May 1, 2014

Rules and Regulations Revisions

Revised April 4, 2014

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1. AUTHORITY & PURPOSE OF THESE RULES & REGULATIONS

1.1. The Lower Niobrara Natural Resources District (District) shall adopt and promulgate, in accordance with The Nebraska Groundwater Management and Protection Act, Neb. Rev. Stat. §§46-701 et,seq., (Act) such rules and regulations as are necessary to the discharge of duties assigned to the District by the Act and Voluntary Integrated Management Plan (IMP) as adopted May 1, 2014, (Appendix 2; IMP Goals, Objectives and Action Items) and subsequently amended as necessary by the District and the Department of Natural Resources (Department).

1.2. Groundwater is owned by the public and the only right held by an overlying landowner is in the reasonable and beneficial use of the groundwater underlying his or her land subject to the provisions of the Act, associated state law, and the correlative rights of other landowners when the groundwater is insufficient to meet the reasonable needs of all users. The District is responsible for the management of the groundwater within the District, Neb. Rev. Stat. §46-703 (4).

1.3. The District Board of Directors (Board) adopted these Rules and Regulations after a Public Hearing, May 2, 2016.

2. APPLICATION OF THESE RULES AND REGULATIONS

2.1. These Rules and Regulations apply to matters of groundwater quality, groundwater quantity and prevention or resolution of conflicts between users of hydrologically connected groundwater and surface water, within the entire area defined by the geographical boundaries of the District, Appendix 1,in accordance with Neb. Rev. Stat. §46-707.

2.2. Preference in the use of groundwater shall be given to those using the water for domestic purposes. They shall have preference over those claiming it for any other purpose. Those using the water for agricultural purposes shall have preference over those using the same for manufacturing or industrial purposes. As used in this rule; a.) Domestic use of groundwater shall mean all uses of groundwater for human needs as it relates to health, fire control, and sanitation and shall include the use of groundwater for domestic livestock as related to normal farm and ranch operations; and b.) Agricultural purposes shall include, but not be limited to, Confined Animal Feeding Operation (CAFOs) and/or aquaculture purposes in accordance with Neb. Rev. Stat. §46-613.

2.3. Neb. Rev. Stat §§46-703 and 704(3) provide~~s~~ the District significant legal authority to regulate activities within its boundaries in a way that ensures agriculture remains an important industry to the State of Nebraska. The District's Groundwater Management Plan, revisions 12-13-2005, 09-03-2009, 10-14-2011 and as subsequently adopted by amendment by the Lower Niobrara Natural Resources District Board of Directors, remains effective in accordance with Neb. Rev. Stat §46-709.

3. DEFINITIONS

3.1. Acre-inch shall mean the amount of water necessary to cover an acre of land to a depth of one inch.

3.2. Act shall mean the Nebraska Ground Water Management and Protection Act, Neb. Rev. Stat. §§46-701-46-754 as amended.

3.3. Agricultural Transfers means, but is not limited to, the transfer of groundwater to be used in the production of crops, livestock or aquaculture purposes in accordance with Neb. Rev. Stat. §46-613.

3.4. Alleged Violator shall mean any person against which a complaint has been filed in accordance with Rule 5.

3.5. Allocation shall mean the allotment of a specified total number of acre-inches of irrigation water per irrigated acre per year or an average number of acre-inches of irrigation water per irrigated acre over any reasonable period of time not to exceed five years.
3.6. Best Management Practices shall mean schedules of activities, maintenance procedures, and other management practices utilized to prevent or reduce present and future contamination of groundwater which may include irrigation scheduling, proper rate and timing of fertilizer application, and other fertilizer and pesticide management programs. In determining the rate of fertilizer application, the District shall consult with the University of Nebraska or a certified crop advisor certified by the American Society of Agronomy.
3.7. Board or Board of Directors shall mean the Board of Directors of the Lower Niobrara Natural Resources District and/or its employees and agents acting at the direction of the Board of Directors.
3.8. Certification shall mean a current written acknowledgement of completion issued by the District to the operator for completion of the necessary educational programs outlined by the District.
3.9. Certified Operator shall mean the person or persons responsible for making decisions on any type of applications of nitrogen fertilizer on an area greater than one acre and applying more than 50 pounds per acre of actual nitrogen fertilizer on any agricultural land within the District, either commercially or privately, who must receive certification by the District once every four years by attending and participating in a Nitrogen Management Certification class given by the District or by neighboring Natural Resources Districts.
3.10. Certified Irrigated Acre means any acre of land for which the landowner has provided District approved documentation and which has been authorized by the Board for the application of groundwater.
3.11. Commingling Water Well shall mean two (2) or more groundwater wells that are commingled, combined, clustered, or joined and shall be considered for the purpose of these Rules and Regulations as one (1) water well. Other than a water source used to water range livestock, the combined capacity of commingled water wells shall require a water well construction permit pursuant to these Rules and Regulations and shall be subject to the same Rules and Regulations as any water well located within the District.
3.12. Common Carrier means any carrier of water including a pipe, canal, ditch, or other means of piping or adjoining water for irrigation purposes.
3.13. Complainant shall mean any person who files a complaint alleging a violation of these Rules and Regulations in accordance with Rule 6.
3.14. Contamination or Contamination of Groundwater shall mean nitrate-nitrogen or other material which enters the groundwater due to the action of any person and causes degradation of the quality of the groundwater sufficient to make such groundwater unsuitable for present or reasonably foreseeable beneficial uses.
3.15. Controls mean any requirement, obligation, duty, or restriction placed upon a landowner and/or operator of the land by these Rules and Regulations.
3.16. Department, NDNR, or DNR means the Nebraska Department of Natural Resources.
3.17. Dewatering Well means a water well-constructed for the purpose of lowering the groundwater surface elevation, either temporarily or permanently.
3.18. District shall mean the Lower Niobrara Natural Resources District.
3.19. District Staff shall mean a person employed either full-time or part-time by the Lower Niobrara Natural Resources District.

3.20. Educational Programs shall mean information and educational training sessions designed to acquaint landowners and operators with Best Management Practices in the operation of their irrigation and cropping systems.
3.21. Field Boundaries shall mean the area which is certified with the District.
3.22. Flow meter or Flowmeter shall mean a measuring device, approved by the District, to measure the quantity of water pumped, withdrawn, or taken from a groundwater well, common carrier, and/or surface water source.
3.23. Good Cause Shown shall mean a reasonable justification for granting a variance that would otherwise be prohibited by these Rule and Regulation in which the Board reasonably and in good faith believes will provide an economic, environmental, social or public health and safety benefit that is equal to or greater than the benefit resulting from the prohibition in which a variance is sought
3.24. Groundwater shall mean water which occurs in or moves, seeps, filters, or percolates through ground under the surface of the land.
3.25. Groundwater Reservoir Life Goal shall be the goal of the District to provide an adequate supply of acceptable quality groundwater to forever fulfill the reasonable groundwater demands within the District for domestic, municipal, agricultural, industrial, wildlife, and other uses deemed beneficial by the District's Board of Directors.
3.26. Groundwater User shall mean a person who at any time extracts, withdraws, or confines groundwater for any use by himself/herself or allows such use by other persons at a rate in excess of 50 gallons per minute. Whenever the landowner and operator are different, the term "groundwater user" shall mean both the landowner and the operator.
3.27. Gross System Capacity or gallons per minute per acre is a method developed by the University of Nebraska to determine if an irrigation system has sufficient capacity by soil type to meet a crops need during the growing season. http://cropwatch.unl.edu/archive/-/asset_publisher/VHeSpfv0Agju/content/4913602 or Neb Guide G1851
3.28. Helper Well, Supplemental Well, Combined Wells shall mean any water well or wells that is used in conjunction with other irrigation well(s) and is used for the purpose of supplementing the rate of withdrawal, in gallons per minute, of the irrigation well or series of irrigation wells without increasing the number of acres irrigated.
3.29. High Capacity Livestock Well means a well or commingled wells with combined or total pumping capacity of over 50 gallons per minute that is used for the watering of livestock and other uses of water directly related to the operation of a feedlot or other confined livestock or dairy operation.
3.30. Illegal Water Well shall mean a.) Any water well operated or constructed without or in violation of a permit required by the Act; b.) Any water well not in compliance with rules and regulations adopted and promulgated pursuant to the Act; c.) Any water well not properly registered in accordance with Neb. Rev. Stat. §§ 46-602 to 46-604; or d.) Any water well not in compliance with any other applicable laws of the State of Nebraska or with rules and regulations promulgated pursuant to such laws.
3.31. Improper Irrigation Run-off shall mean the occurrence of irrigation run-off water after January 1, 1977: a.) Which causes or contributes to the accumulation of water upon or beneath the surface of the lands of any other person(s) to their detriment; or b.) Which causes or contributes to the deterioration of water quality by depositing sediment and/or associated chemicals in surface waters within the area.

3.32. Inspector shall mean an employee, agent, or director of the District authorized to perform the functions assigned thereto by these Rules and Regulations.
3.33. Irrigated Acre shall mean any acre that is certified as such pursuant to Rules and Regulations of the District and that is actually capable of being supplied water through irrigation works, mechanisms, or facilities existing at the time of the allocation.
3.34. Irrigation Run-off Water shall mean groundwater used for irrigation purposes, which escapes from land owned, leased, or otherwise under the direct supervision and control of a groundwater user.
3.35. Lagoon Water shall mean water, not considered groundwater or surface water, that is part of a manure waste system that stores effluent from livestock, municipal, commercial or industrial facilities to be used to provide nutrients and water to crops.
3.36. Landowner shall mean any person who owns or has an executed contract for the purchase land.
3.37. Late Permit shall mean any permit received by the District after the construction has begun or completed.
3.38. Livestock Facilities means: a.) buildings, lots or pens, to house livestock which normally are not used for the growing of crops or vegetation; b.) any livestock facility that is required by the Livestock Waste Management Act or state livestock waste regulations to obtain a permit from the Department of Environmental Quality; or c.) Places where livestock which are confined for more than ninety (90) days per year. Livestock Facilities shall not mean pastures, on rangeland, or other grazing lands where livestock are kept and allowed to feed on vegetation growing therein.
3.39. Management Area shall mean all areas within the Lower Niobrara Natural Resources District as designated by the District pursuant to Neb. Rev. Stat. §§ 46-712 or 46-718, any area designated by the Director of Environmental Quality pursuant to Section 46-725, or any area designated by the Interrelated Water Review Board pursuant to Neb. Rev. Stat. § 46-719. Management area includes a control area or a special groundwater quality protection area designated prior to July 19, 1996.
3.40. Management Plan shall mean a Groundwater Management Plan developed by the District and submitted to the Director of Nebraska Department of Natural Resources or its predecessor for review pursuant to Neb. Rev. Stat. §§46-656.12-656.15. Neb. Rev. Stat. §§ 46-656.12 to 46-656.15.
3.41. Maximum Contaminant Level or MCL shall mean the maximum permissible level of a contaminant in water, which is deliverable to any user of public or private water system as established by the Environmental Protection Agency (EPA). The MCL represents a level of a contaminant beyond which serious health problems have occurred or can occur.
3.42. New Groundwater Irrigated Acre shall mean an acre that is not certified to be irrigated or not off-set and is allowed to be irrigated by the variance process.
3.43. Nitrate-Nitrogen Concentration in Groundwater means the amount of nitrate in groundwater expressed in units of mg/L NO_3-N. The unit NO_3-N simply is nitrogen which is in the form of nitrate.
3.44. Nitrate-Nitrogen Concentration in Nitrogen Fertilizer represents the amount of nitrate nitrogen which is available to the crop, which also referred to as actual nitrogen.
3.45. Nitrogen Fertilizer means a livestock waste or chemical compound in which the percentage of nitrate-nitrogen is greater than the percentage of any other nutrient in the compound or, when applied, results in an average application rate of more than fifty (50) pounds of nitrate-nitrogen (actual nitrogen) per acre over the field to which it is being applied.
3.46. Off-set shall mean the effect of the new water use has been accounted for and has been determined by the District to be the same amount of water or less, to be depleted from the stream over a 50-year period.
3.47. Operator shall mean that person who has the most direct control over the day-to-day farming operations of the land concerned.

3.48. Parts Per Million (ppm) shall mean a ratio used to describe the presence of any substance that may contaminate water, where one part of the contaminant is present among one million parts water.
3.49. Person shall mean a natural person, a partnership, a limited liability company, an association, a corporation, a municipality, an irrigation district, an agency or a political subdivision of the state, or a department, an agency, or a bureau of the United States.
3.50. Point Source Pollution shall mean any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, channel, tunnel conduit, well, discrete fissure, container, rolling stock, vessel, other floating craft, or other conveyance, over which the Nebraska Department of Environmental Quality has regulatory authority and from which a substance which can cause or contribute to contamination of groundwater is or may be discharged.
3.51. Property Boundary shall mean the boundary of ownership of any tract of land.
3.52. Proof of Production shall mean Average Production History documents provided to the District by the Landowner/Operator which show the proven average crop yield of a field which is used for Federal Crop Insurance for other insurance purposes.
3.53. Replacement Well shall mean a water well which replaces an abandoned water well within three years of the last operation of the abandoned water well and is constructed to provide water to the same tract of land as the abandoned water well being replaced.
3.54. Rotation shall mean a recurring series of use and nonuse of irrigation wells on an hourly, daily, weekly, monthly, or yearly basis.
3.55. Soil Sampling shall mean the collection of soils for nutrient analysis. One soil sample for nitrate-nitrogen will consist of a minimum of eight cores representing no more than 80 acres. Entire soil cores must be collected to a minimum depth of 24 inches. Core depth increments of 0-8 inches and 8-24 inches are suggested.
3.56. Sub-Area or Sub-Basin shall mean a geographical area within the management area, which is so designated by the Board and for which controls specific to that sub-area have been adopted pursuant to these Rules and Regulations.
3.57. Sub-Irrigation or Sub-Irrigated Land shall mean the natural occurrence of a groundwater table within the root zone of agriculture vegetation, not exceeding ten feet below the surface of the ground.
3.58. Surface Water Project Sponsor shall mean an irrigation district created pursuant to Chapter 46, article 1, a reclamation district created pursuant to Chapter 46, article 5, or a public power and irrigation district created pursuant to Chapter 70, article 6.
3.59. Test Hole shall mean a hole designed to obtain information on hydrogeologic conditions or characteristics of the water bearing layers in the aquifer prior to construction of a groundwater well.
3.60. To Commence Construction of a Water Well shall mean the beginning of the boring, drilling, jetting, digging, or excavating of actual water well from which groundwater is to be withdrawn.
3.61. Tract of Land shall mean a portion of property defined by a number assigned by the County Assessor Office.
3.62. Trigger or Action Level Trigger is the measured or observed phenomenon that draws attention to the fact that corrective action should be taken to avoid an undesirable outcome if no action is taken; such as: groundwater quality, significant drawdown of neighboring wells following expansion of irrigated acres or a new well in the immediate area, subsidence of ground, significant lowering of the groundwater static water level in Sub-Basin, and other occurrences.

3.63. Variance shall mean: a.) a written approval to act in a manner contrary to the existing rules or regulations from a governing body whose rule or regulation is otherwise applicable; b.) a written approval to deviate from a restriction imposed by these Rules and Regulations.
3.64. Water Well/Groundwater Well shall mean any excavation that is drilled, cored, bored, washed, driven, dug, jetted, or otherwise constructed for the purpose of exploring for groundwater, monitoring groundwater, utilizing the geothermal properties of the ground, obtaining hydrogeologic information, or extracting water from or injecting water into the underground water reservoir. Water well shall not include any excavation made for obtaining or prospecting for oil or natural gas or for inserting media to re-pressure oil or natural gas bearing formations regulated by the Nebraska Oil and Gas Conservation Commission.
3.65. Water Well Permit/Groundwater Well Permit shall mean the authorization given by the District for construction of water wells capable of pumping greater than 50 gallons per minute in accordance with Neb. Rev. Stat. § 46-735.

4. ENFORCEMENT

4.1. The District shall enforce these Rules and Regulations using the following procedures:

4.1.1. Upon obtaining information indicating any person/s is in violation of any Rule or Regulation, the District Manager shall issue a Notice of Violation to the person in violation. The Notice of Violation shall specify: (A) The Rule or Regulation that is being violated or has been violated; (B) The action required to be taken to come into compliance with the Rule or Regulation; (C) The period of time within which the person in violation must come into compliance; and (D) The consequences of failing to come into compliance within the period of time specified. The Notice of Violation shall be sent to the person in violation via certified United States Mail, return receipt requested. District staff shall make an inspection and prepare a written report following the period of time specified to come into compliance to verify the prescribed corrective action has been taken to achieve compliance.

4.1.2. If the inspection and written report specified in Rule 4.1.1, indicate that the person in violation of the Rule or Regulation has achieved compliance within the prescribed period, no further action shall be taken but the written report shall be retained by the District for future reference. If the inspection and written report indicate the person has not achieved compliance with the Rule and Regulation, the District Manager shall refer the written report of the violation to the District Board, along with any additional information he/she believes to be relevant, for further action by the District Board.

4.1.3. The District Board shall review the written report and any other relevant information provided to it by the District Manager. If, after review of the written report and other relevant information, the District Board has reason to believe that the person/s is in violation of a Rule or Regulation, it shall issue an order to cease and desist of the action causing the violation. Said order shall notify the person that failure to comply with the order to cease and desist will result in the District Board referring the matter to the Nebraska Attorney General for enforcement proceedings and/or of its intent to initiate its own civil or criminal enforcement action/s. The order to cease and desist shall also advise the recipient that if he/she is of the belief that no violation has or is occurring he/she may request a formal hearing before the District Board to present evidence and argument supporting their position. Such request for a formal hearing shall be made in writing and must be received at the District office no later than 30 days from date the requesting party received the order to cease and desist.

4.1.4. Upon receipt of the request for a formal hearing, the District staff shall schedule the formal hearing immediately preceding a scheduled meeting of the Board of Directors, not more than 60 days from the date the request for a formal hearing was received at the District office. Extensions of the time to initiate the formal hearing may be granted upon a showing of good cause but not to exceed 60 days.

4.1.4.1 The person/s requesting the formal hearing may be represented only by legal counsel or his/her self. The District shall be represented by its legal counsel or the District Manager or the District Manager's designee.

4.1.4.2 The District Board Chairperson or his/her designee shall preside as the hearing officer and shall rule on all matters regarding the proceeding. The hearing officer shall begin the hearing by allowing the District representative to make an opening statement explaining the District's position. Following the District, the person requesting the hearing shall be allowed to make an opening statement. After opening statements have been concluded, the District shall present its written report as an exhibit along with any other additional relevant evidence. After the District has presented its evidence, the person requesting the hearing may present all evidence supporting his/her position. The District may present rebuttal evidence. Following the presentation of all evidence, the District may make a closing argument followed by a closing argument by the person requesting the hearing. The hearing record will then be closed and no further evidence or argument will be entertained.

4.1.4.3 The formal rules of evidence shall not apply and evidence may be adduced through the testimony of witnesses and offering of exhibits, including written, electronic, video, or models. The District shall make an audio recording of the proceeding that may be transcribed for future reference.

4.1.4.4 Following the close of the hearing record, the District Board shall review the hearing record and make a final order to: (a.) lift the order to cease and desist; or (b.) retain the order to cease and desist; or (c.) modify the order to cease and desist. The District Board shall consider only the information contained in the hearing record and shall issue its final order in writing no less than 30 days following the date of the hearing.

4.1.4.5 If the District Board does not lift the order to cease and desist, the person who requested the formal hearing shall have 10 days after the issuance of the final order within which to achieve compliance, unless otherwise specified in said final order.

4.1.5 If the person in violation fails to come into compliance within the period specified in an order to cease and desist or a final order following a formal hearing, the District Board may refer the matter to the Nebraska Attorney General for prosecution or it may initiate its own civil or criminal proceeding.

5. COMPLAINTS

5.1. Any person who owns land, leases land, or resides within the District; or any non-resident person who can show the actions of any landowner or operator within the District directly affects him or her; or an employee or other agent of the Board so authorized; or the Board on its own motion, may file a written complaint. Said complaint shall be filed against a landowner/operator or both, and shall provide the information on which a violation of these Rules and Regulations or other violations of laws governed by these Rules and Regulations is alleged. Said complaints shall be investigated by the District Staff, which may include an inspection of the subject property. If the investigation is substantiated, the matter shall be prosecuted in accordance with Rule 4.

5.2. Complaints shall be filed at the office of the District, 410 Walnut Street, Butte, NE 68722, on complaint forms prepared by the District. Forms shall be made available at such office or other offices designated by the Board.

6. INSPECTIONS

6.1. When a written complaint alleging a violation of these Rules and Regulations is filed with the District, the District Staff shall determine whether, because of the nature of the violation alleged, an inspection is necessary to determine whether or not the landowner or operator is, at the time of inspection, or was, at the time complained of, in violation of these Rules and Regulations. The District Staff, upon proper identification and after informing the person in control of the land either in person or by certified mail, of the complaint and the District Staff's purpose, is authorized to enter upon the land if necessary for the purpose of making an inspection of the alleged violation. Upon completion of the inspection, the District Staff shall file a report of his or her findings with the District Manager.

6.2. The District Manager shall review the complaint, the inspection report, if any, and other information available to the District and shall decide whether, in his or her opinion, there is reasonable cause to believe that a violation has occurred or is occurring. If the District Manager concludes that a violation has or is occurring, he or she shall prosecute the mater in accordance with Rule 4. Regardless of what the District Manager concludes, the District shall deliver a copy of the complaint, any Inspector reports, and the District Manager's conclusions to the alleged violator and to the complainant, if other than the District Staff or the Board, in person, or shall transmit the same by certified mail.

7. ALLEGED VIOLATOR AND COMPLAINANT ALTERNATIVES (RULE REPEALED)

8. ACTION SUBSEQUENT TO ALLEGED VIOLATOR CONSENT TO CEASE AND DESIST ORDER (RULE REPEALED)

9. BOARD ACTION SUBSEQUENT TO ALLEGED VIOLATOR OR COMPLAINANT REQUEST FOR A HEARING (RULE REPEALED)

10. BOARD ACTION IF ALLEGED VIOLATOR FAILS TO RESPOND OR APPEAR

10.1. When an alleged violator has been notified of Board action in accordance with Rule 4, and such alleged violator has failed to respond, or when an alleged violator has been notified of Board action in accordance with Rule 4 of this section and has failed to appear at any properly scheduled formal hearing, the Board shall:

10.1.1. Review the complaint, the District Manager's report, any inspection report, and any other pertinent information; and

10.1.2. Review such findings, and issue such order or orders in accordance with these Rules and Regulations as it deems appropriate based upon the information available.

11. ALLEGED VIOLATORS ACTIONS FOLLOWING ISSUANCE OF CEASE AND DESIST ORDER (RULE REPEALED)

12. BOARD AUTHORIZATION TO INITIATE COURT ACTION (RULE REPEALED)

13. ESTABLISHMENT OF GROUNDWATER MANAGEMENT AREA

13.1. The District, following a Public Hearing held in accordance with Neb. Rev. Stat. § 46-712, §46-739, and §46-743, may establish a Groundwater Management Area and adopt rules and regulations governing the: a.)

Protection of the groundwater quality; b.) Protection of the groundwater quantity; or c.) Prevention or resolution of conflicts between hydrologically connected groundwater users and surface water appropriators .
13.2. The District may impose additional requirements for groundwater quality purposes, including any of the following: a.) Require utilization of Best Management Practices for the operation of irrigation systems and crop fertilization practices; b.) Require the analysis of irrigation water and the deep soil sampling and analysis thereof for fertilizer and chemical content; c.) Require attendance at educational programs designed to teach practices to protect groundwater and surface water quality, as well as testing of participants in the courses, and certification of participating participants after successfully completing the educational programs; d.) Require submittal of crop and irrigation water reporting forms; e.) Other requirements as specified in the respective management area phase designation or as adopted by the District Board.

14. GROUNDWATER QUALITY MANAGEMENT SUB-AREA PHASE DESIGNATION AND CONTROLS

14.1. The District has monitored groundwater quality in approximately 455 irrigation wells since 1996. This program of monitoring groundwater quality, together with research programs by others, has identified a widespread nitrate contamination problem in the groundwater underlying the District. A small portion of the groundwater samples are also monitored for other contaminates, primarily pesticides. Although other contaminants have been identified in the District's groundwater, concentration levels are well below Maximum Contaminant Levels (MCLs) as established by the Environmental Protection Agency (EPA).
14.2. To address the ever-increasing problem of high nitrate in the groundwater, the District has adopted controls to deal with the problem and possibly reverse the trend. Most of these controls are Best Management Practices (BMPs) which are designed to protect the environment, but also increase management efficiency, saving the crop producer input costs.
14.3. Although the groundwater nitrate contamination problem is widespread, it is not uniform throughout the entire District. Therefore, the District is divided into Groundwater Management Protection Areas and Sub-Areas, referred to as Groundwater Quality Management Sub-Areas, each with a range of nitrate-nitrogen concentration in the groundwater in that particular Sub-Area. A Phase I Management Sub-Area corresponds to a nitrate-nitrogen concentration of 0 to 5.0 parts per million (ppm). Phase II Management Sub-Area corresponds to a nitrate-nitrogen concentration in the groundwater of greater than (>) 5.0 to 9.0 ppm. A Phase III Management Sub-Area corresponds to an area with nitrate-nitrogen concentration levels greater than (>) 9.0 ppm. The entire District was initially designated as Phase I in 1996 when the District's Groundwater Management Plan was adopted by the Board. After monitoring for two consecutive years some subareas were determined to be greater than 0-5.0 ppm and the sub area was designated in accordance with Rule 14.4.
14.4. Prior to establishing or changing the designation of any Groundwater Quality Management Sub-Area from a lower to a higher Phase, there shall be a public hearing held to allow testimony in favor or against the establishment of the proposed Groundwater Quality Management Sub-Area change.
14.5. Designation of Groundwater Quality Management Sub-Areas.

14.5.1. Phase I Groundwater Quality Management Sub-Area: 0 – 5.0 ppm nitrate-nitrogen: Following a public hearing in 1996, the entire Lower Niobrara Natural Resources District (LNNRD) was designated as a Phase I Groundwater Quality Management Sub-Area. A Phase I management sub-area primarily promotes the implementation of Best Management Practices (BMPs) through educational programs. Much of the District is still designated as a Phase I Groundwater Quality Management Area.

14.5.2. Phase II Groundwater Quality Management Sub-Area: > 5.0 - 9.0 ppm nitrate-nitrogen: a.) If after a minimum of two monitoring periods (where a monitoring period is two years) and the groundwater quality sampling data verifies the concentration of nitrate-nitrogen in the groundwater is within the Phase II range, the phase designation will be changed to Phase II by the Board, following a public hearing; b.) Phase II management sub-areas will be designated by townships (36 square miles) or sub-townships within the District; c.) Before a Phase II management sub-area can be designated, 50% of the registered irrigation wells monitored by the District, within a township or sub-township, must have nitrate levels greater than 50% of the Maximum Contaminant Level (MCL) as determined by the EPA. As of Jan. 1, 2014, the MCL level is 10 ppm. (parts per million); d.) In sub-areas with nine or fewer registered irrigation wells, the District may monitor all such wells and work with operators managing those wells on an independent basis. If those wells are concentrated in one part of a township, the District may subdivide that township for Phase designation and monitoring. All portions of subdivided townships are subject to appropriate Phase regulations; e.) An area will remain in Phase II for a minimum of two monitoring periods (each monitoring period is two years), after which time the evaluation of data will enable the District to determine the Phase designation for the following two monitoring periods.

14.5.3. Phase III Groundwater Quality Management Sub-Area: > 9.0 ppm nitrate nitrogen: a.) If after a minimum of two monitoring periods (where a monitoring period is two years) in Phase II, the groundwater quality sampling data verifies the concentration of nitrate-nitrogen in the groundwater is within the Phase III range, the phase designation will be changed to Phase III by the Board, following a public hearing; b.) Phase III management sub-areas will be designated by townships (36 square miles) or sub-townships within the District; c.) Before a Phase III management sub-area can be designated, 50% of the registered irrigation wells monitored by the District, within a township or sub-township, must have nitrate levels greater than 90% of the Maximum Contaminant Level (MCL) as determined by the EPA. As of Jan. 1, 2014, the MCL level is 10 (parts per million); d.) In sub-areas with nine or fewer registered irrigation wells, the District may monitor all such wells and work with operators managing those wells on an independent basis. If those wells are concentrated in one part of a township, the District may subdivide that township for Phase designation and monitoring. All portions of subdivided townships are subject to appropriate Phase regulations. An area will remain in Phase III for a minimum of two monitoring periods (each monitoring period is two years), after which time the evaluation of data will enable the District to determine the Phase designation for the following two monitoring periods.

14.6. Groundwater Quality Management Sub-Area Controls.

14.6.1. Phase I Groundwater Quality Management Sub-Area: 0 – 5.0 ppm nitrate-nitrogen.

14.6.1.1. All operators or contract applicators of nitrogen fertilizers involved in the decision of whether to apply nitrogen fertilizer, whether by contract or privately, must maintain certification in nitrogen management if the agricultural land to be fertilized is larger than one acre or if more than fifty (50) pounds of actual nitrogen per acre will be applied. Nitrogen Management Certification from other NRDs will be accepted as fulfillment for certification requirements in the District. This will be accomplished by attending a class once every four years as conducted by the District. Recertification can also be completed by a take home test provided by the NRD or online.

14.6.1.2. The District discourages fall (September 23 to December 20) and winter (December 21 to March 1) application of commercial nitrogen fertilizer until after March 1 on any soil type. This does not apply to applications of less than 20 pounds of actual nitrogen per acre on fall or spring seeded crops.

14.6.1.3. The District recommends that all irrigation wells be sampled and analyzed for nitrate-nitrogen once every four years by the operator or District staff and reported on a form provided by the District.

14.6.1.3.1. The water sample shall be collected after the well has been running for at least 15 minutes. This water sample may be analyzed at the District Office in Butte or sent to a laboratory for analysis. Please contact the office for assistance in locating a laboratory to perform the test.

14.6.1.4. The District encourages a voluntary nitrate-nitrogen water analysis for all domestic and stock wells. The water sample shall be collected after the well has been running for at least 15 minutes. This water sample may be analyzed in the District Office in Butte or sent to a laboratory for analysis. Please contact the office for assistance in locating a laboratory to perform the test.

14.6.1.5. The District encourages deep soil sampling for nitrate analysis on each field of at least 40 acres or more when applying more than 50 pounds of actual nitrogen/acre/year.

14.6.1.6. One soil sample for nitrate-nitrogen will consist of a minimum of eight cores representing no more than 80 acres. Entire soil cores must be collected to a minimum depth of 24 inches. Core depth increments of 0-8 inches and 8-24 inches are suggested.

14.6.1.7. The composite soil sample shall be sent to a soil lab approved by the District. Please contact the office for assistance in locating a laboratory to perform the test.

14.6.1.8. The recommended nitrogen fertilizer application rate will be determined by using UNL recommendations or a crop advisor certified by the American Society of Agronomy.

14.6.2. Phase II Groundwater Quality Management Sub-Area: > 5.0 – 9.0 ppm nitrate-nitrogen:

14.6.2.1. All Phase I requirements will remain in effect unless modified by Phase II requirements.

14.6.2.2. All operators or contract applicators of nitrogen fertilizers involved in the decision of whether to apply nitrogen fertilizer, whether by contract or privately, must maintain certification in nitrogen management if the agricultural land to be fertilized is larger than one acre or if more than fifty (50) pounds of actual nitrogen per acre will be applied. Nitrogen Management Certification from other NRDs will be accepted as fulfillment for certification requirements in the Lower Niobrara NRD. This will be accomplished by attending a class once every four years as supplied by the District. Recertification can be completed by a take home test provided by the NRD, online, or another approved method.

14.6.2.3. Fall (September 23 to December 20) and winter (December 21 to March 1) application of commercial nitrogen fertilizer will not be allowed until after November 1 and is discouraged until March 1 on any soil type. Exceptions will be allowed for application rates of less than 20 pounds/acre of actual nitrogen on fall or spring seeded crops. Spring (March 1 to June 20) applications of commercial fertilizer greater than 100 pounds of actual nitrogen per acre will be encouraged through split applications (i.e. pre-plant, pesticide applications, starters, pivot applications, and side-dress).

14.6.2.4. Deep soil sampling and nitrate analysis on fields of at least 40 acres is required when applying more than 50 pounds/acre/year of actual nitrogen. Samples are required to extend at least two feet down, and are encouraged to extend three feet. Each sample should represent an area no larger than 80 acres and will consist of a minimum of eight cores. Entire soil cores must be collected to a minimum

depth of 24 inches. Core depth increments of 0-8 inches and 8-24 inches are suggested. Crops following a legume crop will not be required to have deep soil analysis prior to the harvest of that crop.

14.6.2.5. Sampling and analysis shall be performed prior to application of commercial nitrogen fertilizer or manure on each crop field for the ensuing year.

14.6.2.6. The composite soil sample shall be sent to a soil lab approved by the District. Please contact the office for assistance in locating a laboratory to perform the test.

14.6.2.7. The recommended nitrogen application rate will be determined by using UNL recommendations or a crop advisor certified by the American Society of Agronomy.

14.6.2.8. Annual Crop Report Requirements: Landowner/Operators shall submit annually an on-line Crop Report to the District on or before December 31, (for the crop year just completed). If the Landowner/Operator does not have internet access they can 1) come to office to complete or 2) make an appointment for District Staff to do an in home visit to complete on-line form. An on-line form will be filed for each field of at least 40 acres. This annual Crop Report Form will include: a.) Results of water nitrate analysis for each irrigation well supplying water to the field. Results must be for the well water sampled and analyzed within the last two years; b.) Crop planted and proof of production (Average Production History) for each crop grown on field (insurance records or Federal Crop Insurance records)(a form is available at the District office to allow information to be provided to the District directly for insurance carrier); c.) Crop to be planted next year; d.) Nitrogen fertilizer needs assessment for the crop to be planted. Operators will be required to include fertilizer application rates based on University of Nebraska Lincoln (UNL) recommendations or a certified crop advisor certified by the American Society of Agronomy; e.) Actual amount of nitrogen fertilizer applied to the field (type of commercial fertilizer, manufacturer, type of manure or organic fertilizer applied) and amount of pesticide applied; f.) Actual crop yield realized; g.) Metered quantity of groundwater, (in total inches) applied to the crop or an estimate based on well pumping rate. The District can easily and quickly determine the pumping rate by taking measurements with an ultrasonic flow meter to determine the volume of water applied through the irrigation system; h.) Results of deep soil analysis. (Some fields may not require sampling and analysis. See Phase II requirements.)

14.6.2.8.1. For quality assurance the District Staff will schedule random in home or office completion of the on-line Crop Report form/s with the Landowner/Operator. The District Staff will do up to 10% of the total Landowner/Operator reports submitted each year. Those selected will be notified via letter.

14.6.2.9. Residents of towns within a Phase II Sub-Area who apply fertilizers or pesticides are encouraged to attend a workshop presented by the District to inform attendees about proper application of lawn and garden chemicals.

14.6.2.10. Animal waste and municipality waste shall be properly applied and accounted for to avoid surface and groundwater contamination.

14.6.2.11. All livestock facilities requiring a permit must be properly permitted by the State of Nebraska. A copy of the permit must be filed with the District.

14.6.2.12. Nitrogen application, including waste (solid or effluent) shall not exceed crop need. Waste effluent pumped from a lagoon or waste pit, applied to the ground by an irrigation system, knifed into the ground or surface applied, must be properly accounted for and made a part of the total crop need

assessment. The District recommends the waste be analyzed at a lab and the District will assist the producer in finding a lab to perform the test.

14.6.2.13. The District discourages spreading of waste on frozen or snow covered ground. If waste is spread on frozen ground it will be limited to land where slopes are 4% or less or have adequate erosion control practices.

14.6.2.14. Waste will not be spread on land subject to frequent flooding, that is, land subject to flooding more than once in a 10 year period.

14.6.2.15. Waste shall not be spread into a drainage area or within 200 feet of an adjacent water body.

14.6.2.16. Waste disposal is discouraged on tilled ground with greater than 10% slopes unless adequate erosion control practices are present.

14.6.3. Phase III Groundwater Quality Management Sub-Area: >9.0 ppm nitrate-nitrogen

14.6.3.1. All Phase I and II requirements shall remain in effect unless modified by Phase III requirements.

14.6.3.2. An application of commercial nitrate-nitrogen fertilizer is prohibited on all soils until after March 1. Exceptions will be allowed for application rates less than 20 pounds of actual nitrogen per acre on fall or spring seeded crops. Spring (March 1 to June 20) application of actual nitrogen over 100 pounds of actual nitrogen will require split application: pre-plant, starters, pivot applications, and side-dressing with no more than 50% applied as pre-plant or pre-emergent.

14.6.3.2.1. If more than 50% is applied as pre-plant or pre-emergent a District approved inhibitor must be used at the manufacture's recommended rate. The operators shall be required to furnish certification from dealer that an inhibitor was used and at recommended rate, unless the total pre-plant application is 80 pounds per acre of actual nitrogen or less, in which case the 50 percent rule above would not apply, or; all applied as side dress post-emergent.

14.6.3.2.2. Nitrogen applications must not exceed the District's recommendations. A copy of a fertilizer receipt showing the amount of fertilizer purchased for the regulated fields will be submitted to the District with the annual report.

14.6.3.3. An annual analysis of groundwater from each irrigation well for nitrate/nitrogen levels in parts per million (ppm) with the analysis to be made by a laboratory utilizing EPA approved methods.

14.6.3.4. The required annual deep soils analysis for residual nitrate/nitrogen on each field or 40 acre tract, whichever is smaller, with the analysis to be conducted by a laboratory participating in the University of Nebraska Soil Testing Program. Each composite sample tested must consist of a mixture from no less than one three-foot probe every five acres.

14.6.3.5. If manure or sludge is used, a credit for the nitrogen in the manure or sludge must be used in the calculation for the nitrogen recommendation. A laboratory analysis must be conducted for each source of manure or sludge and attached to the report form.

14.6.3.6. A credit for previous year's crop if the previous year was in a legume crop (beans, alfalfa, etc.) must be used in the calculation for the nitrogen recommendation for corn and sorghum.

14.6.3.7. All crop fields in a Phase III management area are required to have a crop rotation plan submitted to the District.

14.6.3.8. All crop fields in a Phase III management area are required to plant a cover crop to reduce nitrogen leaching.

14.6.3.9. In order for the operator to better manage fertilizer applications and control leaching of nutrients below the root zone, continuous monitoring of the inches of groundwater applied per acre on each field shall be required.

