

Neola Light & Water



Source Water Protection Plan
PWS #7853043

Prepared For

Neola Light & Water

Prepared by

Brent Beste, Iowa Rural Water Association, Source Water Protection Specialist

Assistance Provided by

City of Neola

West Pottawattamie Soil and Water Conservation District/Neola-Henschal Watershed

USDA – Natural Resources Conservation Service – Council Bluffs Field Office

Growers United

Iowa DNR Field Office #4

Local Landowners

Completed

9/18/2014

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Note: Any [blue underlined](#) words will link to the online database location if one is available when using an electronically formatted version of the Source Water Protection Plan

Introduction

Background of Source Water Protection

In 1974 the United States Congress enacted the Safe Drinking Water Act (SDWA) with the goal of providing safe drinking water for public water supplies and their users. The SDWA gave the United States Environmental Protection Agency (EPA) the authority to develop a uniform national drinking water protection program, and to establish standards for known or suspected drinking water contaminants. In 1996, Congress amended the SDWA to reflect a growing awareness of potential biological and chemical threats to drinking water. The amendment to the SDWA outlines a plan for communities to protect their own source and keep program effectiveness at the local level.

During 1998-1999, the Iowa Department of Natural Resources (IDNR) and the Iowa Geological Survey Bureau (IGSB) started developing a Source Water Protection Program for the State of Iowa. In October 1999, EPA approved the IDNR Source Water Protection Program, including the already active program of Wellhead Protection.

At this time, legislators in the State of Iowa indicated that Iowa will maintain a voluntary approach to Source Water Protection planning. A voluntary implementation (as opposed to regulatory) is appropriate for Iowa due to the uniqueness of each public water supply system. The voluntary approach also conveys a positive image of the Source Water Protection Program

Iowa Rural Water Association (IRWA) has taken an active role in developing Source Water Protection Plans for small communities. IRWA's mission in this regard is to provide technical assistance to small communities in developing Source Water Protection Plans to protect their drinking water supplies.

Currently, IRWA's Source Water Protection Program is serviced by two grants. One supplies a program through a USDA-FSA grant and another through the Iowa Department of Natural Resources (IDNR). The Neola Light & Water Source Water Protection Plan has been developed through Iowa Rural Water Association's IDNR Source Water Protection Program

Purpose

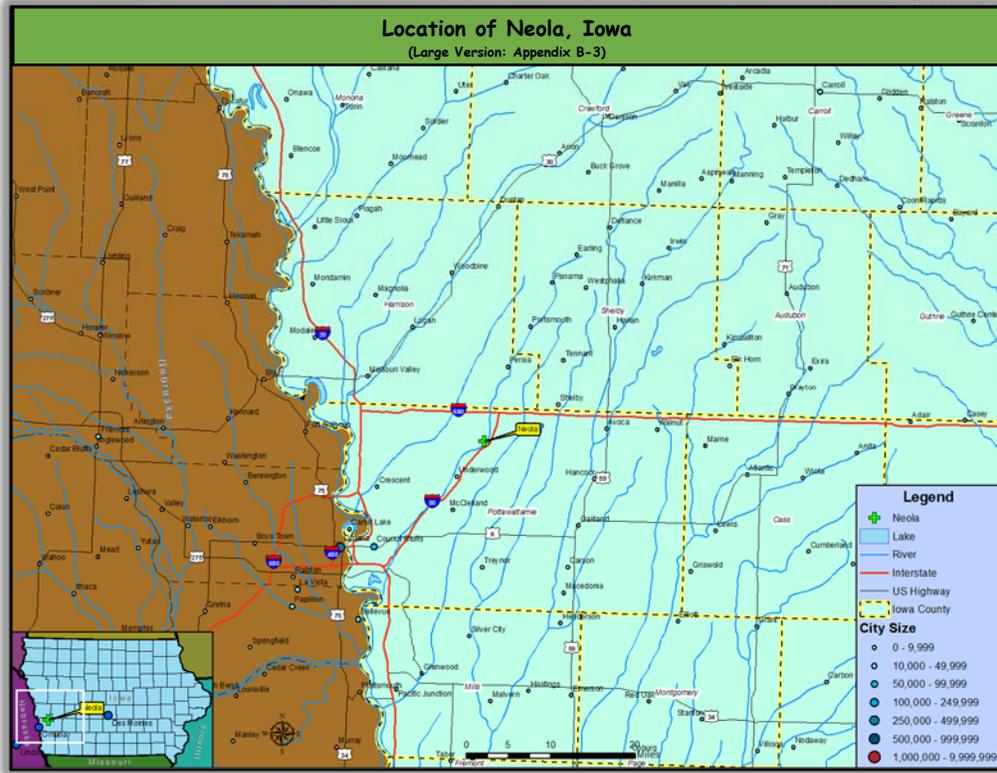
The purpose of the Source Water Protection (SWP) plan is to provide an organized approach to effectively protect public water supplies from contamination. There are many important reasons for protecting Neola's drinking water.

- Safeguard the health of community residents
- Prevent and reduce financial burdens caused by contaminated drinking water should it occur
- Educate and promote community awareness on drinking water contamination
- Safe drinking water is the life line of the community in the present and in the future
- Develop a contingency plan in the unlikely event that your drinking water supply would happen to become contaminate

Neola Light & Water #7853043

Location

Neola Light & Water is the public water utility operated by the City of Neola. Neola is located in western Iowa southwest of the Interstate 80 and Interstate 680 interchange. Neola is nestled on a hillside west of I-80.



Neola is a small community surrounded by agriculture and bounded on the south by Neola Creek and on the east by Mosquito Creek. Neola Light & Water operates two Dakota wells on the south side of the community near Neola Creek.

Water Supply Information

Source

Neola Light & Water operates two deep Dakota wells. These wells are located near the baseball field on the south edge of the City. The wells, #3 and #4, are both high in iron with well #3 being higher than #4. Due to the iron concentrations found in well #3, it is only used as an emergency standby well. Well #4 is the primary active well for Neola Light & Water. The city has used and plugged numerous shallow wells throughout its history.

Neola Light & Water Public Water Supply Well Inventory

GeoSAM	Tag ID	Local Name	Drill Date	Aquifer	Depth	Status	Elevation	Bedrock Depth	Pump Test Date	Static Water Level	Pumping Water Level	Yield
40978		Neola #1	1/1/1953	Alluvial	53	Not used	1095	N/A	1/1/1953	23	32	0
40979		Neola #2	1/1/1953	Alluvial	83	Not Used	1096	N/A	N/A	N/A	N/A	N/A
40985		Neola #2	Unknown	Alluvial	0	Not Used	1085	N/A	N/A	N/A	N/A	N/A
40982		Neola #3	6/12/1948	Alluvial	47.17	Not Used	1094	N/A	N/A	N/A	N/A	N/A

Neola Light & Water Public Water Supply Well Inventory

GeoSAM	Tag ID	Local Name	Drill Date	Aquifer	Depth	Status	Elevation	Bedrock Depth	Pump Test Date	Static Water Level	Pumping Water Level	Yield
40980	1040383	Neola #3	6/22/1966	Dakota	122.5	Active	1090	Unkn	1/1/1966	11	56	300
40981	1040384	Neola #4	1/1/1978	Dakota	114	Standby	1092	Unkn	N/A	N/A	N/A	N/A
40984		Neola #Sandpoint	Unknown	Alluvial	35	Not Used	1095	N/A	N/A	N/A	N/A	N/A
40983		Neola #Sandpoint	Unknown	Alluvial	35	Not Used	1095	N/A	N/A	N/A	N/A	N/A

Source: www.iowasourcewater.org -> Source Water Tracker -> [Neola Light & Water](#)

Customers

Neola Light & Water provides water to the citizens and visitors of the City of Neola. The utility provides water to a population of nearly 850 residents on almost 420 connections. The utility provides an average of 69,000 gallons of water per day (gpd) and a maximum of 181,000 gpd. The utility provides storage and water pressure to the community through a 75,000 gallon elevated storage tank located in the northwestern part of the community.

Water Quality

Water quality in Neola is fair. The water supply has issues with iron and manganese due to the geologic material that the wells are drilled into. The mineralization of sandstone and sand and gravel increases the amount of iron and manganese in water. This creates a slight discoloration and odor in the water. To solve this, the water is treated so that it is not noticed at the tap. This is fairly common issue throughout Iowa, and most community water supplies treat water to remove taste, odor, and color issues. These are referred to by EPA as secondary water quality standards.

The other water quality issue in Neola is nitrate. Nitrate impact is found in most cases from non-point source pollution. Nitrate in Neola averages between six and eight parts per million (ppm). This has been mostly consistent since 2007, with one significantly lower sample. The cause of this decrease is unknown.

Treatment

Due to the concentration of iron in the source water, Neola extensively treats the drinking water. Neola completed the construction of new water treatment facility in the mid 1990’s. This facility consists of the addition of potassium permanganate and greensand pressure filtration to remove iron and manganese from the drinking water. Phosphate is added to coat water service and household lines to prevent corrosion of lead and copper. The utility also uses hypochlorination to disinfect the water. Finally, fluoride is added for dental health.

Hydrogeology

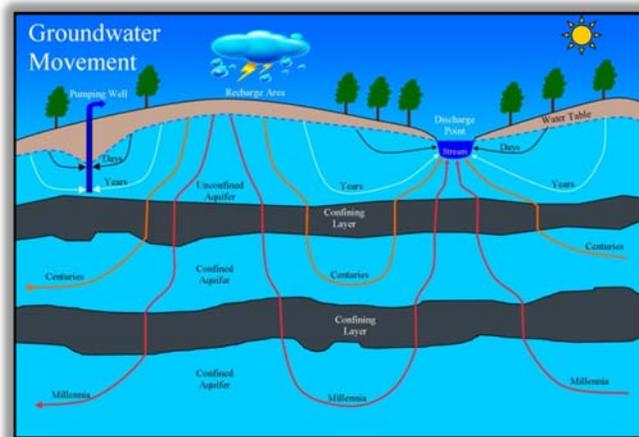
Over 80% of Iowan’s obtain their drinking water from groundwater. Groundwater is found in aquifers that vary in depth, size and water quality. Many different aquifers are found and used in Iowa to supply quality drinking water to municipalities and private residences.

Along many of Iowa’s Rivers we find surficial or unconfined aquifers. Surficial aquifers are

generally made up of sand and gravel with little material overlying them. These are found in the modern river valleys, and are generally referred to as alluvial, drift, or buried channel aquifers. Alluvial aquifers are generally exposed to the surface and located next to modern day rivers. Drift aquifers are small rogue areas of sand and gravel that are generally small in nature and for the most part are only used for local or private wells, not community water supplies. Buried channel aquifers are very good sources of drinking water for all uses and mark out former river channels.

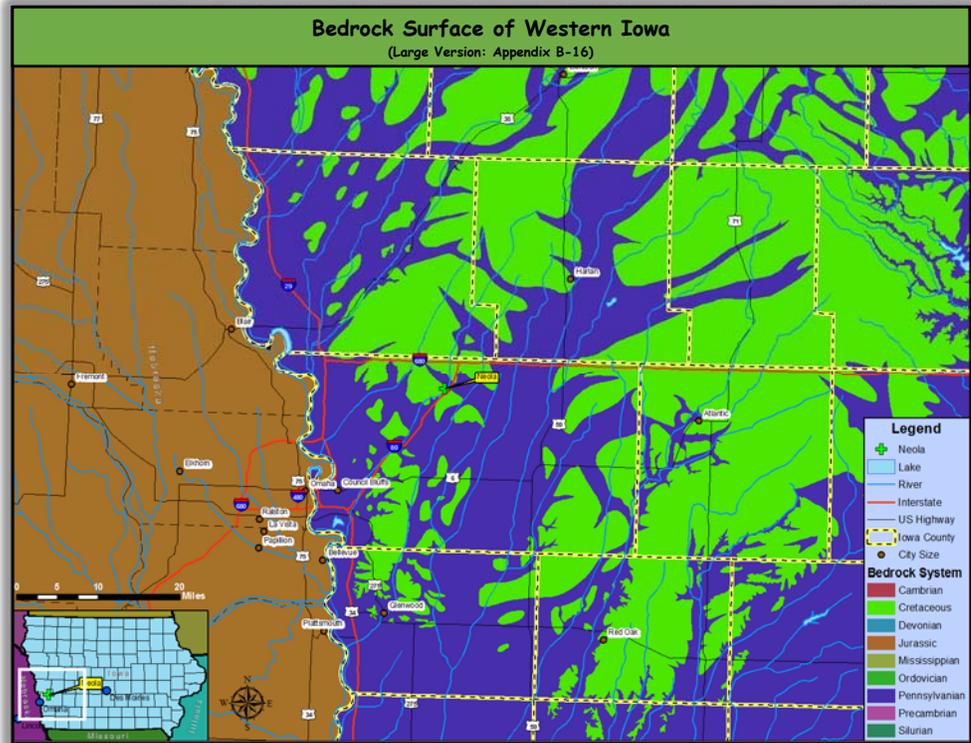
In most of Iowa we find confined aquifers located in the bedrock beneath the glacial till that makes Iowa well suited for farming activities. These aquifers provide a reliable source of good quality water in much of central and northeastern Iowa. From central Iowa southward, the bedrock aquifers are rarely used. These aquifers are deeper as you move southwest across the state and the water generally contains higher amounts dissolved minerals. We like to see water stay in contact with the ground for extended periods of time because it tends to “clean” the water of harmful chemicals. If water stays in contact too long, it will dissolve minerals from the surrounding rock. This creates a very poor quality of water. These aquifers are still used in industries such as ethanol production because the wells produce plenty of water, and require little treatment to be used in these industries.

In Iowa, we are looking for aquifers that have good water quality, are easily recharged, and also have confining layers that are thick. Confining layers are layers of soil or rock that do not easily transmit water. These are generally made up of clay or shale and act as a confining unit depending on its thickness. This is very important when classifying a well as deep or shallow. [Iowa’s Administrative Code](#) (IAC, Chapter 40.2) defines shallow and deep wells. If an aquifer has a continuous layer of low permeable rock at least 25 feet below the ground surface and is a minimum of 5 feet thick, a well is considered a deep well. If a well does not meet these criteria, the well is considered shallow.