14.6.3.9.1. No groundwater shall be withdrawn from any well located within a Phase III Water Quality Management Area for irrigation use on land growing crops in a Phase III Groundwater Quality Management Area prior to having in place and operational a District approved flow meter.

14.6.3.9.2. If a flow meter is not in place and operational the system will be in violation and deemed to be an illegal well.

14.6.3.9.3. All groundwater users shall within 30 days of the installation of a new, different or repaired flow meter on any well located within the Management Area, certify such installation on a form supplied by the District.

14.6.3.9.4. The District staff shall periodically check flow meters on a random basis for readings and proper operation.

14.6.3.9.5. When flow meters are removed for servicing or replacement, records of the flow meter reading shall be kept. Meters may be removed for off season storage.

14.6.3.9.6. Any malfunctioning flow meter must be repaired or replaced within 96 hours after discovery.

14.6.3.10. Irrigation scheduling, rain sensors, or other approved water monitoring and control devices will be required. Actual quantity of irrigation water applied to the crop field and the method of application is required on the annual Crop Reporting Forms. The District will require one monitoring device per field of at least 40 acres.

14.6.3.11. The District requires the operator to implement and maintain two additional Best Management Practices. The two additional Best Management Practices can be selected from the list in Appendix 5: Best Management Practices. These practices will also be listed on the Annual Crop Report Form.

14.6.3.12. The District requires a water sample from irrigation wells analyzed within the last 2 years on the Annual Crop Report Form. The water sample shall be collected after the well has been running for at least 15 minutes. This water sample may be analyzed at the District office in Butte or sent to a laboratory for analysis. Please contact the office for assistance in locating a laboratory to perform the test. A fee may be associated with nitrate testing.

14.6.3.13. Pre-Cropping Report Requirement: Landowner/Operator shall submit on or before March 1 an annual on-line Pre-Cropping report to the District (If the Landowner/Operator does not have internet access they can 1) come to office to complete or 2) make an appointment for District Staff to do an in home visit to complete on-line form) showing: a.) The number of acres in corn, sorghum and/or potatoes and the number of field acres irrigated; b.) The results of the groundwater nitrate/nitrogen analysis in ppm for each well, with each well identified by legal location to the nearest 10 acre tract; c.) The results of the residual nitrate/nitrogen deep soils analysis on each field or 80 acre tract, whichever is less, identified by locations using legal description and showing the irrigation well(s) identified in (b) above used to irrigate that field; d.) Credit for legume crop (beans, alfalfa, etc.) and/or manure or sludge applied; e.) The crop to be grown and the per acre yield based on the proof of production for determining nitrogen needs on each field; f.) The recommended commercial nitrogen fertilizer application rate utilizing the District's formula for commercial nitrogen fertilizer recommendations, and:

14.6.3.14. Post Cropping Report Requirements: Landowner/Operators shall submit annually an on-line Crop Report to the District on or before December 31, (the end of each crop year just completed). If the Landowner/Operator does not have internet access they can 1) come to office to complete or 2) make an appointment for District Staff to do an in home visit to complete on-line form. An on-line form will be filed for each field of at least 40 acres. This annual Crop Report Form will include: a.) Results of water nitrate analysis for each irrigation well supplying water to the field. Results must be for the well water sampled and analyzed within the last two years; b.) Crop planted and proof of production (Average Production History) for each crop grown on field (insurance records or Federal Crop Insurance records); c.) Crop to be planted next year; d.) Nitrogen fertilizer need assessment for the crop planted. Operators will be required to include fertilizer application rates based on University of Nebraska Lincoln (UNL) recommendations or a certified crop advisor certified by the American Society of Agronomy; e.) Actual amount of nitrogen fertilizer applied to the field, verified with receipts from all fertilizer suppliers (type of commercial fertilizer, manufacturer, type of manure or organic fertilizer applied) and amount of pesticide applied; f.) Actual crop yield realized; g.) Metered quantity of groundwater, (in total inches) applied to the crop or an estimate based on well pumping rate. h.) Results of deep soil analysis. (Some fields may not require sampling and analysis. See Phase II requirements.)

14.6.3.15. For quality assurance the District Staff will schedule random in home or office completion of the on-line Crop Reporting form(s) with the Landowner/Operator. The District Staff will do up to 10% of the total Landowner/Operator reports submitted each year. Those selected will be notified via letter.

14.7. Bazile Groundwater Quality Management Area

14.7.1.1. Area Designation and Boundaries: The Bazile Groundwater Quality Management Area includes all of Township 29N Range 6W (Miller Township); all of Township 29N Range 7W (Logan Township) and all of Township 29N Range 8W (in Walnut Grove Township) in Knox County, Nebraska, which is located in the southeast corner of the District.

14.7.1.2. The portion of the Lower Niobrara Natural Resources District located in the Bazile Groundwater Quality Management Area is shown on the map in Appendix 3

14.7.1.3. The Bazile Groundwater Management Area is subject to all requirements of a Phase I and Phase II Groundwater Quality Management Area, plus requirements designated by the governing body. The requirements are listed in Appendix 4.

14.8. Exemptions and/or Incentives to Improve Groundwater Quality

14.8.1. If a field and associated irrigation well(s) located in a Phase II are below the Phase II trigger limits (5.0 ppm or lower nitrate-nitrogen in the water) the producer may not be subject to the requirements of 14.6.2. (Phase II Crop Report Forms)

14.8.2. If a field and associated irrigation well located in Phase III area nitrate levels are below 9.0 ppm the producer may not be subject to the requirements of 14.6.3, (Pre-Cropping Reporting Form) but will be required to comply with the requirements of 14.6.2 (Phase II Crop Report Form) unless the nitrates are below 5.0 ppm for 3 consecutive years. A field meeting the nitrate levels are below 5.0 ppm will be considered a Phase I field and only subject to 14.6.1 requirements.

14.8.2.1. In order to maintain the exempt status an annual water quality sample will be collected by the District during the normal irrigation season.

14.8.2.2. A flowmeter is still required to be in place and operational and annual flowmeter readings reported to the District

14.8.2.3. Exemption is lost if the annual water quality sample exceeds the parts per million of nitrate nitrogen for exempted Phase for three consecutive seasons.

15. CERTIFICATION OF ALL GROUNDWATER USES

15.1. The area subject to Certification of All Groundwater Uses is the entire geographic area within the geographical boundaries of the District.

15.2. By January 1, 2017, all groundwater uses in the District shall be certified and approved by the District in accordance with these Rules and Regulations. The certification process will be conducted by the District and according to the following schedule: a.) Boyd and Keya Paha Counties: by April 1, 2015; b.) Knox and Rock Counties: by October 1, 2015; c.) Holt County: by April 1, 2016; d.) This process may be expedited quicker if staffing allows.

15.3. It is incumbent upon the person applying for certification of groundwater use to present to and thoroughly review with the District all documentation during the certification process to ensure the purpose and quantity of groundwater use within the District is accurately accounted for and agreed upon.

15.4. Certification of Groundwater Use for Irrigation

15.4.1. A landowner, who uses a regulated well for the purpose of supplying groundwater to irrigate crops within the District, must obtain District certification for each irrigated tract. This certification can be accomplished by applying to the District on District forms. The District will consider historical information provided by the applicant that verifies groundwater irrigation use on the tract for a minimum of two (2) out of-ten (10) years between 2004 and 2014. The documentation submitted with the application must include: a.) Location of each tract to be irrigated by legal description to the nearest quarter section; b.) Aerial photo or map of each tract; c.) Size, in acres, of the irrigated tract; d.) Department registration number(s) of any wells historically used to irrigate each tract; e.) Any sources of irrigation water other than groundwater to be used on each tract; f.). USDA-FSA records for each tract for the year an irrigation history is claimed; g.) County Assessor records for each tract for the year an irrigation history is claimed; h.) Any other information deemed necessary by the District.

15.4.2. Acres that were historically irrigated, which do not meet the requirements 15.4.1 (irrigated 2 of 10 years), but meets the minimum ranking criteria without conservation practices added for the addition of irrigated area (18.19-18.20) shall receive 95% certification of the total amount of irrigated acres should the person certifying the acres decide to reactivate those acres for irrigation purposes.

15.4.3. Acres with documented irrigated history but currently enrolled in any local, state, or federal conservation programs that would prevent the landowner from irrigating and meets the minimum ranking criteria without conservation practices added for the addition of irrigated acres (16.19-16.20) shall receive 95% certification for the total amount of irrigated acres should they choose to proceed with the certification process with the following conditions: a.) Acres must be certified respectfully by dates associated with this Rule; b.) Proof of historical use shall be by submission of information specified in this rule and had the means to irrigate during that time period.

15.4.4. Acres which do not meet the 2 out of 10 years must go through the Variance Committee to be certified as irrigated acres.

15.5. New or Added Acres are required to meet all the requirement of 15. 4. for certification of irrigated acres.

15.6. Certification of Groundwater Uses for Public Water Supply.

15.6.1. Any person who uses a regulated well to supply groundwater for public supplies must obtain certification of each use by applying to the District on forms provided by the District. The applicant shall furnish the following information with the application: a.) Public water supply system permit number(s); b.) Registration number of water well(s); c.) Location of groundwater use by legal description or map of distribution area; d.) Identification of any sources of water for the public water system other than groundwater; e.) Total number of service connections.

15.7. Certification of Groundwater Uses for other than Irrigation and Public Water Supply.

15.7.1. Any person who uses a regulated well to supply groundwater with a capacity of greater than 50 gallons per minute for uses other than irrigation of crops or public water supply must obtain certification of each use by applying to the District on forms provided by the District. The applicant shall furnish the following information with the application: a.) Purpose of groundwater use; b.) Location of groundwater use by legal description; c.) Registration number of water well(s); d.) Identification of any sources of water for the use other than groundwater.

15.8. Consideration of Documentation Supporting Applications for Certification of Groundwater Uses and Certification Decisions.

15.8.1. The District will take into consideration the documentation concerning groundwater uses from the following sources, and in the following order of preference: a.) Records of the U.S. Department of Agriculture; b.) Records of the County Assessor; c.) Evidence submitted by the applicant or the District's staff; d.) Any other information deemed relevant by the District; e.) The District may request more information from an applicant.

15.8.2. Certification of groundwater uses will be based on the size and location of irrigated tracts, the capacity of livestock operations, or on the amount and purpose of other uses based on two of the last ten years. Applicants who feel the information for that period does not reflect normal circumstances for that groundwater use may produce evidence to support their position. The District shall take this information into consideration when reviewing applications for certification. The application will be reviewed by the Variance Committee of the District for a recommendation to the District Board. A majority vote by the Board of Directors present at an open meeting of the Board shall be necessary for approval of an application for certification.

15.9. Changes in Certification

15.9.1.1. The Board may re-evaluate any determination on certification of groundwater uses from time to time on its own motion or upon receiving an application for change in certification from an owner. Such application for change must be submitted on forms provided by the District. The Board may approve changes if it finds that such changes would not increase the number of total irrigated acres, or otherwise have detrimental effects on neighboring groundwater or surface water users. The Board may rescind any previously approved certification if it finds: a.)The application for certification contained any false or misleading information; or the groundwater user failed to meet any conditions stipulated in the certification. b.) Any change in property ownership that results in a certified groundwater use passing from one person to another must be reported to the District by the new property owner within 60 days of the completion of the transaction on forms provided by the District. c.) If for any reason, including but not

limited to consideration for receipt of funds paid by the District or by any other party, a landowner agrees to permanently discontinue irrigation on acres for which certification has previously been approved, the Board shall rescind such certification to the extent it applies to those acres.

15.9.1.2. Any time a certification is modified or rescinded the District shall notify the applicable landowner or landowners by certified mail of any changes in or rescission of a previously approved certification.

15.9.1.3. A groundwater user aggrieved by a determination of the Board regarding certification of groundwater use may request a hearing before the District for the purpose of reconsidering the decision. The request must be filed with the District within thirty (30) days of receipt of notice of the Board's action on the groundwater user's application. Such hearing shall be conducted in accordance with the District's Rules and Regulations. The burden of proof shall be on the groundwater user to document the District's decision should be reversed.

15.9.1.4. The Board may grant a variance from the strict application of these Rules and Regulations if it determines that construction of a new groundwater well for irrigation, public water supply, commercial, or any other reason to alleviate an emergency situation involving the supply of water for human consumption or for any other reason supported by good cause shown. The request for a variance must provide all the information requested by the District on forms provided by the District, and any other information requested by the District. Such request shall be acted upon by the Board following a public hearing.

15.10. All irrigated acres not Certified by December 31, 2017 will be considered OUT OF COMPLIANCE with these Rules and Regulations and maybe subject to provision of Rule 4.

16. APPLICATION FOR EXPANSION OF GROUNDWATER IRRIGATED ACRES

16.1. In accordance with Neb. Rev. Stat. §§ 46-707(1) and 46-714(12) the District may allow a limited number of total new groundwater irrigated acres annually to maintain the current status of the District as not being fully appropriated. The number of new groundwater irrigated acres will be limited to no more than 2,500 acres per year for the entire geographic area within the geographical boundaries of the District. The Board reserves the right to approve less than the 2500 acres on an annual basis. There will be no carryover of unapplied for acres.

16.2. The District will enforce this limitation consistent with its authority under the law and its Rules and Regulations. In addition, engaging in unauthorized irrigation may be grounds for denying an application to expand groundwater irrigated acres under the ranking criteria set forth below.

16.3. If a request for expansion of new irrigated acres requires construction of a new groundwater well, the respective well permit application will not be accepted until authorization is granted by the District for the expansion of those irrigated acres.

16.3.1. If the acres will be irrigated with a new well(s) the application shall include: a.) Approximate legal description for the new well(s); b) All proposed well(s) for the addition of irrigated acres must meet all the requirements set forth in Rule 17.

16.4. If the new irrigated acres are to be irrigated with existing well(s) the application shall include the well registration number(s) of all well(s).

16.5. The Board will at their regularly scheduled June board meeting determine if the District will allow the addition of irrigated acres for that calendar year.

16.5.1. If the Board allows the addition of irrigated acres for that calendar year, a letter will be sent to the Department stating the total number of new irrigated acres the District has approved.

16.5.2. If the Board does not allow the addition of irrigated acres in that calendar year, a letter will be sent to the Department requesting the Department to deny granting any applications for new surface water appropriations.

16.6. The application period to apply for new groundwater irrigated acres shall only be annually during the months of July and August. An application received outside of an application period will be returned to the applicants as untimely. All application materials and documents shall be signed and provided by the applicant rather than any designee, contractor, or agent.

16.7. A maximum of 160 irrigated acres per individual, corporation, limited liability company, partnership, other entity or trust will be allowed per application period for expanded irrigated acres. Multiple parties are prohibited from sharing a well(s) and/or pivot system to irrigate adjoining lands even if the total number of acres to be irrigated by using the shared well(s) and/or pivot system totals less than 160 acres.

16.8. For the purposes of this rule, if an individual and any member of his or her immediate family owns and controls, directly or indirectly, more than fifty percent (50%) of the ownership of said irrigated acres, either individually or through a corporation, limited liability company, partnership, other entity or trust, such irrigated acres will be considered as owned by the applicant. A member of one's immediate family shall include spouses, children, and lineal descendants of the same.

16.9. The application shall be accompanied with a non-refundable filing fee to be determined annually by a majority vote of the Board prior to the application period.

16.10. The applicants will be notified on the status of their application within 60 days following the application period.

16.11. Applications not approved may be resubmitted the following year with the appropriate non-refundable filing fees.

16.12. The application shall be made on forms provided by the District. District staff shall prepare the relevant forms and submit them to the Board for approval.

16.13. The application shall include the most recent aerial photo delineating the new acres being applied and, as applicable, the proposed location of the new well(s) or location of existing well(s) to be used.

16.14. The current landowner or duly authorized representative shall sign the application and be present when application is presented to and reviewed by the staff.

16.15. Application is non-transferable between parcels of land, water wells or applicants.

16.16. Application does not include the Permit Fee to Construct a Water Well.

16.17. Application may be declined if it is incomplete or information is inaccurate.

16.18. The District will review the application for expanding groundwater irrigated acres based on factors including, but not limited to, whether or not the expanded irrigated acres in the application would support/promote the overall goal of the IMP in attaining and or maintaining a desired balance between water uses and water supplies, while contributing to the near and long term objectives of the District of protecting and sound management of our natural resources.

16.19. The Board retains the authority to establish ranking criteria for the evaluation of applications for expanding the number of acres irrigated with groundwater. Factors to be considered in the ranking criteria may include, but are not limited to, the following: a.) Irrigation system type (e.g., sprinkler, drip, or flood); b.) Land

capability class rating using USDA Natural Resources Conservation Service Web Soil Survey; c.) Stream depletion factors using best available science; d.) Groundwater quantity; e.) No more than 3 well permits well be granted per existing or anticipated irrigation system; f.) Groundwater quality (nitrates) and compliance with the Nitrogen Certification Guidelines in the District's Ground Water Management Plan; g.) Irrigation concentration (well spacing requirements); h.) All wells are required to be a minimum of 600 feet from any existing registered irrigation, domestic, livestock well, commercial or industrial well(s) or any not-yet-constructed well(s) with a valid well permit and 3000 feet from public water supply well(s); i.) Compliance with District Rules and Regulations, including compliance with the limitation on expansion of groundwater irrigated acres under these provisions; and j.) Such other factors that may assist the Board in determining whether the application would promote the goals of groundwater management and conservation within the District.

16.20. A minimum of score of 20 points on the Lower Niobrara Natural Resources District Criteria Ranking for Adding New Irrigated Acres in the District is required for an application to be considered for approval. A copy of the current ranking sheet is available at the District Office, 410 Walnut Street, Butte, NE.

16.21. Ranking score may be improved by adding conservation practices or removing lower class land from the area to be irrigated. A maximum of 15 points can be added to a score utilizing conservation practices. The Board may decide the conservation practices which may be applied to the particular track in the application for expanded irrigated acres.

16.22. The installation of a flow meter is required as a condition for any application for expansion of irrigated acres.

16.23. Flow rate in gallons per minute and total volume of water pumped during the irrigation season will be reported by the owner/operator and submitted to District staff on an annual basis by December 31st of each year. As a condition of approval to expand groundwater irrigated acres, the landowner shall agree that District staff shall be granted access to all land approved for irrigation under these Rules.

16.24. Applications granted under these provisions are deemed unique and special with regard to the specific application, and do not create a precedent for future applications or matters pertaining to other lands, whether or not they are similarly situated.

16.25. Approved applications for the expansion of irrigated acres will have until September 1st of the following calendar year (for example: applications approved in October 2015 must be completed by September 1, 2016) for all conditions of the application to be completed.

16.26. The District may cancel an approved application for expansion of irrigated acres at any time there is a violation of the District's Rules and Regulations.

17. GROUNDWATER WELL PERMITS

17.1. Any person that owns or controls land upon which the construction, decommissioning or temporary capping of a water well is to be accomplished, shall accomplish such tasks in accordance with the Water Well Standards and Contractor Licensing Act and the regulations adopted pursuant thereto.

17.2. Any person who intends to construct any new or replacement water well(s) that fall within the following categories on land which he/she owns or controls within the District shall, before commencing such activity, apply for a permit from the District on forms provided by the District and receive approval from the District:

17.2.1. Any groundwater well designed and constructed or modified to pump greater than fifty (50) gallons per minute.

17.2.2. Any water well designed and constructed to pump fifty gallons per minute or less if such water well is combined with any other water well(s) or other water source serving a single purpose, other than a water source used to water range livestock. Each source requires a permit and registration with the Department.

17.2.3. Any groundwater well drilled, bored, or constructed by any means to be a horizontal or angled well capable of drawing groundwater from an area laterally located from the drill hole at the ground surface is an illegal well and prohibited from construction and use.

17.3. Any person who has failed to obtain a permit as required by Rule 17 shall make application for a late permit on forms provided by the District.

17.3.1. The late permit application shall contain the same information as required by Rule 17. The application for a late permit shall be accompanied by a two hundred fifty dollar ($250) fee payable to the District.

17.3.2. If the late permit does not meet the requirements of this rule it will be considered an illegal well and must be properly abandoned and sealed.

17.4. Spacing of Water Wells – No water well requiring a permit under this rule shall be constructed within 600 feet of any other registered irrigation, domestic, livestock well, commercial or industrial well or any not-yet-constructed well(s) with a valid well permit, or within 3,000 feet of a public water supply well(s).

17.4.1. Spacing from a field boundary where a well is to be constructed should be at least one half (300 feet) the distance set forth in 17.4.

17.5. Replacement well spacing shall be constructed no more than 150 feet from the original well and must be located within the track of land to be irrigated.

17.5.1. If the replacement well is to be located greater than 150 feet from the original well and meets the requirements of 17.11. the well permits can be approved by the District Staff.

17.5.2. Replacement wells can only be constructed to pump equal to the gallons per minute as the well being replaced.

17.6. Illegal Water Wells are not protected by the provisions of this rule. The failure of a person to update water well registration information, ownership and irrigated acres records shall not jeopardize his/her well spacing protection provided under this rule unless: a.) the District determines that said person has knowingly attempted to deceive the District; b.) the well owner was notified by the District the water well was identified as unregistered and constructed after such date in which registration was required and said person failed to act in good faith to register the water well. If the well owner agrees to comply with registering the water well, the District will provide assistance as needed; c.) District determines that said person has failed to act in good faith in matters pertaining to these Rules and Regulations.

17.7. Commingling of Groundwater Well(s) and/or Surface Water.

17.7.1. Helper, supplemental, combined well(s) may be constructed subject to the following conditions:

17.7.1.1. A helper well application must be submitted with a non-refundable fee of one hundred dollars ($100.00). The application process may take up to one year to complete

17.7.1.2. A flow meter must be present to obtain the flow rate in gallons per minute of the well(s) supplying the system.

17.7.1.3. Flow rate in gallons per minute of well(s) supplying the system must be recorded by District staff monthly during growing season to establish an average flow rate of the system for a growing season.

17.7.1.4. Flow rates in gallons per minute averaging more than the University of Nebraska Gross System Capacity, gallons per minute per acre (gpm/ac) formula for soil type will not qualify for additional

helper/supplemental well. (Crop Watch, July 6, 2012, Irrigation Management with Limited Capacity or Water Allocations)

17.7.1.4.1. Gross System Capacity, gpm/ac = system flow rate (gpm) divided by acres irrigated (example 800 gpm/130 ac = 6.2 gpm/ac)

17.7.1.4.2. Net capacity 9 of 10 years (gallons per minute per acre) by soil type in region 1 which includes the entire geographic area within the geographical boundaries of the District in Holt, Boyd and Knox Counties. The gpm/ac by soil type are: Silt Loam – 3.9, Sandy Clay Loam – 4.1, Silty Clay Loam – 4.2, Silty Clay – 4.4, Sandy Loam – 4.5, Loamy Sand – 4.8, Fine Sand – 5.0. (list of soils of the District can be found in Appendix 7)

17.7.1.4.3. Net capacity 9 of 10 years (Gallons per minute per acre) by soil type in region 2 which includes the entire geographic area within the geographical boundaries of the District in Keya Paha and Rock Counties. The gpm/ac by soil type are: Silt Loam – 4.6, Sandy Clay Loam – 4.9, Silty Clay Loam – 5.1, Silty Clay – 5.1, Sandy Loam – 5.2, Loamy Sand – 5.4, Fine Sand – 5.9. (list of soils of the District can be found in Appendix 7)

17.7.1.5. The applicant will have the site evaluated by an independent hydrologic engineer to determine the effect of a new well on surrounding registered well(s).

17.7.1.6. The application meets all other requirements listed in this rule.

17.7.2. No comingled, combined or cluster of wells will be allowed to supply greater than the Gross System Capacity gpm/ac for the soil type irrigated by the system.

17.7.3. Spacing for commingled water wells: When water wells are commingled, combined, clustered, or joined and have a combined total capacity greater than fifty (50) gallons per minute, each water well shall comply with all provisions of Rule 17.4.

17.7.4. Request for a well spacing variance – Any person applying for a permit to construct a well that would violate any portion of Rule 17 may request a variance as outlined in Rule 20.

17.7.5. Commingling of Groundwater and Surface Water. Groundwater wells may be allowed to be added to surface water systems on a case by case basis. Applications for commingling groundwater and surface water can be made through the Variance Committee following the Rules set forth in Rule 20. In the alternative, the District may issue a groundwater well permit to landowners who desire to use groundwater on lands which have a surface water appropriation attached, provided the landowner has relinquished the surface water appropriation to offset or mitigate the groundwater use.

17.8. Application Information Required to Obtain a Groundwater Well Permit.

17.8.1. The application for a new groundwater well shall be accompanied by a non-refundable fifty-dollar ($50.00) filing fee payable to the District and shall contain the following information: a.) Name and post office address of the owner(s); b.) Intended use; c.) Intended location of the proposed groundwater well or other means of obtaining groundwater; d.) Intended size, type and description of the proposed groundwater well and the estimated depth; e.) Estimated capacity in gallons per minute; f.) Acreage and location of the land involved if the water is to be used for irrigation; g.) Description of the proposed use if other than for irrigation purposes; h.) Registration number of the water well being replaced if applicable; and i.) Such other information as the District requires.

17.8.2. Each application for a groundwater well permit must be accompanied with documentation that a test hole(s) was drilled to determine the likelihood of developing a satisfactory well before the well to be constructed is started. The following information regarding each test hole(s) shall be collected and submitted

to the District with the well application: a.) Geologic/lithologic log of materials encountered with depth; b.) Geographic coordinates of the test hole location; c.) Test hole must be drilled within 330 feet of the proposed well location as indicated on the well permit application; d.) Geologic/lithologic log must clearly detail the depth, color, thickness and size of material of the various geologic formations encountered and the measured depth to groundwater from the ground surface.

17.8.3. If the District finds the application for a permit or late permit is incomplete or needs corrections, it shall return the application to the applicant for any necessary corrections. Corrections must be made within sixty (60) days or the application will be cancelled. No refund of any application fees shall be made regardless of whether the permit is approved, canceled or denied.

17.9. Well Permit Application Review. District staff will review the applications received and compile all pertinent hydrogeologic data, information provided by the applicant and other information. The information will be brought to the Groundwater Management Committee for consideration where upon a recommendation will be made to approve, deny or table the application. The recommendation by the Committee will be brought before the entire Board for consideration. An application may be tabled until the next Board meeting if the Groundwater Management Committee and/or Board feels additional information is needed to make a decision or the application was received after 4:30 pm on the Thursday prior to the regularly scheduled monthly Board meeting the first Monday of each month.

17.10. Using the best data available to the District, including any information submitted by the applicant as part of the well permit application, evidence must show the proposed well has the ability to meet or exceed the flow volume included on the permit application and produce enough water to support the purpose shown on the permit application. Data must also show the well will not have a significant negative impact to the long term sustainability of the aquifer that serves as the primary source of water for the proposed well and the proposed well will not negatively impact the ability of pre-existing properly constructed, maintained and operated registered wells served by the same primary aquifer to operate in a reasonable manner. Permit applications meeting all the criteria set forth in this section shall be approved by the District and those failing to meet the criteria shall be denied or approved with conditions as established by the District.

17.11. The District has developed a standardized method for evaluating and ranking well permit applications based upon criteria set forth in the District's Well Permit Ranking System (See Appendix 6). The main criteria considered includes: a.) Thickness of primary aquifer formation; b.) Calculated transmissivity of the primary aquifer formation; c.) Well density of surrounding irrigation, domestic, livestock and public water supply wells; d.) Method of applying groundwater to land if the well permit application is for irrigation; and e.) All wells must meet a minimum score of 250 point to be considered.

17.12. Public water supply wells are subject to all requirements set forth by the Nebraska Department of Health and Human Services, as well as Sections 17.2 and 17.8.1.

17.13. No more than three irrigation groundwater wells will be approved to supply water to a single tract of land or to one irrigation system.

17.13.1. All wells supplying a system must be located within the track of land to be irrigated.

17.13.2. If a groundwater well cannot be located within the same track of land a variance can be applied for according to Rule 20.

17.14. Denial of a permit. An application for a permit or late permit for a groundwater well in a management area shall be denied only if the District finds: a.) Application fails to meet the criteria set forth in Rule 17; b.)

Location or operation of the proposed groundwater well or other work would conflict with any regulations or controls adopted by the District or of other applicable laws of the State of Nebraska; c.) Applicant refuses to agree to the terms in Rule 17.24 and 17.25; d.) Well permit application includes any intentionally misleading or falsified data; e.) Well permit application fails to meet a minimum ranking score established by the Board of Directors; f.) Proposed use would not be a beneficial use of water for domestic, agricultural, manufacturing or industrial purposes; g.) In the case of a late permit only, the applicant did not act in good faith in failing to obtain a timely permit; h.) All permits shall be issued with or without conditions attached and approved or denied not later than sixty (60) days after receipt by the District of a complete and properly prepared application.

17.15. Hydrogeologic evaluation required. Any person who intends to modify any existing groundwater well or construct any new, helper or replacement groundwater well with an annual withdrawal of groundwater greater than 500 acre-feet, such person shall, in addition to the information and requirements for the well permit application in Rule 17.2, 17.3 and 17.4, provide the District with a hydrogeologic evaluation illustrating the impact, if any, from the intended withdrawal on the static water level of the aquifer and on local groundwater users.

17.16. Construction/withdrawal prohibited – The NRD Board of Directors reserves the right to deny any well permit application under this Section based upon the following: a.) Proposed water well is shown by the hydrogeologic evaluation and/or other data and information to have a reasonable short or long-term probability of adversely impacting the local aquifer and surrounding groundwater wells with a higher preference of use; b.) Hydrogeologic evaluation does not conform with accepted methods, or the data used does not adequately represent actual hydrologic and/or hydrogeologic conditions; c.) No waivers of liability have been obtained or provided by the well permit applicant; d.) Construction of the water well or increased groundwater withdrawal would violate any other provisions of these Rules and Regulations; e.) Application fails to meet the minimum criteria set forth in this rule.

17.17. Groundwater withdrawal. For purposes of this rule, groundwater withdrawal shall mean the total groundwater pumped, less any water returned to the aquifer through an injection well within one thousand (1,000) feet of the source.

17.18. Operations that return water to the aquifer must provide the District with evidence of compliance with federal, state, and local rules and regulations governing such activities.

17.19. Waivers of liability. Waivers of liability obtained from potentially impacted groundwater users will be considered by the District when determining whether to grant or deny a water well permit.

17.20. Flow meter required. All new and replacement water wells designed and constructed to pump greater than 50 gallons per minute, or existing groundwater wells modified to pump greater than 50 gallons per minute, must be equipped with a flow meter prior to groundwater withdrawal if any of the following conditions are met: a.) New or replacement high capacity wells approved after March 1st, 2014; b.) Proposed or modified existing water well is located within a designated Phase II or Phase III Groundwater Quality Management Area or meets the requirements set for in Rule 22 Groundwater Management Controls; c.) Allocations as outlined by Rule 22 become effective; d.) Any person with an approved permit that owns or controls land upon which a groundwater well is proposed to be constructed or groundwater withdrawal increased as provided in Rule 17.7.

17.21. Exempt wells. No permit shall be required for: a.) Test holes or dewatering wells with an intended use of ninety days or less; or b.) Single water wells designed and constructed to pump fifty (50) gallons per minute or less.

17.22. Permit no exemption from liability. The issuance of a permit by the District, as provided for in this Rule, should not be construed by the applicant to exempt him/her from any liability which may result from the withdrawal of groundwater.
17.23. When a permit is approved – the applicant shall commence construction of the water well as soon as possible after the date of the permit approval. The applicant shall have one (1) year after the permit approval date to complete construction of the well. If the applicant fails to complete the well under the terms of the permit, the District will cancel the permit.
17.24. Within eighteen (18) months after the water well registration filing date with the Department of Natural Resources, the applicant agrees to allow District staff to: a.) Collect a GPS (global positioning satellite) location coordinate of said well; b.) Collect and analyze a water sample from said well, in order to establish a benchmark nitrate-nitrogen concentration; c.) Measure the pumping rate from said well under normal operating conditions; d.) Measure static water levels from said well in the spring and fall.
17.25. The applicant agrees to allow the District to add the approved well or wells to the District's observation well monitoring network for collecting static water level measurement data as deemed necessary.
17.26. A permit issued shall specify all regulations and controls adopted by the District relevant to the construction or utilization of the proposed water well. The District shall transmit one copy of each permit issued to the Department, the permit applicant and the identified well contractor.

18. TRANSFER OF GROUNDWATER: CERTIFIED IRRIGATED ACRES, TYPE OF GROUNDWATER USE, OR CHANGE

18.1. Groundwater users intending to withdraw and physically transfer groundwater, transfer certified irrigated acres, transfer the type of use, or add/change a type of use of groundwater within the Management Area shall, before making any such transfer, apply for and be approved for the transfer by the Board. All applications will go before the Groundwater Management Committee once all the required documentation listed in this Rule are provided to the Staff. The Committee will review the application(s) quarterly. At the next regular scheduled Board meeting the Committee will make a recommendation to the Board to approve or deny the application.
18.2. The withdrawal and transfer of groundwater for domestic purposes is subject to Neb. Rev. Stat. § 46-691.01, and as such, will not be subject to Groundwater Transfer Rules.
18.3. The withdrawal and transfer of groundwater within the District solely for the purpose of providing water to range livestock will not be subject to Groundwater Transfer Rules.
18.4. Permanent or temporary (one time) transfers may occur only if the following conditions are met: a.) All transfers of groundwater or use must occur within the same Hydrogeologic Unit Code as defined by the United State Geologic Service (USGS) (Appendix 8) where the groundwater was originally withdrawn; b.) All transfers of certified irrigated acres must occur within the same Hydrogeologic Unit Code as defined by the United State Geologic Service (USGS) (Appendix 8) where the acres were originally certified; c.) Transfers may not occur in any sub-district or basin determined by the Board of Directors to be undergoing significant groundwater declines; d.) Transfers may not occur in any area the Board has determined to have groundwater quality issues; and e.) All transfers of groundwater use or acres must not be transferred to a section designated with a higher stream depletion factor in accordance with the best available data to the District.
18.5. Agricultural Transfers: After the effective date of these Rules, an agricultural user intending to withdraw and physically transfer groundwater off of the overlying land which he/she controls or transfer the certified irrigated acres shall, before making such transfer, apply for and be subject to Board approval for the transfer.

18.5.1. Agricultural transfers shall not exceed the historic consumptive use and/or the certified irrigated acres.

18.5.2. Agricultural transfers exceeding the historic consumptive use and/or the certified acres will require a variance from the District along with a specified offset for the increased consumptive use portion of the transfer.

18.5.3. Transfers may not occur in any sub-basin determined by the Board of Directors to be undergoing significant groundwater declines.

18.5.4. Transfers may not occur in any area that the Board has determined to have groundwater quality issues.

18.5.5. No transfers of groundwater use or acres will be transferred to a section designated with a higher stream depletion factor in accordance the best available data to the District.

18.5.6. The permanent transfer of certified irrigated acres may be accomplished by either decommissioning the well(s) or modifying it into a well(s) pumping fifty (50) gallons per minute or less: a.) If decommissioning the well a notice of abandonment form must be filed with the Department; b.) If modifying the well(s), a modification form must be filed with the Department.

18.5.7. The person transferring the acres must decertify the irrigated acres with the District, and the person to whom the acres are to be transferred must certify the acres to be irrigated with the District.

18.5.8. Transfers of certified irrigated acres off of land that is also served by surface water will not be permitted unless the surface water appropriation is relinquished for that parcel of land or an offset is provided to the District for the new acres to be irrigated.

18.6. Transfers of Type of Use: Any person who withdraws groundwater from a well located within the District and transfers the type of use of that water (e.g. irrigation to industrial) or adds a type of use of groundwater to the well (e.g. adds an industrial use to an existing irrigation well), shall apply for a transfer permit on forms provided by the District and before commencing the transfer, be granted a transfer permit.

18.6.1. No change in the type of use of groundwater shall be approved unless such change results in no increase in the historical consumptive use of the groundwater to be transferred or an offset is provided for any increase in historical consumptive use.

18.6.2. No transfer will be approved if the water use moves to another Section with a higher stream depletion factor as determined the best available data to the District.

18.6.3. No person shall use a groundwater well for purposes other than its registered purpose or until the groundwater well registration has been changed to the intended new use or the additional use has been added to the registration.

18.6.4. In the case of a replacement well, a person may modify and equip the original groundwater well to be used for range livestock, monitoring, observation, or any other non-consumptive or de minims use approved by the District.

18.6.5. The change to a new use or the addition of a use shall be made by filing a groundwater well registration modification with the Department and the change must be in conformance with Neb. Rev. Stat. §§ 46-609(1) and 46-651.

18.7. Municipal Transfer Permits: The District shall approve, without the filing of a District transfer permit application, the withdrawal and transport of groundwater when a public water supplier providing water for municipal purposes, so long as that water supplier submits a notification of permit application to the District. If

a public water supplier files an application for a permit from the Department under the Municipal and Rural Domestic Ground Water Transfers Permit Act, the permit applicant shall advise the District of its filing.

18.7.1. Any variance approved by the Board for the public water supplier at any time before or during the permitting process shall be forwarded to the Department. Any condition of the variance approval shall be clearly stated, along with monitoring and/or compliance provisions.

18.7.2. When the Department initiates the consultation with the District regarding a permit application, the District shall advise the Department of any of the applicant's unmet obligations under District Rules (e.g. variance not yet applied for or granted)

18.8. Industrial Transfer Permits: Transfers for which permits or approval for transfer have been obtained pursuant to the Industrial Groundwater Regulatory Act are not required to apply for a transfer permit from the District. Commercial and Industrial users who are required to file for a permit from the Department under the Industrial Groundwater Regulatory Act shall advise the District of such application.

18.8.1. Any variance approved by the Board for the user at any time before or during the permitting process shall be forwarded to the Department. Any condition of the variance approval shall be clearly stated, along with monitoring and/or compliance provisions.

18.8.2. When the Department initiates the consultation with the District regarding a permit application, the District shall advise the Department of any of the applicant's unmet obligations under District Rules (e.g. variance not yet applied for or granted).

18.8.3. A water well construction permit shall not be issued until the industrial transfer permit has been obtained from the Department and a copy of the permit is on file with the District.

18.9. Transfer Out of District: Requests for transfer of groundwater out of the District pursuant to Neb. Rev. Stat. § 46-613.01 shall require District action to approve or deny the transfer request prior to submission of the required transfer permit application to the Department.