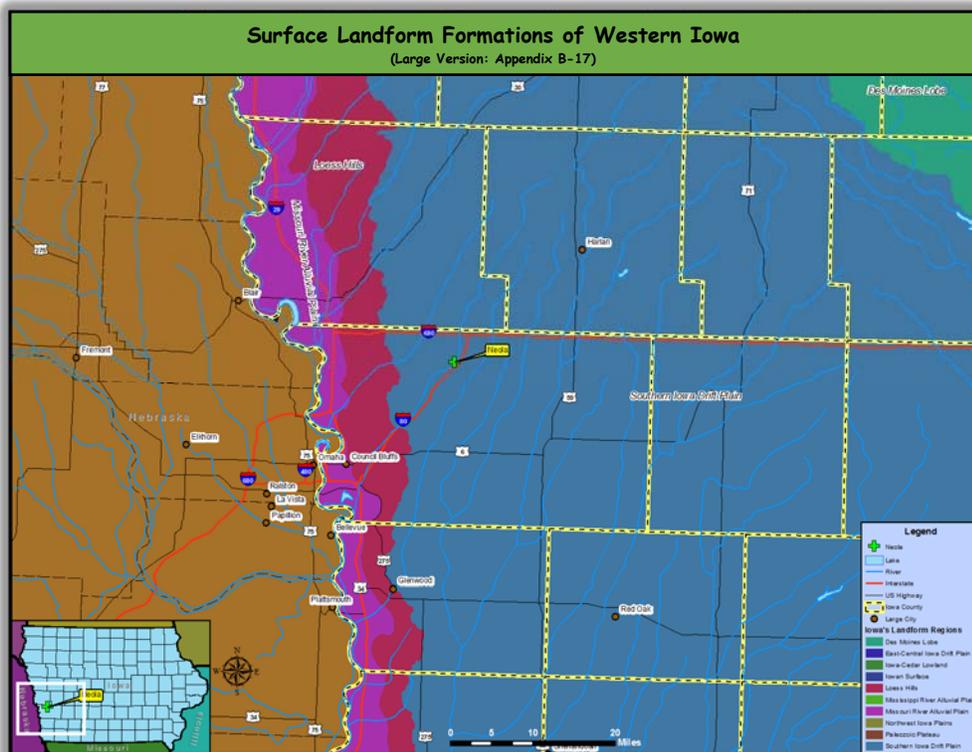


Deep wells are less susceptible to contamination, thus they are given lower susceptibility designations. Neola Light & Water wells meet these criteria. Geologic records indicate that the overlying material is between 25 and 50ft in thickness. Neola Light & Water wells were assigned a ranking of **susceptible** due to the thickness of the confining layer. This indicates that the wells have the potential to be impacted by surface contaminants such as underground storage tanks and agricultural chemicals. Microscopic particulate analysis (MPA) has been completed by Neola Light & Water to ensure that the surface is not having a biological impact on the deep aquifer.

Neola taps the deep Dakota bedrock aquifer to provide water to the City. The Dakota bedrock aquifer is a sandstone material. Sandstone is an excellent water producing rock, with known treatable water quality issues. These are related to mineralization of the quartz



material that creates higher amounts of iron and manganese. These minerals are easily removed from the water through filtration. The Dakota sandstone bedrock aquifer was formed by marine

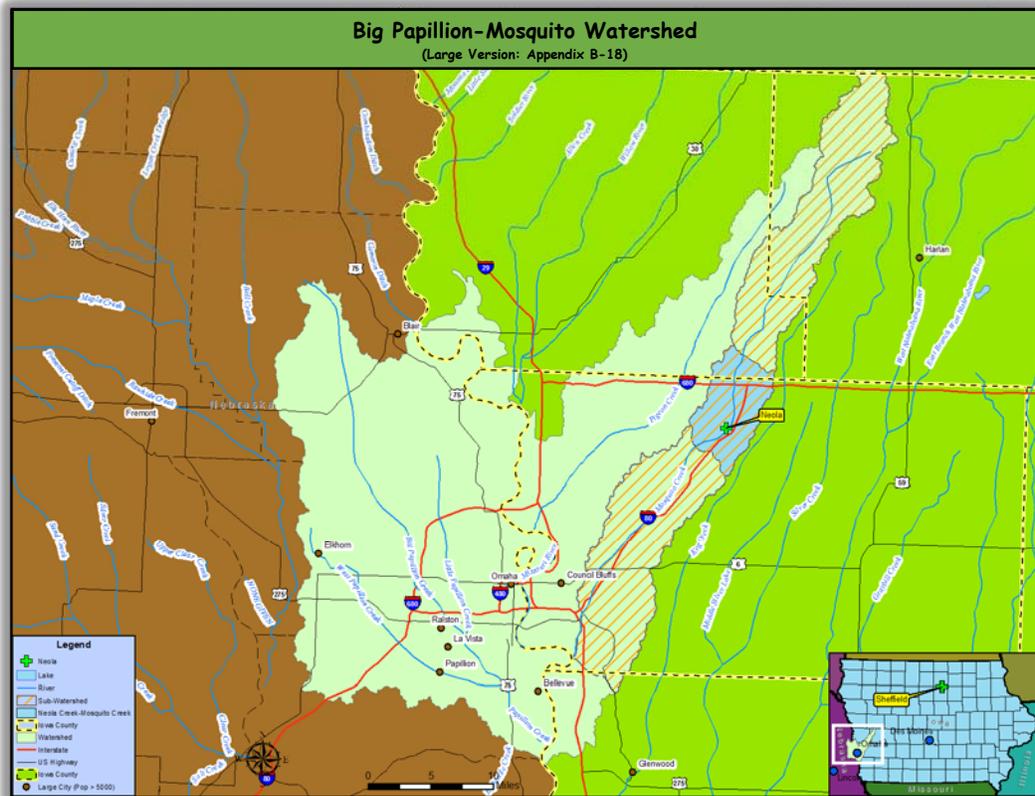


environment covering Precambrian era sedimentary rock during the Cretaceous period. The aquifer provides a significant amount of water for public and private use throughout western, and specifically northwestern Iowa (Groundwater Atlas of the

United States, [HA 730-J](#)). Neola pulls water from one of the “fingers” of Dakota sandstone that reaches to the south.

Neola lies on the western edge of the Southern Iowa Drift Plain landform feature. This plain covers nearly all of southern Iowa. The surface is noted by the rolling hills carved by the rivers running through them. The deposits that make up the drift plane are eroded glacial till overlain by a layer loess. (Landform Regions of Iowa, 2000)

Neola lies in the Mosquito Creek sub-watershed as part of the larger Big Papillion-Mosquito watershed. Mosquito Creek runs just to the east of Neola, and Neola creek on the south side of Neola



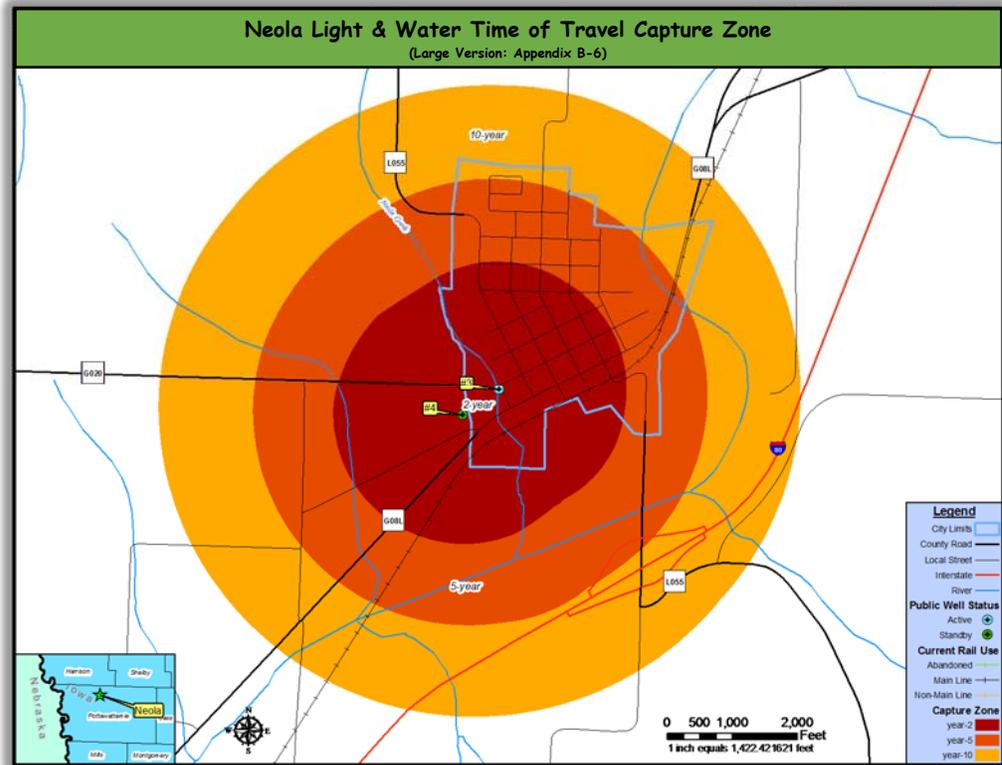
dumps in to Mosquito Creek just SE of the City. The surface water has been determined to not be having an impact on drinking water source through MPA testing.

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Neola Light & Water Source Water Protection Plan

Capture Zone

Neola Light & Water has a time of travel capture zone (map to the left). This area is the estimated area that the surface is recharging the drinking water source. This area was delineated using an analytical element model for delineating source water protection



areas. The model was last updated in 2009. A defined 2-year, 5-year, and 10-year time of travel were estimated. The capture zone should not be taken as 100% accurate due to unknowns in geology, well construction, and changes in water use.