18.9.1. When the Department initiates the consultation with the District regarding a permit application, the District shall respond according to the following provisions: a.) District shall advise the Department of any of the applicant's unmet obligations under District rules (e.g., variance not yet applied for or granted); b.) Any formal action taken by the Board adopting any offset determined by the Department or the District to be necessary to maintain compliance with any formal agreement or to mitigate any effects to surrounding groundwater users or surface water appropriators for uses other than municipal or industrial/commercial; c.) If the District determines an offset on behalf of the user, the nature of the offset and of the enforcement provisions that will be required; d.) Groundwater well construction permit shall not be issued until a permit to transfer groundwater to an adjoining District has been obtained from the Department and a copy of the permit is on file with the original District.

18.9.2. Application for and Approval of Transfers: In accordance with Neb. Rev. Stat. § 46-739(k) the District may deny or condition its approval of any transfers to the extent such conditions are necessary to: a.) Ensure the consistency of the transfer with the purpose or purposes for which the management area or sub-district was designated; b.) Prevent adverse effects on other groundwater users or on surface water appropriators; c.) Prevent adverse effects on the state's ability to comply with an interstate compact or decree or to fulfill the provisions of any other formal state contract or agreement; and d.) Otherwise protect the public interest and prevent detriment to the public welfare.

18.9.3. In making its decision regarding a transfer application, the Board may consider relevant information, including but not limited to: a.) Information obtained from studies within the sub-district; b.) Whether the proposed use is a beneficial use of groundwater; c.) Alternative sources of surface water or groundwater available to the applicant for the proposed withdrawal, transport, and use; d.) Any negative effect of the proposed withdrawal, transfer and use on groundwater or surface water supplies needed to meet reasonable future demands for water within the State; e.) Groundwater quality of the area being transferred to; f.) Whether the proposed withdrawal, transfer, and use is consistent with the goals and objectives of the integrated management plan; g.) Trends in the change of groundwater levels in the sub-basin; h.) Other transfers into the area in proximity to the well proposed to be used; i.) Total usage in proximity to the well proposed to be used; and j.) Other factors that would increase the rate of consumptive use in the area of the well proposed to be used.

18.10. An application for a transfer shall include, but not be limited to the following: a.) Names and addresses for each landowner involved in the proposed transfer and the name and address of the operator if different than the landowner; b.) Legal description of the land involved in the proposed transfer along with well registration numbers of all wells proposed to be used; c.) Nature of the proposed use, including whether the transfer is temporary or permanent; d.) Current rate of withdrawal from all wells proposed to be used and the maximum proposed amount of withdrawal from the source well; e.) Identification of any other alternative sources of surface water or groundwater available to the applicant for the proposed use and the reasons why use of such alternative source or sources are not being sought; f.) Proof of ownership from the FSA or County Assessor for each certified acre to be involved in the transfer request; g.) An assessment of the effects of the proposed withdrawal, transfer, and use on existing groundwater users, on existing surface water appropriators, and on groundwater and surface water supplies needed to meet present or reasonable future demands within the State; h.) Assessment of the effects of the proposed withdrawal, transfer, and use on the environment in the vicinity of the proposed withdrawal and proposed use; i.) Any other information the applicant deems relevant to the District's criteria for approval of the proposed withdrawal, transfer, and use; j.) Signatures from all of the landowners involved; k.) Aerial photograph(s) showing all certified acres involved in the transfer.

18.11. Nothing contained in Groundwater Transfer Rules is intended or shall be construed as: a.) Permitting the development of any new well with adequate offset; b.) Prohibiting a person from pursuing a variance from these Rules and Regulations.

19. FLOW METERS

19.1. Water Well Permit Condition for Requiring Flow Meters on Wells. The District Board of Directors recognizes the need for improved groundwater use data throughout the District. Therefore, except as specified in Section 19.2.1, as a condition of District approved well permits, and as described in this Rule the proper installation and maintenance of flow meters shall be required on wells constructed within the District; the reporting of data from these flow meters shall be required from ground water users; and, finally, District staff and/or their representatives shall be authorized to perform inspections of these flow meters. [Neb. Rev. Stat. §46-707 (2) and (3)]

19.2. Flow Meters Required on Wells. This section describes the situations under which the District will or will not require flow meters on water wells. Local, state and federal requirements for flow meters may differ from District requirements.

19.2.1. Any water well permit issued by the District on or after March 1 2014, shall include a condition requiring the owner to equip the well(s) with a District approved flow meter prior to groundwater

withdrawal, except for the following: a.)Inactive Status Well – a flow meter shall not be required for any water well that is registered with the Nebraska Department of Natural Resources as an 'inactive' status well. A flow meter shall be required when the registration of a water well with the Department is modified from 'inactive' to 'active' status. b.) Combined Wells – groundwater withdrawals from water wells that are connected by a common pipeline may be measured by one flow meter provided the total groundwater withdrawal is measured.

19.3. Groundwater User Responsible for Flow Meter Care. It shall be the duty of groundwater users to ensure that each flow meter installed to comply with this Rule is fully functional, properly maintained and in good working condition.

19.4. Maintain Flow Meter Integrity. It shall be a violation of these Rules and Regulations for any person to willfully damage, alter, remove, reset, adjust, manipulate, obstruct, or in any manner interfere with or tamper with any flow meter required under this Rule for the purpose or with the intent of producing an incorrect, inaccurate or misleading measurement, or to cause, procure or direct any other person to do so.

19.5. Sealing of Flow Meters. Flow meters installed to comply with this Rule may be sealed by the District to discourage/prevent tampering. Such a seal may not be removed without written approval of the District, except that written permission shall not be required prior to breaking such seal for the emergency situation in which a malfunctioning flow meter prevents a groundwater user from being able to use their well for its intended beneficial use, and the District seal must be broken in order to correct the emergency situation, if the groundwater user has made a good faith effort to contact the District, but cannot do so. Any groundwater user who breaks the District's seal under the emergency situation described above must inform the District in writing within five (5) working days of breaking such seal.

19.6. Flow Meter Inspection. Flow meters installed to comply with this Rule 19 may be periodically inspected by District staff or their representative for proper readings and operation. The District shall provide landowners written notification of this inspection. The District will have 30 days from the postmarked date of this notification to perform the inspection, and shall report the results of the inspection to the landowner. It is the intent of the Board that a reasonable attempt be made to contact a landowner to schedule this inspection or any other inspection performed pursuant to Rule 19 of these Rules and Regulations.

19.7. Flow Meter Specifications and Installation Requirements. Any flow meter installed to comply with these Rules must be selected from a list approved by the District, and must meet or exceed the following minimum specifications, except for public water supply wells regulated under the Nebraska Department of Health and Human Services Title 179, Chapter 22:

19.7.1. List of Approved Flow Meters. The District will maintain a list of flow meter models and/or brands that are approved for use in the District for the purposes of this Rule that meet or exceed the following specifications. This list may be viewed in the District Office at 410 Walnut Street, Butte, NE. This list may be updated periodically by the District.

19.7.2. Written Installation, Operation and Maintenance Procedures. The meter manufacturer must have detailed written instructions for the installation and operation of the flow meter and for the frequency and methods for maintaining the flow meter.

19.7.3. Accuracy. Flow meters must be accurate to within plus-or-minus two percent (+/-2%) of the flow meter reading.

19.7.4. Flow Meter Display. Total Volume of Flow (Totalizer), acre-inches. Flow meters shall have a clearly readable indicator to record and display the total volume of groundwater withdrawal, which shall measure in units of acre-inches, and shall clearly and visibly display any multiplier needed to convert the meter reading to the correct total volume of groundwater withdrawal. The totalizer shall be non-resettable.

19.7.5. Totalizer Recording Capacity. Each flow meter totalizer shall have sufficient range to record the Lower Niobrara Natural Resources District Proposed Quantity Subarea total volume of water expected to be withdrawn over at least a one year period.

19.7.6. Flow Meter Sizing. Flow meters shall be installed and calibrated to pipe size so the expected flow rate and pressure are within the manufacturer's design parameters for the flow meter. The meter size, serial number and the direction of flow shall be clearly stamped on the body of the meter. The inside pipe diameter for which the meter has been calibrated shall be clearly shown on the meter to the nearest 0.001 of an inch.

19.7.7. Protection from Elements. Flow meters, especially the register and meterhead, shall be protected from the weather, livestock, and other potential sources of damage to the meter.

19.7.8. Installation. Flow meters and any appurtenances shall be installed according to the manufacturer's specifications to ensure accurate operation. Flow meters shall be positioned so there is a length of pipe upstream of the flow meter that is no less than the equivalent of five (5) pipe diameters from any valve, elbow, or any other source of turbulent flow, or as recommended by the manufacturer. There shall also be unobstructed flow for a length of pipe downstream of the flow meter that is equal to at least one (1) pipe diameter. The flow meter shall also be placed in such a manner the pipe, including the flow meter and the necessary upstream and downstream lengths of pipe, will have a full flow of water.

19.7.9. Reporting Flow Meter Installation. Groundwater users shall report the installation of a flow meter to the District, on a form provided by the District, within 30 days of installation of the flow meter.

19.7.10. District Inspection and Report. District shall inspect flow meters for proper installation and operation. The District shall perform this inspection within 30 days of receiving a report of installation without written notice to the landowner. The District shall report the results of the inspection, including any corrections required for proper installation of the flow meter, to the landowner.

19.7.11. Flow Meter Maintenance and Repair. Groundwater users shall ensure the good working condition of flow meters, and shall be responsible for maintenance of flow meters and for repair or replacement of a malfunctioning or improperly installed flow meters.

19.7.12. Maintenance Schedule. Flow meter maintenance shall be scheduled and performed according to the manufacturer's recommendations.

19.7.13. Operating Conditions. Each flow meter shall be kept in good working condition and clear of debris and other material or objects that could interfere with the inspection, operation, and performance of the flow meter.

19.7.14. Malfunctioning Flow Meter. Any malfunctioning flow meter must be reported to the District within five (5) working days following its discovery. The groundwater user shall report to the District the totalizer reading before repairing the meter on-site or removing the flow meter for repair on a form provided by the District. The District shall provide written notice the report was received.

19.7.15. Flow Measurement While Meter is Being Repaired. District may provide a temporary flow meter, if the District has suitable equipment available, or some other means of measuring groundwater withdrawal while a flow meter is being repaired.

19.7.16. Certification of Flow Meter Repair. Persons or companies that repair and/or calibrate any flow meter installed under these Rules and Regulations shall certify in writing the repaired or calibrated flow meter meets the manufacturer's original specifications, and the groundwater user shall provide the District with a copy of that certification. The District shall provide written notice the certification was received.

19.8. Reports. Groundwater users shall annually submit a report of groundwater withdrawal to the District on a form provided by the District. The report must be postmarked or otherwise submitted to the District by March 15th of the following year. If March 15th is a non-business day, the report must be postmarked by the next following business day. Operators in a Phase II area can meet this requirement by submitting a Phase II report in compliance with Rule 14.6.2. Failure to properly install and maintain a flow meter, to provide the necessary reports to the District or to comply with the other provisions of this Rule 19 shall be a violation of these Rules and Regulations.

20. VARIANCES

20.1. The Board of Directors may grant variances from the strict application of these Rules and Regulations upon good cause shown.

20.2. An application for a variance shall be made on forms provided by the District and the application will be acted upon by the Variance Committee. The applicant or his/her representative shall be present at the Variance Committee meeting. With prior notification to the District, written testimony may be provided if the applicant cannot be present.

20.3. An applicant shall pay a non-refundable variance application fee of $300.00 due at the time of making application prior to meeting with the committee.

20.4. The 7-member Variance Committee shall meet~~s~~ with all individuals who request a variance from the Rules and Regulations of the Board. The Committee shall report~~s~~ its recommendations on variance applications to the Board at the next regular scheduled Board meeting for Board action.

20.4.1. The Manager will distribute all information concerning the variance application to the Committee, all other Board members, and person(s) requesting the variance.

20.4.2. The Manager will set the time to hear the variance request with the Committee.

20.4.3. The Board, at its discretion, may designate conditions under which specific requests for a variance may be approved by methods other than the Variance Committee process. A variance granted under these conditions shall be referred to as an "expedited variance.

20.5. An expedited variance shall be applied for using forms provided by the District. An expedited variance may be granted by the Variance Committee upon approval of the Board, or their designated representative, for the purpose of approving an expedited variance for: (currently there are no expedited variance)

21. USE OF LAGOON WATER FOR IRRIGATION

21.1. Lagoon water may be applied through an irrigation system to acres not certified to groundwater or surface water when:

21.1.1. There is a significant weather rain event that puts the lagoon at a point of water elevation that jeopardizes the integrity of the structure or puts it to a must-pump status according to their Nutrient Management Plan filed with the Nebraska Department of Environmental Quality; and

21.1.2. The total application of lagoon water is less than 3 acre-inches per acre per year to a field; and

21.1.3. A map indicating the amount of acres and location of those acres is on file with the District; and

21.1.4. Proper management of the lagoon has been followed according to the Nutrient Management Plan filed with the Nebraska Department of Environmental Quality; and

21.1.5. The District has been notified prior to operation and agrees the requirements of these Rules have been met.

21.2. Concern not covered in 21.1 can be brought before the District Variance Committee for resolution.

22. GROUNDWATER MANAGEMENT CONTROLS

22.1. The District has established triggering mechanisms for groundwater quantity protection. These triggers are activated when certain conditions are detected by the NRD Groundwater Quantity Monitoring Program. The triggers are intended to be protective measures that will initiate actions before serious problems occur. Once a trigger is activated, the District will begin a series of actions including the delineation of sub-areas, called Action Levels, and establish controls, including the required use of Best Management Practices, to protect groundwater supplies or remediate existing problems.

22.2. Triggers for groundwater quantity protection consist of several phases, called action levels, which respond to worsening conditions with increasingly rigorous corrective measures. Each action level has its own triggering mechanism, so that changing conditions will trigger new action levels.

22.3. Flexibility has been built into the triggers and action levels because of the complex hydrogeology of the District. The current triggers and actions are used for the entire District, which may be too protective in some areas and may under-protect other areas. As our knowledge of the District's hydrogeology increases, the triggering mechanisms and actions will be 'fine-tuned' to improve the effectiveness of our groundwater quantity protection efforts. The District will develop unique triggers and actions for different regions of the District as more local hydrogeologic information becomes available.

22.4. Emergency action can be taken by the Board in the event the water supply does not meet the requirements set forth in 2.2. These actions may include, but are not limited to: a.) Meet with all affected users and/or landowners in the area or sub-basin; b.) Establish extent of area or sub-basin affected; c.) Mitigate workable solutions; d.) Establish short term allocations for all users in affected area or sub-basin; e.) Other actions needed to mitigate a solution.

22.5. Action Level 1 Sub-Areas will require the District to increase educational efforts in the area, form a local Citizen's Advisory Committee, and conduct a study to determine the extent of the problem. Action Levels 2 and 3 will require groundwater users to perform certain actions.

22.6. Prior to the formation of an Action Level 2 or 3 Sub-Area, the District will amend these Rules and Regulations as needed, and will hold at least one (1) public hearing to consider adopting the amendments and to consider the formation of the Sub-Area as required by law.

22.7. The following criteria and controls will be used to trigger, delineate, and treat Action Level Sub-Areas:

22.8. Action Level 1**:** The District will initiate the following actions when, in 2 years out of any 3 year period, the spring groundwater level of any well(s) in the routine Groundwater Quantity Monitoring Program drops 5% of the average saturated thickness of the primary aquifer of a Sub-Area or District average from the spring average levels of 1995. When this trigger is actuated, the NRD will take the following actions:

22.8.1. Intensify educational efforts in the area including, but not limited to, information concerning: a.) Groundwater conservation practices; b.) Potential regulatory actions of the 2nd and 3rd Action Levels (see below); c.) Form a local Citizen's Advisory Committee; d.) Increase the number of wells monitored in the area to determine the extent of the problem, to serve as a basis for triggering Action Level 2, and to obtain the hydrogeologic information necessary to delineate an Action Level 2 sub-area. The intensified monitoring program described below applies to the entire District. The actual monitoring program for each problem area may vary according to the local hydrogeologic characteristics of the area.

22.8.2. The District will determine a rudimentary area to be monitored. The shape and size of the area may change as more information is gathered. A minimum area of 9 square miles will be monitored.

22.8.3. The minimum number of monitoring sites will be 50% of the number of registered irrigation wells in the area that are suitable for use as groundwater level observation wells (taking into account criteria such as quality of well construction and screened intervals). The District will also consider using registered industrial, livestock, monitoring, observation, public water supply, and domestic wells that would be suitable as monitoring sites.

22.8.4. The intensified monitoring will begin no later than the spring after the trigger was actuated for Action Level 1.

22.8.5. Determine the necessary control measures, Rules and Regulations for Action Levels 2 and 3.

22.9. Action Level 2**:** An area will be placed into Action Level 2 when the spring groundwater levels in 80% of the wells monitored in the intensified monitoring program conducted in Action Level 1 drop 5% of the average saturated thickness of the primary aquifer of a Sub-Area or District average from the spring average levels of 1995 in those wells for 3 years out of any 4 year period of time. The area affected by this drop must be a minimum of 9 square miles in size.

22.9.1. The District will actively seek public opinion while amending the Rules and Regulations for the Sub-Area. Information from Action Level 1 will be utilized in amending the Rules and Regulations. Prior to the formation of an Action Level 2 Sub-Area, the District will hold at least one (1) public hearing to consider the adoption of the amendments and the formation of the sub-area as required by law.

22.9.2. The District shall require volume metering of wells used for any one or more of the following categories of groundwater use: municipal, agricultural, manufacturing, commercial, or industrial. The District will also require owners of these wells to submit to the District an annual report of the amount of water pumped.

22.9.3. Additionally, the District will choose at least one of the following authorized controls: a.) Allocate groundwater withdrawal on an acre-inch basis, specifying the total number of acre-inches of irrigation water per irrigated acre per year or an average number of acre-inches of irrigation water per irrigated acre over any reasonable period of time not to exceed five years; b.) Adopt a system of rotation of use of groundwater by utilizing a recurring series of use and nonuse of irrigation wells on an hourly, daily, weekly, monthly basis or yearly basis; c.) Adopt well spacing requirements more restrictive than statutory well spacing requirements; c.) Require the reduction of irrigated acres, where the nonuse of irrigated acres will be a uniform percentage reduction of each landowner's irrigated acres; d.) Require irrigation scheduling; e.) Adopt other reasonable regulations to protect the quantity of groundwater in the Sub-Area; f.) District will also continue the educational efforts and the groundwater level monitoring of Action Level 1.

22.10. Action Level 3: An area will be placed in Action Level 3 when the spring groundwater levels in 80% of the wells monitored in Action Level 2 drop 10% of the average saturated thickness of the primary aquifer of a Sub-Area or District average from the spring average levels of 1995 in those wells for 3 years out of any 4 year period of time. The area affected must be a minimum of 9 square miles in size. The District may also declare an Action Level 3 when the Director of the Department makes a final determination that all or part of the District is fully appropriated under Neb. Rev. Stat. § 46-713.

22.10.1. Prior to the formation of an Action Level 3 sub-area, the District will hold at least one (1) public hearing to consider the adoption of any amendments to the Rules and Regulations and the formation of the sub-area as required by law.

22.11. In addition to the controls of Action Level 2, the District may require any of the following controls for an Action Level 3 sub area: a.) Require the use of tensiometers, soil moisture blocks, or other irrigation scheduling devices; b.) Require annual reports with water level measurements and quantifying the total withdrawal from wells; c.) Close the area to the issuance of any additional new well permits for a period of one (1) year; d.) District will also continue the educational efforts and the groundwater level monitoring of the first two Action Levels.

23. WATER BANKING

23.1. The District will develop water banking Rules and Regulations when the opportunity arises for the District to have available water from the retired certified acres or retired surface water allocation.

24. CHEMIGATION

24.1. Authority: These rules and regulations are adopted pursuant to the authority granted in Neb. Rev. Stat. §§46-701-754, the Nebraska Ground Water Management and Protection Act, and Neb. Rev. Stat. §§46-1101-1148, the Nebraska Chemigation Act.

24.2. Definitions:

24.2.1.1. Applicator shall mean any person engaged in the application of chemicals by means of chemigation. Applicator shall include any person operating equipment used for chemigation whether for himself or herself or on behalf of the permit holder for the land on which the chemigation will take place.

24.2.1.2. Chemical shall mean any fertilizer, herbicide, or pesticide mixed with the water supply.

24.2.1.3. Chemigation shall mean any process whereby chemicals are applied to land or crops in or with water through an on farm irrigation distribution system.

24.2.1.4. Council shall mean the Environmental Quality Council.

24.2.1.5. Department shall mean the Department of Environmental Quality.

24.2.1.6. Director shall mean the Director of Environmental Quality.
24.2.1.7. District shall mean Lower Niobrara Natural Resources District
24.2.1.8. Fertilizer shall mean any formulation or product used as a plant nutrient which is intended to promote plant growth and contains one or more plant nutrients recognized by the Association of American Plant Food Control Officials in its official publication.
24.2.1.9. Injection location shall mean each site where chemicals will be applied through an irrigation distribution system.
24.2.1.10. Irrigation distribution system shall mean any device or combination of devices having a hose, pipe, or other conduit, which connects directly to any source of ground or surface water, through which water or a mixture of water and chemicals is drawn and applied for agricultural or horticultural purposes. Irrigation distribution system shall not include any hand-held hose sprayer or other similar device which is constructed so that an interruption in water flow automatically prevents any backflow to the water source.
24.2.1.11. Open discharge system shall mean a system in which the water is pumped or diverted directly into a ditch or canal in such a manner that the force of gravity at the point of discharge into the ditch or canal cannot cause water to flow back to the point from which the water was pumped or diverted.
24.2.1.12. Permit holder shall mean the owner or operator of land who applies or authorizes the application of chemicals to such land by means of chemigation. The permit holder shall be the party primarily responsible for any liability arising from chemigation on the property.
24.2.1.13. Pesticide shall mean any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, insect, rodent, nematode, fungus, weed, or other form of plant or animal life or virus, except viruses on or in living humans or animals, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.
24.2.1.14. Restricted Use Pesticide shall mean those determined by the Council, Department of Natural Resources, or the EPA safe for application only when applied by or under the direct supervision of trained and certified applicators.
24.2.1.15. Working day shall mean Monday through Friday but shall not include Saturday, Sunday, or a federal or state holiday. In computing two working days, the day of receipt of the permit is not included and the last day of the two working days is included.

24.3. Chemigation Application:

24.3.1. No person may chemigate land or crops unless such person obtains authorization, via permit, from the District.
24.3.2. No permit is required to pump or divert water to or through an open discharge system.
24.3.3. Each injection location must be permitted on an annual basis, using forms provided by the District.
24.3.4. Each permit expires on June 1 of each year, and the permit holder is solely responsible for renewal.
24.3.5. An application for a chemigation permit shall be considered received by the District on the date it is either hand delivered or received by mail, so long as the application is properly completed as per Nebraska Administrative Code Title 195, signed by the permit holder, and the permit holder has paid the requisite fee (see Section 24.10: Chemigation Permit Fee Schedule).
24.3.6. Any incomplete, unsigned, or unpaid applications will be returned to the applicant.
24.3.7. Required information includes: a.) Name; b.) Complete address; c.) Phone number (residence or cell); d.) Legal description; e.) Type of permit; f.) Type of injection unit; g.) Certified Chemigation Applicator including; name, certification number and expiration date; h.) Signature of Certified Applicator if different from name on application; i.) Fertilizer name or formulation including total amount applied (if applied through system); j.) Pesticide name and total amount applied (if applied through the system); k.) Total number of acres treated (if a renewal permit); l.) Signature of permit applicant and date.

24.4. Certification:

24.4.1. Pursuant to Title 195, Chapter 13, Nebraska Department of Environmental Quality, all chemigation applicators must undergo and maintain certification. Training programs shall be offered through the University of Nebraska Cooperative Extension Service. The director shall issue a certificate acknowledging the competency, determined through the use of a written examination prepared and administered by the department. Each applicator's certificate, shall be valid for a period of four years, and shall expire on January 1 of the fourth year after the date of issuance.

24.5. Original Permit Process:

24.5.1. The District shall review each completed permit application, conduct an inspection, and approve or deny the application within 45 days after the application is filed.

24.5.2. No chemigation permit, except a Special permit, shall be issued or renewed by the district, if any of the following conditions occur: a.) The applicant has failed to provide the required information, as specified in Title 195, Chapter 2, 002, Nebraska Department of Environmental Quality on the application form; b.) The irrigation distribution system does not comply with the equipment standards set forth in Title 195, Chapters 9 and 10, Nebraska Department of Environmental Quality; c.) The applicator has not been certified as a chemigation applicator by the Department; or d.) Failure of the applicant to remit the appropriate fee

24.5.3. Changes in application information shall be provided to the District within 10 days.

24.6. Renewal Process:

24.6.1. All permits must be renewed annually. If a renewal form has not been completed and filed with the requisite fee (see Section 24.10: Chemigation Permit Fee Schedule), the permit shall not be renewed without filing an original application. Since permits expire on June 1, all renewable applications must be on file with the District by June 1. Each application for renewal is subject to inspection of equipment and site to determine compliance with the Chemigation Act and these rules and regulations. If an inspection reveals noncompliance, renewal shall be refused, suspended, or revoked until compliance is achieved, as determined by the District. Under no circumstances may a permit be transferred.

24.6.1.1. All renewals will be inspected every other year: a.) Renewals in even ranges (6,8,10,12,14,16,18,20,22) will be inspected in odd number years (example 2013), b.) Renewals in odd ranges (7,9,11,13,15,17,19,21)will be inspected in even number years (example 2014).

24.6.1.2. If the system failed the inspection the previous year and not re-inspected it will be considered the same as a new permit

24.7. Special Permits:

24.7.1. If the chemigation system does not need all the safety equipment, as determined by District inspection, the District shall forward such information to the Department for review. If the Department agrees with the District's inspection, the Department shall grant the District authority to issue a special permit.

24.8. Emergency Chemigation Permit Approval:

24.8.1. A person may file an application for an emergency permit as established in Title 195, Chapter 6, Nebraska Department of Environmental Quality. The District shall have two working days to review the permit before issuing or denying. "Two working days" shall mean Monday through Friday, but does not include Saturday, Sunday, or a federal or state holiday. The day the District receives the permit application is not included in the two working days. On the second working day, the District shall complete its review and either issue or deny the permit. If the District has not denied the permit within two working days, the permit shall be deemed issued.

24.8.2. Emergency permits shall be valid for a period of forty five (45) days from the date of issuance. Any holder of an emergency permit or an applicator applying chemicals pursuant thereto who violates any of the provisions of the Nebraska Chemigation Act or standards, rules and regulations adopted under it,

shall have such permit automatically revoked by the district or the Department, without a hearing and shall be guilty of a Class II misdemeanor

24.9. Permit Revocation:

24.9.1. The District shall suspend any and all permitted chemigation systems if there is an actual or imminent threat of danger to the public or environment due to the operation of the chemigation system.

24.9.2. The District shall suspend or deny any and all permits if: a permit was obtained fraudulently; a permit holder fails to notify the district of equipment replacement or alteration within seventy-two hours; Applicator or permit holder fails to notify the District and Department of actual or suspected spill or accident within 24 hours; Permit holder fails to carry out cleanup measures developed by the Department within the time specified.

24.9.3. Should a violation of the Nebraska Chemigation Act or rules and regulations promulgated pursuant to the Act occur, the District shall notify the person in violation. a.) The violator has 10 days to remedy the violation or request a hearing before the District's Board of Directors; b.) If the violation has not been corrected in the 10-day period, the District shall notify the Department of the violation; c.) If after a preliminary investigation, the Department determines there is a violation, then the person's permit shall be revoked until compliance is met; d.) For systems operated by a permit holder, the District may, but shall not be required to, establish a compliance schedule in lieu of the 10-day compliance deadline.

24.10. Chemigation Permit Fee Schedule:

24.10.1. As required by Title 195, Chapter 3, Nebraska Department of Environmental Quality, the District shall review applications, conduct inspects, and approve or deny permits. No permit may be approved without payment of the requisite permit fee, which shall reflect the cost of administration and inspections.

24.10.1.1. An original application fee of $40.00 (not to exceed $150) for each new permit shall be paid to the District, of which $5.00 shall be paid to the Department of Environmental Quality.

24.10.1.2. A new special permit application fee of $40.00 (not to exceed $150) shall be paid to the District, of which $5.00 shall be paid to the Department of Environmental Quality.

24.10.1.3. The special permit renewal and annual renewal fee of $20.00 (not to exceed $100) shall be paid to the District, of which $2.00 shall be paid to the Department of Environmental Quality.

24.10.1.4. An emergency permit application fee of $100.00 (not to exceed $500) shall be paid to the District, of which $10.00 shall be paid to the Department of Environmental Quality.

24.11. Inspections:

24.11.1. District and Department employees shall have reasonable access to inspect all chemigation systems and to otherwise carry out their duties pursuant to the Act; specifically, Neb. Rev. Stat. § 46-1124. The District shall conduct an inspection of each injection location for which the permit is sought in order to ensure compliance with the equipment standards set forth herein and in Title 195, Chapters 9 and 10, Nebraska Department of Environmental Quality.

24.11.2. The District shall conduct an inspection of replaced or altered equipment and shall approve the continuance of chemigation so long as the inspected equipment is deemed to be in compliance with the Act. The District shall not collect a new fee for an inspection of previously approved injection locations.

24.11.3. Timing of inspections: a.) Inspections for original applications shall be conducted within 45 days of filing, b.) Inspections for special permits shall be conducted prior to permit renewal, c.) Inspections for an emergency permit shall be conducted during the 45 day effective period if no inspection was conducted prior to the permit issuance, d.) The District has the right to inspect any location up for renewal to determine compliance. Should an inspection determine noncompliance with the Act, the District shall refuse the application until compliance with the Act is demonstrated.

24.11.3.1. The District will contact the operator to confirm an inspection appointment.

24.11.3.2. The operator must be present to start and stop the system (District personnel will not start or stop any systems).

24.11.3.3. The District inspector will use the following procedures for inspection: a.) Visiually check to determine if all the required equipment is in the proper location; b.) With the operators assistance remove the chemical injection valve and test to determine it holds at least 10 psi and replace in system; c.) Operator will start the system and bring it to normal operating pressure; d.) District inspector will check low pressure drain for proper operation; e.) Operator will shut down the system; f.) District inspector with the operators assistance will remove the inspection port to determine if the mainline check valve is functioning properly; g.) District inspector will determine if the irrigation pump and chemigation pump are interlocked (It will be the operators responsibility to make any electrical connections to prove the interlock system); h.) The District inspector will deny the permit if any of the requirements are not met.

24.11.4. The District will investigate all systems which have been reported to the District to confirm if they are chemigating and/or set-up to chemigate.

24.11.5. The District will spot check systems with un-renewed permits to insure they are not being used to chemigate.

24.11.6. All new and existing systems in the district are subject to spot checks by the District staff to insure they are not chemigating without a permit.

24.11.7. If a site is found to be setup for chemigation and/or is chemigating and does not have a current permit the land owner will be contacted and requested to permit the system. If they do not comply within five (5) days they will be subject to Rule 4.

24.11.8. The District staff shall provide oral and/or written notification to landowner or the operator on a District form, of their intent to inspect any chemigation system and the land upon which chemigation is occurring. The inspections shall occur at the time and date provided by the notification. The landowners and operators shall provide full access to the lands and chemigation system to allow for a full inspection. Failure to provide access may result in the revocation of the permit and such other enforcement actions as are authorized by statute.

24.12. Equipment:

24.12.1. Irrigation distribution systems with chemigation capabilities shall be equipped with the following devices: a.) Mainline Check valve; b.) Vacuum relief valve; c.) Inspection port; d.) Low pressure drain including a twenty feet (20) one (1) inch drain hose; e.) Chemical injection line check valve; f.) Simultaneous interlock device.

24.12.2. Design configuration of all equipment shall be in compliance with Title 195, Chapters 9 &10, Nebraska Department of Environmental Quality and any rules and regulations promulgated by the District.

24.12.3. All permit holders shall maintain the above listed equipment in good working condition at all times of chemigation.

24.13. Posting:

24.13.1. All permit holders shall post signs on chemigated fields when using any herbicide or pesticide, or a chemical for which the label requires posting. A sign with the words, “KEEP OUT, CHEMICAL APPLICATION THROUGH IRRIGATION WATER SYSTEM” shall be posted by the permit holder at each point of entry into the treated area, adjoining farmstead, or residential area, along any public road where public exposure may occur, and at the point of chemical inject if such point is outside the treated area. The signs shall conform to District rules and regulations as well as Title 195, Chapter 12, 002.04, Nebraska Department of Environmental Quality.

24.14. Enforcement:

24.14.1. The District shall enforce the provisions of Neb. Rev. Stat. §§ 46-601, 46-602.01, the Groundwater Management and Protection Act, the Nebraska Chemigation Act, and all its own orders and

rules and regulations adopted pursuant thereto through the issuance of a formal notice of an alleged violation, cease and desist orders issued and enforced against operators or landowners, as determined by the Board of Directors, and/or by bringing an appropriate action in the district court in the county where the violation occurs for the reasons and by the procedures as follows. The District shall give 3 days' notice to the affected person and an opportunity to be heard before issuing a cease and desist order to enforce the Ground Water Management Protection Act or the Chemigation Act.

24.14.2. The District shall make reasonable efforts to obtain voluntary compliance before compelling compliance through the legal system.

24.15. Reporting:

24.15.1. A permit applicant shall notify the District within ten days of any changes in the information provided on the permit application.

24.15.1.1. Failure to report the applicant will be subject to the prevision of Rule 4.

24.15.2. Permit holders shall notify the District and the Department of any actual or suspected accident resulting from the use of chemigation. Failure to do so may result in a civil penalty of not more than five hundred dollars or a guilty verdict of a Class III misdemeanor. Permit holders shall note the District and Department consider each day a single, separate violation.

24.15.3. Permit holders who either replace or alter or authorize such replacement or alteration of chemigation equipment previously approved by the District shall notify the District within 48 hours of such replacement or alteration. The District shall conduct an inspection of the replaced or altered equipment.

25. Erosion and Sediment Control Program

25.1. Authority: These rules and regulations are adopted pursuant to the authority granted in Section 2-4605, R.R.S. 1948, as amended.

25.2. Purpose: The purpose of these rules and regulations is to provide an orderly method for implementing the Erosion and Sediment Control Act, sections 2-4601 et. seq. R.R.S. 1943, as amended to provide for the conservation and preservation of the land, water and other resources of the District, and to thereby: a.) reduce damages caused from wind erosion, b.) reduce storm water runoff and the danger of flooding, c.) reduce sediment damage to lands within the District, d.) reduce non-point pollution from sedimentation and related pollutants, e.) preserve the value of land and its productive capability for present and future generations, and f.) safeguard the health, safety and welfare of the District's citizens.

25.3. Applicability: These rules and regulations apply to all lands within the District except to those lands which lie within the respective jurisdiction of a county or municipality which has adopted and is implementing erosion and sediment control regulations in substantial conformance with the state erosion and sediment control program. Some non-agricultural land-disturbing activities are also excluded and are identified in Rule 25.4, Section (h), sub-sections (2), (3), (4) and (5).

25.4. Definitions as Related the Erosion and Sediment Act:

25.4.1. Alleged violator means the owner of record and the operator, if any, of land which is the subject of a complaint filed in accordance with section 25.8.

25.4.2. Board means the Board of Directors of the Lower Niobrara Natural Resources District.

25.4.3. Committee means the Erosion and Sediment Committee of the Lower Niobrara Natural Resources District.

25.4.4. Conservation Agreement means an agreement between the owner and operator, if any, of a farm unit and the District in which the owner and operator, if any, agrees to implement all or a portion of a farm unit conservation plan. The agreement shall include a schedule for implementation and may be conditioned on the District or other public entity furnishing technical, planning or financial assistance in

the establishment of the soil and water conservation practices necessary to implement the plan or portion of the plan.

25.4.5. District means the Lower Niobrara Natural Resources District.

25.4.6. Excess Erosion means the occurrence of erosion in excess of the applicable soil-loss tolerance level which causes or contributes to an accumulation of sediment upon the lands of any other person to the detriment or damage of such other person.

25.4.7. Farm Unit conservation plan means a plan jointly developed by the owner and, if appropriate, the operator of a farm unit and the District. Such plan shall be based on the determined conservation needs of the farm unit and identification of practices which may be expected to prevent soil loss by erosion to the applicable soil-loss tolerance level. The plan may also, if practicable, identify alternative practices by which such objective may be attained.

25.4.7.1. Non-Agricultural Land-Disturbing Activity means a land change including, but not limited to, tilling, clearing, grading, excavating, transporting, or filling land which may result in soil erosion from wind or water and the movement of sediment and sediment-related pollutants into the waters of the state or onto lands in the state, but shall not include: a.) Activities related directly to the production of agricultural, horticultural or silvicultural crops, including, but not limited to, tilling, planting, or harvesting of such crops; b.) Installation of above ground public utility lines and connections, fence posts, sign posts, telephone poles, electric poles, and other kinds of posts or poles; c.) Emergency work to protect life or property; and d.) Activities related to the construction of housing, industrial, and commercial developments on sites under two acres in size; and e.) Activities related to the operation, construction, or maintenance of industrial or commercial public power district or public power and irrigation district facilities or sites when such activity is conducted pursuant to state of federal law or is part of the operational plan for such facility or site.

25.4.8. Sediment Damage means: a.) the economic or physical damage to the land or other property of one person resulting from the deposition of sediment, by water or wind, or soil eroded from the lands of another person; b.) the degradation of water quality and/or the reduced beneficial use of the water in the stream or lake involved resulting from soil sedimentation or the deposition of chemical laden sediments. For the purpose of this program, chemicals shall include, but is not limited to, any agricultural, municipal, or industrial chemicals or waste deposited on the soil. c.) Physical effects to land or property which are relatively short term in nature and which cause no economic damage and no lasting physical damage shall not constitute sediment damage for the purpose of these rules and regulations.

25.5. Soil-Loss Tolerance Level means the maximum amount of soil loss due to erosion by wind or water, expressed in terms of tons per acre per year, which is determined to be acceptable in accordance with the Erosion and Sediment Control Act. Soil loss from water erosion may include: a.) sheet and rill erosion which includes relatively uniform soil loss across the entire field slope which may leave small channels located at regular intervals across the slope and; b.) ephemeral gully erosion which occurs in well-defined depressions or natural drainage ways where concentrated overland flow results in the convergence of rills forming deeper and wider channels.

25.6. T value means the average annual tons per acre soil loss that a given soil may experience and still maintain its productivity over an extended period of time.