Potential Contaminant Inventory

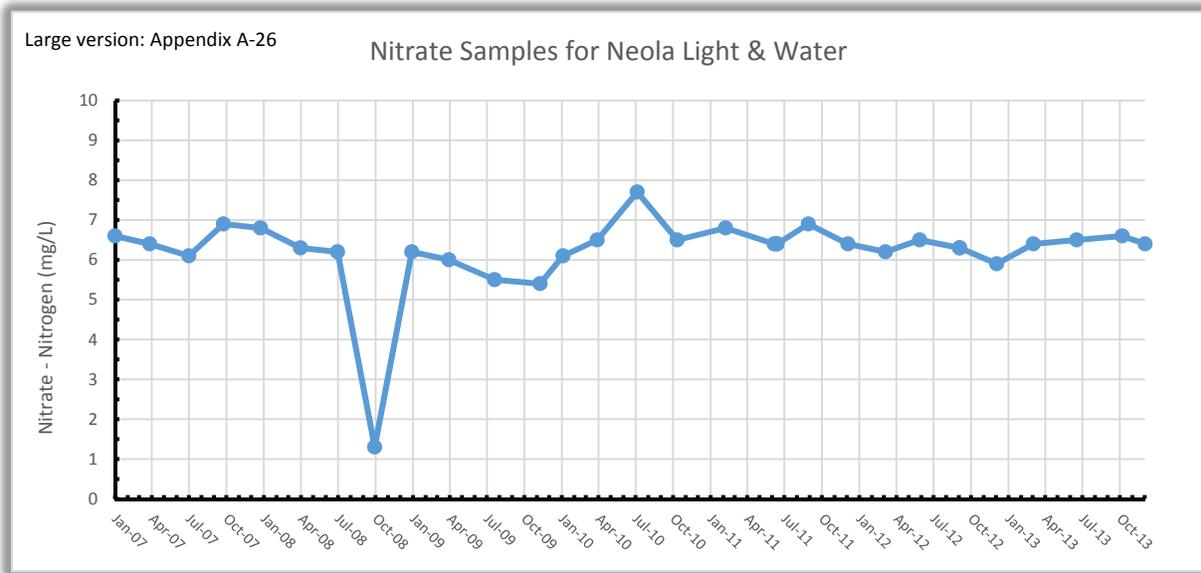
Neola has a number of potential point sources of contamination that could impact the drinking water source. The local coop has a number of chemical storage areas at the facility. All existing storage areas are above ground and are in basins or located inside a new structure. Due to unknowns in hydrogeology, other potential point sources related to above ground tanks may impact the water source including large above ground fuel storage tanks to the southwest.

The largest concern is the steady nitrate values that have been recorded in the recent past. The capture zone is dominated by agricultural activity, likely showing an impact from non-point source pollution. The soils support easy movement of water and water soluble contaminants.

Nitrate/Non-Point Source

Nitrate is a significant concern in Neola. Each of the utilities wells are high in nitrate. The assumption is that this is coming from agricultural sources based on the known contaminant

inventory lacking a known nitrogen loss. Agricultural fertilizers are a known source of non-point contamination in Iowa. These fertilizers enter the ground during application, and continual



use has led to increased nitrate in the groundwater and surface water. Neola nitrate values have remained consistently between six and seven milligrams of nitrate per Liter of water (mg/L). There have been spikes over seven and points below six. The graph above is the actual nitrate information for Neola. This is split between two different source entry points. Prior to December of 2011, the City used both wells regularly and reported a blended water nitrate sample from wells #3 and #4. After December 2011, only Well #4 has been used.

Potential Point-Source Contaminant Sites

Point source contaminants are not the focus of this project due to the nitrate issues. Threats from point source contaminants include above ground fuel and chemical storage. The tanks are located in spill containment basins or are double walled. Many underground storage tanks have been closed. There is an active LUST site in the capture zone, but in spring 2014 the monitoring wells were plugged and it was classified as no further action required.

The city also has three storm water discharge points on Neola Creek that during times of high water may impact the drinking water source. Two of the points are upstream from Well #4, and one is just downstream. The City is considering sampling the points to see if there is an impact from the creek. The utility is addressing these through community education to decrease fertilizer and chemical use in the City of Neola.

Ranking Criteria

The potential contaminants are listed below alphabetically. The FieldID# links to the table of potential contaminants and orange numbers on the potential contaminant maps (Appendix B, pages B-9 & B-10). The potential contaminants were ranked on 3 scales. The first was a 1-5 scale based on the chemical type and storage threat with 5 being the highest. The second was on the basis of the aquifer susceptibility. In Neola Light & Water, the aquifer being taken into

consideration is a **Dakota aquifer** that is **susceptible** to contamination. All potential contaminants were given a ranking of 4 for aquifer susceptibility due to known surficial impacts on groundwater. The third scale was the proximity to the well. If the contaminant was in the 2-year it was given a 3, 5-year was given a 2 and 10-year was assigned a value of 1. The assigned risk assessment was developed using the total risk number. If a potential contaminant had a total risk value of 9 or larger, it was ranked as a High threat of contamination, 6-8 were ranked as a Moderate threat of contamination and 5 or lower is a Low threat of contamination.

Neola Water Supply Potential Point Source Contaminant Inventory									
Field ID	Facility Name	Address	Site Type	DNR Program ID	Capture Zone	Total Risk	Risk Ranking	Site Status	Hazardous Material
23	Water Plant		Power Plant		2-Year	8	Moderate	Closed	Power Plant
14	Neola City Shed		Above Ground Storage Tank		2-Year	11	High	Active	Fuel
2	Century Link	203 Pearl	Tier II Chemical Storage	FAIDSIT2A00000617	2-Year	9	High	Active	Telecommunications Lubricants
3	Dons Fuel	309 Front St	Leaking Underground Storage Tank	8LTB39	2-Year	12	High	Active	Fuel
1	Former Heath's Service	403 Front St	Leaking Underground Storage Tank - Closed	9LTG78	2-Year	9	High	Closed	Fuel
5	Doug Ring	29745 Front St	Above Ground Storage Tank	1339	2-Year	9	High	Active	Fuel
4	Dons Fuel and Auto	29747 Front S6	Above Ground Storage Tank	440	2-Year	9	High	Active	Fuel, Diesel
15	Neola Wastewater Treatment Facility		Wastewater Treatment Facility - Municipal		2-Year	9	High	Active	Wastewater
22	Wastewater Discharge		Wastewater Discharge	7853001	2-Year	8	Moderate	Active	Wastewater
17	Storm Water Discharge		Storm Water Discharge		2-Year	9	High	Active	Storm Water
18	Storm Water Discharge		Storm Water Discharge		2-Year	8	Moderate	Active	Storm Water
6	Electrical Substation		Electrical Substation		2-Year	10	High	Active	Lubricants (Historic PCBs)
13	Neola Cemetery		Cemetery		10-Year	5	Low	Active	
20	The Scouler Company - Neola	405 Front St	Air Permit - Group 1 Grain Elevators	78-05-004	2-Year	7	Moderate	Active	Grain Storage
19	Storm Water Discharge		Storm Water Discharge		2-Year	8	Moderate	Active	Storm Water
16	Old Neola WW Treatment Plant		Wastewater Treatment Facility - Municipal		2-Year	7	Moderate	Closed	Wastewater
7	Heartland Coop		Above Ground Storage Tank		2-Year	11	High	Active	Nitrogen
8	Heartland Coop		Chemical Storage		2-Year	8	Moderate	Active	Pesticide, Fertilizer
9	Heartland Coop		Above Ground Storage Tank		2-Year	11	High	Active	Fuel
10	Heartland Coop		Tier II Chemical Storage	FAIDSIT2A00003446	2-Year	9	Moderate	Active	Anhydrous Ammonia
11	Heartland Coop	501 Front St	Underground Storage Tank - Closed	198603408	2-Year	6	Moderate	Closed	Fuel
21	Trafton Enterprises, Inc		Leaking Underground Storage Tank - Closed	9LTK30	5-Year	6	Slight	Closed	Fuel

12	Kum and Go #23	29356 298th St	Underground Storage Tank	198607027	10-Year	9	Moderate	Active	Gasoline, Diesel
Onsite Potential Contaminant Inventory Completed: 5/7/2014, Database Review Completed: 5/22/2014									

Neola Light & Water Known Private Wells						
Well ID	Owner	Capture Zone	Data Source	Depth	Completion Date	Status
52905	Kum & Go Store #23	10-year	IGS well database	160		Active
38478	Quail Run Golf Course	10-year	IGS well database	140	06/14/1994	Unknown
38476	Quail Run Golf Course	10-year	IGS well database	168	09/15/1995	Active
38477	Neola Golf Course	10-year	IGS well database	85	08/26/1993	Test Well
55613	Phippen, Matt	10-year	IGS well database	244	10/12/2001	Active
11007	Unkn	10-year	Permitted private wells	60	5/13/1993	Unknown
10678	Unkn	2-year	Permitted private wells	175	10/25/1989	Unknown
16660	Unkn	5-year	Permitted private wells	140	4/19/1995	Unknown
2098512	Huddle, William & Diane	10-year	Private well tracking system	173	05/01/2004	Active
2085121	Hubbard, Hazel	10-year	Private well tracking system	Unkn		Retired
2102015	Dermody, James & Megan	10-year	Private well tracking system	128	10/30/2004	Retired
2097665	Hall, Traverse	5-year	Private well tracking system	186	09/25/2003	Active
2150327	Benzing, Diana	10-year	Private well tracking system	200	10/15/2010	Geothermal
Source: NRGIS Sourcewater_Otherwells Layer						

Neola Light & Water Potential Non-Point Sources of Contamination				
Contaminant	Location	Type	Size/Amount	Description
Row Crop Agriculture	North, South and West of the Wells	Agriculture	~1014 acres or 58% of the Capture Zone	Cash crop corn and soybeans are planted in row crop agricultural land throughout much of the capture zone. The non-point threat is from widespread fertilizer and herbicide/pesticide use
Neola Creek	Less than 50ft west of Well #4	Surface Water	Small stream	Surface water is a threat from chemicals in the water that may flow into the aquifer through natural bank recharge/flooding or induced recharge
Mosquito Creek	NE to SW part of the Capture Zone	Surface Water	Regional Stream	Surface water is a threat from chemicals in the water that may flow into the aquifer through natural bank recharge/flooding

Neola Light & Water Source Water Protection Committee							
Name	Affiliation	Email	Phone	Mailing Address	City	State	Zip
Brent Beste	IRWA	brentbeste@iowaruralwater.org	(515) 205-4026	4221 S. 22 nd Ave E.	Newton	IA	50208
Jeremy Van Arsdol	Neola Light and Water	jvanarsdol@live.com	(402) 681-0557	PO Box 67	Neola	IA	51559
Kevin SeEVERS	Neola-Henschal Watershed	Neola-henschal@pottswcd.org	(712) 328-2489	305 McKenzie Ave	Council Bluffs	IA	51503
Pete Sorensen	Neola City Council	ssorenson@fbfs.com	(402) 960-8897	PO Box 67	Neola	IA	51559
Matt Allen	NRCS	Matthew.allen@ia.usda.gov	(712) 328-2489	305 McKenzie Ave	Council Bluffs	IA	51503
Tim Kramer	Growers United	Tim.kramer@plantpioneer.com	(712) 249-7005				

Neola Light & Water Source Water Protection Committee							
Name	Affiliation	Email	Phone	Mailing Address	City	State	Zip
Ron Barrier	Rolling B Farms	rbarrier@hotmail.com	(402) 681-5783				
Keith Wilken	IDNR Field Office #4	Keith.wilken@dnr.iowa.gov	(712) 243-1934	1401 Sunnyside Lane	Atlantic	IA	50022

Focus Area

The Neola source water committee has decided to focus on the area to the northwest and southwest of the wells. The goal is to work with the landowners, Lions Club, and the bike trail committee to better manage the land. This includes native grass plantings, decreased nutrient application and timing changes, and working to improve land management. The committee hopes to see decreases in nitrate concentrations in the public wells over the years with goals of staged implementation. This is to ensure the availability of cost share is spread over multiple years and that all of the burden is not put on the landowners at one time.

The second focus is on public education and storm water management. Working with the Neola-Henschall watershed group has provided an opportunity to cooperatively educate homeowners and business' in Neola to implement storm water practices. The goals is to develop brochures, classroom events, and citywide education events to demonstrate what impact storm water is having on local water bodies and the drinking water source and what can be done at home to improve water quality.

Management Strategies

Initial Projects Prepared: 6/16/2014 – 6/17/2014

Small Committee Discussed and updated: 7/1/2014; updated 8/13/2014

Project List Finalized by the Committee: 8/19/2014; updated 8/29/2014

1. Educational Campaign and Events

- a. Cost: Staff Time, Promotional Materials, Refreshments (if necessary)
- b. Goal:
 - i. Educational events promoting source water protection and implementation
 - ii. Source water promotional brochures/flyers
- c. Timeline: Ongoing, starting fall 2014
- d. Contact:
 - i. Jeremy Van Arsdol, Water Superintendent, City of Neola
 - ii. Pete Sorenson, City of Neola
 - iii. Contact: Brent Beste, Source Water Specialist, Iowa Rural Water Assn.
 - iv. Contact: Kevin SeEVERS, Project Coordinator, West Pott SWCD
- e. Implementation Status: Committee Discussed

Project Description

The benefit of educational campaigns is that it gets the word out about projects and goals that the City has. Education before implementation is key to getting community buy in for projects, especially those that have significant costs (i.e. land purchases).

Community sponsored events promoting source water protection and where drinking water comes from, water plant tours, and home management practices can show residents how to protect drinking water at home. Assistance can be provided by outside groups, refreshments always encourage attendance, and the community will learn about the efforts the city is working on to ensure that they have good quality and safe drinking water.



Brochures and flyers are a benefit because they are a cheap and easy way to notify the residents of water supply activities, where drinking water comes from, and can supply lots of information at one time. These educational materials can describe practices, show how they can be completed, and where to get more information. Paper materials can also easily be posted on the City website with links to more information projects to protect water resources.

Goal

- Educational event in conjunction with Iowa Rural Water Association and West Pott SWCD to promote watershed and source water protection efforts and practices
- Brochures/flyers made available to residents on the website, at city hall or through mailings

Results

This project has been discussed by the source water protection committee.

2. **Work with the landowners in the capture zone to install cover crops through the establishment period**
 - a. Cost: Staff Time
 - b. Goal: Staggered installation starting in key areas
 - c. Timeline: 2015-2018
 - d. Contact:
 - i. Kevin Seevers, Project Coordinator, West Pott SWCD (Through 2016)
 - ii. Jeremy Van Arsdol, Water Superintendent, City of Neola
 - e. Implementation Status: Committee discussed

Project Description

- Cover Crop Benefits
 - Decrease soil loss
 - Increase soil organic matter
 - Increase wildlife
 - Increase infiltration
 - Sequester and scavenge residual nitrogen

- Cover Crop Downfalls
 - Cost – Yearly seed and planting costs
 - Crop insurance timing issues
 - Initial increase in nutrient needs
 - Herbicide used to kill crop in the spring



All of this depends on the correct seed blend, which is where the West Pott SWCD and Tim Kramer with Growers

United comes in. They can assist the landowners with the proper seed selection, government cost shares, and when to plant.

Goal

- Work with all landowners in the Capture Zone to install cover crops
 - Cost Share available from West Pottawattamie SWCD (until Fall 2016)
 - NW of the Wells in 1st year
 - SW of the Wells in 2nd year
 - S of the Wells in 3rd year
 - SE of the wells in the 4th year
- Work with the landowners/operators to ensure cover crop establishment in the years following the initial installation
- Work with Tim Kramer to reduce costs of the seed through bulk purchase and flyover installation with all agricultural operators at once

Results

This project has been discussed by the source water protection committee. Two land owners in the capture zone, Ron Barrier and Pete Sorensen, have expressed interest in cover crops on their property.