25.7. Soil-Loss Tolerance Level: USDA Soil Survey data provides value of soil loss tolerance (T) for various soil series across the District and are described as Soil-Loss Tolerance Levels in the NRCS TECHNICAL GUIDES. These soil-loss tolerance levels for the soils of the District have been adopted by the Board and are attached hereto as Appendix 20. Each soil series listed may contain one or more soil mapping units-referred to in Rule 25.10. The permitted soil-loss tolerance levels for particular lands may not exceed the T value noted in Appendix 20.

25.8. Administration: The Board delegates the responsibility for administering these rules and regulations to the District Manager except to the extent Board action is specifically required by these rules and

regulations or by law. The following duties shall be performed by or under the direction of the District Manager.

25.8.1. Keep an accurate record of all complaints received, investigations made, and other official actions.

25.8.2. Investigate all complaints made in writing to the District Office relating to the application of these rules and regulations and report in writing all alleged violations to the Board. (See Appendix 10)

25.8.3. Monitor compliance with all farm unit conservation plans approved and orders issued by the Board.

25.8.4. Except to the extent jurisdiction has been assumed by a municipality or county in accordance with section 2-4606, and after a written and signed complaint has been made, the District Manager and such staff as he or she shall designate shall have the following powers and responsibilities:

25.8.4.1. At any reasonable time, after notice to the owner and operator, if any, to enter upon any public or private lands within the area affected by these rules and regulations for the purpose of investigating complaints and to make inspections to determine compliance. The owner, operator, if any, and any other necessary technical personnel and representatives of the District may accompany the inspector.

25.8.4.2. Upon reasonable cause, to report to the Board any violations of any administrative order issued by the Board pursuant to Section 2-4608, R.R.S. 1943, as amended, and these rules and regulations,

25.8.4.3. At the direction of the Board, and in accordance with Section 25.13 and 25.18, to commence any legal proceedings necessary to enforce these rules and regulations and any order issued pursuant to them.

25.9. Violation: A violation of these rules and regulations exists if: a.) sediment damage is occurring; b.) average annual soil losses on the land which is the source of that damage are exceeding the soil-loss tolerance level adopted in rule 25.5; c.) the activity causing the soil loss is not an exempted non-agricultural land distributing activity (Rule 25.4.7.1 b.) to e.) and d.) the land which is the source of the damage is not in strict compliance with a conservation agreement approved by the District.

25.10. Complaint: A complaint alleging that soil erosion is occurring in excess of the soil loss tolerance level or that sediment damage is occurring, may be filed in the District office by: a.) any owner or operator of land damaged by sediment, b.) any authorized representative of a state agency or political subdivision whose roads or other public facilities are being damaged by sediment, c.) any authorized representative of a state agency or political subdivision with responsibility for water quality maintenance if it is alleged that the soil erosion complained of is adversely affecting water quality, or d.) any District staff member, or other person authorized by the Board to file complaints.

25.10.1. Complaints shall be made in writing and signed on a form provided by the director.

25.11. Investigation of Complaint:

25.11.1. Upon receipt of a properly filed complaint, a representative of the District shall notify the alleged violator within ten (10) days that a complaint has been filed and that an investigation will be initiated to determine whether a violation of these rules and regulations has occurred. The investigation shall take place as soon as possible after the complaint has been filed and notice given. The alleged violator shall be given an opportunity to accompany the person conducting the investigation.

25.11.2. If a farm unit conservation plan previously approved by the District is being implemented and maintained in strict conformance with a conservation agreement including the land subject to the complaint, the complaint shall be dismissed. The alleged violator, complainant, and Board shall be notified.

25.11.3. Upon completion of the investigation, the investigator shall file a report of his or her findings with the Committee and shall provide copies to the alleged violator and the complainant. The report shall include: a.) the location and estimated acreage involved in the alleged violation; b.) the investigator's

conclusions concerning the existence of any sediment damage and a description of the location and nature of any sediment damage identified; and c.) the location of land(s) which the investigator concludes are the source of the sediment, the nature of the land use on such lands, and the estimated average annual soil losses from such land(s).

25.11.4. The investigator may utilize the services of professional staff, consultants, or technicians of other state or federal agencies, if necessary.

25.12. Determination of Soil Loss:

25.12.1. Soil losses shall be determined by using the applicable portions of the then current version of the United States Department of Agriculture, Natural Resources Conservation Service Field Office Technical Guide to estimate the average annual sheet and rill erosion, ephemeral erosion or wind erosion.

25.12.2. The soil losses normally will be calculated on a soil survey mapping unit basis. If it is determined that soil loss in excess of the applicable soil loss tolerance level is occurring in the portion of one or more mapping units under the ownership and control of the alleged violator, they may not be averaged with other non-violating units for the purpose of determining overall soil loss.

25.12.3. If it is determined that the sediment damage complained of is resulting from erosion from a land parcel smaller than the soil mapping unit, the soil loss equation in the Field Office Tech.

25.12.3.1. The guide may be applied to such smaller portion only if such portion is two acres or greater.

25.12.4. The cover and crop management factor, "C", used in calculating sheet and rill erosion may incorporate a cropping history of up to five years. Crop rotation patterns longer than five years but not more than ten years may be used for the purpose of planning future compliance with soil loss tolerance levels but exceeding the limits may not be planned for more than two consecutive years. Soil losses from irrigation and gully erosion may also be determined by using acceptable scientific procedures and may, if deemed appropriate by the Board, be added to soil losses for sheet and rill, ephemeral and wind erosion. Soil losses from streambank erosion shall not be calculated and these rules and regulations are not applicable to this type of erosion. Application of the soil loss equation formulas will be made by someone whose qualifications to make such determinations can be supported in court.

25.13. Committee and Board Action:

25.13.1. The committee shall assist the District staff in administering these rules and regulations and make determinations as to whether a probable violation of these rules and regulations has or has not occurred. Such determination shall be based upon the investigator's report completed pursuant to Section 25.9 and an on-site inspection by the committee, if warranted. The committee shall report its findings to the Board, the alleged violator and the complainant with a recommendation of further action as follows:

25.13.2. If the staff and committee determines that no violation of these rules and regulations has occurred, it shall recommend and the Board may approve dismissal of the complaint. The complainant shall be given the opportunity to appear before the entire Board before the Board acts on the recommendation.

25.13.3. If the committee determines that a farm unit conservation plan previously approved by the District is being implemented and maintained in strict conformance with a conservation agreement including the land subject to the complaint, it shall recommend and the Board may approve dismissal of the complaint.

25.13.4. If the committee determines that a probable violation of these rules and regulations has occurred, it shall proceed in accordance with Section 25.12.

25.14. Notice of Violation: If the committee determines that a probable violation of these rules and regulations has occurred, the alleged violator shall be informed of its findings by letter delivered in person or sent by registered or certified mail. The letter shall specify the options available to the alleged violator, including:

25.14.1. The alleged violator shall be given an opportunity to contact the District within ten days after receipt of notice concerning the development of a plan and schedule for eliminating excess erosion and sedimentation from the land that generated the complaint. If appropriate at this time, alternative practices for inclusion in a plan may be suggested. Information on cost-share programs and an indication of whether cost-share money is available may also be supplied.

25.14.2. The alleged violator shall be given an opportunity to contest the committee's findings at a regularly scheduled Board meeting or, if desired, a Board hearing to be held no sooner than fifteen days after receipt of notice. Notice of the date shall be given. The alleged violator may request a formal public hearing within ten (10) days of receipt of notice. The District's rules for formal adjudicatory hearings shall govern the conduct of all such hearings.

25.14.3. The alleged violator shall be further notified that if he or she does not respond to the notice and does not appear at the Board meeting for which notice was given, the Board shall proceed in accordance with Rule 25.15 in his or her absence to make a final determination on the complaint and issue an administrative order if the Board concludes that a violation has occurred.

25.15. Development and Approval of Plan for Compliance:

25.15.1. If the alleged violator contacts the District pursuant to Section 25.12 (a) and indicates a desire to jointly develop either a farm unit conservation plan or a plan for eliminating excess erosion on or sedimentation from the land that generated the complaint, Board action on the complaint shall be delayed until further action is taken by the committee pursuant to (b) or (d) of this Rule. The District Manager and the alleged violator shall promptly secure the assistance of the Natural Resources Conservation Service (NRCS) or such other professional resource planners as are deemed necessary to assist in preparation of such a plan and shall attempt to prepare a mutually acceptable plan in accordance with the NRCS Field Office Technical Guide. Any plan developed in accordance with this section shall identify, as applicable, the soil and water conservation practice(s) or erosion and sediment control practice(s) to be applied or utilized and shall be accompanied by a proposed conservation agreement setting forth a schedule for compliance.

25.15.2. Any plan developed by the alleged violator and the District Manager shall be presented to the committee. If the committee agrees to the proposed plan and to the accompanying conservation agreement, the Board may thereafter approve such plan and agreement. The complainant shall be notified of such action. In considering the schedule for compliance contained within the conservation agreement, the Board may approve a longer time for compliance than would be permissible if an order were issued pursuant to Section 12.15, but shall not do so without consideration of the nature and extent of any additional sediment damages the complainant is likely to suffer until the plan has been fully implemented.

25.15.3. Strict conformance with a plan and agreement approved pursuant to this Rule shall be deemed compliance with these rules and regulations for the lands which are subject to the agreement.

25.15.4. If no mutually acceptable plan and conservation agreement have been prepared by the alleged violator and the District manager within an acceptable time period or if the committee concludes at any time that progress is not being made and is no longer likely on preparation of such a plan, the complaint shall be again referred to the Board and the alleged violator shall be so notified in person or by registered or certified mail and shall be given the information and option described in Section 12.12.1.2. For purposes of this rule, acceptable time period shall mean (1) 90 days for alleged violations involving agricultural, horticultural, or silvicultural activities and (2) 15 days for alleged violations involving non-agricultural land distributing activities.

25.15.5. Following refusal of a landowner to discontinue an activity causing erosion which constitutes a violation in Section 25.7, and to establish a plan and schedule for eliminating excess erosion pursuant to these rules, and if the immediate discontinuance of such activity is necessary to reduce or eliminate damage to neighboring property, the District may petition the District court for an order to the owner

and, if appropriate, the operator, to immediately cease and desist such activity until excess erosion can be brought into conformance with the soil-loss tolerance level or sediment resulting from excess erosion is prevented from leaving the property.

25.16. Practices:

25.16.1. Practices designed to reduce or control soil erosion or sediment damage may be approved in developing a plan under Section 12.13 and may be required by the District in an administrative order pursuant to Section 12.15.

25.16.2. Soil and water conservation practices, applicable only to land used for agricultural, horticultural, or silvicultural purposes, may include:

25.16.2.1. Permanent practices, such as the planting of perennial grasses, legumes, shrubs, or trees, the establishment of grassed waterways, the construction of terraces, grade control structures, tile outlets, and other practices approved by the District.

25.16.2.2. Temporary soil and water conservation practices, such as the planting of annual or biennial crops, use of strip-cropping, contour planting, conservation tillage or residue management system, and other cultural practices approved by the District.

25.16.3. The District shall maintain a complete list of approved permanent and temporary soil and water conservation practices as part of its local erosion and sediment control program.

25.16.4. Erosion and sediment control practices, which are applicable to activities other than agricultural, horticultural, or silvicultural activities, may include:

25.16.4.1. The construction or installation and maintenance of permanent structures or devices necessary to carry to a suitable outlet away from any building site, any commercial or industrial development or any publicly or privately owned recreational or service facility not served by a central storm sewer system, any water which would otherwise cause erosion in excess of the applicable soil-loss tolerance level and which does not carry or constitute sewage or industrial or other waste to a suitable outlet away from any development or facility not served by a central storm sewer system;

25.16.4.2. The use of temporary devices or structures, temporary seeding, mulching (including fiber mats, plastic, straw), diversions, silt fences, sediment traps or other measures adequate either to prevent erosion in excess of the applicable soil loss tolerable levels or to prevent excessive downstream sedimentation from land which is the site if it is directly affected by any non-agricultural land-distributing activity; or

25.16.4.3. The establishment and maintenance of vegetation upon the right-of-way of any completed portion of any public street, road, highway or the construction or installation thereon of permanent structures or devices or other measures adequate to prevent erosion on the right-of-way in excess of the applicable soil-loss tolerance level.

25.16.5. The District shall maintain a complete list of approved erosion and sediment control practices as part of its local erosion and sediment control program.

25.17. Order: If, after Board consideration of the complaint at a meeting or hearing for which the alleged violator has been given notice in accordance with Section 12.12, the Board finds that sediment damage has occurred, that average annual erosion on the land which is the source of the damage is occurring in excess of the applicable soil-loss tolerance level(s), and that a conservation plan has not been developed nor is being implemented according to a conservation agreement, it shall issue an administrative order to the violator stating:

25.17.1. The date of the order,

25.17.2. The identity of the source of the violation and its location;

25.17.3. The authority of the Board to issue such order;

25.17.4. The specific findings, including (i) the estimated average annual soil loss and the extent to which erosion exceeds the applicable soil-loss tolerance level and, (ii) the nature of the sediment damage or water quality impairment resulting from such excessive erosion;

25.17.5. If desired by the Board, the alternative soil and water conservation practices or erosion and sediment control practices required to bring the land into conformance with these rules and regulations. When the erosion is the result of agricultural, horticultural, or silvicultural activities, the soil and water conservation practices required shall be those necessary to bring the land into conformance with the applicable soil-loss tolerance level. Where the erosion complained of is the result of a non-agricultural land-distributing activity, the Board may authorize the violator to either bring the land into conformance with applicable soil loss tolerance level or to prevent sediment resulting from excessive erosion from leaving the land;

25.17.6. Any requirements concerning the operation, utilization, or maintenance of the alternative practices identified;

25.17.7. The deadlines for commencing and completing work necessary to comply with this order: a.) The time for initiating work needed to establish the necessary soil and water conservation practices or permanent erosion and sediment control practices shall not exceed six months after service or mailing of the order to the violator and shall be completed no later than one year after service or mailing of the order to the violator unless an extension has been granted upon a showing of good cause; b.)The time for initiating work for temporary erosion and sediment control practices for nonagricultural land-distributing activities shall be not less than five (5) days nor more than fifteen (15) days after service or mailing of the order and shall be completed not longer than forty-five (45) days after service or mailing unless an extension has been granted upon a showing of good cause. An extension shall only be granted after review and affirmative action of the Board.

25.17.8. The action to be taken by the Board if the violator does not comply.

25.17.9. A copy of the dismissal or administrative order shall be delivered to the owner and to the operator, if any, of the land in question by personal service or certified or registered mail.

25.18. Cost-Share Assistance: To prevent excess erosion and sediment from leaving the land due to any agricultural or nonagricultural land-disturbing activity, cost-share assistance may be available from the District. Such assistance, if available, may be used for any erosion or sediment control practice. The lack of available cost-sharing assistance does not offset the requirement that the owner and, if appropriate, the operator of such land comply with the terms of an approved plan of compliance or an administrative order.

25.19. Supplemental Orders: The Board may issue supplemental orders, as necessary, to extend the time of compliance with an administrative order if, in its judgment, the failure to commence or complete work as required by the administrative order is due to factors beyond the control of the person to whom the order is directed and the person can be relied upon to commence and complete the necessary work at the earliest possible time.

25.20. Non-Compliance: Subject to any limitations imposed by the Board, the District Manager may cause the District to commence legal proceedings by filing a petition in the name of the District in the District Court in which a majority of the land is located requesting a court order requiring immediate compliance with the administrative order or any supplemental order issued previously, if he or she has reasonable cause to believe after inspection that an administrative order issued previously by the Board is not being complied with because:

25.20.1. The work necessary to comply with the order is not commenced on or before the date specified in the order or in any supplemental orders;

25.20.2. The work is not being performed with due diligence, is not satisfactorily completed by the date specified in the order, or is not being operated, utilized, or maintained in accordance with requirements set forth in the order;

25.20.3. The work is not of a type or quantity specified by the District, and when completed, it will not or does not reduce soil loss to within the applicable soil-loss tolerance level for the identified land or, in the case of non-agricultural land-distributing activity, will not or does not prevent sediment resulting from

excessive erosion from leaving the land involved, or

25.20.4. The person to whom the order is directed informs the District that he or she does not intend to comply.

26. PASTURE/HAYLAND HISTORIC IRRIGATED ACRES

26.1. This Rule only applies to land which is in permanent perennial vegetation and is/or has been enrolled in a Conservation Reserve Program (CRP) and does not meet the District's minimum ranking criteria for Historic Certified Irrigated Acres (Rule 15.4.2).

26.2. The tract of land must have an active registered high capacity well located within the field boundaries.

26.3. In order for the tract of land to maintain its Pasture/Hayland Historic Irrigated Acres status the owner agrees to:

26.3.1. Maintain ownership of the approved tract of land

26.3.1.1. If ownership changes the tract of land will lose its irrigated status until the new owner re-certifies the tract of land.

26.3.2. Maintain or improve the permanent perennial vegetation

26.3.3. Install and maintain a District approved flowmeter which will be verified by District Staff.

26.3.4. Pasture/Hayland Historic Irrigated Acres will be subject to allocations.

26.3.4.1. Allocation will be forty (40) inches/acre for five (5) years.

26.3.4.2. An administrative fee may be charged to cover the cost of administrating the allocation.

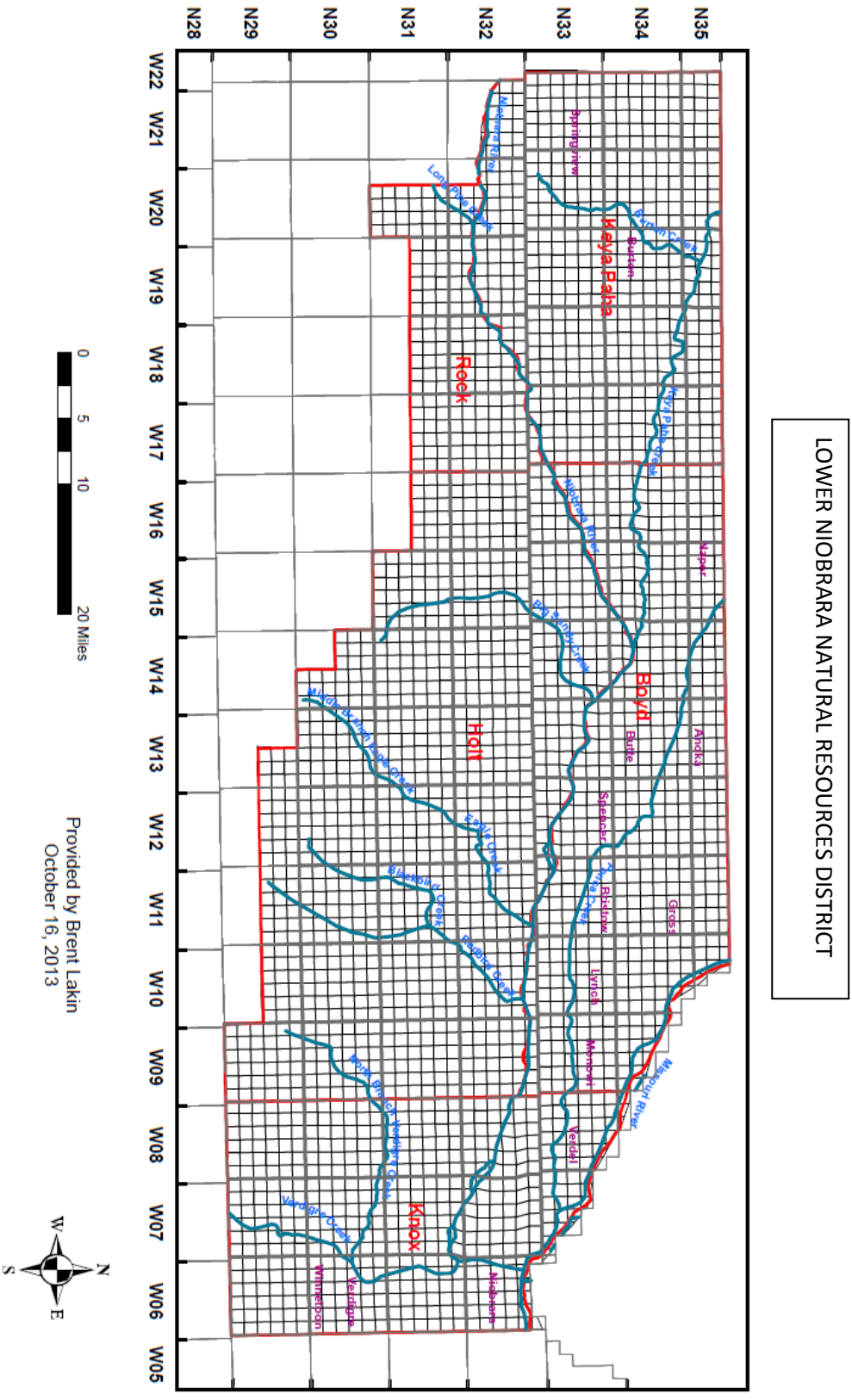
26.3.4.3. An annual report of inches applied will be submitted to the District by November 1st of each year. District Staff will randomly check flowmeter readings prior to the next irrigation season.

26.3.4.4. Failure to report may result in the forfeiture of the remaining allocation purchased.

26.3.5. An Application to Transfer will void the Irrigated Acre Certification of the tract of land.

26.3.6. If crops other than permanent perennial vegetation are present or planted the tract of land will not be certified or will lose its certification and owner may be considered out of compliance with the Districts Rules and Regulations and be subject to penalties.

APPENDIX 1: – MAP AND LEGAL DESCRIPTION OF DISTRICT



BOYD All Precincts.

KNOX Thence down the main channel of the River to its intersection with a line dividing R-5 and 6W of the 6th P.M. in Knox County; thence southerly to the SE corner of T-29N, R-6W of the 6th P.M.; thence westerly along the Knox-Antelope County Line to the SW corner of Knox County at the SW corner of T-29N, R-8W of the 6th P.M.

HOLT Thence westerly to the SW corner of T-29N, R-9W of the 6th P.M.; thence northerly to the SW corner of S-18, T-29N, R-9W of the 6th P.M.; thence westerly to the SW corner of S-15, T-29N, R-13W of the 6th P.M.; thence northerly to the SE corner of S-33, T-30N, R-13W of the 6th P.M.; thence westerly to the SW corner of S-34, T-30N, R-14W of the 6th P.M.; thence northerly to the SE corner of S-16, T-30N, R-14W of the 6th P.M.; thence westerly to the SW corner of S-18, T-30N, R-14W of the 6th P.M.; thence northerly to the SE corner of T-31, R-15W of the 6th P.M.; westerly to the SW corner of T -31, R-15W of the 6th P. M.; thence northerly to the SE corner of S-13, T-31N, R-16W of the 6th P.M.; thence westerly to the Holt-Rock County line at the SW corner of S-18, T-31 **N,** R-16W of the 6th P.M.

ROCK Thence westerly to the SW corner of S-18, T-31N, R-19W of the 6th P.M.; thence southerly to the SE corner of T -31 N, R-20W of the 6th P. M.: thence westerly to the Rock-Brown County line at the SW corner of S-33, T-31 **N,** R-20W of the 6th P.M.; thence northerly on the Rock-Brown County line to it's intersection with the middle channel of the Niobrara River; thence up the main channel of the Niobrara River to its intersection with a line dividing Ranges 21W and 22W thence northerly on said dividing line to the point of beginning.

KEYA PAHA Commencing at a point at the NW corner of T-35N, R-21W of the 6th P.M. in Keya Paha County; thence easterly along the northern boundary of the State of Nebraska to its intersection with the middle channel of the Missouri River.

APPENDIX 2: – IMP GOALS, OBJECTIVES AND ACTION ITEMS.

Goal 1

1. To develop and implement processes for the adequate collection of hydrologic and other related data to assess water resources within the District.

Goal 1 Objectives

1.1. To conduct data collection and analyses of water supplies and demands, utilizing the best available information, data, and science.
1.2. To conduct studies to identify hydrologically distinct sub-areas within the District for the purposes of integrated management.
1.3. To monitor changes in water uses within the District.

Goal 2

2. To develop systematic approaches for the development and sustainability of water resources within the District.

Goal 2 Objectives

2.1. To assess the potential impact of new surface water and groundwater uses on existing surface water and groundwater users within the District
2.2. To determine allowable levels of water development for the District, and by subbasin when designated.

Goal 3

3. To prevent, resolve, and minimize water related conflicts among and between surface water and groundwater users.

Goal 3 Objectives

3.1. To establish procedures for securing water for sustained future growth of domestic, municipal, agricultural, commercial, and industrial water users within the District.
3.2. To establish rules and regulations regarding transfers, variances, water banking, water leasing, or other actions of water management within the District, if necessary, to enhance equitable water use management, mitigate new uses, or to avoid conflicts.

Goal 4

4. To develop and provide educational opportunities and outreach materials about hydrologically connected surface water and groundwater, water conservation, and to keep the constituents of the District informed about the IMP as it is implemented.

Goal 4 Objectives

4.1. To develop and disseminate water conservation guidelines for individuals to achieve sustainable water use.
4.2. To identify cost-share opportunities that may include collaborating with other agencies and other NRDs to implement plan objectives.
4.3. To encourage participation in information sharing with other organizations and agencies to conserve resources and prevent duplication of work.

Regulatory & Non-Regulatory Action Items

This voluntary IMP includes both regulatory and non-regulatory action items. The regulatory actions are mandatory. The non-regulatory actions are encouraged to be implemented voluntarily by water users. The groundwater controls authorized for adoption by the District are set forth in *Neb. Rev. Stat.* §§ 46-715 and 46-739; the surface water controls authorized for adoption by the Department are in *Neb. Rev. Stat.* §46-716 of the Ground Water Management and Protection Act.

A. Non-regulatory Action Items to Achieve Goals & Objectives
   1. The District and the Department will utilize available groundwater models and hydrologic tools to achieve the following:
      (a) To assist in identifying critical hydrologic areas in the District;
      (b) Collaborate with municipalities, water suppliers, and other entities to identify current water uses and future water demands;
      (c) Determine subbasins or sub-regions for the purposes of water management through the development of hydrogeological maps of the District;
      (d) Assess potential impacts to existing users consistent with Nebraska Administrative Code Title 457, Chapter 24;
      (e) Assess potential impacts to users by subbasins or sub-regions, once additional data and tools become available;
      (f) Identify regions where additional data may be needed;
      (g) Locate and confirm irrigated acres through the use of infrared photography of the District;
      (h) Measure additional surface water flows during periods of water shortages through the implementation of streamgages.
   2. Water Use Reporting and Data Exchange
      (a) Irrigation water use reporting. The District will implement a voluntary program on all high capacity wells to annually report the total quantity pumped, rate of pumping, and acres irrigated, in accordance with a system and format developed by the District. In addition, the Department will implement a voluntary reporting program for surface water irrigation permit holders in the District to identify the quantity of water pumped, the acres irrigated, and the type of irrigation system (e.g., gravity, pivot, etc.) used.
      (b) Municipal, commercial, and industrial water usage reporting. The District will implement a voluntary program for all municipal, industrial, and commercial establishments with high capacity wells to report annually their water use characteristics and well pumping data to the District, in accordance with a system and format implemented by the District. Once a database of water usage is collected and the water usage characteristics are known, the reporting requirements may change.
      (c) Data exchange. The District and the Department will develop a system to exchange water related information and share with other agencies if warranted.
   3. Information and Education Programs
      (a) The District and the Department will provide educational materials, such as pamphlets or website pages, or carry out educational activities, such as public meetings. This information may include topics such as hydrologically connected waters, integrated management plans, the planning process, or best management practices.
      (b) Contingent on budget and staff resources, the District and the Department will jointly pursue opportunities for public outreach efforts, such as news releases, in order to support water education or programs.

(c) The District and the Department will jointly identify and study opportunities for the development of transfers, variances, water banking, water leasing, and other actions of water management to potentially be used in the District.

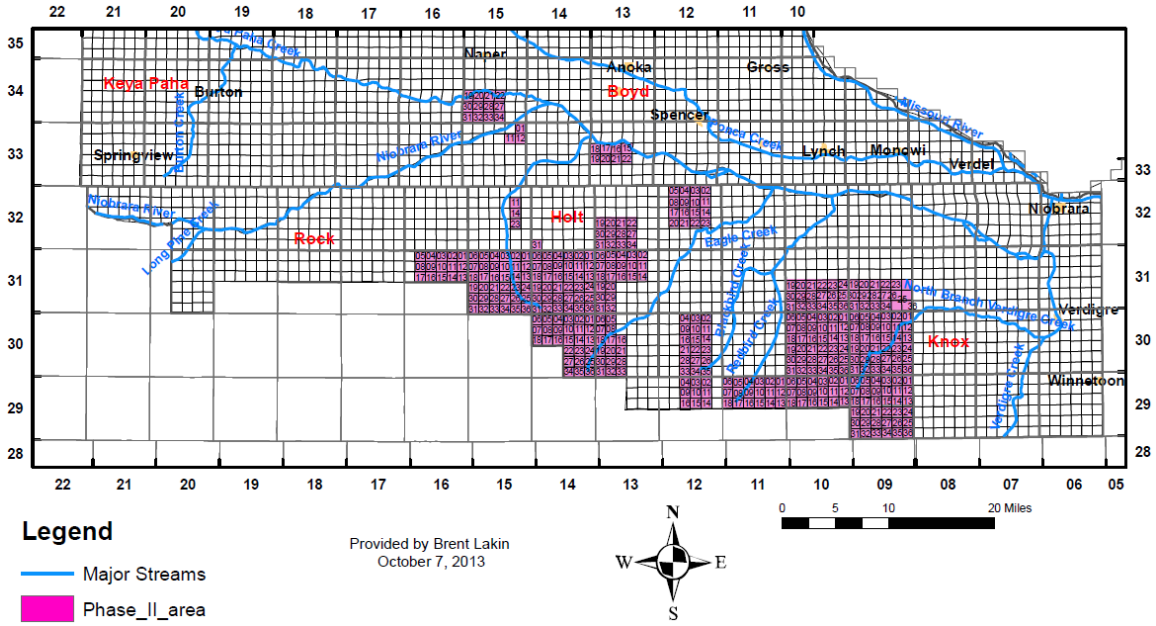
B. Groundwater Action Items (Controls) to Achieve Goals & Objectives

The District's Rules and Regulations will contain procedural details for the controls listed in this IMP. Persons desiring to apply for a new groundwater use or to alter an existing use should contact the District.

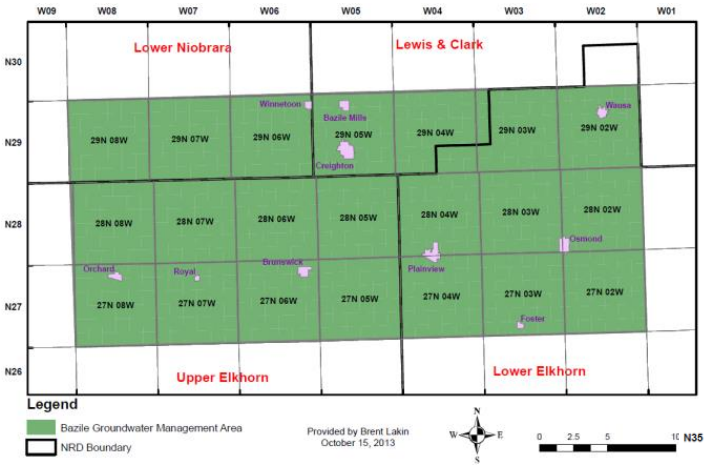
1. Certification of groundwater irrigated acres. The District will certify all irrigated acres within the District boundaries within two years (time will begin when the IMP is approved and goes into effect). The District is in the process of certifying all groundwater irrigated acres utilizing a GIS-based data system in conjunction with County Assessors and aerial photographs of historically irrigated acres.
2. Ranking system for the addition of wells. The District will develop controls for well permit ranking for the addition of new and/or helper irrigation wells on new and/or existing irrigated acres. In order for a well permit to be approved, the District will set a minimum score that all wells must meet before a permit will be approved. The purpose of the ranking system is to be able to continue to allow high capacity well development without creating negative impacts, conflicts, or interferences with neighboring water users. A maximum number of wells per system will be established using the following criteria: (1) thickness of primary aquifer formation; (2) calculated transmissivity; (3) irrigation well density; (4) public water supply well density; (5) domestic, livestock, and other well densities; (6) irrigation best management practice and stream depletion factors; and (7) certification by a hydrologist and/or a professional engineer the existing well has failed and a new well is necessary to continue pumping an adequate volume of irrigation water to the existing irrigated acres.
3. Flow metering. The District will require the mandatory installation of water flow meters on all new high capacity wells and/or modified irrigation wells and/or irrigation systems, commercial, industrial, or municipal water supply systems. This includes installation of a water flow meter prior to the addition of a helper well/s. The District will encourage the voluntary installation of water flow meters on all existing high capacity well systems.
4. Restriction on addition of irrigated acres. The District will establish a set number of new irrigated acres which can be applied for on an annual basis. The new acres will meet a minimum score set by the Board. The following criteria will be used: (1) irrigation type; (2) land capability class rating using USDA Natural Resources Conservation Service Web Soil Survey; (3) stream depletion factors; (4) groundwater quantity; (5) groundwater quality (nitrates) and compliance with the Nitrogen Certification Guidelines in the District's Ground Water Management Plan; and (6) irrigation concentration (well spacing requirements). These restrictions will be made mandatory throughout the entire District.

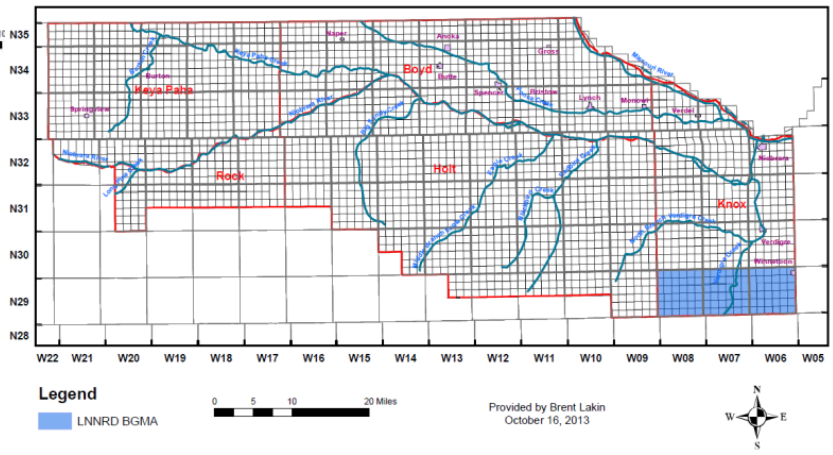
APPENDIX 3: – MAPS OF GROUNDWATER QUALITY AREAS

Lower Niobrara Natural Resources District Phase I (entire District) and Phase II Groundwater Management Area



Bazile Groundwater Quality Management Area





APPENDIX 4: – BAZILE GROUNDWATER MANAGEMENT PLAN ACTIONS AND TASKS

The advisory council identified several Action Items that will facilitate meeting the project goals. The Action Items listed below will be periodically reviewed and revised as the implementation of the plan progresses. It should be noted all of the activities are specific to the BGMA

1. User Education - to be completed within five years of plan approval.
    a. Prepare bi-annual mailings explaining the groundwater concerns, best management practices (BMPs), cost share programs, etc.
    b. Issue periodic news releases.
    c. Hold a minimum of three meetings to further educate producers.
    d. Initiate one-to-one contact with producers to facilitate the implementation or further implementation of BMPs.
    e. Educate communities in the area on the benefits of wellhead protection management planning.
2. Soil Sampling.
    a. Require annual soil sampling for any crop (including turf grass) where >50 lbs per acre per year of organic or inorganic nitrogen will be applied.
        i. Each sample will only be representative of 40 acres.
        ii. Sampling depths will be 0-8" and 8-24".
        iii. Producers are encouraged to sample 24"- 48".
    b. Each soil sample must include a cation exchange capacity and organic matter analysis.
    c. It is recommended NRDs provide cost share.
3. Irrigation Water Sampling.
    a. Irrigation water will be sampled every other year.
        i. Irrigation water users are encouraged to sample water annually.
    b. It is recommended NRDs provide cost share.
4. Water Well Flow Meters.
    a. Each operator is required to have at least one irrigation well flow meter.
    b. Larger operations will be required to have at least one meter per 10 existing wells.
    c. All new and replacement wells will be required to install a flow meter.
    d. Meters should be installed within five years of plan approval.
    e. NRDs should develop a meter inspection program.
5. Soil Moisture Sensors and Irrigation Scheduling.
    a. Each operator is required to install and utilize at least one soil moisture sensor for irrigation scheduling.
    b. Larger operations will be required to have at least one soil moisture sensor per 10 wells.
    c. Implementation should be completed within five years of plan approval.
6. Fall Fertilizer Application.
    a. No nitrogen fertilizer (organic or inorganic) shall be applied post-harvest to November 1.
    b. Surface applied organic nutrients will be exempted from this if the application is in compliance with future cropping needs and a nutrient management plan.
7. Winter Application.
    a. Nitrogen fertilizer applications to frozen or snow covered ground will not be allowed without district permission.
8. Manure Applications.
    a. All manure applied will be based on a nutrient analysis.
    b. Require applicator to uniformly apply organic nutrients.
    c. Application equipment should be maintained and calibrated.
9. Crop Tissue Analysis.
    a. Each producer will be required to complete one growing season tissue analysis and one late

season stalk nitrate test within five years of the plan approval.

10. Split Fertilizer Applications.
    a. Split application of nitrogen fertilizer will be required where the soil cat ion exchange capacity is <10.
    b. In soil types where the cation exchange capacity is> 10, one-to-one contact with producers should be undertaken to increase split applications on 50% of the BGMA.
11. Fertilizer application through irrigation system (fertigation).
    a. Work with producers to achieve 90% of corn producers utilizing fertigation.
    b. NRD are encouraged to provide cost share.
12. Nitrification Inhibitors.
    a. Encourage the use of nitrification inhibitors through education.
13. Variable application and precision farming.
    a. Create a partnership with local fertilizer distributors and crop consultants to create demonstration field(s).
    b. Demonstrations will include nitrification inhibitors; growing season tissue analysis and late season stalk nitrate test.
    c. Demonstration fields should incorporate multiple BMPs including no-till, cover crops, etc.
14. Nitrogen Budgeting/Accounting.
    a. Require producers to document nitrogen requirements and usage for all fields where >501bs per acre of nitrogen is applied.
    b. NRDs are encouraged to utilize a common reporting form or other form that contains the required information.
15. Sub-surface Irrigation.
    a. Work with a sub-surface irrigation system distributor to establish one demonstration field that includes the usage of a fertigation system.
16. Irrigation Well Rehabilitation.
    a. Implement water well construction standards that protect confined layers.
    b. Work with the Nebraska Water Well Standards Board to conduct a well rehabilitation demonstration.
17. Vadose Zone Sampling.
    a. The NRDs should establish baseline vadose zone nitrate conditions and conduct periodic re-assessments including the 10 and 20 year time frame.
18. Areas of Significant Concerns.
    a. The NRDs will monitor the progress of the actions and tasks undertaken and where necessary increased management will be undertaken.