3. Work with the SWCD and NRCS to promote nutrient management strategies available through the farm bill conservation programs to local landowners

- a. Cost: Staff Time
- b. Goal: All row crop agricultural property in the capture zone
- c. Timeline: Ongoing
- d. Contact:
 - i. Jeremy Van Arsdol, Water Superintendent, City of Neola
 - ii. Matt Allen, Natural Resources Conservation Service
- e. Implementation Status: Committee discussed

Project Description

Developing a working relationship with the landowners by expressing water quality concerns and working with them to correct the problem will help correct the nitrate issues in Neola. Many landowners are open to helping solve problems, instead of outright being blamed for it and required to do something. There are many options conservation practices that keeps a majority of land in production. New and innovative conservation measures provide maximum benefits while keeping as much land in production as possible.

The benefits to enacting the below conservation measures are significant. Many of the measures improve wildlife habitat, native plants filter/use excess nutrients, slow the movement of sediment, and may decrease the nutrient demand of the field. Many of the programs provide cost share, technical assistance, and implementation assistance to landowners. For example, dedicating just 10% of property to prairie strips has shown significant reductions of nitrogen and phosphorus in surface water and groundwater. Combining multiple practices has shown greater reductions than relying on one practice only.

Row Crop Soil and Water Conservation Practices

- Conservation Reserve Program (CRP): Wellhead and General Sign Up Programs
 - Benefits
 - Guaranteed income
 - Long term contracts (10-15yrs)
 - Increased wildlife habitat
 - Increased infiltration
 - Increased nutrient up take
 - Downfalls
 - Annual Maintenance
 - Loss of Crop Land
 - CRP rental rates do not match commercial rates
- Nutrient Management: Fertilizer timing (side dress nitrogen when needed), spring only application, follow Iowa State application recommendations
 - Benefits
 - Decreased application (lower fertilizer costs)
 - Possible decreased fertilizer loss
 - Downfalls
 - Proper timing is necessary
- Install Buffers near streams and wellheads
 - Benefits
 - Increased infiltration
 - Decreased sediment loss to streams



- Increased wildlife habitat
 - Increased infiltration at edge of field
 - Downfalls
 - Loss of crop ground
 - Cost of installation
- Prairie Strips (Newer Program)
 - Benefits
 - Only requires strategic placement of prairie strips in 10% of a field/watershed
 - Removes significant quantities of nitrogen and phosphorus
 - Eligible for General and Continuous CRP
 - Relatively low costs
 - Downfalls
 - Loss of farmland
 - Costs
 - Maintenance – ensure not damaging during planting/harvest
- Other soil and water conservation practices that improve surface water/groundwater quality
 - Grassed Waterways
 - Conservation Crop Rotations
 - Terraces
 - Bioreactors/edge of field improvements

Possible Funding Sources

- USDA
 - EQUIP (Federal Cost Share)
 - CRP Programs (federal rental payments, possible city incentives)
- Cost Share Programs (City, County, State, Federal, Watershed)
- WIRB (Watershed Improvement Review Board)
 - Dedicated project funding (land purchase, structures, wetlands) through the watershed district

Sources

- 2014 Continuous CRP Fact Sheet, June 2014 – USDA-FSA
- 2014 EQUIP Key Iowa Practices for General Funding, June 2014 – USDA-NRCS
- Cover Crops to Improve Soil Iowa Fact Sheet, June 2013, USDA-NRCS
- Small Changes, Big Impacts: Prairie Conservation Strips, March 2014 – STRIPS Program

Goal

- Work with the landowners to change the application timing and amount of fertilizer applied to maximize uptake
- Promote in field conservation measures to improve surface and groundwater quality

Results

This project has been discussed by the source water protection committee.

4. Work with the owner next to Neola Creek and west of Well #4 to convert the property to native grasses through CRP/Land Purchase etc.

- a. Cost: Current land values/difference between commercial and CRP rental rates
- b. Goal: See map in Appendix B, Page B-14
- c. Timeline: Discussions beginning Fall 2014
- d. Contact:
 - i. Jeremy Van Arsdol, Water Superintendent, City of Neola
 - ii. Pete Sorenson, City of Neola
- e. Implementation Status: Committee Discussed

Project Description

The City could work with landowner(s) to convert the property mapped in Appendix B, page B-14 to native grasses through the Wellhead CRP program. The property would be planted in native grasses through this program and the root systems would aid in filtering out nutrients, slow sediment, and beautify the area.

The other option is to work with the landowner to purchase the property. This is a very small parcel, and may be more beneficial to the city than wellhead CRP. If the hydrogeology works, and setbacks are met, there is the possibility that it could be a new well site. The city could also purchase the property and convert it to a park extension/outdoor classroom planted in native grasses. This would be a benefit for source water protection, outdoor recreation, and educational opportunities.

The City should also contact Chad Fields at IDNR Water Supply Engineering section to have a well forecast completed for this area. If it is determined that the location is viable for a future City well, the City is considering purchasing over renting the property.

Contact: Chad Fields: chad.fields@dnr.iowa.gov; (515) 725-3407

Goal

- Work with the property owners west of the Well #4, west of Neola Creek to enroll the property in CRP
- Purchase the property and develop an outdoor classroom for residents and students
- Wellhead CRP can be promoted to all landowners in the capture zone
- Funding/Planting Assistance
 - Iowa West for land purchase grants
 - REAP For Park Development/Land Purchase
 - WIRB (Currently an RFP is not anticipated unless the state allocates money in 2015 legislative session)
 - Pheasants Forever for assistance with seed planting etc for this area

Results

This project has been discussed by the source water protection committee.

5. Work with the Bike Trail committee to plant native grasses along the trail, specifically in the areas through the capture zone

- a. Cost: Depends on possible grants and cost shares
- b. Goal: Along the bike trail in the capture zone
- c. Timeline: Depends on the Bike Trail, prior to 2017
- d. Contact:
 - i. Pete Sorenson, City of Neola
- e. Implementation Status: Committee discussed

Project Description

Currently, there is a bike trail extension in the works, with part of it going through the City of Neola. This is a great opportunity to plant native grasses instead of random seeds along the trail. These could add native flowering plants along the trail, and help filter nutrients in the capture zone prior to water reaching the wells.

There may also be funding opportunities through the Resource Enhancement and Protection (REAP) program. This is a funding opportunity through IDNR and allows entities to apply for grants for a variety of conservation efforts.

Goal

- Plant native grasses along the new bike trail and spur line in Neola
 - Apply for a grant through the REAP program to partially cover costs

Results

The source water protection committee has discussed this strategy.

6. Develop a Gateway and Roadside Planting area using REAP

- a. Cost: Depends on grants and cost share
- b. Goal: Road ditches along the Front St and Sycamore Rd.
- c. Timeline: Spring 2016 planting
- d. Contact:
 - i. Jeremy Van Arsdol, Water Superintendent, City of Neola
- e. Implementation Status: Committee Discussed

Project Description

REAP has a separate program for roadside vegetation and planting. This provides communities the opportunity to develop a “gateway” entrance to the community that includes native plantings in road ditches. This could go hand in hand with the bike trail areas and help improve soil quality, infiltration in the road ditch, and nutrient filtration in the ditches. This may help decrease the amount of road salt that unknowingly enters groundwater, filter nutrients from runoff, and improve the look as you enter Neola from the SW.

REAP grants can be sought to cover a portion of the implementation costs.

Goal

- Work with Pottawattamie County to plant native grasses in the road ditches to develop a community gateway entrance on Front St. and Sycamore Rd.

Results

This strategy has been discussed by the source water protection committee.

7. Work with Kevin Seevers and the Neola-Henschal Watershed Management group to institute storm water management strategies

- a. Cost: Staff time, Refreshments, materials
- b. Goal: Educational Events
- c. Timeline: Various events before December 2016
- d. Contact:
 - i. Pete Sorensen, City of Neola
 - ii. Kevin Seevers, Project Coordinator, West Pott SWCD
- e. Implementation Status: Committee Discussed

Project Description

Currently, West Pott Soil and Water Conservation District has a Watershed grant for the Neola-Henschal watersheds. One of the focus' of this authority is to work on storm water management practices in the City.

West Pott SWCD and IRWA are working to develop educational events in Neola to promote storm water management techniques. This may include general public meetings, rain barrel construction classes, and other strategies to get public information out regarding storm water management. Events are being discussed for the fall of 2014, but have not yet been finalized.

Goal (starting ideas)

- Educational Events
- Rain Gardens
- Rain Barrels (Possible class to construct one)
- Buffers
- Native grass plantings



Results

This project has been discussed by the source water protection committee. Pete is also going to be contacting another member of the community that has expressed interest in and even installed rain gardens. Some possible locations discussed by the community include the Presbyterian Church and hillside areas near the west side of Neola.

8. Work with the Lions Club on the park redevelopment plans to include native turf grasses (such as buffalo grass) in place of standard turf grasses (kentucky blue grass)

- a. Cost: Estimate of \$.51/sqft for buffalo grass sod through a vendor
- b. Goal: Replace low traffic areas with native turf grasses (buffalo grass)

- c. Timeline:
 - i. Spring 2015 for area around well #4
 - ii. When the park is redeveloped
- d. Contact:
 - i. Jeremy Van Arsdol, Water Superintendent, City of Neola
- e. Implementation Status: Committee Discussed

Project Description

Converting to native turf grasses instead of Kentucky blue grass will have a number of benefits. Native turf grasses are more drought resistant, require less water, and also require less maintenance. This project benefits source water by establishing a deeper root system to improve infiltration and use excess nutrients. This also benefits source water by eliminating nutrient and chemical application used to care for modern turf grasses such as Kentucky blue grass.

There are some downfalls. Buffalo grass for example does not like to take a beating, does not look good during the establishment phase, and greens up later than traditional grasses. These reasons make it an option for areas that are low traffic.

Goal

- Convert the grasses near well #4 to native turf grasses (city property)
- Convert the grasses outside of the baseball field to native turf grasses, such as buffalo grass

Results

This project has been discussed by the source water protection committee. The City is investigating possibly purchasing buffalo grass sod to plant in the spring of 2015 around well #4. The City is also

9. Work with the West Pott SWCD to share water quality data and continued monitoring after the initial practices have been installed

- a. Cost: Lab testing costs for more tests
- b. Goal: Nitrate from all city wells, and storm water discharge points
- c. Timeline: Ongoing (until at least 2016 when the watershed contract expires)
- d. Contact:
 - i. Jeremy Van Arsdol, Water Superintendent, City of Neola
 - ii. Kevin Seevers, Project Coordinator, West Pott SWCD
- e. Implementation Status: Committee Discussed

Project Description

This data sharing project will help with grant applications to show the need for management strategies to be implemented. Data such as the well nitrate values can help the SWCD with grant applications by showing the need to protect groundwater and storm water discharge from excessive nutrients.

Goal

- Monitor storm water discharge nutrient levels from the outlets into Neola Creek
- Monitor sanitary sewer effluent for changes in nutrient values
- Monitor nutrient levels in groundwater – go to monthly for a year to see if there is a difference in month to month trends vs. quarterly
 - Sample each well individually to see aerial coverage
- Provide quarterly water quality updates to those landowners that are working with the City and SWCD to install nutrient reduction management strategies
 - This provides the operators/producers updates to the management of practices that are being installed and how they are performing

Results

This project has been discussed by the source water protection committee.

10. Sanitary sewer inspections and maintenance

- a. Cost: Staff time, Liquid Smoke
- b. Goal: Smoke Blowing in the alluvial parts of the capture zone
- c. Timeline: Fall 2014
- d. Contact:
 - i. Jeremy Van Arsdol, City of Neola
 - ii. Brent Beste, Iowa Rural Water Assn.
 - iii. Contact: John Veach, Wastewater Technician, Iowa Rural Water Assn.
- e. Implementation Status: Committee Discussed

Project Description

Completing regular maintenance and inspections on the sanitary sewer system is good practice to ensure the system meets regulatory requirements. This also helps determine sources of I&I (infiltration and inflow). Any location where water can get into the system, water can also get out. Ensuring that water is not getting into the system will help make sure that the drinking water system is not compromised.

Sanitary sewers are also a source of one of the emerging contaminants in groundwater. Groundwater investigations in Ames, IA and Madison, WI have found traces of short living viruses, pharmaceuticals, and other traces of human activity in deep wells. The wells where these contaminants were found were thought to be well protected from surface activities. There currently is no guidance or completed research to verify the source, but studies are leaning towards leaking sanitary sewers and other sources of raw sewage.

Smoke blowing is a great starting point. When it is dry, it is possible that smoke will come out of the ground near locations where the sewer



system is leaking. Iowa Rural Water Associations Wastewater Technicians are available to assist the City with this project at no cost to the city, with the exception of consumables such as the liquid smoke.

To follow up sources of smoke, conducting sewer cameras to visually inspect the location is a good idea before spending money on potentially costly repairs. IRWA has push cameras available for use, but they only work in small lines. It may be necessary to contract this extended part of the project out to private contractors.

Goal

- Work with IRWA to schedule sanitary sewer smoke blowing
 - Assistance and equipment provided by IRWA
- If issues are noted, work with IRWA or a contractor to use a camera to inspect the select locations

Results

This project has been discussed by the source water protection committee.

11. Work to promote residential lawn care management such as proper fertilizing, converting to native turf, and limited chemical application/use

- a. Cost: Staff Time, promotional materials
- b. Goal: Promotional materials distributed to residents of Neola
- c. Timeline: Spring 2015
- d. Contact:
 - i. Jeremy Van Arsdol, Water Superintendent, City of Neola
 - ii. Contact: Brent Beste, Source Water Specialist, Iowa Rural Water Assn.
- e. Implementation Status: Committee discussed

Project Description

This project is meant to promote awareness of the impact of lawn fertilizing on the water supply and public waterways. Using brochures, public educational events, and other promotional materials to spread the word can help decrease nutrients and chemicals in the watershed.

Goal

- Decrease nutrient and chemical use in Neola
 - Brochures promoting proper fertilizer application and water use
 - Public educational event to promote these activities
 - Brochures promoting proper hazardous chemical use and storage

Results

This project has been discussed by the source water protection committee.

12. Hang water supply protection area signs near the edges of the capture zone

- a. Cost: Staff time to install
- b. Goal: Signs and Stickers
- c. Timeline: Fall 2014

- d. Contact:
 - i. Jeremy Van Arsdol, Water Superintendent, City of Neola
 - ii. Brent Beste, Source Water Specialist, Iowa Rural Water Assn.
- e. Implementation Status: Committee Discussed

Project Description

Hanging signage near the edges of the capture zone or primary protection areas will help develop awareness of where Neola’s drinking water comes from. The other goal is to deter people from illegal dumping in this area, hopefully making them think twice about dumping.



IRWA provides signage to communities completing source water protection plans. Two to three of these signs are provided at no costs to the community, with others available for purchase. IRWA also provides stickers for water/wastewater facilities that alert potential vandals that it is a federal offense if the facility is tampered with.

Goal

- Install IRWA provided Water Supply Protection Area Signs in select areas
- Install IRWA provided “Federal Offense for Tampering” stickers on water supply facilities

Results

This project has been discussed by the source water protection committee.