Roles and Responsibilities

Several agencies, in addition to the watershed advisory council, will be responsible for various aspects of this project. A list of the participating agencies and their role in the project is as follows:

Nebraska Department of Environmental Quality WEQ): The NDEQ can provide funding to address nonpoint source problems. Funding comes from the EPA through Section 319 of the Federal Clean Water Act. In addition to providing technical assistance and grant administration, the NDEQ can also assist with water quality planning and monitoring.

Natural Resources District (NRDs): By statute the NRDs are responsible for managing groundwater within the state through the implementation of groundwater management plans. The NRDs can also contribute funding for the implementation ofBMPs, monitoring, and project administration.

USDA Natural Resources Conservation Service CNRCS): The NRCS can contribute funding through the EQIP program. Funds can be used for engineering, practice installation, practice incentives and technical support. The NRCS can also provide technical expertise and support during the implementation of the groundwater management plan.

APPENDIX 5: – LIST OF BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) provide logical and practical methods of improving groundwater quality. Best Management Practices are schedules of activities, maintenance procedures, and other management practices utilized to prevent or reduce present and future groundwater contamination. Best Management Practices include but are not limited to the following:

- Irrigation scheduling
- Proper rate of fertilizer application
- Pesticide management programs
- Rain interrupters on irrigation systems
- Crop Nutrient Management
- Monitors on application equipment
- UNL fertilizer recommended rate
- Use of nitrification inhibitors
- Proper timing of fertilizer application
- Chlorophyll meter
- Crop growth Infrared sensors
- Test plot - approximately 3-4 acres demonstrating:
    - reduced nitrogen rates
    - different nitrogen application timing than routinely practiced
    - use of inhibitors
    - use of nitrate concentration in irrigation groundwater
    - any other Nitrogen Best Management Practices
- Proper timing/rate of pesticide application
- Integrated Pest Management
- Irrigation scheduling
- Tensiometers
- Electrical resistance blocks
- Other conservation practices approved by the District

APPENDIX 6: – WELL PERMIT RANKING SYSTEM METHODOLOGY

Goal: To continue to allow high capacity well development without creating impacts, conflicts or interference with neighboring water well users.

The following criteria will be used in the District's Well Permitting Ranking System.

Main Criteria

1. Thickness of Primary Aquifer Formation
2. Transmissivity
3. Irrigation Well Density
4. Public Water Supply Well Density
5. Domestic, Livestock & "Other" Well Density
6. Irrigation Best Management Practices
    a. Irrigation Method
    b. Approved Soil Moisture Monitoring Equipment
    c. Other

Methodology

1. Thickness of Primary Aquifer Formation
    a. 1 point for each foot of primary aquifer thickness beginning with 0 points at 10 feet of thickness.
    b. Example – 18 feet of aquifer thickness equals 8 points (18ft – 10 ft).
    c. Maximum point value of 100.

2. Transmissivity
    a. The testhole log submitted will be reviewed and scored by comparing the testhole geologic particle size description, poor degree of sorting entry, and the estimated equivalent hydraulic conductivity from the work at the University of Nebraska Conservation and Survey by E.C. Reed and R. Piskin and/or by S.O. Lackey. (see Table 1 and Table 2).
    b. The hydraulic conductivity value for each geologic entry is then multiplied by the number of feet of thickness of the material as shown in the following equation: (1)
        i. $T = K * b$

        where T = transmissivity, gpd/ft
        K = hydraulic conductivity, ft/day
        b = saturated thickness, ft
    c. The corresponding "T" values for each layer of material are then added together and multiplied by 7.48 gal/ft^3 to express total transmissivity (T_t) in gpd/ft, as shown in the following equation: (2)
        i. $T_t = \sum (K * b) * 7.48$ gal/ft^3
    d. 1 point is scored for each 1,000 gpd/ft of transmissivity rounded to the nearest integer.
    e. Maximum point value of 100.

Table 1

Estimated Hydraulic Conductivity from Particle Size Descriptions

	Degree of Sorting			Silt Content		
Grain Size	**Poor**	**Moderate**	**High**	**Slight**	**Moderate**	**Very**
Clay and silt:						
Clay	0.0			2		
Silt, slightly clayey	1.3			18		
Silt, moderately clayey	2.7			11		
Silt, very clayey				7		
Silt; loess; sandy silt				20		
Sand and gravel						
Very fine sand	13	20	27	23	19	13
Very fine to fine sand	27	27		24	20	13
Very fine to medium sand	36	41-47		32	27	21
Very fine to coarse sand	48			40	31	24
Very fine to very coarse sand	59			51	40	29
Very fine sand to fine gravel	76			67	52	38
Very fine sand to medium gravel	99			80	66	49
Very fine sand to coarse gravel	128			107	86	64
Fine sand	27	40	53	33	27	20
Fine to medium sand	53	67		48	39	30
Fine to coarse sand	58	67-72		53	43	32
Fine to very coarse sand	70			60	47	35
Fine sand to fine gravel	88			74	59	44
Fine sand to medium gravel	114			94	75	57
Fine sand to coarse gravel	145			107	87	72
Medium sand	67	80	94	64	51	40
Medium to coarse sand	74	94		72	57	42

Medium to very coarse sand	84	98-111		71	61	49
Medium sand to fine gravel	103			84	68	52
Medium sand to medium gravel	131			114	82	66
Medium sand to coarse gravel	164			134	108	82
Coarse sand	80	107	134	94	74	53
Coarse to very coarse sand	94	134		94	75	57
Coarse sand to fine gravel	116	136-156		107	88	68
Coarse sand to medium gravel	147			114	94	74
Coarse sand to coarse gravel	184			134	100	92
Very coarse sand	107	147	187	114	94	74
Very coarse sand to fine gravel	134	214		120	104	84
Very coarse sand to medium gravel	170	199-227		147	123	99
Very coarse sand to coarse gravel	207			160	132	104
Gravel						
Fine gravel	160	214	267	227	140	107
Fine to medium gravel	201	334		201	167	134
Fine to coarse gravel	245	289-334		234	189	144
Medium gravel:	241	321	401	241	201	160
Medium to coarse gravel	294	468		294	243	191
Coarse gravel	334	468	602	334	284	234

The table above shows the estimated hydraulic conductivity values in units of (ft per day) from an unpublished and undated paper by E.C. Reed and R. Piskin as it was published in “Hydrogeology of Parts of the Twin Platte and Middle Republican Natural Resources Districts, Southwestern Nebraska” by J. W. Goeke, J. M. Peckenpaugh, R. E. Cady, and J. T. Dugan, Nebraska Water Survey Paper No. 70, April 1992, published through the Conservation and Survey Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Table 2

Estimated Hydraulic Conductivity

Ogallala Generalized Description-LN NRD

11/6/2014 **CSD/Sol**

Sand	vf-m	sl-v sty	sotring=mod to well			
		ave=mod	Hi side of mod			Generally gradational changes in grain size,
K (R&P)	36	27	45		**Average K=36**	i.e. silt grading to sand then back to silt

Sandstone	vf-m	sl-v sty	sotring=mod to well	cementation=sl-mod		Generally more slight than moderate
		ave=mod	Hi side of mod	mod=50% & sl=25%		cemented: (27+27+18)/3 =24 (note: quick
K (R&P)		Ave 36		18 -27	**Average K=24**	scan of e-logs SS is ~20-30 ohm-m less than
						sand. 24 is 33% less than 36

Pepper Sand	f-m	none to sl	well to mod		
			low side of well		(Note 36*1.25=45)
K (R&P)	53	48	67	**Average K=56**	

Silt	K (R&P)	**Average K=10**	Note: on the high side because Ogallala silt is often m-v sandy. Note: Sandy clay is often the term drillers use for silt.

Clay	K (R&P)	**K=1**	Note: On the low side since often drillers use this term for not sand but could be silt.

Factors

Multiple * .75 if below		**Multiple by .6 if below**		**Multiple * 1.5 if below**		**Add 3 if below**	
First Description	**Second Description**	**First Description**	**Second Description**	**First Description**	**Second Description**	**First**	**Second**
Sand (36)	with clay silty or with silt and sandstone partly cemented	Sand (36)	and clay and silt very silty	Silt (8)	and sand with sand and sandstone	Clay (1)	sandy and sand with sand and SS
Sandstone (24)	with clay clay streaks silty or with silt	Sandstone (24)	and clay and silt very silty	**Other:**			

The Table 2 above for estimated hydraulic conductivity (K in ft/day) was developed by S.O. Lackey, Hydrogeologist, for the University of Nebraska Conservation and Survey Division. The K values are based on review of many testhole particle size descriptions and their estimated hydraulic conductivities for primary formations in the Ogallala aquifer found in the Lower Niobrara NRD.

Estimated hydraulic conductivity values in both Table 1 and Table 2 can be used as given or averaged to best fit the well drillers' testhole descriptions of particle size for the lithology of each layer of the primary aquifer.

3. Irrigation Well Density

a. The irrigation well density is the distance away from the proposed irrigation well in relation to all other irrigation wells located within a 6,000 foot radius. The point value is calculated using the following empirical equation: (3)

i. Points = $100 - [\sum (d * (d * .00012)) / t] - [(n / t) / .01]$

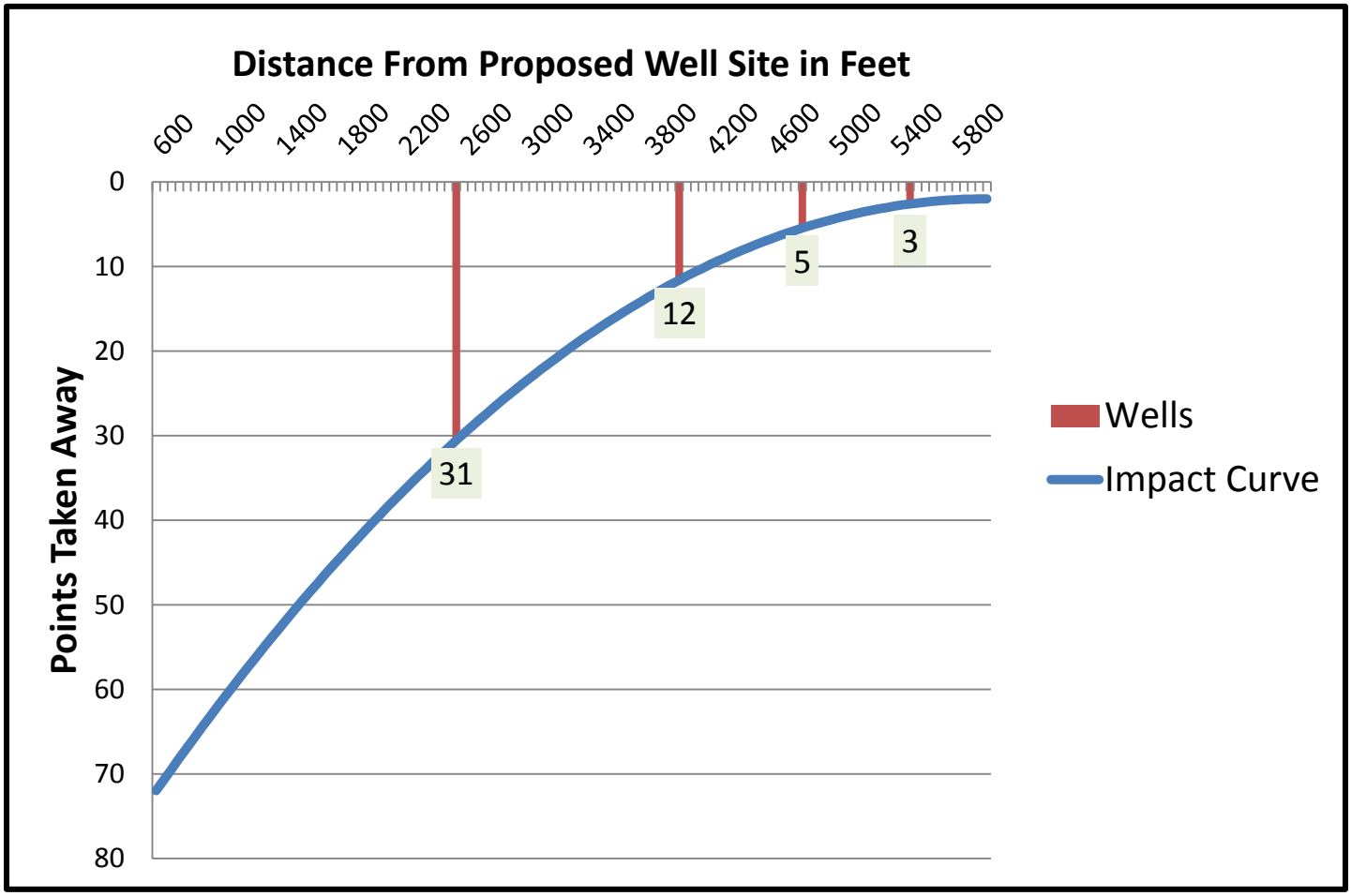
where n = number of irrigation wells within 6,000 feet of the proposed well.

d = 6,000 – (distance from proposed well).

$t = T_t / 1000$

ii. Maximum point value of 100.

iii. Graphical representation of Equation (3) with 4 irrigation wells at distances of 2,550, 3,850, 4,800, and 5500 feet and a t value equal to 50. **Resulting Score: 48 Points.**



4. Public Water Supply Well Density

a. The public water supply well density is the distance away from the proposed irrigation well in relation to public supply wells located within a 6,000 foot radius. The point value for public water supply wells located within a 6,000 foot radius is calculated using the following empirical equation: (4)

i. $\text{Points} = 50 - [\ \sum (d * (d * .00012)) / t\ ] - [\ (n / t) / .01\ ]$

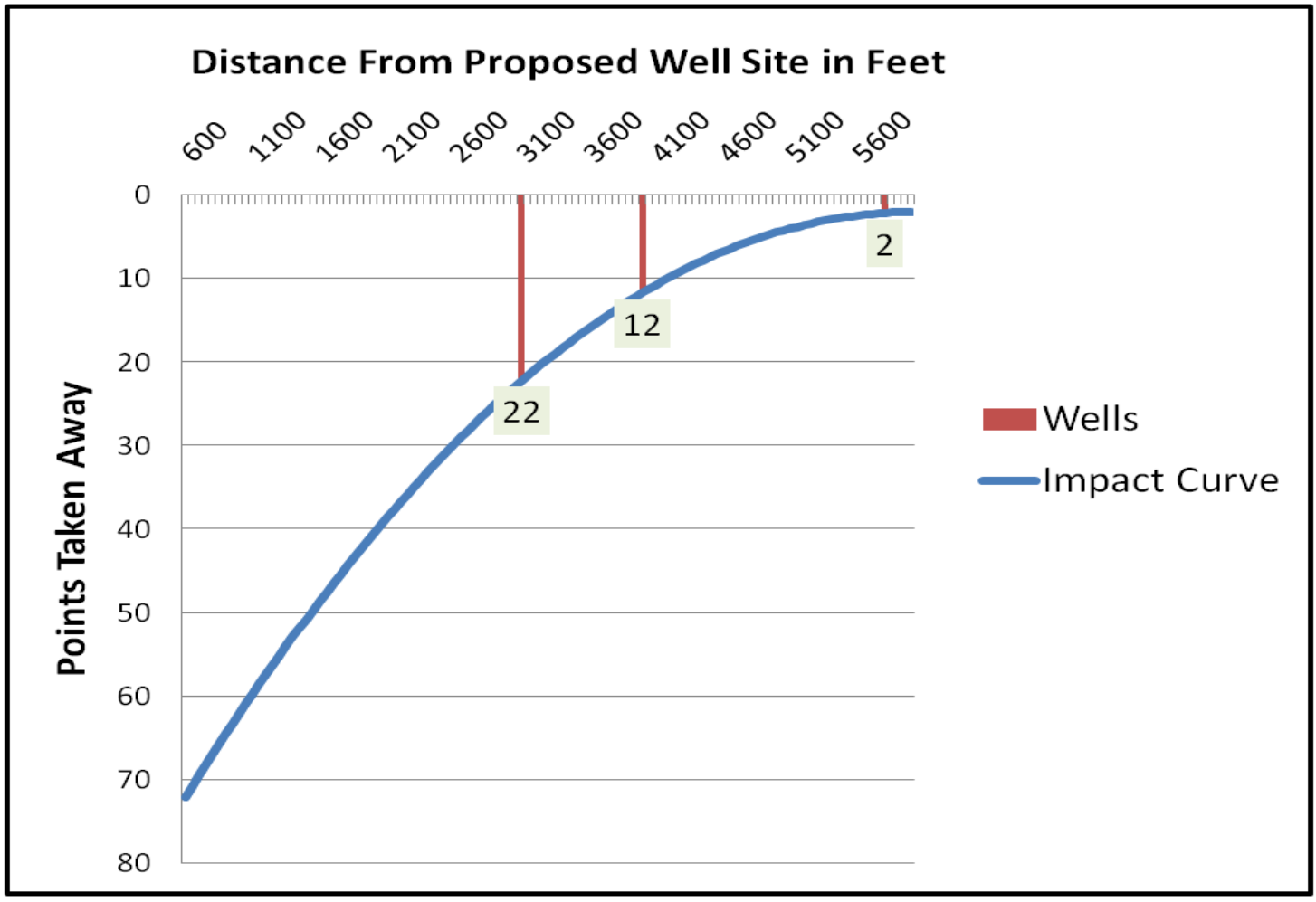
where n = number of public water supply wells within 6,000 feet

d = 6,000 - distance from proposed well

$t = T_t / 1000$

ii. Maximum positive point value of 50. This maximum point value provides extra protection of higher valued Public Water Supply Wells and the legal requirement that this public water system must continue to meet the demands of customers connected to the system.

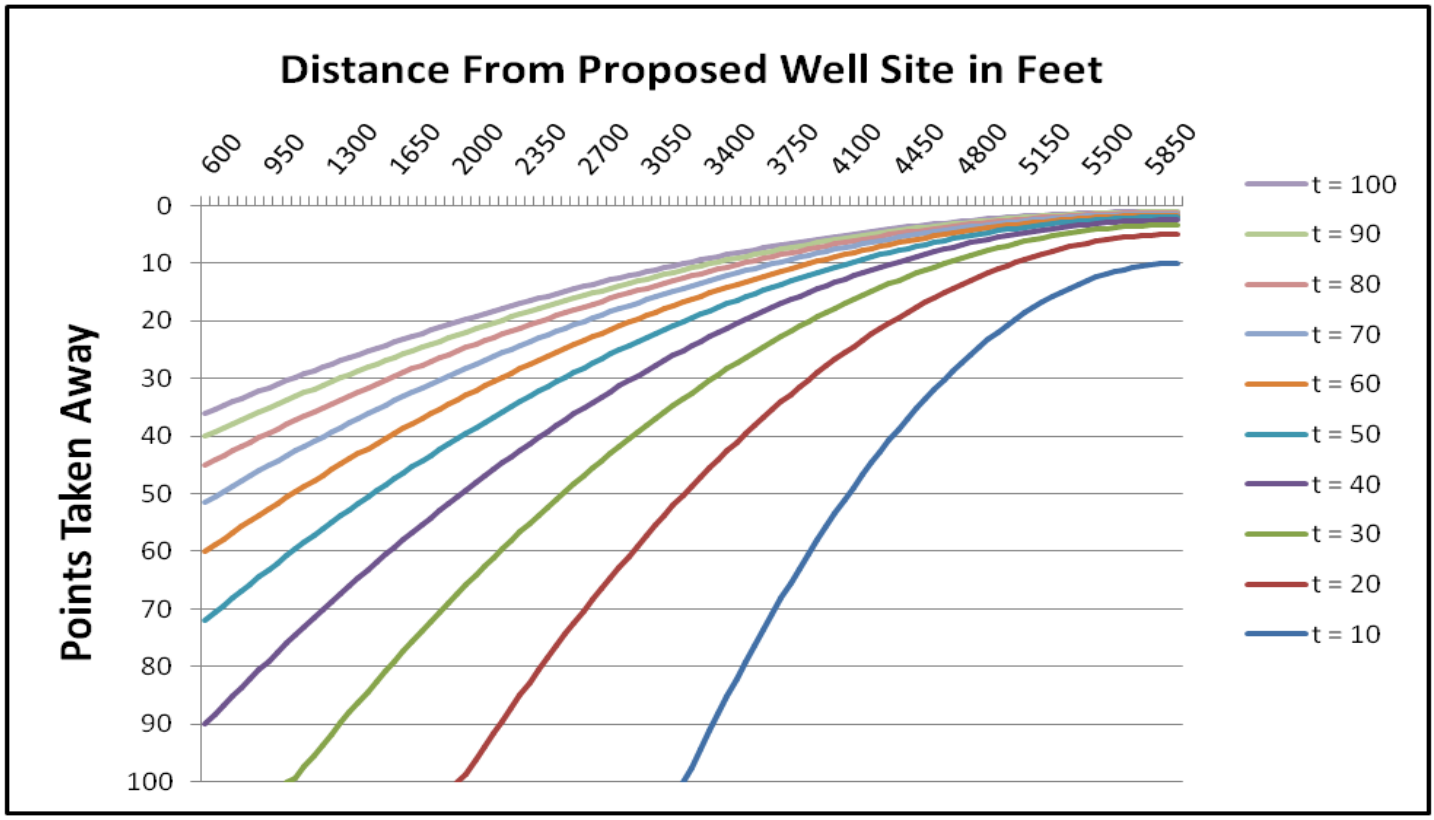
iii. Graphical representation of Equation (4) with 3 public water supply wells at distances of 3,100, 4,000, and 5800 feet and a t value of 50. **Resulting Score: 14 points.**



5. **Domestic, Livestock & "Other" Well Density**
    a. The domestic, livestock & "other" well densities are also calculated using equation (3) as for Public Water Supply Well density. Domestic and Livestock Wells are also recognized as needing higher protection from irrigation wells. The "other" wells such as commercial, industrial, and still others will have to be considered on their own merits and would likely be determined by the District's Variance Committee and Board of Directors.
6. **Irrigation Best Management Practices**
    a. Additional ranking system points available based upon irrigation management practices agreed to be installed and operated:
        i. Irrigation Method
            - Gravity 0
            - Pivot/Sprinkler 25
            - Subsurface Drip 50
        ii. Irrigation Management Practice
            - Approved Soil Moisture Monitoring Equipment 25

Well Density and Transmissivity

a. The well density calculations are completed using the calculated total transmissivity (T_t) of the primary aquifer from the testhole log.
b. Graphical representation of the impact curve **and points taken away** are based on calculated total transmissivity where $t = T_t / 1000$.



Example Calculation of Well Permit Ranking System:

Example Data

Testhole Log

Material	From, ft.	To, ft.	b	K in ft per day	T in ft per day
Top soil	0	2			
Meduim gravel	2	18			
Fine gravel	18	23			
Fine gravel	23	30	7	160	1120
Brown clay	30	33	3	1	3
Fine to medium gravel	33	36	3	201	603
Fine gravel	36	54	18	160	2880
Fine sand to fine gravel	54	75	21	88	1848
Brown clay	75	90	15	1	15
Clay with fine sand layers	90	108	18	4	72
Clay with fine sand layers	108	144	36	4	144
Brown clay	144	162	18	1	18
Yellow clay / Shale	162	180			
		Total	139		6,703

Static Water Level 23 feet

139 feet

$T = K * b$ = ft /day * ft = ft^2/day * 7.48 gal/ft^3 = gpd/ft , hence

6,703 ft per day * 7.48 gal per cubic ft = 50,138 gpd/ft which = T_t Total Transmissibilty of primary aquifer.

Ranking System Worksheet

Criteria	Maximum Points	Value	Units	Point Value
1. Thickness of Primary Aquifer Formation	100	139	feet	**100**
2. Transmissivity	100	50,138	gallons per day per foot	**50**
3. Irrigation Well Density	100	48		**48**
		4	# of wells	
4. Public Water Supply Well Density	50	14		**14**
		3	# of wells	
5. Domestic & Livestock Well Density	50	50		**50**
		0	# of wells	
6. Irrigation Best Management Practices				**25**
Gravity	0			
Pivot/Sprinkler	25			
Subsurface Drip	50			
Soil Moisture Monitoring	25			
Total Points Possible	475			**287**

Definitions and Discussion/Summary of Well Permit Ranking Methodology

Primary Aquifer Thickness (b). A geologic formation, group of formations, or part of a formation containing sufficient saturated permeable material to yield economical quantities of groundwater to wells.

Hydraulic Conductivity (K), ft/day. The rate of groundwater flow through a porous medium measured in gallons per day through a cross-section of one square foot under a unit hydraulic gradient at prevailing temperature. The estimated hydraulic conductivity values for calculating the transmissivity were estimated based on work at the University of Nebraska Conservation by E.C. Reed and R. Piskin. They assigned permeability values to various unconsolidated materials based on grain size, particle size, degree of sorting, and silt content. This work has been used by several authors as the basis for estimating hydraulic conductivity of the sedimentary deposits of Nebraska. Due to the well driller's personal interpretation of particle size descriptions only the "Poor" Degree of Sorting column of values will be used to estimate the hydraulic conductivity, K, values.

Transmissivity (T), ft^2/day. The rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient expressed in ft^2 per day . It is a function of properties of the water, the porous media, and thickness of the porous media. Transmissivity differs from place to place and can vary with time. Differences in transmissivity are related to lateral changes in textural composition of the sediments comprising the aquifer. As the water table rises or declines, the saturated thickness also changes, thereby changing the transmissivity. Therefore we will define the term Total Transmissivity.

Total Transmissivity (T_t), gpd/ft. The transmissivity of the primary aquifer approximated by summing the products of hydraulic conductivity and thickness for each different lithology layer that occurs in the vertical section of the aquifer. The effect of differing transmissivity upon the shape, depth, and radial extent of the cone of depression for any well, when pumped, differs in size and shape depending upon the pumping rate, length of pumping period, aquifer characteristics, slope of the water table, and groundwater recharge within the zone of influence of the well. A low aquifer transmissivity (less than 10,000 gpd/ft) the cone of depression would be deep with a small base and steep sides. For an aquifer with a high transmissivity (greater than 100,000 gpd/ft) the cone of depression would be shallow with an extensive radius.

Empirical equation. An equation arrived at by relying on or derived from observations, experiments, and/or practical experience, not theory.

Interference between adjacent wells. The total interference effect in any one well tapping the same aquifer in a well field is the sum of the influences produced by all others of the group.

In summary:

The methodology set forth herein for ranking new, supplemental, and replacement well permits used to determine the hydraulic conductivity and transmissivity is as previously stated: each layer(s) of principle aquifer material recorded in the testhole lithologic log is classified and assigned a value for hydraulic conductivity based upon the tables by Reed, Piskin, and Lackey . The hydraulic conductivity is then multiplied by the thickness, in feet, of that material to get a transmissivity value for the layer(s). The sum of the transmissivities of the principle aquifer layer(s) is the "total transmissivity" of the aquifer(s) at the testhole location. Once the transmissivity has been determined an impact on the surrounding wells within 6,000 feet of the testhole location will be established using the Lower Niobrara NRD well density impact empirical equation. This equation uses the factors of distance and transmissivity to establish an impact derived from each individual well and a compounded impact from the interaction of all the wells within the 6,000 feet, for which the sum of results is the total well density score.

APPENDIX 7: – SOIL TYPES WITHIN THE DISTRICT

The following are soil type identifications which are found in the District. This identification will be used to determine which category a soil of a given field will be identified as for use in calculating the Gross System Capacity. The following are the seven (7) soil types used in the Gross System Capacity: Silt Loam, Sandy Clay Loam, Silty Clay Loam, Silty Clay, Sandy Loam, Loamy Sand, Fine Sand. The percent of each soil type in a given field will be used to calculate the average Gross System Capacity for a field.

oldmusym	oldmuname
Go	Grigston silt loam, 0 to 2 percent slopes
IhB	Inavale loamy fine sand, 0 to 3 percent slopes
IgB	Inavale fine sand, channeled, 0 to 3 percent slopes
IfD	Inavale fine sand, 3 to 11 percent slopes
In	Inavale fine sandy loam, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Et	Eltree silt loam, 0 to 2 percent slopes
BrG	Bristow silty clay, 20 to 40 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
BoD	Boyd silty clay, 6 to 11 percent slopes
Bs	Brocksburg fine sandy loam, 0 to 2 percent slopes
Bt	Brocksburg loam, 0 to 2 percent slopes
Jn	Jansen loam, 0 to 2 percent slopes
JnC	Jansen loam, 2 to 6 percent slopes
JnD	Jansen loam, 6 to 11 percent slopes
LaD	Labu silty clay, 6 to 11 percent slopes
LcF	Labu-Sansarc silty clays, 11 to 30 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
LsC	Lynch silty clay, 2 to 6 percent slopes
LsD	Lynch silty clay, 6 to 11 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
LyD	Lynch-Bristow silty clays, 6 to 11 percent slopes
LyF	Lynch-Bristow silty clays, 11 to 30 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
MaG	Mariaville-Paka loams, 15 to 40 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
MeE	Meadin sandy loam, 3 to 17 percent slopes
Oe	O'Neill fine sandy loam, 0 to 2 percent slopes
OeC	O'Neill fine sandy loam, 2 to 6 percent slopes
OfD	O'Neill-Meadin fine sandy loams, 3 to 9 percent slopes
PaC	Paka fine sandy loam, 2 to 6 percent slopes
Ph	Paka loam, 0 to 2 percent slopes
PhC	Paka loam, 2 to 6 percent slopes
PhD	Paka loam, 6 to 11 percent slopes
PoC	Promise silty clay, 2 to 6 percent slopes
RaE	Ree silt loam, 11 to 15 percent slopes
RaC	Ree silt loam, 2 to 6 percent slopes
RaD	Ree silt loam, 6 to 11 percent slopes
ReC	Reliance silt loam, 2 to 6 percent slopes

ReD	Reliance silt loam, 6 to 11 percent slopes
RfC	Reliance silty clay loam, 2 to 6 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
SaG	Sansarc silty clay, 20 to 40 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Ve	Verdel silty clay, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
WeC	Wewela fine sandy loam, 2 to 6 percent slopes
Cb	Cass fine sandy loam, 0 to 2 percent slopes
Sc	Scott silt loam, 0 to 1 percent slopes
Or	Ord fine sandy loam, 0 to 2 percent slopes
DuB	Dunday loamy fine sand, 0 to 3 percent slopes
DuC	Dunday loamy fine sand, 3 to 6 percent slopes
DuD	Dunday loamy fine sand, 6 to 11 percent slopes
DxB	Dunday loamy fine sand, loamy substratum, 0 to 3 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
VaE	Valentine fine sand, 6 to 17 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
VbB	Valentine loamy sand, 0 to 3 percent slopes
On	Onita silt loam, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
GrB	Grigston silt loam, channeled, 0 to 3 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Ba	Barney silt loam, 0 to 2 percent slopes
Le	Leshara silt loam, 0 to 2 percent slopes
Be	Blendon fine sandy loam, 0 to 2 percent slopes
BeC	Blendon fine sandy loam, 2 to 6 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
CrE2	Crofton silt loam, 11 to 15 percent slopes, eroded
	This map unit was added to the soil survey from an adjacent county for joining purposes.
NoC	Nora silt loam, 2 to 6 percent slopes
NoD	Nora silt loam, 6 to 11 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Ab	Albaton silty clay, 0 to 2 percent slopes
Bd	Blake silty clay loam, 0 to 2 percent slopes
He	Haynie silt loam, 0 to 2 percent slopes
Oa	Onawa silty clay, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Ha	Hall silt loam, 0 to 2 percent slopes
Sm	Simeon loamy sand, 0 to 2 percent slopes
SvF2	Simeon-Valentine complex, 3 to 30 percent slopes, eroded
SuC	Simeon-Valentine loamy sands, 0 to 6 percent slopes
AnF	Anselmo fine sandy loam, 11 to 20 percent slopes
AnC	Anselmo fine sandy loam, 2 to 6 percent slopes

AnD	Anselmo fine sandy loam, 6 to 11 percent slopes
ArF	Anselmo-Rock outcrop complex, 11 to 20 percent slopes
Rw	Riverwash
AED	Arents, earthen dam
GP	Gravel pit
M-W	Miscellaneous water, sewage lagoons
zw	This map unit was added to the soil survey from an adjacent county for joining purposes.
W	Water
zwa	Water > 40 acres
Bn	Boel fine sandy loam, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Ib	Inavale fine sand, 0 to 2 percent slopes
Id	Inavale loamy fine sand, 0 to 2 percent slopes
Ia	Inavale sand, channeled
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Nb	Nimbro silt loam, 0 to 2 percent slopes
BwG	Bristow silty clay, 20 to 40 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Jn	Jansen loam, 0 to 2 percent slopes
JnC	Jansen loam, 2 to 6 percent slopes
JsC	Jansen-Meadin loams, 3 to 6 percent slopes
Jt	Josburg fine sandy loam, 0 to 2 percent slopes
Jw	Josburg loam, 0 to 2 percent slopes
LaC	Labu silty clay, 2 to 6 percent slopes
LaD	Labu silty clay, 6 to 11 percent slopes
LcF	Labu-Sansarc silty clays, 11 to 30 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
LxC	Lynch silty clay, 2 to 6 percent slopes
LxD	Lynch silty clay, 6 to 11 percent slopes
MfB	Meadin loam, 0 to 3 percent slopes
MeB	Meadin sandy loam, 0 to 3 percent slopes
MeF	Meadin sandy loam, 3 to 30 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Oe	O'Neill fine sandy loam, 0 to 2 percent slopes
OeC	O'Neill fine sandy loam, 2 to 6 percent slopes
Of	O'Neill loam, 0 to 2 percent slopes
OdB	O'Neill loamy sand, 0 to 3 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
OmF	O'Neill-Meadin fine sandy loams, 11 to 30 percent slopes
OmC	O'Neill-Meadin fine sandy loams, 2 to 6 percent slopes
OmD	O'Neill-Meadin fine sandy loams, 6 to 11 percent slopes
Pg	Paka fine sandy loam, 0 to 2 percent slopes
PgC	Paka fine sandy loam, 2 to 6 percent slopes
Ph	Paka loam, 0 to 2 percent slopes
PhC	Paka loam, 2 to 6 percent slopes
PhD2	Paka loam, 6 to 11 percent slopes, eroded
SaG	Sansarc silty clay, 20 to 40 percent slopes

Vx	Verdel silty clay loam, 0 to 2 percent slopes
Ws	Wewela fine sandy loam, 0 to 2 percent slopes
WsC	Wewela fine sandy loam, 2 to 6 percent slopes
Wt	Wewela loam, 0 to 2 percent slopes
Ld	Lamo-Lute loams, 0 to 2 percent slopes
Ce	Cass fine sandy loam, 0 to 2 percent slopes
Fm	Fillmore silt loam, 0 to 2 percent slopes
Ts	Almeria-Calamus complex, channeled
Bc	Blackloup loam, 0 to 1 percent slopes
Bd	Blackloup loam, wet, 0 to 1 percent slopes
Or	Ord loam, 0 to 2 percent slopes
Os	Ord-Lute fine sandy loams, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Ep	Elsmere fine sandy loam, 0 to 2 percent slopes
LkB	Libory loamy fine sand, 0 to 3 percent slopes
LmB	Libory-Whitelake loamy fine sands, 0 to 3 percent slopes
Bg	Blown-out land-Valentine complex, 6 to 60 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
DuB	Dunday loamy sand, 0 to 3 percent slopes
DuC	Dunday loamy sand, 3 to 6 percent slopes
DxB	Dunn loamy sand, 0 to 3 percent slopes
Eb	Els loamy sand, 0 to 2 percent slopes
EfB	Els-Ipage complex, 0 to 3 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Em	Elsmere loamy fine sand, 0 to 2 percent slopes
En	Elsmere loamy fine sand, clayey substratum, 0 to 2 percent slopes
EsB	Elsmere-Ipage loamy fine sands, 0 to 3 percent slopes
Eu	Elsmere-Selia loamy fine sands, 0 to 2 percent slopes
Gb	Gannett loam, 0 to 2 percent slopes
Gf	Gannett loam, wet, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
IgB	Ipage loamy sand, 0 to 3 percent slopes
IfB	Ipage sand, 0 to 3 percent slopes
ItB	Ipage-Tryon fine sands, 0 to 3 percent slopes
Lp	Loup fine sandy loam, 0 to 2 percent slopes
Lr	Loup fine sandy loam, wet, 0 to 2 percent slopes
Ma	Marlake fine sandy loam, 0 to 2 percent slopes
PtB	Pivot loamy sand, 0 to 3 percent slopes
PtC	Pivot loamy sand, 3 to 9 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
To	Tryon loamy fine sand, 0 to 2 percent slopes
Tp	Tryon loamy fine sand, wet, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
VaB	Valentine fine sand, 0 to 3 percent slopes
VaD	Valentine fine sand, 3 to 9 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
VaE	Valentine fine sand, rolling

VaG	Valentine fine sand, Rolling, and Hilly
	This map unit was added to the soil survey from an adjacent county for joining purposes.
VeD	Valentine-Dunday loamy fine sands, 3 to 9 percent slopes
VmD	Valentine-Els complex, 0 to 9 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
VeB	Valentine-Dunday loamy fine sands, 0 to 3 percent slopes
VsD	Valentine-Simeon sands, 3 to 9 percent slopes
VsF2	Valentine-Simeon sands, 9 to 30 percent slopes, eroded
VtE	Valentine-Tryon fine sands, 0 to 17 percent slopes
VwD	Valentine-Wewela complex, 3 to 9 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Ba	Barney silt loam, channeled
Ls	Barney-Boel-Calamus complex, channeled
Lf	Lawet loam, drained, 0 to 2 percent slopes
Lg	Lawet-Lute complex, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Te	Trent silt loam, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Bb	Bazile silt loam, 0 to 2 percent slopes
BbC	Bazile silt loam, 2 to 6 percent slopes
BsB	Boelus loamy sand, 0 to 3 percent slopes
BsC	Boelus loamy sand, 3 to 6 percent slopes
BsD	Boelus loamy sand, 6 to 11 percent slopes
BtB	Boelus loamy sand, gravelly substratum, 0 to 3 percent slopes
BuD	Boelus-Meadin complex, 6 to 11 percent slopes
ByF	Brunswick-Tassel fine sandy loams, 11 to 40 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
BxF	Brunswick-Pivot complex, 9 to 30 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
No	Nora silt loam, 0 to 2 percent slopes
NoC	Nora silt loam, 2 to 6 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
LnC	Loretto loam, 2 to 6 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Bm	Boel loamy fine sand, 0 to 2 percent slopes
Bo	Boel silty clay loam, overwash, 0 to 2 percent slopes
Bp	Boel-Inavale complex, channeled
Lh	Lex-Lute loams, 0 to 2 percent slopes
Ax	Anselmo-O'Neill sandy loams, 0 to 2 percent slopes
SmB	Simeon loamy sand, 0 to 3 percent slopes
SkB	Simeon sand, 0 to 3 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.