13. Develop a Backflow Prevention Program/Ordinance

- a. Cost: Ordinance development costs
- b. Goal: Backflow prevention ordinance
- c. Timeline: Fall 2015
- d. Contact:
 - i. Jeremy Van Arsdol, Water Superintendent, City of Neola
 - ii. Sample Ordinance: Brent Beste, Source Water Specialist, Iowa Rural Water Assn.
- e. Implementation Status: Committee discussed



Project Description

Backflow prevention is important to protect the distribution system from outside contamination. Backflow can come from many sources, but is the result of negative pressure occurring. Negative pressure can occur during a fire, main breaks, or hydrant flushing. An example of contamination is somebody is refilling a bucket of dirty mop water with the hose hanging it, and the water being sucked out of the bucket through the hose and into the drinking water distribution system. If this happens, utility customers could get sick.

Goal

- Institute a backflow prevention program ordinance requiring large preventers to be tested yearly with a report delivered to the water department
- Encourage the installation of anti-siphon water connections/hose bibs in private residents/commercial facilities (new plumbing standard that is coming out for new construction/replacement of hose connections)



Results

This project has been discussed by the source water protection committee.

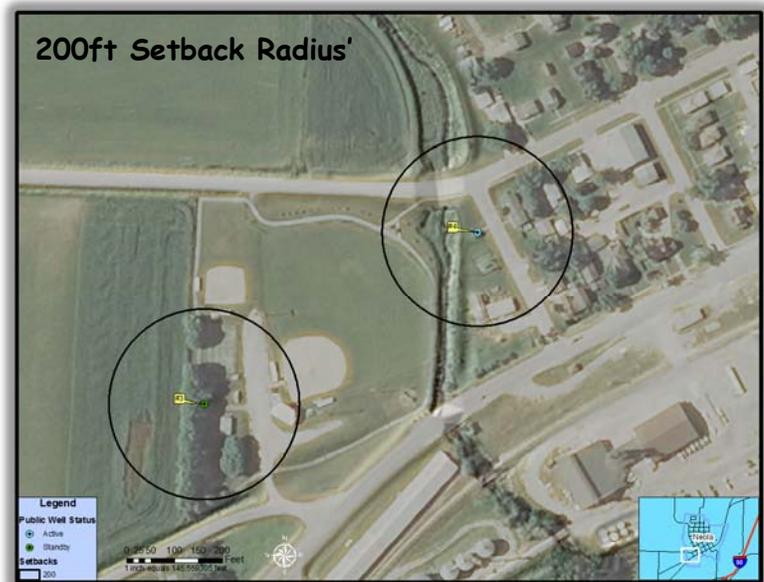
14. Institute a 200ft zone of control ordinance prohibiting the use of chemicals within 200ft of a public water supply well

- a. Cost: Ordinance development costs
- b. Goal: 200ft and setback requirement ordinance
- c. Timeline: Fall 2015
- d. Contact:
 - i. Jeremy Van Arsdol, Water Superintendent, City of Neola
 - ii. Sample Ordinance: Brent Beste, Source Water Specialist, Iowa Rural Water Assn.
- e. Implementation Status: Committee discussed

Project Description

Protecting the nearest 200ft of a well will help prevent contamination from small spills and eliminate chemical use within 200ft of a well. It also helps when a new well needs to be installed. The ordinance will be in place and the city can work with residents and pick the best possible location for a new well.

The IAC requires that all wells drilled after 1979 have 200ft of control. This can be established through land purchases, ordinances or easements. Neola’s public wells were drilled in 1960 (Well #3) and 1978 (Well #4). These wells are not required to have this protection, but all future wells must. This ordinance will be a starting point for new wells that are constructed in the future. It is also a starting point in protecting the existing public wells from surface contamination. The ordinance will



allow the city to ban chemical application and storage within 200ft of public wells for new development.

Reference: [Iowa Administrative Code, Environmental Protection Committee, 567, Chap. 43.3\(7\) Water Supplies - Design and Operation](#)

Goal

- 200ft zone of control ordinance that eliminates chemical application within 200ft of a public well and set the IDNR mandatory setbacks for chemical storage/use as part of the City code.

Results

This project has been discussed by the source water protection committee.

15. Work with owners of private wells to abandon and properly plug all private wells in City Limits and the Capture Zone

- a. Cost: Staff Time/Education Material
- b. Goal: Locate all private wells in the community and encourage plugging
- c. Timeline: Outlined above
- d. Contact:
 - i. Jeremy Van Arsdol, Water Superintendent, City of Neola
- e. Implementation Status: Committee discussed

Project Description

Neola requires all water users to connect to the Public Water Supply if available. Few wells are left in the City or capture zone. Plugging private wells eliminates possible pathways for contamination to reach deeper drinking water aquifers. This happens when chemicals enter the soil and groundwater system. When chemicals in the soil or groundwater reach a well that has failing casing or improper construction, there is a possibility that deeper aquifers can be contaminated. The State of Iowa requires all abandoned or not used wells be properly plugged. (See IAC information below)

The [Iowa Administrative Code, Section 567, Chapter 39](#) contains the following regarding private wells:

"Abandoned well" - means a water well which is no longer in use or which is in such a state of disrepair that continued use for the purpose of accessing water is unsafe or impractical.

39.5(4) - Wells abandoned after April 25, 1990. All classes of wells which are abandoned on or after April 25, 1990, must be properly plugged within 90 days of the date of abandonment.



This requires owners of wells that are no longer in use or in disrepair to plug them within 90 days of abandoning.

Goal

- Locate wells in Neola while completing regular activities
- If a well is found, contact the homeowner to determine status
 - Conduct an inspection for potential cross connections with the City water supply
 - Recommend that the well be plugged if not in use or if it is in the capture zone
 - Follow up 6 months after locating
 - Follow up 1yr after locating

**Results**

This project has been discussed by the source water protection committee.

16. Guide the development of Geothermal Wells in the City of Neola

- a. Cost: Staff Time, Ordinance Development
- b. Goal: Ordinance/Planning Zoning
- c. Timeline: Spring 2016
- d. Contact:
 - i. Jeremy Van Arsdol, Water Superintendent, City of Neola
 - ii. Sample Ordinance: Brent Beste, Source Water Specialist, Iowa Rural Water Assn.
- e. Implementation Status: Committee discussed

Project Description

Managing the type of geothermal systems that can be installed and where they can be installed will protect the water source in many ways. This can eliminate all forms of geothermal, specific types, require a city permit for installation to include a GPS location, etc. The benefit is that guiding develop may prevent contamination pathways that are not necessary from being developed, contamination from materials that can be used in geothermal wells (i.e. coolant), and the threat from improper construction or failure of the wells.

Goal

- Work with local geothermal installers to develop guidance to protect the drinking water source
 - This would ensure that geothermal systems can be installed in the City. Most existing no new well ordinances ban all types of well installation
- Develop an ordinance containing the following
 - Ban the installation of new geothermal systems in the primary protection zone
 - Restrict the type of systems installed to horizontal systems in the sand and gravel areas and that other wells do not penetrate confining layers (upland areas)

- Require that all systems use food grade materials as the liquid in the system
- Require that all wells are constructed to drinking water standards (cased, sanitary seals, grouted)
- Require a permit with a nominal fee to:
 - GPS locate of the geothermal system
 - Well Log Collected by the City
 - Ordinance Enforcement

Results

This project has been discussed by the source water protection committee.

17. Work with landowners to install buffer/filter strips along Neola Creek

- a. Cost: Staff Time, Ordinance Development
- b. Goal: Ordinance/Planning Zoning
- c. Timeline: Fall 2016
- d. Contact:
 - i. Jeremy Van Arsdol, Water Superintendent, City of Neola
 - ii. Kevin Seevers, Project Coordinator, West Pott SWCD
- e. Implementation Status: Committee discussed

Project Description

The installation of these buffers benefits the environment by filtering excess nutrients in runoff, slowing runoff prior to reaching Neola Creek, and increases the wildlife along the creek. The benefit to the water supply is filtered water running through Neola Creek, which is possibly hydraulically connected to Neola Creek. Working in conjunction with West Pott SWCD and the City to promote this practice to landowners will be a benefit to all involved.

Goal

- Installation of 20 to 120ft wide filter strips or riparian buffers along Neola Creek to the north of the City wells

Results

This project has been discussed by the source water protection committee.

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