An	Anselmo fine sandy loam, 0 to 2 percent slopes
AnC	Anselmo fine sandy loam, 2 to 6 percent slopes
At	Anselmo loam, 0 to 2 percent slopes
AxC	Anselmo-O'Neill sandy loams, 2 to 6 percent slopes
Rw	Riverwash
Ft	Fluvaquents, sandy-Fluvaquents, loamy complex, 0 to 1 percent slopes
LD	Sanitary landfill
INT	Aquolls
AED	Arents, earthen dam
GP	Gravel pit
Pm	Pits, sand and gravel
M-W	Miscellaneous water, sewage lagoons
zw	This map unit was added to the soil survey from an adjacent county for joining purposes.
W	Water
zwa	Water > 40 acres
Bo	Boel fine sandy loam, 0 to 2 percent slopes
IhB	Inavale loamy fine sand, 0 to 3 percent slopes
IgB	Inavale fine sand, channeled, 0 to 3 percent slopes
IfD	Inavale fine sand, 3 to 11 percent slopes
Mu	Munjor fine sandy loam, 0 to 2 percent slopes
Bt	Brocksburg loam, 0 to 1 percent slopes
Tu	Tuthill fine sandy loam, 0 to 2 percent slopes
Ho	Holt fine sandy loam, 0 to 2 percent slopes
HoC	Holt fine sandy loam, 2 to 6 percent slopes
HtC	Holt-Tassel fine sandy loams, 3 to 6 percent slopes
HtD	Holt-Tassel fine sandy loams, 6 to 11 percent slopes
MfC	Manter fine sandy loam, 2 to 6 percent slopes
MaB	Manter loamy fine sand, 0 to 3 percent slopes
MaC	Manter loamy fine sand, 3 to 6 percent slopes
Ja	Jansen fine sandy loam, 0 to 2 percent slopes
Jn	Jansen loam, 0 to 2 percent slopes
JnC	Jansen loam, 2 to 6 percent slopes
JoB	Jansen-Meadin loams, 0 to 3 percent slopes
TaF	Tassel loamy fine sand, 3 to 30 percent slopes
TdE	Tassel-Duda complex, 3 to 15 percent slopes
TrG	Tassel-Ronson-Duda complex, 15 to 70 percent slopes
LaD	Labu silty clay, 6 to 11 percent slopes
LcF	Labu-Sansarc silty clays, 11 to 30 percent slopes
MkG	Mariaville-Keota silt loams, 15 to 60 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
MnF	Meadin gravelly sandy loam, 3 to 30 percent slopes
Oe	O'Neill fine sandy loam, 0 to 2 percent slopes
OeC	O'Neill fine sandy loam, 2 to 6 percent slopes
OeD	O'Neill fine sandy loam, 6 to 9 percent slopes
OaB	O'Neill loamy fine sand, 0 to 3 percent slopes
OhB	O'Neill-Meadin fine sandy loams, 0 to 3 percent slopes
OkD	O'Neill-Valentine complex, 1 to 9 percent slopes
Pf	Paka fine sandy loam, 0 to 2 percent slopes

	This map unit was added to the soil survey from an adjacent county for joining purposes.
Ph	Paka loam, 0 to 1 percent slopes
PhB	Paka loam, 1 to 3 percent slopes
PmC	Paka-Mariaville loams, 3 to 6 percent slopes
PmF	Paka-Mariaville loams, 11 to 30 percent slopes
RaB	Ree loam, 1 to 3 percent slopes
Rb	Ree loam, clayey substratum, 0 to 2 percent slopes
ReC	Reliance silt loam, 2 to 6 percent slopes
RoD	Ronson-Anselmo fine sandy loams, 6 to 9 percent slopes
RoF	Ronson-Anselmo fine sandy loams, 9 to 30 percent slopes
RtB	Ronson-Tassel fine sandy loams, 0 to 3 percent slopes
SaG	Sansarc silty clay, 20 to 40 percent slopes
Ve	Verdel silty clay loam, 0 to 1 percent slopes
VeB	Verdel silty clay loam, 1 to 3 percent slopes
VeC	Verdel silty clay loam, 3 to 6 percent slopes
WeB	Wewela fine sandy loam, 0 to 3 percent slopes
WeC	Wewela fine sandy loam, 3 to 6 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Bc	Blackloup loam, 0 to 1 percent slopes
Bd	Blackloup loam, wet, 0 to 1 percent slopes
Op	Ord fine sandy loam, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Or	Ord-Loup fine sandy loams, 0 to 2 percent slopes
DdB	Duda loamy fine sand, 0 to 3 percent slopes
DdC	Duda loamy fine sand, 3 to 6 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
DuB	Dunday loamy fine sand, 0 to 3 percent slopes
DxB	Dunday-Duda loamy fine sands, 0 to 3 percent slopes
Eo	Els fine sand, 0 to 2 percent slopes
Es	Elsmere loamy fine sand, 0 to 2 percent slopes
IpB	Ipage loamy fine sand, 0 to 3 percent slopes
Lo	Loup fine sandy loam, 0 to 2 percent slopes
Lp	Loup fine sandy loam, wet, 0 to 2 percent slopes
Mm	Marlake loamy fine sand, 0 to 1 percent slopes
MpB	McKelvie loamy fine sand, 0 to 3 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
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VaG	Valentine fine sand, hilly
VaF	Valentine fine sand, rolling
	This map unit was added to the soil survey from an adjacent county for joining purposes.
VbD	Valentine loamy fine sand, gently rolling
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
VcF	Valentine-Tassel complex, rolling
VdC	Valentine-Wewela loamy fine sands, 3 to 6 percent slopes
VdF	Valentine-Wewela loamy fine sands, 6 to 30 percent slopes

On	Onita silt loam, 0 to 1 percent slopes
ScF	Schamber gravelly sandy loam, 11 to 30 percent slopes
Vo	Vetal fine sandy loam, 0 to 2 percent slopes
Vt	Vetal loam, 0 to 1 percent slopes
VtB	Vetal loam, 1 to 3 percent slopes
VtC	Vetal loam, 3 to 6 percent slopes
Ba	Barney fine sandy loam, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Bb	Barney-Bolent complex, channeled
Ab	Albaton variant clay, 0 to 2 percent slopes
Cb	Cass loam, 0 to 2 percent slopes
CcB	Cass loam, channeled, 0 to 3 percent slopes
SmF	Simeon-Manter-Ronson complex, 6 to 17 percent slopes
SvF2	Simeon-Valentine fine sands, 6 to 17 percent slopes, eroded
SwB	Simeon-Valentine loamy sands, 0 to 3 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
An	Anselmo fine sandy loam, 0 to 2 percent slopes
AnC	Anselmo fine sandy loam, 2 to 6 percent slopes
AmB	Anselmo loamy fine sand, 0 to 3 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Fu	Fluvaquents
Ft	Fluvaquents, sandy-Fluvaquents, loamy complex, 0 to 1 percent slopes
AED	Arents, Earthen Dam
M-W	Miscellaneous Water, Sewage Lagoons
W	Water
zwb	Water < 40 acres
zwa	Water > 40 acres
Ig	Inavale fine sand, channeled, 0 to 2 percent slopes
Iv	Inavale fine sand, channeled, frequently flooded
Ig2	Inavale fine sand, poorly drained, channeled, 0 to 2 percent slopes, frequently flooded
Im	Inavale fine sandy loam, 0 to 2 percent slopes
Im2f	Inavale fine sandy loam, poorly drained, 0 to 2 percent slopes, frequently flooded
Im2	Inavale fine sandy loam, poorly drained, 0 to 2 percent slopes, rarely flooded
In	Inavale fine sandy loam, rarely flooded
Im1	Inavale fine sandy loam, somewhat poorly drained, 0 to 2 percent slopes, rarely flooded
If	Inavale fine sand, 0 to 2 percent slopes
Ia	Inavale fine sand, rarely flooded
If1	Inavale fine sand, somewhat poorly drained, 0 to 2 percent slopes, rarely flooded
Ih	Inavale loamy fine sand, 0 to 2 percent slopes
Ie	Inavale loamy fine sand, rarely flooded
Ih1	Inavale loamy fine sand, somewhat poorly drained, 0 to 2 percent slopes, rarely flooded
Et	Eltree silt loam, 0 to 2 percent slopes
EtC	Eltree silt loam, 2 to 6 percent slopes
BvG	Bristow silty clay, 30 to 60 percent slopes
LbD	Labu silty clay, 6 to 11 percent slopes
LcF	Labu-Sansarc complex, 11 to 30 percent slopes
LyF	Lynch-Bristow complex, 11 to 30 percent slopes
LzD	Lynch-Verdel complex, 6 to 11 percent slopes

MbF	Mariaville very fine sandy loam, 3 to 30 percent slopes
MeB	Meadin sandy loam, 0 to 3 percent slopes
MgF	Meadin-O'Neill complex, 3 to 30 percent slopes
Oe	O'Neill sandy loam, 0 to 2 percent slopes
OeC	O'Neill sandy loam, 2 to 6 percent slopes
Ph	Paka loam, 0 to 2 percent slopes
PhC	Paka loam, 2 to 6 percent slopes
PhD	Paka loam, 6 to 11 percent slopes
PhE	Paka loam, 11 to 15 percent slopes
SaG	Sansarc silty clay, 30 to 60 percent slopes
Ve	Verdel silty clay, 0 to 2 percent slopes
Vr	Verdel silty clay, 0 to 2 percent slopes
Ve2	Verdel silty clay, poorly drained, 0 to 2 percent slopes
Ve1	Verdel silty clay, somewhat poorly drained, 0 to 2 percent slopes
VeC	Verdel silty clay, 2 to 6 percent slopes
VeD	Verdel silty clay, 6 to 11 percent slopes
VfF	Verdigre fine sandy loam, 11 to 30 percent slopes
VfC	Verdigre fine sandy loam, 2 to 6 percent slopes
VfD	Verdigre fine sandy loam, 6 to 11 percent slopes
VgC	Verdigre loam, 2 to 6 percent slopes
VgD	Verdigre loam, 6 to 11 percent slopes
VgF	Verdigre loam, 11 to 30 percent slopes
LhC2	Longford silty clay loam, 2 to 6 percent slopes, eroded
Hd	Hobbs silt loam, 0 to 2 percent slopes
Sw	Solomon silty clay, 0 to 2 percent slopes
KzB	Kezan silt loam, channeled, 0 to 2 percent slopes
Ke	Kezan silt loam, 0 to 2 percent slopes
Kn	Kezan silt loam, occasionally flooded
Kef	Kezan silt loam, poorly drained, 0 to 2 percent slopes, frequently flooded
By	Butler silt loam, 0 to 2 percent slopes
Sc	Scott silt loam, 0 to 1 percent slopes
So	Solomon silty clay, rarely flooded
Fm	Fillmore silt loam, 0 to 1 percent slopes
LhD2	Longford silty clay loam, 6 to 11 percent slopes, eroded
Og	Ord fine sandy loam, 0 to 2 percent slopes
Of	Ord fine sandy loam, occasionally flooded
Oh	Ord loam, 0 to 2 percent slopes
Ok	Ord loam, occasionally flooded
Oh2	Ord loam, poorly drained, 0 to 2 percent slopes, occasionally flooded
Eh	Elsmere fine sandy loam, 0 to 2 percent slopes
Em	Elsmere fine sandy loam, rarely flooded
Ef	Elsmere loamy fine sand, 0 to 2 percent slopes
VaD	Valentine fine sand, 3 to 9 percent slopes
VaE	Valentine fine sand, 9 to 24 percent slopes
BoE2	Betts clay loam, 11 to 15 percent slopes, eroded
BoF	Betts clay loam, 15 to 30 percent slopes
BoG	Betts clay loam, 30 to 60 percent slopes
BoD2	Betts clay loam, 6 to 11 percent slopes, eroded

	This map unit was added to the soil survey from an adjacent county for joining purposes.
Ao	Aowa silt loam, 0 to 2 percent slopes
Aw	Aowa silt loam, occasionally flooded
Ao2f	Aowa silt loam, poorly drained, 0 to 2 percent slopes, frequently flooded
Ao2	Aowa silt loam, poorly drained, 0 to 2 percent slopes, occasionally flooded
Ao1	Aowa silt loam, somewhat poorly drained, 0 to 2 percent slopes, occasionally flooded
Ar	Aowa silt loam, channeled, 0 to 2 percent slopes
As	Aowa silt loam, channeled, frequently flooded
Ar2	Aowa silt loam, poorly drained, channeled, 0 to 2 percent slopes, frequently flooded
Ba	Barney loam, 0 to 2 percent slopes
Bb	Barney loam, frequently flooded
Co	Coleridge silt loam, 0 to 2 percent slopes
Cp	Coleridge silt loam, occasionally flooded
Mk	Meckling loamy fine sand, occasionally flooded
Nw	Norway loamy fine sand, frequently flooded
Oc	Obert silt loam, occasionally flooded
Obf	Obert silt loam, very poorly drained, 0 to 2 percent slopes, frequently flooded
Ob	Obert silt loam, wet, 0 to 2 percent slopes
Ou	Orwet loam, 0 to 2 percent slopes
Ow	Orwet loam, rarely flooded
Sh	Shell silt loam, 0 to 2 percent slopes
Se	Shell silt loam, occasionally flooded
Sh1	Shell silt loam, somewhat poorly drained, 0 to 2 percent slopes, occasionally flooded
Iw	Inglewood loamy fine sand, rarely flooded
Bn	Bazile loam, 0 to 2 percent slopes
Bp	Blendon fine sandy loam, 0 to 2 percent slopes
Lk	Loretto fine sandy loam, 0 to 2 percent slopes
SdD	Sardak loamy fine sand, 2 to 9 percent slopes
ToB	Thurman fine sandy loam, 0 to 3 percent slopes
Tr	Trent silt loam, 0 to 2 percent slopes
Tx	Trent silt loam, moderately wet, 0 to 2 percent slopes
Or	Ortello fine sandy loam, 0 to 2 percent slopes
AcC	Alcester silt loam, 2 to 6 percent slopes
AcD	Alcester silt loam, 6 to 11 percent slopes
BnC	Bazile loam, 2 to 6 percent slopes
BnD	Bazile loam, 6 to 11 percent slopes
Bd	Bazile loamy fine sand, 0 to 2 percent slopes
BdC	Bazile loamy fine sand, 2 to 6 percent slopes
BdD	Bazile loamy fine sand, 6 to 11 percent slopes
Bt	Boelus loamy sand, 0 to 2 percent slopes
BtC	Boelus loamy sand, 2 to 6 percent slopes
BtD	Boelus loamy sand, 6 to 11 percent slopes
BwD	Brunswick fine sandy loam, 6 to 11 percent slopes
BxE	Brunswick-Paka complex, 6 to 15 percent slopes
BxF	Brunswick-Paka complex, 15 to 30 percent slopes
CtE2	Crofton-Thurman complex, 11 to 15 percent slopes, eroded
CtF	Crofton-Thurman complex, 15 to 30 percent slopes
CtD2	Crofton-Thurman complex, 6 to 11 percent slopes, eroded

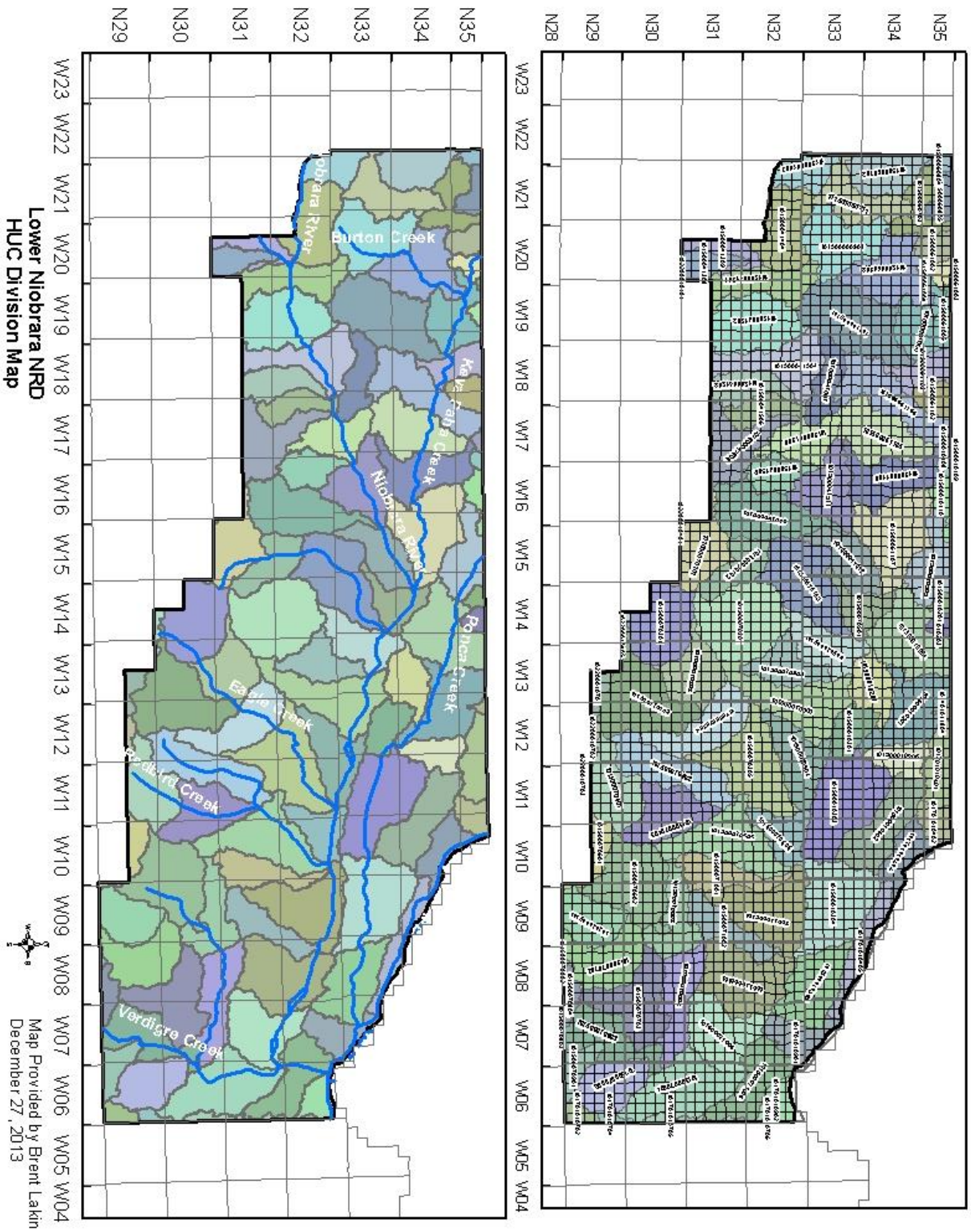
CrE2	Crofton silt loam, 11 to 15 percent slopes, eroded
CrF	Crofton silt loam, 15 to 30 percent slopes
CrC2	Crofton silt loam, 2 to 6 percent slopes, eroded
CrG	Crofton silt loam, 30 to 60 percent slopes
CrD2	Crofton silt loam, 6 to 11 percent slopes, eroded
CsC2	Crofton-Nora complex, 2 to 6 percent slopes, eroded
CsD2	Crofton-Nora complex, 6 to 11 percent slopes, eroded
	This map unit was added to the soil survey from an adjacent county for joining purposes.
ThB	Thurman loamy fine sand, 0 to 3 percent slopes
ThC	Thurman loamy fine sand, 3 to 6 percent slopes
TfB	Thurman fine sand, 0 to 3 percent slopes
TfC	Thurman fine sand, 3 to 6 percent slopes
ToF	Thurman fine sandy loam, 11 to 30 percent slopes
ToD	Thurman fine sandy loam, 3 to 11 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
NoE	Nora silty clay loam, 11 to 15 percent slopes
GaG	Gavins silt loam, 30 to 60 percent slopes
NoC	Nora silty clay loam, 2 to 6 percent slopes
NoD	Nora silty clay loam, 6 to 11 percent slopes
CsE2	Crofton-Nora complex, 11 to 15 percent slopes, eroded
LkC	Loretto fine sandy loam, 2 to 6 percent slopes
Mm	Moody loam, 0 to 2 percent slopes
MmC	Moody loam, 2 to 6 percent slopes
Mo	Moody silty clay loam, 0 to 2 percent slopes
MoC	Moody silty clay loam, 2 to 6 percent slopes
RdD	Redstoe silt loam, 6 to 11 percent slopes
RgF	Redstoe-Gavins complex, 11 to 30 percent slopes
OrC	Ortello fine sandy loam, 2 to 6 percent slopes
Aa	Albaton silty clay, 0 to 2 percent slopes
At	Albaton silty clay, occasionally flooded
Ab	Albaton silty clay, ponded, 0 to 1 percent slopes
An	Albaton silty clay, ponded, frequently flooded
Br	Blyburg silt loam, 0 to 2 percent slopes
Br2	Blyburg silt loam, poorly drained, 0 to 2 percent slope, occasionally flooded
Bg	Blyburg silt loam, rarely flooded
Br1	Blyburg silt loam, somewhat poorly drained, 0 to 2 percent slopes, rarely flooded
Pt	Percival silty clay, 0 to 2 percent slopes
Pv	Percival silty clay, rarely flooded
Od	Onawa silty clay, 0 to 2 percent slopes
Od2	Onawa silty clay, poorly drained, 0 to 2 percent slopes, rarely flooded
On	Onawa silty clay, rarely flooded
Bs	Boel loamy fine sand, 0 to 2 percent slopes
Be	Boel loamy fine sand, occasionally flooded
Bs2	Boel loamy fine sand, poorly drained, 0 to 2 percent slopes, occasionally flooded
Gf	Gibbon silt loam, 0 to 2 percent slopes
Gb	Gibbon silt loam, occasionally flooded
Gf2f	Gibbon silt loam, poorly drained, 0 to 2 percent slopes, frequently flooded
Gf2	Gibbon silt loam, poorly drained, 0 to 2 percent slopes, occasionally flooded

Gf3	Gibbon silt loam, very poorly drained, 0 to 2 percent slopes, occasionally flooded
Ho	Hord silt loam, 0 to 2 percent slopes
Hr	Hord silt loam, 0 to 2 percent slopes
StC	Simeon loamy sand, 0 to 6 percent slopes
SsF2	Simeon sand, 6 to 30 percent slopes, eroded
SuC	Simeon sandy loam, 0 to 6 percent slopes
SvF	Simeon-Thurman complex, 6 to 30 percent slopes
UbF	Urban land, 3 to 30 percent slopes
Ft	Fluvaquents, frequently flooded
Fu	Fluvaquents, silty, 0 to 2 percent slopes
LD	Sanitary Landfill
GP	Gravel Pits
M-W	Miscellaneous Water, Sewage Lagoons
W	Water
zw	Water, undifferentiated
	This map unit was added to the soil survey from an adjacent county for joining purposes.
JsB	Jansen loamy sand, 0 to 3 percent slopes
LcG	Labu-Sansarc silty clays, 11 to 40 percent slopes
MeB	Meadin sandy loam, 0 to 3 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Oe	O'Neill sandy loam, 0 to 2 percent slopes
OeC	O'Neill sandy loam, 2 to 6 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
OhD	O'Neill-Meadin sandy loams, 6 to 11 percent slopes
WeC	Wewela fine sandy loam, 2 to 6 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Or	Ord loam, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
LfB	Libory loamy fine sand, 0 to 3 percent slopes
DuB	Dunday loamy fine sand, 0 to 3 percent slopes
Eo	Els loamy sand, 0 to 2 percent slopes
EpB	Els-Ipage complex, 0 to 3 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
ErC	Els-Ipage-Tryon loamy sands, 0 to 6 percent slopes
Es	Elsmere loamy fine sand, 0 to 2 percent slopes
ExB	Elsmere-Selia loamy fine sands, 0 to 3 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
IgB	Ipage loamy sand, 0 to 3 percent slopes
Lo	Loup fine sandy loam, 0 to 2 percent slopes
Lp	Loup fine sandy loam, wet, 0 to 2 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Ma	Marlake loamy fine sand, 0 to 1 percent slopes
TdG	Tassel-Valentine-Duda complex, 15 to 70 percent slopes
PtB	Pivot loamy sand, 0 to 3 percent slopes
PvD	Pivot-Valentine complex, 0 to 9 percent slopes

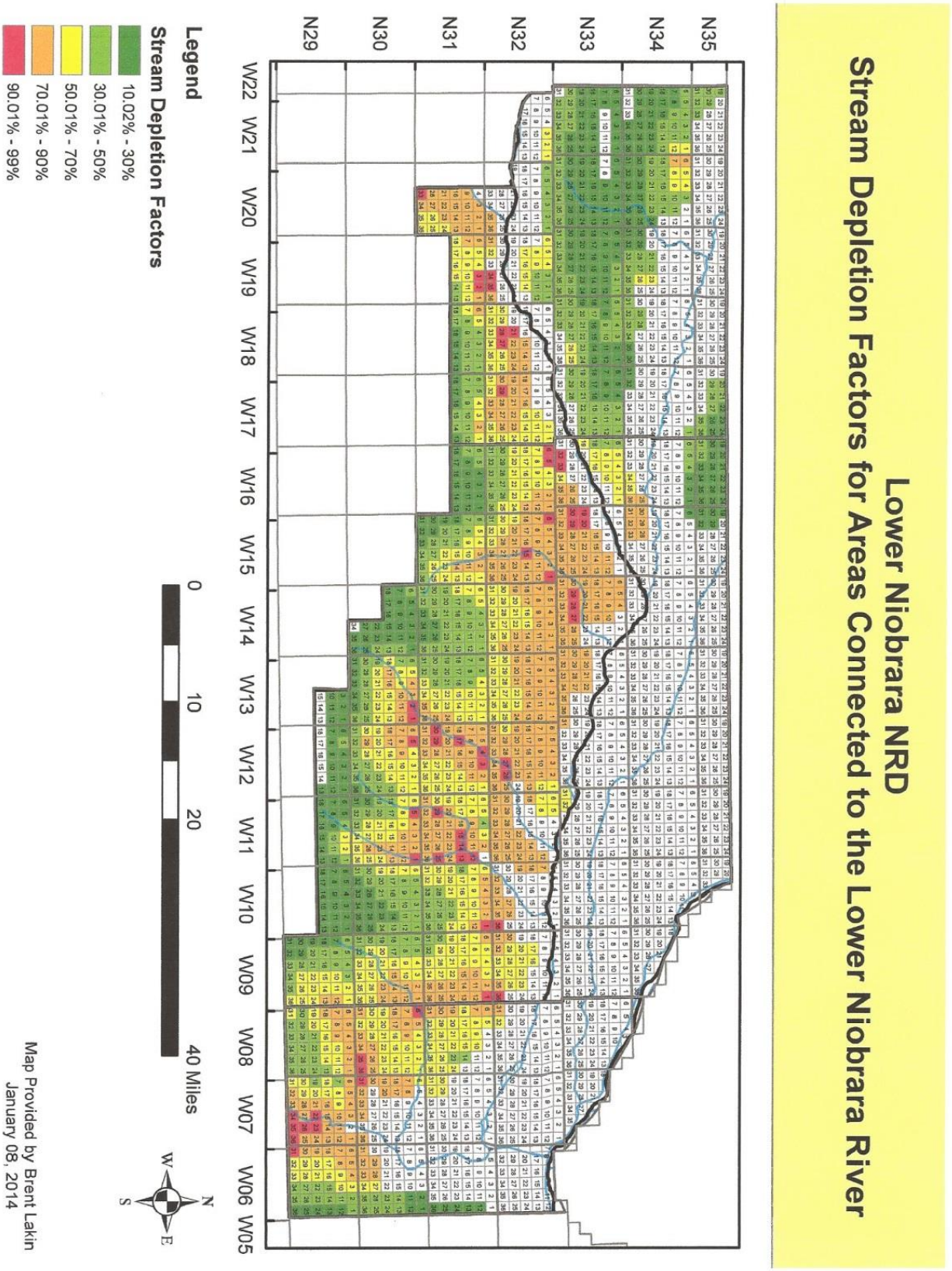
	This map unit was added to the soil survey from an adjacent county for joining purposes.
Tn	Tryon loamy fine sand, 0 to 2 percent slopes
To	Tryon loamy fine sand, wet, 0 to 2 percent slopes
TpB	Tryon-Els loamy sands, 0 to 3 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
VaB	Valentine fine sand, 0 to 3 percent slopes
VaD	Valentine fine sand, 3 to 9 percent slopes
VaE	Valentine fine sand, rolling
VaG	Valentine fine sand, rolling and hilly
VbB	Valentine loamy fine sand, 0 to 3 percent slopes
VbD	Valentine loamy fine sand, 3 to 9 percent slopes
VdD	Valentine-Boelus fine sands, 0 to 9 percent slopes
VfD	Valentine-Els fine sands, 0 to 9 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
	This map unit was added to the soil survey from an adjacent county for joining purposes.
VoB	Vetal loam, 1 to 3 percent slopes
Ba	Barney-Boel complex, channeled
BpB	Boelus loamy sand, 0 to 3 percent slopes
BtF	Brunswick-Tassel fine sandy loams, 11 to 40 percent slopes
BrD	Brunswick-Tassel loamy sands, 3 to 11 percent slopes
Bm	Boel loamy fine sand, 0 to 2 percent slopes
SkB	Simeon loamy sand, 0 to 3 percent slopes
	This map unit was added to the soil survey from an adjacent county for joining purposes.
SmD	Simeon-Meadin complex, 0 to 9 percent slopes
SvG2	Simeon-Valentine sands, 9 to 60 percent slopes, eroded
LD	Sanitary landfill
GP	Gravel pit
M-W	Miscellaneous water, sewage lagoons
W	Water
zwa	Water > 40 acres

APPENDIX 8: – HYDROGEOLOGIC UNIT CODE MAP OF DISTRICT

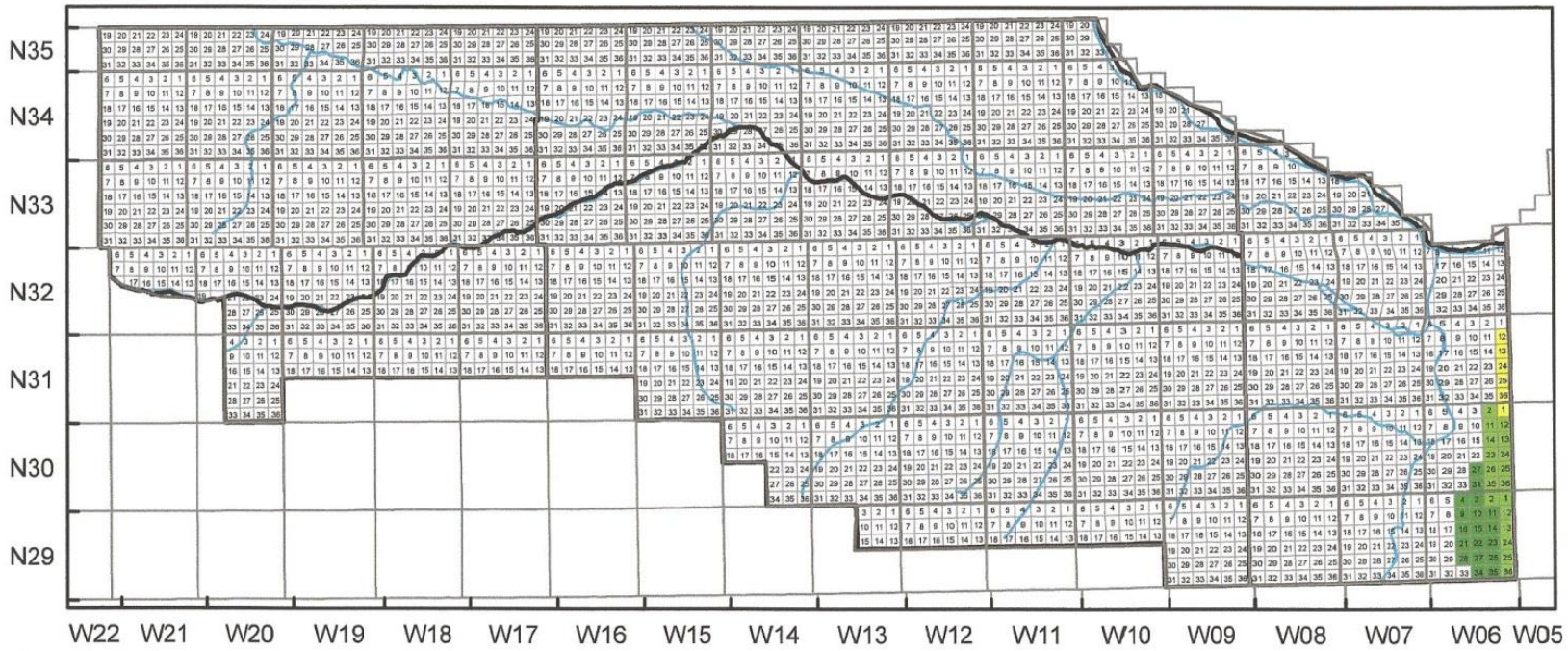
These maps establish the areas in which groundwater can be transferred. Groundwater cannot be transferred out of a given Hydrogeologic Unit.



APPENDIX 9: – STREAM DEPLETION MAPS OF THE DISTRICT



Lower Niobrara NRD
Stream Depletion Factors for Areas Connected to the Bazile Creek



Legend

bazile_sdf

Weighted_A

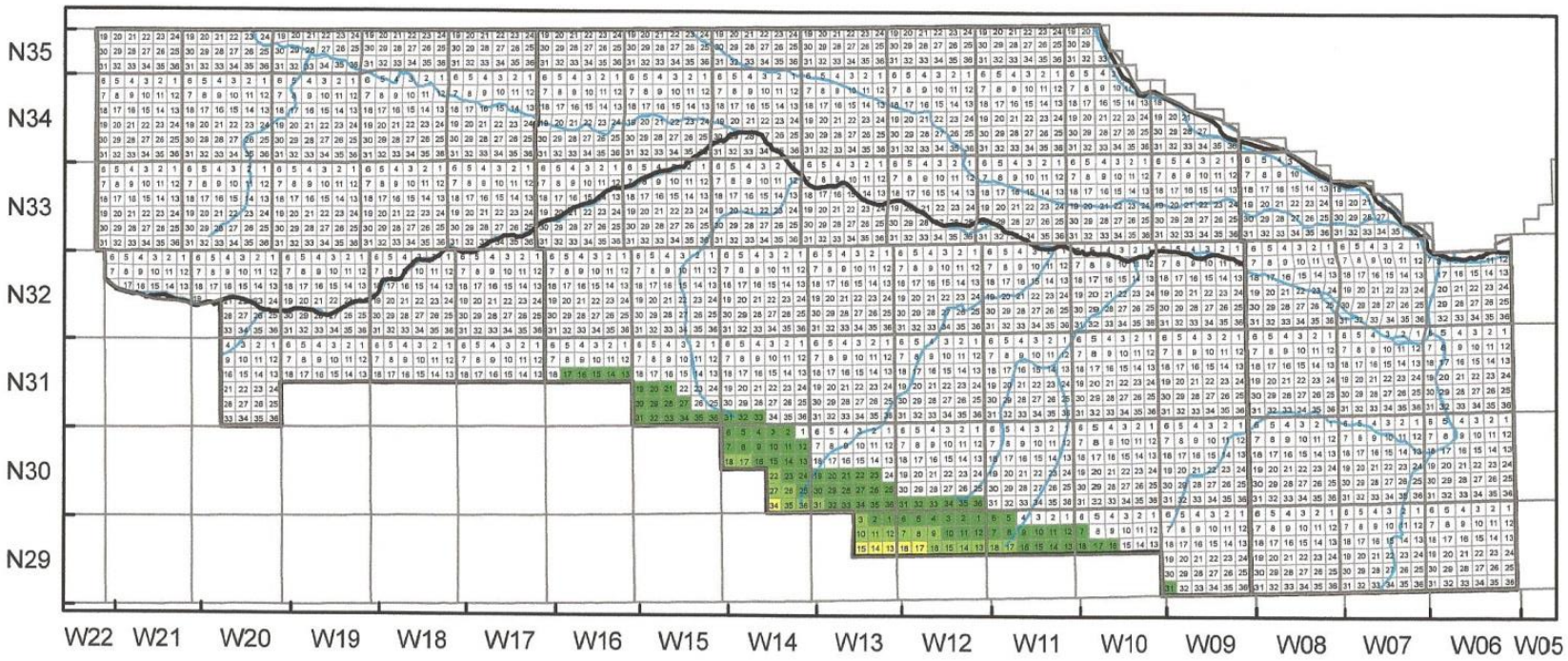
- 10.32% - 30%
- 30.01% - 50%
- 50.01% - 70%
- 70.01% - 90%
- 90.01% - 99%

0 10 20 40 Miles

N
W E
S

Map Provided by Brent Lakin
January 08, 2014

Lower Niobrara NRD
Stream Depletion Factors for Areas Connected to the Lower Platte River Basin



Legend

Elkhorn River Stream Depletion Factors

- 10.01% - 30%
- 30.01% - 50%
- 50.01% - 70%
- 70.01% - 90%
- 90.01% - 99%

0 10 20 40 Miles

N
W E
S

Map Provided by Brent Lakin
January 08, 2014

APPENDIX 10: FORM 1

Lower Niobrara NRD Erosion & Sediment Control Program

NOTICE OF FILING OF COMPLAINT AND INSPECTION DATE

COMPLAINT NO. _____

DATE: _____

NAME: _____ ADDRESS: _____

A complaint has been filed with the Lower Niobrara Natural Resources District by (*name of complainant*) stating that sediment damages have occurred on (*his/her/their*) property and alleging that this sediment is originating for soil erosion occurring on your lands at an excess rate. The tract of land against which the complaint was filed is described as follows: (*legal description*).

In order to determine the validity of this complaint, it will be necessary for the District Board of Directors and their agents to inspect this tract of land to ascertain whether such excess soil loss is actually occurring. This inspection will be made on (*date*) at (*time*). You are invited to accompany the inspection team.

This letter is sent in compliance with the notice requirements of Section 2-4608 of the Revised Statutes of Nebraska and Rule (_____) of the Rules and Regulations of the (_____) Natural Resources District. You will be sent a copy of the inspection report when completed. If you have any questions, please contact me at our District office: (*contact information*).

Signature:_____, General Manager

Lower Niobrara Natural Resources District

APPENDIX 11: Lower Niobrara NRD Erosion & Sediment Control Program FORM 2

NOTICE OF VIOLATION

COMPLAINT NO. _____

DATE: _____

NAME: _____ ADDRESS: _____

You were notified on (*date*) that a complaint had been filed with the Lower Niobrara Natural Resources District by (*name*) alleging that sediment originating from excess rates of soil erosion on your land was causing sediment damages on (*his/her/their*) property. An inspection of these lands was conducted on (*date*).

Based on this inspection and the report of the investigator, the Committee designated by the District Board for this purpose, has determined that there is reasonable cause to believe that sediment damages have occurred and were the result of soil loss from your land in excess of the tolerance level established by the District in violation of the Erosion and Sediment Control Rules and Regulations.

The portions of your land believed to be in violation are identified on the map which is included in the investigator's report accompanying this notice.

You are further advised that you have two options at this point.

1. Should you develop an acceptable conservation plan or erosion and sediment control plan to eliminate excess erosion on the areas of your land, which are in violation, and sign a conservation agreement with the District, no further action will be taken on this complaint, provided that you remain in compliance with the plan and agreement. Cost-share assistance may be available for installation of permanent soil and water conservation practices at a cost-share rate set by the counties FSA boards or the District. If you are interested in pursuing this option, you must contact the District office within 10 days after receiving this notice. We are ready to assist you in developing a plan.
2. Should you wish to contest the findings in the report and/or the conclusions of the Committee, you are entitled to do so at a meeting of the District Board (*date and time*) at (*location*). If you wish to have a formal adjudicatory hearing, you must request it within 10 days after receiving this notice. Hearing information will be provided to you.

Finally, you are advised that if you do not respond to this notice in either of the preceding ways, the District Board shall proceed to make a final determination on the complaint, and if appropriate, issue an administrative order requiring you to correct the excess erosion, which may be enforced by court action as prescribed by law.

We encourage you to select the first option and we remain ready to assist you in eliminating the excess erosion on your land.

Signature: _____

Print: _____

APPENDIX 12 : Lower Niobrara NRD Erosion & Sediment Control Program FORM 3

CONSERVATION AGREEMENT

COMPLAINT NO. _____

DATE: _____

NAME: _____ ADDRESS: _____

LEGAL: _____ COUNTY: _____

This agreement is made and entered into this __day of _____, 20____, by and between the Lower Niobrara Natural Resources District, herein called DISTRICT, and _____, herein called COOPERATOR; and is executed to satisfy the

requirements of Nebraska Revised Statute Section 2-4603(2) and should be interpreted and performed in a manner which promotes the policies of the Nebraska Erosion and Sediment Control Act, Nebraska Revised Statutes Sections 2-4601 to 2-4613.

WITNESSETH:

COOPERATOR agrees to implement the farm unit conservation plan (or a portion of the farm unit conservation plan), or in the case of nonagricultural land-disturbing activities, an erosion and sediment control plan, attached to this agreement according to the Schedule for Completion accompanying the plan. Both the plan and schedule are incorporated herein by reference.

DISTRICT agrees to provide assistance to COOPERATOR in applying the plan to COOPERATOR'S farm and furnish, as available, technical and financial assistance, equipment, and materials to COOPERATOR at rates established by DISTRICT.

DISTRICT AND COOPERATOR mutually agree that:

1. Compliance with this agreement shall be deemed compliance with the requirements of the Nebraska Erosion and Sediment Control Act and the erosion and sediment control program approved by the District.

2. Cost-share for erosion and sediment control practices may be available from the DISTRICT. However, lack of available cost-share assistance does not offset the requirement that the COOPERATOR implement this farm unit conservation plan in the timed prescribed.

3. Neither DISTRICT nor COOPERATOR shall be liable for damages to the other in connection with the performance of this agreement unless such damages are caused by negligence or misconduct.

4. This agreement may be amended upon thirty days notice.

This agreement shall be in effect when signed by both parties and remain in effect unless it is terminated by either party by giving sixty days notice in writing to the other party.

_____ Date: _____

Owner/Operator

_____

Address

_____ Date: _____

Lower Niobrara Natural Resources District

APPENDIX 13: Lower Niobrara NRD Erosion & Sediment Control Program FORM 3a

CONSERVATION PLAN FOR COMPLETION

AND

COOPERATOR'S RECORD OF COMPLIANCE

COMPLAINT NO. _____

DATE: _____

NAME: _____ ADDRESS: _____

LEGAL: _____ COUNTY: _____

Attach photograph, map, or diagram designating fields or tracts involved by number.

A. Planned

1. *Record land use planned by field or tracts listing conservation practice(s) and/or resource management systems to be applied. Describe briefly, what will be done and how it will be done.*

2. *Indicate the amount of conservation practices planned and completion date(s).*

B. Practice(s) Completion

1. *Indicate conservation practice(s) completed and completion date(s).*

Cooperator: _____ Date: _____

Preparer: _____ Date: _____

APPENDIX 14 Lower Niobrara NRD Erosion & Sediment Control Program FORM 4

ADMINISTRATIVE ORDER

COMPLAINT NO. _____

DATE: _____

NAME: _____ ADDRESS: _____

The District Board has considered this complaint and makes the following findings:

1. On (*date*) this complaint was filed in the District office by (*complainant*) alleging that sediment damage (*has occurred/was occurring*) on (*his/her/their*) property and further alleged that sediment originating from excess erosion on the land of (*alleged violator*) was causing this damage. The District notified (*alleged violator*) of this complaint by letter dated (*date*).

2. On (*date*), as requested by the District investigator, (*inspector*) inspected the

lands of (*complainant*) and (*alleged violator*) filed a report with the Committee of the Board designated for this purpose.

3. On (*date*) the Committee notified (*alleged violator*) of its preliminary finding of

probable violation of the Rules and Regulations of the District.

4. The District General Manager or appropriate designee and (*alleged violator*) have

attempted to develop mutually a conservation plan or erosion and sediment control plan for the lands which are the subject of this complaint but have been unable to reach agreement. The Committee properly concluded that no progress was being made or likely to be made on preparation of an acceptable plan.

-or-

4a. The District Board held a public hearing on this complaint on (*date*) as requested by

(*alleged violator*). (Summarize).

-or-

4b. (*alleged violator*) did not respond to the Notice of Violation.

The District Board further FINDS:

1. Sediment damage has occurred on the land of (*complainant*). (Describe).

2. The source of this sediment damage is the land of (*alleged violator*). The average annual soil loss on (*alleged violator's*) land, determined by using the NRCS Technical Guides, is estimated to be (*rate*), which is

in excess of the applicable soil-loss tolerance level(s) of (*established rate*) for soil series ( ) adopted in Rule 25 of the District's Rules and Regulations.

Based on the foregoing findings, the District Board CONCLUDES:

1. The land of (*alleged violator*) is in violation of the Rules and Regulations of the

District and the Nebraska Erosion and Sediment Control Act.

Therefore, by virtue of the authority vested in the District Board by Nebraska Revised Statute Section 2-4608, the District Board ORDERS:

(For agricultural land)

1. (*alleged violator*) shall bring those areas of (*his/her/their*) land which exceed the applicable soil-loss tolerance level(s) into conformance with the Rules and Regulations of the District. The District Board has determined that implementation of the following alternative soil and water conservation practices will bring the land into conformance and which may be used to comply with this order. (List two or more practices).

Work needed to establish these practices must be commenced (*date*) (no later than six (6) months after service or mailing of this order) and satisfactorily completed by (*date*) (no later than one year after service of mailing of this order).

2. (*alleged violator*) is hereby advised that should the work required by this order to correct the erosion, which is occurring not be initiated and satisfactorily completed by the time specified in this order or should (*alleged violator*) advise the District that (*he/she/they*) (*does/do*) not intend to comply with this order, the District Board will commence proceedings to enforce this order as prescribed by law.

-or-

(For non-agricultural Land-Disturbing Activity)

1. (*alleged violator*) shall either bring those areas of (*his/her/their*) land which exceed the applicable soil-loss tolerance level(s) into conformance with the District Rules and
Regulations or prevent sediment resulting from excess erosion from leaving said land areas. The following erosion and sediment control practices will accomplish this and may be used to comply with this order. (List two or more practices).

Work necessary to establish these practices must be initiated by (*date*) (shall not exceed five (5) days after service or mailing of the order). Temporary practices shall be satisfactorily completed by

(*date*) (no longer than fifteen (15) days after service or mailing of this order) and permanent practices shall be satisfactorily completed by (*date*) (no longer than forty-five (45) days after service or mailing of the order unless an extension has been granted upon a showing of good cause. An extension shall only be granted after review and affirmative action of the Board.

2. (*alleged violator*) is hereby advised that should the work required by this order to correct the erosion, which is occurring not be initiated and satisfactorily completed by the time specified in this order or should (*alleged violator*) advise the District that (*he/she/they*) (*does/do*) not intend to comply with this order, the District Board will commence proceedings to enforce this order as prescribed by law.

Chairperson: _____

Lower Niobrara Natural Resources District

APPENDIX 15 Lower Niobrara NRD Erosion & Sediment Control Program FORM 5a

DISMISSAL OF VERBAL COMPLAINT, CONSERVATION AGREEMENT APPLIES

COMPLAINT NO. _____

DATE: _____

NAME: _____ ADDRESS: _____

The Lower Niobrara Natural Resources District's Investigator having found that (*name*):

1. Has land which was the subject to the complaint filed by (*name*) on (*date*), from which soil loss is not exceeding soil-loss tolerance levels, or

2. Has a farm unit conservation plan or erosion and sediment control plan covering the land subject to the complaint filed by (*name*) on (*date*), and

3. Is implementing said plan in strict compliance with a conservation agreement signed with the District on (*date*), and therefore said complaint is dismissed.

Signature: _____

Print: _____

Title: _____

APPENDIX 16 Lower Niobrara NRD Erosion & Sediment Control Program FORM 5b

DISMISSAL OF COMPLAINT, CONSERVATION AGREEMENT APPLIES

COMPLAINT NO. _____

DATE: _____

NAME: _____ ADDRESS: _____

The Lower Niobrara Natural Resources District's Investigator having found that (*name*):

1. Has a farm unit conservation plan or erosion and sediment control plan covering the land subject to the complaint filed by (*name*) on (*date*), and

2. Is implementing said plan in strict compliance with a conservation agreement signed with the District on (*date*), dismisses said complaint.

Signature: _____

Print: _____

Title: _____

APPENDIX 17 Lower Niobrara NRD Erosion & Sediment Control Program FORM 6

DISMISSAL OF COMPLAINT, AFTER FINDINGS

COMPLAINT NO. _____

DATE: _____

NAME: _____ ADDRESS: _____

The District Board has considered this complaint and makes the following FINDINGS:

1. On (*date*), this complaint was filed in the District office by (*complainant*) alleging that sediment damage has (*occurred/was occurring*) on (*his/her/their*) property and further alleged that sediment originating from excess erosion on the land of (*alleged violator*) was causing this damage. The District notified (*alleged violator*) of this complaint by letter dated (*date*).

2. On (*date*), the District investigator (*inspector*), inspected the lands of (*complainant*) and (*alleged violator*) and filed a report with the Committee of the board designated for this purpose.

3. On (*date*), the Committee notified (*alleged violator*) of its preliminary findings of probable violation of the Rules and Regulations of the District.

4. The District and (*alleged violator*) have attempted to develop mutually a conservation plan or erosion and sediment control plan for the lands, which are the subject of this complaint but have been unable to reach agreement. The Committee properly concluded that no progress was being made or

likely to be made on preparation of an acceptable plan.

-or-

4a. The District Board held a public hearing on this complaint on (*date*), as requested by (*alleged violator*). (Summarize briefly).

-or-

4b. (*alleged violator*) did not respond to the Notice of Violation. The District Board further finds:

1. Sediment damage (*has not/has*) occurred on the land of (*complainant*). (Describe).

2. The average annual soil loss on (*alleged violator's*) land, determined by using the NRCS Technical Guides, is estimated to be (*rate*), which (*is/is not*) in excess of the applicable soil-loss tolerance level(s) of (*established rate*) for soil series ( ) adopted in Rule ( ) of the District's Rules and Regulations.

Based on the foregoing findings, the District Board CONCLUDES:

1. The land of (*alleged violator*) is not in violation of the Rules and Regulations of the District and the Nebraska Erosion and Sediment Control Act.

Therefore, the District Board dismissed this complaint.

Chairman: _____

Lower Niobrara Natural Resources District

APPENDIX 18 Lower Niobrara Natural Resources District FORM 7

Erosion & Sediment Control Program

COMPLAINT CHECKLIST

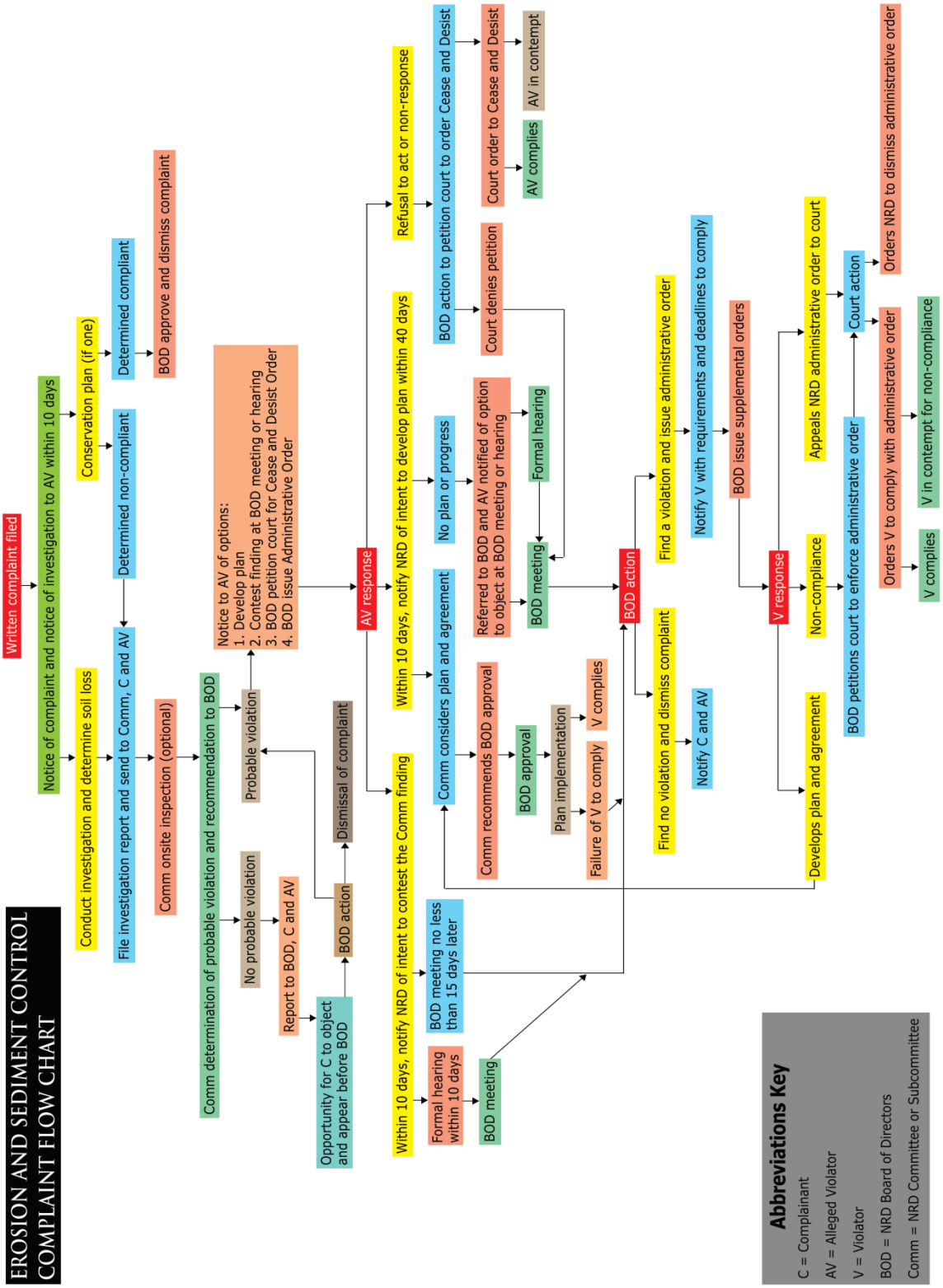
Complaint #: _____	Complainant: _____
Date Form Filed: _____	Alleged Violator: _____

Pre-inspection
____ Review rules & regulations/statutes for timetables - procedures
____ Verify ownership/lienholder of land where problem is originating
____ Contact NRCS re: conservation plan or erosion and sediment control plan status, average annual soil loss, etc.
____ Certified letter to alleged violator sent within 10-day period.
a. Include notification of alleged violation
b. Copy of applicable statutes pertaining to the Sediment and Erosion Control Program
c. Invitation to be present for the investigation
____ Letter to complainant, alleged violator, NRCS and other agencies regarding inspection date, time and other pertinent information.

Inspection
____ Pertinent inspection equipment as necessary
____ Location of alleged violation: verified legal description and acres involved
____ Sources - land use, soil loss, soil types and other pertinent information
____ Damages - measurements of extent of damage, photograph, copies of costs, invoices of damaged property and other pertinent documentation
____ Prepare documentation report with the Committee designated by the Board

Follow-up
____ Notify all parties of NRD board recommendation.
a. Recommendation of dismissal. (Complainant may appeal)
b. Recommendation of Action
____ Certified letter informing violator of probable violation and recommended Action.
a. Violator has 10 days after receipt of letter to respond re: conservation plan
b. District cost-share assistance is not required but may be available
____ Prepared conservation agreement with schedule of compliance
____ If violator disagrees with probable violation opportunity is given to contest finding at a board meeting, board hearing or other formal public hearing.
____ If violator refuses conservation plan or erosion and sediment control plan the NRD board issues administrative order.
a. May be stricter than conservation agreement
b. Violator has 30 days to appeal
____ If violator continues to refuse to cooperate a court order is issued.

APPENDIX 19


EROSION AND SEDIMENT CONTROL COMPLAINT FLOW CHART
Written complaint filed
Notice of complaint and notice of investigation to AV within 10 days
Conduct investigation and determine soil loss
Conservation plan (if one)
File investigation report and send to Comm, C and AV
Determined non-compliant
Determined compliant
Comm onsite inspection (optional)
BOD approve and dismiss complaint
Comm determination of probable violation and recommendation to BOD
Notice to AV of options:
1. Develop plan
2. Contest finding at BOD meeting or hearing
3. BOD petition court for Cease and Desist Order
4. BOD issue Administrative Order
No probable violation
Probable violation
Report to BOD, C and AV
Opportunity for C to object and appear before BOD
BOD action
Dismissal of complaint
AV response
Refusal to act or non-response
Within 10 days, notify NRD of intent to contest the Comm finding
Within 10 days, notify NRD of intent to develop plan within 40 days
BOD action to petition court to order Cease and Desist
Court order to Cease and Desist
Formal hearing within 10 days
BOD meeting no less than 15 days later
Comm considers plan and agreement
No plan or progress
Referred to BOD and AV notified of option to object at BOD meeting or hearing
Court denies petition
AV complies
AV in contempt
BOD meeting
Comm recommends BOD approval
BOD approval
Plan implementation
Failure of V to comply
V complies
BOD meeting
Formal hearing
BOD action
Find a violation and issue administrative order
Find no violation and dismiss complaint
Notify V with requirements and deadlines to comply
Notify C and AV
BOD issue supplemental orders
V response
Appeals NRD administrative order to court
Develops plan and agreement
Non-compliance
BOD petitions court to enforce administrative order
Court action
Orders NRD to dismiss administrative order
Orders V to comply with administrative order
V complies
V in contempt for non-compliance
Abbreviations Key
C = Complainant
AV = Alleged Violator
V = Violator
BOD = NRD Board of Directors
Comm = NRD Committee or Subcommittee

APPENDIX 20 – NRCS SOIL LOSS TOLARANCES

areaname	areasymbol	oldmusym	oldmuname	musym	muname	T Loss Allowance in Tons/Acre
Boyd County, Nebraska	NE015	Go	Grigston silt loam, 0 to 2 percent slopes	1039	Grigston silt loam, occasionally flooded	5
Holt County, Nebraska	NE089	Bn	Boel fine sandy loam, 0 to 2 percent slopes	2100	Boel fine sandy loam, occasionally flooded	5
Boyd County, Nebraska	NE015	IhB	Inavale loamy fine sand, 0 to 3 percent slopes	2110	Inavale loamy fine sand, occasionally flooded	5
Boyd County, Nebraska	NE015	IgB	Inavale fine sand, channeled, 0 to 3 percent slopes	2322	Inavale fine sand, channeled, frequently flooded	5
Boyd County, Nebraska	NE015	IfD	Inavale fine sand, 3 to 11 percent slopes	2325	Inavale fine sand, 3 to 11 percent slopes	5
Knox County, Nebraska	NE107	Im	Inavale fine sandy loam, 0 to 2 percent slopes	2327	Inavale fine sandy loam, rarely flooded	5
Boyd County, Nebraska	NE015	In	Inavale fine sandy loam, 0 to 2 percent slopes	2328	Inavale fine sandy loam, occasionally flooded	5
Holt County, Nebraska	NE089	Ib	Inavale fine sand, 0 to 2 percent slopes	2330	Inavale fine sand, rarely flooded	5
Holt County, Nebraska	NE089	Id	Inavale loamy fine sand, 0 to 2 percent slopes	2331	Inavale loamy fine sand, rarely flooded	5
Holt County, Nebraska	NE089	Ia	Inavale sand, channeled	2346	Inavale sand, channeled, frequently flooded	5
Keya Paha County, Nebraska	NE103	Mu	Munjor fine sandy loam, 0 to 2 percent slopes	2360	Munjor fine sandy loam, rarely flooded	5
Boyd County, Nebraska	NE015	Et	Eltree silt loam, 0 to 2 percent slopes	2561	Eltree silt loam, 0 to 3 percent slopes	5
Knox County, Nebraska	NE107	EtC	Eltree silt loam, 2 to 6 percent slopes	2563	Eltree silt loam, 3 to 6 percent slopes	5
Holt County, Nebraska	NE089	Nb	Nimbro silt loam, 0 to 2 percent slopes	3105	Nimbro silt loam, 0 to 2 percent slopes	5
Boyd County, Nebraska	NE015	BrG	Bristow silty clay, 20 to 40 percent slopes	3150	Bristow silty clay, 20 to 40 percent slopes	2
Knox County, Nebraska	NE107	BvG	Bristow silty clay, 30 to 60 percent slopes	3151	Bristow silty clay, 30 to 60 percent slopes	2
Boyd County, Nebraska	NE015	BoD	Boyd silty clay, 6 to 11 percent slopes	3152	Boyd silty clay, 6 to 11 percent slopes	4
Boyd County, Nebraska	NE015	Bs	Brocksburg fine sandy loam, 0 to 2 percent slopes	3155	Brocksburg fine sandy loam, 0 to 2 percent slopes	4
Boyd County, Nebraska	NE015	Bt	Brocksburg loam, 0 to 2 percent slopes	3156	Brocksburg loam, 0 to 2 percent slopes	4
Keya Paha County, Nebraska	NE103	Tu	Tuthill fine sandy loam, 0 to 2 percent slopes	3167	Hennings fine sandy loam, 0 to 3 percent slopes	4
Keya Paha County, Nebraska	NE103	Ho	Holt fine sandy loam, 0 to 2 percent slopes	3170	Holt fine sandy loam, 0 to 2 percent slopes	4
Keya Paha County, Nebraska	NE103	HoC	Holt fine sandy loam, 2 to 6 percent slopes	3171	Holt fine sandy loam, 2 to 6 percent slopes	4
Keya Paha County, Nebraska	NE103	HtC	Holt-Tassel fine sandy loams, 3 to 6 percent slopes	3172	Holt-Longpine fine sandy loams, 2 to 6 percent slopes	4
Keya Paha County, Nebraska	NE103	HtD	Holt-Tassel fine sandy loams, 6 to 11 percent slopes	3173	Holt-Longpine fine sandy loams, 6 to 11 percent slopes	4
Keya Paha County, Nebraska	NE103	MfC	Manter fine sandy loam, 2 to 6 percent slopes	3177	Holt variant fine sandy loam, 3 to 6 percent slopes	5
Keya Paha County, Nebraska	NE103	MaB	Manter loamy fine sand, 0 to 3 percent slopes	3178	Holt variant loamy fine sand, 0 to 3 percent slopes	5
Keya Paha County, Nebraska	NE103	MaC	Manter loamy fine sand, 3 to 6 percent slopes	3179	Holt variant loamy fine sand, 3 to 6 percent slopes	5
Keya Paha County, Nebraska	NE103	Ja	Jansen fine sandy loam, 0 to 2 percent slopes	3180	Jansen fine sandy loam, 0 to 2 percent slopes	4
Boyd County, Nebraska	NE015	Jn	Jansen loam, 0 to 2 percent slopes	3183	Jansen loam, 0 to 2 percent slopes	4
Boyd County, Nebraska	NE015	JnC	Jansen loam, 2 to 6 percent slopes	3184	Jansen loam, 2 to 6 percent slopes	4
Boyd County, Nebraska	NE015	JnD	Jansen loam, 6 to 11 percent slopes	3186	Jansen loam, 6 to 11 percent slopes	4
Keya Paha County,	NE103	JoB	Jansen-Meadin loams, 0 to 3 percent slopes	3192	Jansen-Meadin loams, 0 to 2 percent slopes	4

Nebraska						
Holt County, Nebraska	NE089	JsC	Jansen-Meadin loams, 3 to 6 percent slopes	3193	Jansen-Meadin loams, 2 to 6 percent slopes	4
Rock County, Nebraska	NE149	JsB	Jansen loamy sand, 0 to 3 percent slopes	3195	Jansen loamy sand, 0 to 2 percent slopes	4
Holt County, Nebraska	NE089	Jt	Josburg fine sandy loam, 0 to 2 percent slopes	3205	Josburg fine sandy loam, 0 to 2 percent slopes	5
Holt County, Nebraska	NE089	Jw	Josburg loam, 0 to 2 percent slopes	3206	Josburg loam, 0 to 2 percent slopes	5
Keya Paha County, Nebraska	NE103	TaF	Tassel loamy fine sand, 3 to 30 percent slopes	3213	Longpine loamy fine sand, 3 to 30 percent slopes	2
Keya Paha County, Nebraska	NE103	TdE	Tassel-Duda complex, 3 to 15 percent slopes	3214	Longpine-Duda complex, 3 to 15 percent slopes	2
Keya Paha County, Nebraska	NE103	TrG	Tassel-Ronson-Duda complex, 15 to 70 percent slopes	3215	Longpine-Ronson-Duda complex, 15 to 70 percent slopes	2
Holt County, Nebraska	NE089	LaC	Labu silty clay, 2 to 6 percent slopes	3220	Labu silty clay, 2 to 6 percent slopes	4
Boyd County, Nebraska	NE015	LaD	Labu silty clay, 6 to 11 percent slopes	3221	Labu silty clay, 6 to 11 percent slopes	4
Boyd County, Nebraska	NE015	LcF	Labu-Sansarc silty clays, 11 to 30 percent slopes	3225	Labu-Sansarc silty clays, 11 to 30 percent slopes	4
Rock County, Nebraska	NE149	LcG	Labu-Sansarc silty clays, 11 to 40 percent slopes	3226	Labu-Sansarc silty clays, 11 to 40 percent slopes	4
Knox County, Nebraska	NE107	LcF	Labu-Sansarc complex, 11 to 30 percent slopes	3227	Labu-Sansarc complex, 11 to 30 percent slopes	4
Boyd County, Nebraska	NE015	LsC	Lynch silty clay, 2 to 6 percent slopes	3230	Lynch silty clay, 2 to 6 percent slopes	4
Holt County, Nebraska	NE089	LxD	Lynch silty clay, 6 to 11 percent slopes	3231	Lynch silty clay, 6 to 11 percent slopes	4
Knox County, Nebraska	NE107	LyF	Lynch-Bristow complex, 11 to 30 percent slopes	3232	Lynch-Bristow complex, 11 to 30 percent slopes	4
Boyd County, Nebraska	NE015	LyD	Lynch-Bristow silty clays, 6 to 11 percent slopes	3233	Lynch-Bristow silty clays, 6 to 11 percent slopes	4
Boyd County, Nebraska	NE015	LyF	Lynch-Bristow silty clays, 11 to 30 percent slopes	3234	Lynch-Bristow silty clays, 11 to 30 percent slopes	4
Knox County, Nebraska	NE107	LzD	Lynch-Verdel complex, 6 to 11 percent slopes	3235	Lynch-Verdel complex, 6 to 11 percent slopes	4
Knox County, Nebraska	NE107	MbF	Mariaville very fine sandy loam, 3 to 30 percent slopes	3238	Mariaville very fine sandy loam, 2 to 30 percent slopes	2
Keya Paha County, Nebraska	NE103	MkG	Mariaville-Keota silt loams, 15 to 60 percent slopes	3239	Mariaville-Keota silt loams, 11 to 60 percent slopes	2
Boyd County, Nebraska	NE015	MaG	Mariaville-Paka loams, 15 to 40 percent slopes	3240	Mariaville-Paka loams, 11 to 40 percent slopes	2
Keya Paha County, Nebraska	NE103	MnF	Meadin gravelly sandy loam, 3 to 30 percent slopes	3244	Meadin gravelly sandy loam, 2 to 30 percent slopes	2
Holt County, Nebraska	NE089	MfB	Meadin loam, 0 to 3 percent slopes	3245	Meadin loam, 0 to 2 percent slopes	3
Holt County, Nebraska	NE089	MeB	Meadin sandy loam, 0 to 3 percent slopes	3252	Meadin sandy loam, 0 to 2 percent slopes	3
Boyd County, Nebraska	NE015	MeE	Meadin sandy loam, 3 to 17 percent slopes	3254	Meadin sandy loam, 2 to 20 percent slopes	3
Holt County, Nebraska	NE089	MeF	Meadin sandy loam, 3 to 30 percent slopes	3255	Meadin sandy loam, 2 to 30 percent slopes	3
Knox County, Nebraska	NE107	MgF	Meadin-O'Neill complex, 3 to 30 percent slopes	3259	Meadin-O'Neill complex, 2 to 30 percent slopes	3
Boyd County, Nebraska	NE015	Oe	O'Neill fine sandy loam, 0 to 2 percent slopes	3260	O'Neill fine sandy loam, 0 to 2 percent slopes	4
Boyd County, Nebraska	NE015	OeC	O'Neill fine sandy loam, 2 to 6 percent slopes	3261	O'Neill fine sandy loam, 2 to 6 percent slopes	4
Keya Paha County, Nebraska	NE103	OeD	O'Neill fine sandy loam, 6 to 9 percent slopes	3263	O'Neill fine sandy loam, 6 to 11 percent slopes	4
Holt County, Nebraska	NE089	Of	O'Neill loam, 0 to 2 percent slopes	3264	O'Neill loam, 0 to 2 percent slopes	4
Keya Paha County, Nebraska	NE103	OaB	O'Neill loamy fine sand, 0 to 3 percent slopes	3265	O'Neill loamy fine sand, 0 to 2 percent slopes	4
Holt County, Nebraska	NE089	OdB	O'Neill loamy sand, 0 to 3 percent slopes	3266	O'Neill loamy sand, 0 to 2 percent slopes	4
Knox County, Nebraska	NE107	Oe	O'Neill sandy loam, 0 to 2 percent slopes	3267	O'Neill sandy loam, 0 to 2 percent slopes	4
Rock County, Nebraska	NE149	OeC	O'Neill sandy loam, 2 to 6 percent slopes	3268	O'Neill sandy loam, 2 to 6 percent slopes	4

Keya Paha County, Nebraska	NE103	OhB	O'Neill-Meadin fine sandy loams, 0 to 3 percent slopes	3269	O'Neill-Meadin fine sandy loams, 0 to 2 percent slopes	4
Holt County, Nebraska	NE089	OmF	O'Neill-Meadin fine sandy loams, 11 to 30 percent slopes	3270	O'Neill-Meadin fine sandy loams, 11 to 30 percent slopes	4
Holt County, Nebraska	NE089	OmC	O'Neill-Meadin fine sandy loams, 2 to 6 percent slopes	3271	O'Neill-Meadin fine sandy loams, 2 to 6 percent slopes	4
Boyd County, Nebraska	NE015	OfD	O'Neill-Meadin fine sandy loams, 3 to 9 percent slopes	3272	O'Neill-Meadin fine sandy loams, 2 to 11 percent slopes	4
Holt County, Nebraska	NE089	OmD	O'Neill-Meadin fine sandy loams, 6 to 11 percent slopes	3273	O'Neill-Meadin fine sandy loams, 6 to 11 percent slopes	4
Rock County, Nebraska	NE149	OhD	O'Neill-Meadin sandy loams, 6 to 11 percent slopes	3275	O'Neill-Meadin sandy loams, 6 to 11 percent slopes	4
Keya Paha County, Nebraska	NE103	OkD	O'Neill-Valentine complex, 1 to 9 percent slopes	3277	O'Neill-Valentine complex, 2 to 11 percent slopes	4
Keya Paha County, Nebraska	NE103	Pf	Paka fine sandy loam, 0 to 2 percent slopes	3283	Paka fine sandy loam, 0 to 2 percent slopes	5
Holt County, Nebraska	NE089	PgC	Paka fine sandy loam, 2 to 6 percent slopes	3284	Paka fine sandy loam, 2 to 6 percent slopes	5
Boyd County, Nebraska	NE015	Ph	Paka loam, 0 to 2 percent slopes	3285	Paka loam, 0 to 2 percent slopes	5
Boyd County, Nebraska	NE015	PhC	Paka loam, 2 to 6 percent slopes	3286	Paka loam, 2 to 6 percent slopes	5
Holt County, Nebraska	NE089	PhD2	Paka loam, 6 to 11 percent slopes, eroded	3287	Paka loam, 6 to 11 percent slopes, eroded	5
Knox County, Nebraska	NE107	PhE	Paka loam, 11 to 15 percent slopes	3290	Paka loam, 11 to 20 percent slopes	5
Keya Paha County, Nebraska	NE103	PmC	Paka-Mariaville loams, 3 to 6 percent slopes	3291	Paka-Mariaville loams, 2 to 6 percent slopes	5
Keya Paha County, Nebraska	NE103	PmF	Paka-Mariaville loams, 11 to 30 percent slopes	3292	Paka-Mariaville loams, 11 to 30 percent slopes	5
Boyd County, Nebraska	NE015	PoC	Promise silty clay, 2 to 6 percent slopes	3295	Promise silty clay, 2 to 6 percent slopes	5
Keya Paha County, Nebraska	NE103	RaB	Ree loam, 1 to 3 percent slopes	3298	Ree loam, 0 to 2 percent slopes	5
Keya Paha County, Nebraska	NE103	Rb	Ree loam, clayey substratum, 0 to 2 percent slopes	3299	Ree loam, clayey substratum, 0 to 2 percent slopes	5
Boyd County, Nebraska	NE015	RaE	Ree silt loam, 11 to 15 percent slopes	3300	Ree silt loam, 11 to 20 percent slopes	5
Boyd County, Nebraska	NE015	RaC	Ree silt loam, 2 to 6 percent slopes	3301	Ree silt loam, 2 to 6 percent slopes	5
Boyd County, Nebraska	NE015	RaD	Ree silt loam, 6 to 11 percent slopes	3302	Ree silt loam, 6 to 11 percent slopes	5
Boyd County, Nebraska	NE015	ReC	Reliance silt loam, 2 to 6 percent slopes	3305	Reliance silt loam, 2 to 6 percent slopes	5
Keya Paha County, Nebraska	NE103	ReC	Reliance silt loam, 2 to 6 percent slopes	3305	Reliance silt loam, 2 to 6 percent slopes	5
Boyd County, Nebraska	NE015	ReD	Reliance silt loam, 6 to 11 percent slopes	3306	Reliance silt loam, 6 to 11 percent slopes	5
Boyd County, Nebraska	NE015	RfC	Reliance silty clay loam, 2 to 6 percent slopes	3307	Reliance silty clay loam, 2 to 6 percent slopes	5
Keya Paha County, Nebraska	NE103	RoD	Ronson-Anselmo fine sandy loams, 6 to 9 percent slopes	3311	Ronson-Anselmo fine sandy loams, 6 to 11 percent slopes	4
Keya Paha County, Nebraska	NE103	RoF	Ronson-Anselmo fine sandy loams, 9 to 30 percent slopes	3312	Ronson-Anselmo fine sandy loams, 6 to 30 percent slopes	4
Keya Paha County, Nebraska	NE103	RtB	Ronson-Tassel fine sandy loams, 0 to 3 percent slopes	3313	Ronson-Longpine fine sandy loams, 0 to 2 percent slopes	4
Keya Paha County, Nebraska	NE103	SaG	Sansarc silty clay, 20 to 40 percent slopes	3320	Sansarc silty clay, 20 to 40 percent slopes	2
Knox County, Nebraska	NE107	SaG	Sansarc silty clay, 30 to 60 percent slopes	3321	Sansarc silty clay, 30 to 60 percent slopes	2
Keya Paha County, Nebraska	NE103	Ve	Verdel silty clay loam, 0 to 1 percent slopes	3325	Verdel silty clay loam, 0 to 2 percent slopes	5
Keya Paha County, Nebraska	NE103	VeC	Verdel silty clay loam, 3 to 6 percent slopes	3326	Verdel silty clay loam, 2 to 6 percent slopes	5
Boyd County, Nebraska	NE015	Ve	Verdel silty clay, 0 to 2 percent slopes	3327	Verdel silty clay, 0 to 2 percent slopes	5

Knox County, Nebraska	NE107	VeC	Verdel silty clay, 2 to 6 percent slopes	3328	Verdel silty clay, 2 to 6 percent slopes	5
Knox County, Nebraska	NE107	VeD	Verdel silty clay, 6 to 11 percent slopes	3329	Verdel silty clay, 6 to 11 percent slopes	5
Knox County, Nebraska	NE107	VfF	Verdigre fine sandy loam, 11 to 30 percent slopes	3330	Verdigre fine sandy loam, 11 to 30 percent slopes	4
Knox County, Nebraska	NE107	VfC	Verdigre fine sandy loam, 2 to 6 percent slopes	3331	Verdigre fine sandy loam, 2 to 6 percent slopes	4
Knox County, Nebraska	NE107	VfD	Verdigre fine sandy loam, 6 to 11 percent slopes	3332	Verdigre fine sandy loam, 6 to 11 percent slopes	4
Knox County, Nebraska	NE107	VgC	Verdigre loam, 2 to 6 percent slopes	3335	Verdigre loam, 2 to 6 percent slopes	4
Knox County, Nebraska	NE107	VgD	Verdigre loam, 6 to 11 percent slopes	3336	Verdigre loam, 6 to 11 percent slopes	4
Knox County, Nebraska	NE107	VgF	Verdigre loam, 11 to 30 percent slopes	3337	Verdigre loam, 11 to 30 percent slopes	4
Keya Paha County, Nebraska	NE103	WeB	Wewela fine sandy loam, 0 to 3 percent slopes	3340	Wewela fine sandy loam, 0 to 2 percent slopes	4
Holt County, Nebraska	NE089	WsC	Wewela fine sandy loam, 2 to 6 percent slopes	3341	Wewela fine sandy loam, 2 to 6 percent slopes	4
Holt County, Nebraska	NE089	Wt	Wewela loam, 0 to 2 percent slopes	3342	Wewela loam, 0 to 2 percent slopes	4
Knox County, Nebraska	NE107	LhC2	Longford silty clay loam, 2 to 6 percent slopes, eroded	3404	Longford silty clay loam, 3 to 7 percent slopes, eroded	5
Boyd County, Nebraska	NE015	Cb	Cass fine sandy loam, 0 to 2 percent slopes	3521	Cass fine sandy loam, occasionally flooded	5
Holt County, Nebraska	NE089	Ld	Lamo-Lute loams, 0 to 2 percent slopes	3523	Lamo-Lute loams, 0 to 2 percent slopes	5
Knox County, Nebraska	NE107	Hd	Hobbs silt loam, 0 to 2 percent slopes	3561	Hobbs silt loam, occasionally flooded	5
Knox County, Nebraska	NE107	Sw	Solomon silty clay, 0 to 2 percent slopes	3617	Solomon silty clay, occasionally flooded	5
Knox County, Nebraska	NE107	KzB	Kezan silt loam, channeled, 0 to 2 percent slopes	3641	Kezan silt loam, channeled, frequently flooded	5
Knox County, Nebraska	NE107	Ke	Kezan silt loam, 0 to 2 percent slopes	3642	Kezan silt loam, occasionally flooded	5
Holt County, Nebraska	NE089	Ce	Cass fine sandy loam, 0 to 2 percent slopes	3710	Cass fine sandy loam, rarely flooded	5
Knox County, Nebraska	NE107	By	Butler silt loam, 0 to 2 percent slopes	3820	Butler silt loam, 0 to 1 percent slopes	4
Boyd County, Nebraska	NE015	Sc	Scott silt loam, 0 to 1 percent slopes	3910	Scott silt loam, frequently ponded	3
Knox County, Nebraska	NE107	So	Solomon silty clay, rarely flooded	3926	Solomon silty clay, rarely flooded	5
Holt County, Nebraska	NE089	Fm	Fillmore silt loam, 0 to 2 percent slopes	3951	Fillmore silt loam, occasionally ponded	4
Knox County, Nebraska	NE107	Fm	Fillmore silt loam, 0 to 1 percent slopes	3952	Fillmore silt loam, frequently ponded	4
Knox County, Nebraska	NE107	LhD2	Longford silty clay loam, 6 to 11 percent slopes, eroded	4182	Longford silty clay loam, 7 to 11 percent slopes, eroded	5
Holt County, Nebraska	NE089	Ts	Almeria-Calamus complex, channeled	4210	Almeria-Calamus complex, channeled, frequently flooded	
Holt County, Nebraska	NE089	Bc	Blackloup loam, 0 to 1 percent slopes	4215	Blackloup loam, rarely flooded	
Keya Paha County, Nebraska	NE103	Bd	Blackloup loam, wet, 0 to 1 percent slopes	4216	Blackloup loam, occasionally flooded	
Keya Paha County, Nebraska	NE103	Op	Ord fine sandy loam, 0 to 2 percent slopes	4240	Ord fine sandy loam, rarely flooded	5
Knox County, Nebraska	NE107	Of	Ord fine sandy loam, occasionally flooded	4241	Ord fine sandy loam, occasionally flooded	5
Rock County, Nebraska	NE149	Or	Ord loam, 0 to 2 percent slopes	4243	Ord loam, rarely flooded	5
Knox County, Nebraska	NE107	Oh	Ord loam, 0 to 2 percent slopes	4244	Ord loam, occasionally flooded	5
Knox County, Nebraska	NE107	Oh2	Ord loam, poorly drained, 0 to 2 percent slopes, occasionally flooded	4244	Ord loam, occasionally flooded	
Knox County, Nebraska	NE107	Ok	Ord loam, occasionally flooded	4244	Ord loam, occasionally flooded	
Keya Paha County, Nebraska	NE103	Or	Ord-Loup fine sandy loams, 0 to 2 percent slopes	4248	Ord-Loup fine sandy loams, 0 to 1 percent slopes	5
Holt County, Nebraska	NE089	Os	Ord-Lute fine sandy loams, 0 to 2 percent slopes	4249	Ord-Lute fine sandy loams, rarely flooded	5
Knox County, Nebraska	NE107	Eh	Elsmere fine sandy loam, 0 to 2 percent slopes	4352	Elsmere fine sandy loam, rarely flooded	5
Holt County, Nebraska	NE089	LkB	Libory loamy fine sand, 0 to 3 percent slopes	4370	Libory loamy fine sand, 0 to 3 percent slopes	5

Holt County, Nebraska	NE089	LmB	Libory-Whitelake loamy fine sands, 0 to 3 percent slopes	4374	Libory-Whitelake loamy fine sands, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	Bg	Blown-out land-Valentine complex, 6 to 60 percent slopes	4450	Blown-out land-Valentine complex, 0 to 60 percent slopes	1
Keya Paha County, Nebraska	NE103	DdB	Duda loamy fine sand, 0 to 3 percent slopes	4474	Duda loamy fine sand, 0 to 3 percent slopes	4
Keya Paha County, Nebraska	NE103	DdC	Duda loamy fine sand, 3 to 6 percent slopes	4475	Duda loamy fine sand, 3 to 6 percent slopes	4
Boyd County, Nebraska	NE015	DuB	Dunday loamy fine sand, 0 to 3 percent slopes	4485	Dunday loamy fine sand, 0 to 3 percent slopes	5
Boyd County, Nebraska	NE015	DuC	Dunday loamy fine sand, 3 to 6 percent slopes	4488	Dunday loamy fine sand, 3 to 6 percent slopes	5
Boyd County, Nebraska	NE015	DuD	Dunday loamy fine sand, 6 to 11 percent slopes	4493	Dunday loamy fine sand, 6 to 11 percent slopes	5
Boyd County, Nebraska	NE015	DxB	Dunday loamy fine sand, loamy substratum, 0 to 3 percent slopes	4496	Dunday loamy fine sand, loamy substratum, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	DuB	Dunday loamy sand, 0 to 3 percent slopes	4498	Dunday loamy sand, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	DuC	Dunday loamy sand, 3 to 6 percent slopes	4499	Dunday loamy sand, 3 to 6 percent slopes	5
Keya Paha County, Nebraska	NE103	DxB	Dunday-Duda loamy fine sands, 0 to 3 percent slopes	4502	Dunday-Duda loamy fine sands, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	DxB	Dunn loamy sand, 0 to 3 percent slopes	4512	Dunn loamy sand, 0 to 3 percent slopes	5
Keya Paha County, Nebraska	NE103	Eo	Els fine sand, 0 to 2 percent slopes	4521	Els fine sand, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	Eb	Els loamy sand, 0 to 2 percent slopes	4533	Els loamy sand, 0 to 3 percent slopes	5
Rock County, Nebraska	NE149	EpB	Els-Ipage complex, 0 to 3 percent slopes	4542	Els-Ipage complex, 0 to 3 percent slopes	5
Rock County, Nebraska	NE149	ErC	Els-Ipage-Tryon loamy sands, 0 to 6 percent slopes	4548	Els-Ipage-Tryon loamy sands, 0 to 6 percent slopes	5
Knox County, Nebraska	NE107	Ef	Elsmere loamy fine sand, 0 to 2 percent slopes	4553	Elsmere loamy fine sand, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	En	Elsmere loamy fine sand, clayey substratum, 0 to 2 percent slopes	4557	Elsmere loamy fine sand, clayey substratum, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	EsB	Elsmere-Ipage loamy fine sands, 0 to 3 percent slopes	4560	Elsmere-Ipage loamy fine sands, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	Eu	Elsmere-Selia loamy fine sands, 0 to 2 percent slopes	4562	Elsmere-Selia loamy fine sands, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	Gb	Gannett loam, 0 to 2 percent slopes	4576	Gannett loam, 0 to 1 percent slopes	5
Holt County, Nebraska	NE089	Gf	Gannett loam, wet, 0 to 2 percent slopes	4579	Gannett loam, frequently ponded	5
Keya Paha County, Nebraska	NE103	IpB	Ipage loamy fine sand, 0 to 3 percent slopes	4646	Ipage loamy fine sand, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	IgB	Ipage loamy sand, 0 to 3 percent slopes	4650	Ipage loamy sand, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	IfB	Ipage sand, 0 to 3 percent slopes	4653	Ipage sand, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	ItB	Ipage-Tryon fine sands, 0 to 3 percent slopes	4656	Ipage-Tryon fine sands, 0 to 3 percent slopes	5
Keya Paha County, Nebraska	NE103	Lo	Loup fine sandy loam, 0 to 2 percent slopes	4662	Loup fine sandy loam, 0 to 1 percent slopes	5
Holt County, Nebraska	NE089	Lr	Loup fine sandy loam, wet, 0 to 2 percent slopes	4669	Loup fine sandy loam, frequently ponded	5
Holt County, Nebraska	NE089	Ma	Marlake fine sandy loam, 0 to 2 percent slopes	4683	Marlake fine sandy loam, frequently ponded	2
Rock County, Nebraska	NE149	Ma	Marlake loamy fine sand, 0 to 1 percent slopes	4687	Marlake loamy fine sand, frequently ponded	2
Keya Paha County, Nebraska	NE103	Mm	Marlake loamy fine sand, 0 to 1 percent slopes	4687	Marlake loamy fine sand, frequently ponded	2
Keya Paha County, Nebraska	NE103	MpB	McKelvie loamy fine sand, 0 to 3 percent slopes	4700	McKelvie loamy fine sand, 0 to 3 percent slopes	
Rock County, Nebraska	NE149	TdG	Tassel-Valentine-Duda complex, 15 to 70 percent slopes	4706	McKelvie-Longpine-Ronson complex, 17 to 70 percent slopes	2
Holt County, Nebraska	NE089	PtB	Pivot loamy sand, 0 to 3 percent slopes	4721	Pivot loamy sand, 0 to 3 percent slopes	4
Holt County, Nebraska	NE089	PtC	Pivot loamy sand, 3 to 9 percent slopes	4722	Pivot loamy sand, 3 to 9 percent slopes	4
Rock County, Nebraska	NE149	PvD	Pivot-Valentine complex, 0 to 9 percent slopes	4723	Pivot-Valentine complex, 0 to 9 percent slopes	4

Rock County, Nebraska	NE149	Tn	Tryon loamy fine sand, 0 to 2 percent slopes	4746	Tryon loamy fine sand, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	Tp	Tryon loamy fine sand, wet, 0 to 2 percent slopes	4751	Tryon loamy fine sand, frequently ponded	5
Rock County, Nebraska	NE149	TpB	Tryon-Els loamy sands, 0 to 3 percent slopes	4756	Tryon-Els loamy sands, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	VaB	Valentine fine sand, 0 to 3 percent slopes	4781	Valentine fine sand, 0 to 3 percent slopes	5
Rock County, Nebraska	NE149	VaD	Valentine fine sand, 3 to 9 percent slopes	4791	Valentine fine sand, 3 to 9 percent slopes	5
Boyd County, Nebraska	NE015	VaE	Valentine fine sand, 6 to 17 percent slopes	4794	Valentine fine sand, 9 to 17 percent slopes	5
Knox County, Nebraska	NE107	VaE	Valentine fine sand, 9 to 24 percent slopes	4796	Valentine fine sand, 9 to 24 percent slopes	5
Keya Paha County, Nebraska	NE103	VaG	Valentine fine sand, hilly	4800	Valentine fine sand, hilly	5
Holt County, Nebraska	NE089	VaE	Valentine fine sand, rolling	4807	Valentine fine sand, rolling	5
Holt County, Nebraska	NE089	VaG	Valentine fine sand, Rolling, and Hilly	4810	Valentine fine sand, rolling and hilly	5
Rock County, Nebraska	NE149	VbB	Valentine loamy fine sand, 0 to 3 percent slopes	4814	Valentine loamy fine sand, 0 to 3 percent slopes	5
Rock County, Nebraska	NE149	VbD	Valentine loamy fine sand, 3 to 9 percent slopes	4818	Valentine loamy fine sand, 3 to 9 percent slopes	5
Keya Paha County, Nebraska	NE103	VbD	Valentine loamy fine sand, gently rolling	4827	Valentine loamy fine sand, gently rolling	5
Boyd County, Nebraska	NE015	VbB	Valentine loamy sand, 0 to 3 percent slopes	4838	Valentine loamy sand, 0 to 3 percent slopes	5
Rock County, Nebraska	NE149	VdD	Valentine-Boelus fine sands, 0 to 9 percent slopes	4852	Valentine-Boelus fine sands, 0 to 9 percent slopes	5
Holt County, Nebraska	NE089	VeD	Valentine-Dunday loamy fine sands, 3 to 9 percent slopes	4857	Valentine-Dunday loamy fine sands, 3 to 9 percent slopes	5
Holt County, Nebraska	NE089	VmD	Valentine-Els complex, 0 to 9 percent slopes	4858	Valentine-Els complex, 0 to 9 percent slopes	5
Rock County, Nebraska	NE149	VfD	Valentine-Els fine sands, 0 to 9 percent slopes	4861	Valentine-Els fine sands, 0 to 9 percent slopes	5
Holt County, Nebraska	NE089	VeB	Valentine-Dunday loamy fine sands, 0 to 3 percent slopes	4871	Valentine-Dunday loamy fine sands, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	VsD	Valentine-Simeon sands, 3 to 9 percent slopes	4881	Valentine-Simeon sands, 3 to 9 percent slopes	5
Holt County, Nebraska	NE089	VsF2	Valentine-Simeon sands, 9 to 30 percent slopes, eroded	4882	Valentine-Simeon sands, 9 to 30 percent slopes, eroded	5
Keya Paha County, Nebraska	NE103	VcF	Valentine-Tassel complex, rolling	4884	Valentine-Longpine complex, rolling	5
Holt County, Nebraska	NE089	VtE	Valentine-Tryon fine sands, 0 to 17 percent slopes	4888	Valentine-Tryon fine sands, 0 to 17 percent slopes	5
Holt County, Nebraska	NE089	VwD	Valentine-Wewela complex, 3 to 9 percent slopes	4891	Valentine-Wewela complex, 3 to 9 percent slopes	5
Keya Paha County, Nebraska	NE103	VdC	Valentine-Wewela loamy fine sands, 3 to 6 percent slopes	4892	Valentine-Wewela loamy fine sands, 3 to 6 percent slopes	5
Keya Paha County, Nebraska	NE103	VdF	Valentine-Wewela loamy fine sands, 6 to 30 percent slopes	4893	Valentine-Wewela loamy fine sands, 6 to 30 percent slopes	5
Boyd County, Nebraska	NE015	On	Onita silt loam, 0 to 2 percent slopes	5220	Onita silt loam, 0 to 1 percent slopes	5
Keya Paha County, Nebraska	NE103	ScF	Schamber gravelly sandy loam, 11 to 30 percent slopes	5252	Schamber gravelly sandy loam, 9 to 30 percent slopes	2
Keya Paha County, Nebraska	NE103	Vo	Vetal fine sandy loam, 0 to 2 percent slopes	5281	Vetal fine sandy loam, 0 to 3 percent slopes	5
Keya Paha County, Nebraska	NE103	Vt	Vetal loam, 0 to 1 percent slopes	5285	Vetal loam, 0 to 1 percent slopes	5
Rock County, Nebraska	NE149	VoB	Vetal loam, 1 to 3 percent slopes	5286	Vetal loam, 1 to 3 percent slopes	5
Keya Paha County, Nebraska	NE103	VtC	Vetal loam, 3 to 6 percent slopes	5287	Vetal loam, 3 to 6 percent slopes	5
Knox County, Nebraska	NE107	BoE2	Betts clay loam, 11 to 15 percent slopes, eroded	5475	Betts clay loam, 11 to 15 percent slopes, eroded	5
Knox County, Nebraska	NE107	BoF	Betts clay loam, 15 to 30 percent slopes	5476	Betts clay loam, 15 to 30 percent slopes	5
Knox County, Nebraska	NE107	BoG	Betts clay loam, 30 to 60 percent slopes	5477	Betts clay loam, 30 to 60 percent slopes	5

Knox County, Nebraska	NE107	BoD2	Betts clay loam, 6 to 11 percent slopes, eroded	5478	Betts clay loam, 6 to 11 percent slopes, eroded	5
Knox County, Nebraska	NE107	Ao	Aowa silt loam, 0 to 2 percent slopes	6300	Aowa silt loam, occasionally flooded	5
Boyd County, Nebraska	NE015	GrB	Grigston silt loam, channeled, 0 to 3 percent slopes	6301	Aowa silt loam, channeled, frequently flooded	5
Keya Paha County, Nebraska	NE103	Ba	Barney fine sandy loam, 0 to 2 percent slopes	6311	Barney fine sandy loam, frequently flooded	2
Knox County, Nebraska	NE107	Ba	Barney loam, 0 to 2 percent slopes	6312	Barney loam, frequently flooded	5
Holt County, Nebraska	NE089	Ba	Barney silt loam, channeled	6314	Barney silt loam, channeled, frequently flooded	2
Rock County, Nebraska	NE149	Ba	Barney-Boel complex, channeled	6319	Barney-Boel complex, channeled	2
Holt County, Nebraska	NE089	Ls	Barney-Boel-Calamus complex, channeled	6320	Barney-Boel-Calamus complex, channeled	
Keya Paha County, Nebraska	NE103	Bb	Barney-Bolent complex, channeled	6321	Barney-Bolent complex, channeled, occasionally flooded	
Knox County, Nebraska	NE107	Co	Coleridge silt loam, 0 to 2 percent slopes	6323	Coleridge silt loam, occasionally flooded	5
Holt County, Nebraska	NE089	Lf	Lawet loam, drained, 0 to 2 percent slopes	6331	Lawet loam, drained, rarely flooded	5
Holt County, Nebraska	NE089	Lg	Lawet-Lute complex, 0 to 2 percent slopes	6345	Lawet-Lute complex, rarely flooded	5
Boyd County, Nebraska	NE015	Le	Leshara silt loam, 0 to 2 percent slopes	6352	Leshara silt loam, occasionally flooded	5
Knox County, Nebraska	NE107	Mk	Meckling loamy fine sand, occasionally flooded	6357	Meckling loamy fine sand, occasionally flooded	
Knox County, Nebraska	NE107	Nw	Norway loamy fine sand, frequently flooded	6358	Norway loamy fine sand, frequently flooded	
Knox County, Nebraska	NE107	Ob	Obert silt loam, wet, 0 to 2 percent slopes	6366	Obert silt loam, occasionally flooded	5
Knox County, Nebraska	NE107	Ow	Orwet loam, rarely flooded	6369	Orwet loam, rarely flooded	
Knox County, Nebraska	NE107	Se	Shell silt loam, occasionally flooded	6385	Shell silt loam, occasionally flooded	
Knox County, Nebraska	NE107	Iw	Inglewood loamy fine sand, rarely flooded	6457	Inglewood loamy fine sand, rarely flooded	
Knox County, Nebraska	NE107	Bn	Bazile loam, 0 to 2 percent slopes	6500	Bazile loam, 0 to 2 percent slopes	4
Boyd County, Nebraska	NE015	Be	Blendon fine sandy loam, 0 to 2 percent slopes	6508	Blendon fine sandy loam, 0 to 2 percent slopes	5
Boyd County, Nebraska	NE015	BeC	Blendon fine sandy loam, 2 to 6 percent slopes	6510	Blendon fine sandy loam, 2 to 6 percent slopes	5
Knox County, Nebraska	NE107	Lk	Loretto fine sandy loam, 0 to 2 percent slopes	6533	Loretto fine sandy loam, 0 to 2 percent slopes	5
Knox County, Nebraska	NE107	SdD	Sardak loamy fine sand, 2 to 9 percent slopes	6550	Sardak loamy fine sand, 2 to 11 percent slopes, very rare flooding	
Knox County, Nebraska	NE107	ToB	Thurman fine sandy loam, 0 to 3 percent slopes	6561	Thurman fine sandy loam, 0 to 2 percent slopes	5
Holt County, Nebraska	NE089	Te	Trent silt loam, 0 to 2 percent slopes	6575	Trent silt loam, 0 to 2 percent slopes	5
Knox County, Nebraska	NE107	Or	Ortello fine sandy loam, 0 to 2 percent slopes	6578	Ortello fine sandy loam, 0 to 1 percent slopes	5
Knox County, Nebraska	NE107	AcC	Alcester silt loam, 2 to 6 percent slopes	6600	Alcester silt loam, 2 to 6 percent slopes	5
Knox County, Nebraska	NE107	AcD	Alcester silt loam, 6 to 11 percent slopes	6601	Alcester silt loam, 6 to 11 percent slopes	5
Knox County, Nebraska	NE107	BnC	Bazile loam, 2 to 6 percent slopes	6605	Bazile loam, 2 to 6 percent slopes	4
Knox County, Nebraska	NE107	BnD	Bazile loam, 6 to 11 percent slopes	6606	Bazile loam, 6 to 11 percent slopes	4
Knox County, Nebraska	NE107	Bd	Bazile loamy fine sand, 0 to 2 percent slopes	6608	Bazile loamy fine sand, 0 to 2 percent slopes	4
Knox County, Nebraska	NE107	BdC	Bazile loamy fine sand, 2 to 6 percent slopes	6609	Bazile loamy fine sand, 2 to 6 percent slopes	4
Knox County, Nebraska	NE107	BdD	Bazile loamy fine sand, 6 to 11 percent slopes	6610	Bazile loamy fine sand, 6 to 11 percent slopes	4
Holt County, Nebraska	NE089	Bb	Bazile silt loam, 0 to 2 percent slopes	6613	Bazile silt loam, 0 to 2 percent slopes	4
Holt County, Nebraska	NE089	BbC	Bazile silt loam, 2 to 6 percent slopes	6615	Bazile silt loam, 2 to 6 percent slopes	4
Rock County, Nebraska	NE149	BpB	Boelus loamy sand, 0 to 3 percent slopes	6640	Boelus loamy sand, 0 to 3 percent slopes	5
Knox County, Nebraska	NE107	BtC	Boelus loamy sand, 2 to 6 percent slopes	6641	Boelus loamy sand, 3 to 6 percent slopes	5
Holt County, Nebraska	NE089	BsD	Boelus loamy sand, 6 to 11 percent slopes	6642	Boelus loamy sand, 6 to 11 percent slopes	5

Holt County, Nebraska	NE089	BtB	Boelus loamy sand, gravelly substratum, 0 to 3 percent slopes	6643	Boelus loamy sand, gravelly substratum, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	BuD	Boelus-Meadin complex, 6 to 11 percent slopes	6648	Boelus-Meadin complex, 6 to 11 percent slopes	5
Knox County, Nebraska	NE107	BwD	Brunswick fine sandy loam, 6 to 11 percent slopes	6659	Brunswick fine sandy loam, 6 to 11 percent slopes	4
Knox County, Nebraska	NE107	BxE	Brunswick-Paka complex, 6 to 15 percent slopes	6661	Brunswick-Paka complex, 6 to 17 percent slopes	4
Rock County, Nebraska	NE149	BtF	Brunswick-Tassel fine sandy loams, 11 to 40 percent slopes	6662	Brunswick-Longpine fine sandy loams, 11 to 40 percent slopes	4
Knox County, Nebraska	NE107	BxF	Brunswick-Paka complex, 15 to 30 percent slopes	6663	Brunswick-Paka complex, 17 to 30 percent slopes	4
Rock County, Nebraska	NE149	BrD	Brunswick-Tassel loamy sands, 3 to 11 percent slopes	6664	Brunswick-Longpine loamy sands, 3 to 11 percent slopes	4
Holt County, Nebraska	NE089	BxF	Brunswick-Pivot complex, 9 to 30 percent slopes	6665	Brunswick-Pivot complex, 11 to 30 percent slopes	4
Knox County, Nebraska	NE107	CtE2	Crofton-Thurman complex, 11 to 15 percent slopes, eroded	6670	Crofton-Thurman complex, 11 to 17 percent slopes, eroded	5
Knox County, Nebraska	NE107	CtF	Crofton-Thurman complex, 15 to 30 percent slopes	6671	Crofton-Thurman complex, 17 to 30 percent slopes	5
Knox County, Nebraska	NE107	CtD2	Crofton-Thurman complex, 6 to 11 percent slopes, eroded	6672	Crofton-Thurman complex, 6 to 11 percent slopes, eroded	5
Boyd County, Nebraska	NE015	CrE2	Crofton silt loam, 11 to 15 percent slopes, eroded	6673	Crofton silt loam, 11 to 17 percent slopes, eroded	5
Knox County, Nebraska	NE107	CrF	Crofton silt loam, 15 to 30 percent slopes	6680	Crofton silt loam, 17 to 30 percent slopes	5
Knox County, Nebraska	NE107	CrC2	Crofton silt loam, 2 to 6 percent slopes, eroded	6685	Crofton silt loam, 2 to 6 percent slopes, eroded	5
Knox County, Nebraska	NE107	CrG	Crofton silt loam, 30 to 60 percent slopes	6686	Crofton silt loam, 30 to 60 percent slopes	5
Knox County, Nebraska	NE107	CrD2	Crofton silt loam, 6 to 11 percent slopes, eroded	6687	Crofton silt loam, 6 to 11 percent slopes, eroded	5
Knox County, Nebraska	NE107	CsC2	Crofton-Nora complex, 2 to 6 percent slopes, eroded	6693	Crofton-Nora complex, 2 to 6 percent slopes, eroded	5
Knox County, Nebraska	NE107	CsD2	Crofton-Nora complex, 6 to 11 percent slopes, eroded	6694	Crofton-Nora complex, 6 to 11 percent slopes, eroded	5
Knox County, Nebraska	NE107	ThB	Thurman loamy fine sand, 0 to 3 percent slopes	6700	Thurman loamy fine sand, 0 to 2 percent slopes	5
Knox County, Nebraska	NE107	ThC	Thurman loamy fine sand, 3 to 6 percent slopes	6703	Thurman loamy fine sand, 2 to 6 percent slopes	5
Knox County, Nebraska	NE107	TfB	Thurman fine sand, 0 to 3 percent slopes	6723	Thurman fine sand, 0 to 2 percent slopes	5
Knox County, Nebraska	NE107	TfC	Thurman fine sand, 3 to 6 percent slopes	6724	Thurman fine sand, 2 to 6 percent slopes	5
Knox County, Nebraska	NE107	ToF	Thurman fine sandy loam, 11 to 30 percent slopes	6726	Thurman fine sandy loam, 11 to 30 percent slopes	5
Knox County, Nebraska	NE107	ToD	Thurman fine sandy loam, 3 to 11 percent slopes	6727	Thurman fine sandy loam, 2 to 11 percent slopes	5
Holt County, Nebraska	NE089	No	Nora silt loam, 0 to 2 percent slopes	6746	Nora silt loam, 0 to 2 percent slopes	5
Boyd County, Nebraska	NE015	NoC	Nora silt loam, 2 to 6 percent slopes	6753	Nora silt loam, 2 to 6 percent slopes	5
Holt County, Nebraska	NE089	NoC	Nora silt loam, 2 to 6 percent slopes	6753	Nora silt loam, 2 to 6 percent slopes	5
Boyd County, Nebraska	NE015	NoD	Nora silt loam, 6 to 11 percent slopes	6755	Nora silt loam, 6 to 11 percent slopes	5
Knox County, Nebraska	NE107	NoE	Nora silty clay loam, 11 to 15 percent slopes	6758	Nora silty clay loam, 11 to 17 percent slopes	5
Knox County, Nebraska	NE107	GaG	Gavins silt loam, 30 to 60 percent slopes	6761	Gavins silt loam, 30 to 60 percent slopes	2
Knox County, Nebraska	NE107	NoC	Nora silty clay loam, 2 to 6 percent slopes	6765	Nora silty clay loam, 2 to 6 percent slopes	5
Knox County, Nebraska	NE107	NoD	Nora silty clay loam, 6 to 11 percent slopes	6767	Nora silty clay loam, 6 to 11 percent slopes	5
Knox County, Nebraska	NE107	CsE2	Crofton-Nora complex, 11 to 15 percent slopes, eroded	6789	Crofton-Nora complex, 11 to 17 percent slopes, eroded	5
Knox County, Nebraska	NE107	LkC	Loretto fine sandy loam, 2 to 6 percent slopes	6790	Loretto fine sandy loam, 2 to 6 percent slopes	5
Holt County, Nebraska	NE089	LnC	Loretto loam, 2 to 6 percent slopes	6792	Loretto loam, 2 to 6 percent slopes	5
Knox County, Nebraska	NE107	Mm	Moody loam, 0 to 2 percent slopes	6804	Moody loam, 0 to 2 percent slopes	5
Knox County, Nebraska	NE107	MmC	Moody loam, 2 to 6 percent slopes	6805	Moody loam, 2 to 6 percent slopes	5
Knox County, Nebraska	NE107	Mo	Moody silty clay loam, 0 to 2 percent slopes	6808	Moody silty clay loam, 0 to 2 percent slopes	5
Knox County, Nebraska	NE107	MoC	Moody silty clay loam, 2 to 6 percent slopes	6811	Moody silty clay loam, 2 to 6 percent slopes	5
Knox County, Nebraska	NE107	RdD	Redstoe silt loam, 6 to 11 percent slopes	6828	Redstoe silt loam, 6 to 11 percent slopes	4

Knox County, Nebraska	NE107	RgF	Redstoe-Gavins complex, 11 to 30 percent slopes	6829	Redstoe-Gavins complex, 11 to 30 percent slopes	4
Knox County, Nebraska	NE107	OrC	Ortello fine sandy loam, 2 to 6 percent slopes	6845	Ortello fine sandy loam, 3 to 6 percent slopes	5
Knox County, Nebraska	NE107	Aa	Albaton silty clay, 0 to 2 percent slopes	7710	Albaton silty clay, occasionally flooded	5
Knox County, Nebraska	NE107	An	Albaton silty clay, ponded, frequently flooded	7711	Albaton silty clay, frequently flooded	5
Boyd County, Nebraska	NE015	Bd	Blake silty clay loam, 0 to 2 percent slopes	7722	Blake silty clay loam, occasionally flooded	5
Boyd County, Nebraska	NE015	He	Haynie silt loam, 0 to 2 percent slopes	7741	Haynie silt loam, occasionally flooded	5
Knox County, Nebraska	NE107	Bg	Blyburg silt loam, rarely flooded	7765	Blyburg silt loam, rarely flooded	5
Knox County, Nebraska	NE107	Pv	Percival silty clay, rarely flooded	7804	Percival silty clay, rarely flooded	
Boyd County, Nebraska	NE015	Oa	Onawa silty clay, 0 to 2 percent slopes	7880	Onawa silty clay, occasionally flooded	5
Knox County, Nebraska	NE107	Od	Onawa silty clay, 0 to 2 percent slopes	7883	Onawa silty clay, rarely flooded	5
Knox County, Nebraska	NE107	Bs2	Boel loamy fine sand, poorly drained, 0 to 2 percent slopes, occasionally flooded	8420	Boel loamy fine sand, occasionally flooded	
Holt County, Nebraska	NE089	Bo	Boel silty clay loam, overwash, 0 to 2 percent slopes	8422	Boel silty clay loam, overwash, occasionally flooded	5
Holt County, Nebraska	NE089	Bp	Boel-Inavale complex, channeled	8425	Boel-Inavale complex, channeled, frequently flooded	5
Keya Paha County, Nebraska	NE103	Cb	Cass loam, 0 to 2 percent slopes	8435	Cass loam, rarely flooded	5
Keya Paha County, Nebraska	NE103	CcB	Cass loam, channeled, 0 to 3 percent slopes	8437	Cass loam, channeled, frequently flooded	5
Knox County, Nebraska	NE107	Gb	Gibbon silt loam, occasionally flooded	8470	Gibbon silt loam, occasionally flooded	
Holt County, Nebraska	NE089	Lh	Lex-Lute loams, 0 to 2 percent slopes	8509	Lex-Lute loams, rarely flooded	4
Holt County, Nebraska	NE089	Ax	Anselmo-O'Neill sandy loams, 0 to 2 percent slopes	8807	Anselmo-O'Neill sandy loams, 0 to 3 percent slopes	5
Boyd County, Nebraska	NE015	Ha	Hall silt loam, 0 to 2 percent slopes	8840	Hall silt loam, 0 to 1 percent slopes	5
Knox County, Nebraska	NE107	Ho	Hord silt loam, 0 to 2 percent slopes	8869	Hord silt loam, 0 to 1 percent slopes	5
Holt County, Nebraska	NE089	SmB	Simeon loamy sand, 0 to 3 percent slopes	8925	Simeon loamy sand, 0 to 3 percent slopes	5
Knox County, Nebraska	NE107	StC	Simeon loamy sand, 0 to 6 percent slopes	8926	Simeon loamy sand, 0 to 6 percent slopes	5
Holt County, Nebraska	NE089	SkB	Simeon sand, 0 to 3 percent slopes	8929	Simeon sand, 0 to 3 percent slopes	5
Knox County, Nebraska	NE107	SsF2	Simeon sand, 6 to 30 percent slopes, eroded	8931	Simeon sand, 6 to 30 percent slopes, eroded	5
Knox County, Nebraska	NE107	SuC	Simeon sandy loam, 0 to 6 percent slopes	8933	Simeon sandy loam, 0 to 6 percent slopes	5
Keya Paha County, Nebraska	NE103	SmF	Simeon-Manter-Ronson complex, 6 to 17 percent slopes	8935	Simeon-Holt variant-Ronson complex, 6 to 17 percent slopes	5
Rock County, Nebraska	NE149	SmD	Simeon-Meadin complex, 0 to 9 percent slopes	8936	Simeon-Meadin complex, 0 to 9 percent slopes	5
Knox County, Nebraska	NE107	SvF	Simeon-Thurman complex, 6 to 30 percent slopes	8938	Simeon-Thurman complex, 6 to 30 percent slopes	5
Boyd County, Nebraska	NE015	SvF2	Simeon-Valentine complex, 3 to 30 percent slopes, eroded	8940	Simeon-Valentine complex, 3 to 30 percent slopes, eroded	5
Keya Paha County, Nebraska	NE103	SvF2	Simeon-Valentine fine sands, 6 to 17 percent slopes, eroded	8943	Simeon-Valentine fine sands, 6 to 17 percent slopes, eroded	5
Keya Paha County, Nebraska	NE103	SwB	Simeon-Valentine loamy sands, 0 to 3 percent slopes	8945	Simeon-Valentine loamy sands, 0 to 3 percent slopes	5
Boyd County, Nebraska	NE015	SuC	Simeon-Valentine loamy sands, 0 to 6 percent slopes	8946	Simeon-Valentine loamy sands, 0 to 6 percent slopes	5
Rock County, Nebraska	NE149	SvG2	Simeon-Valentine sands, 9 to 60 percent slopes, eroded	8947	Simeon-Valentine sands, 11 to 60 percent slopes, eroded	5
Holt County, Nebraska	NE089	An	Anselmo fine sandy loam, 0 to 2 percent slopes	9001	Anselmo fine sandy loam, 0 to 1 percent slopes	5
Boyd County, Nebraska	NE015	AnF	Anselmo fine sandy loam, 11 to 20 percent slopes	9003	Anselmo fine sandy loam, 11 to 20 percent slopes	5
Boyd County, Nebraska	NE015	AnC	Anselmo fine sandy loam, 2 to 6 percent slopes	9004	Anselmo fine sandy loam, 3 to 6 percent slopes	5
Boyd County, Nebraska	NE015	AnD	Anselmo fine sandy loam, 6 to 11 percent slopes	9006	Anselmo fine sandy loam, 6 to 11 percent slopes	5

Holt County, Nebraska	NE089	At	Anselmo loam, 0 to 2 percent slopes	9010	Anselmo loam, 0 to 1 percent slopes	5
Keya Paha County, Nebraska	NE103	AmB	Anselmo loamy fine sand, 0 to 3 percent slopes	9012	Anselmo loamy fine sand, 0 to 3 percent slopes	5
Holt County, Nebraska	NE089	AxC	Anselmo-O'Neill sandy loams, 2 to 6 percent slopes	9020	Anselmo-O'Neill sandy loams, 3 to 6 percent slopes	5
Boyd County, Nebraska	NE015	ArF	Anselmo-Rock outcrop complex, 11 to 20 percent slopes	9021	Anselmo-Rock outcrop complex, 11 to 17 percent slopes	5
Knox County, Nebraska	NE107	UbF	Urban land, 3 to 30 percent slopes	9707	Urban land, 3 to 30 percent slopes	0
Boyd County, Nebraska	NE015	Rw	Riverwash	9810	Riverwash	0
Knox County, Nebraska	NE107	Ft	Fluvaquents, frequently flooded	9900	Fluvaquents, frequently flooded	
Keya Paha County, Nebraska	NE103	Fu	Fluvaquents	9905	Fluvaquents, sandy-Fluvaquents, loamy complex, frequently flooded	
Holt County, Nebraska	NE089	LD	Sanitary landfill	9967	Sanitary landfill	
Holt County, Nebraska	NE089	INT	Aquolls	9970	Aquolls	
Boyd County, Nebraska	NE015	AED	Arents, earthen dam	9971	Arents, earthen dam	
Holt County, Nebraska	NE089	Pm	Pits, sand and gravel	9983	Gravel pit	0
Boyd County, Nebraska	NE015	M-W	Miscellaneous water, sewage lagoons	9986	Miscellaneous water, sewage lagoon	
Keya Paha County, Nebraska	NE103	zwb	Water < 40 acres	9999	Water	0