

CITY OF HASTINGS

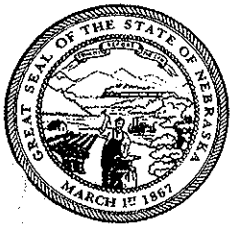
Wellhead Protection Plan

Prepared By:
Hastings Utilities

Adopted by City of Hastings: June 17th, 2010
Submitted to NDEQ: June 22, 2010



**“Protecting Drinking Water is
Everyone’s Responsibility”**



Dave Heineman
Governor

STATE OF NEBRASKA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Michael J. Linder

Director

Suite 400, The Atrium

1200 'N' Street

P.O. Box 98922

Lincoln, Nebraska 68509-8922

Phone (402) 471-2186

FAX (402) 471-2909

website: www.deq.state.ne.us

Matthew S. Rossen – Mayor
City of Hastings
220 North Hastings
PO Box 1085
Hastings, NE 68902-1085

JUL 12 2010

Re: Hastings Wellhead Protection (WHP) Plan Approval

Dear Mayor Rossen and Council Members:

It is my pleasure to approve the WHP Plan you have developed for your public water supply. My approval is based on the requirements of Nebraska State Statute § 46-1506, namely, the Wellhead Protection Area (WHPA) boundaries are reasonably defined, the controls are reasonably related to ground water protection, and the approval is in the public interest. It is obvious that you, the Council, Hastings Utilities employees and the Wellhead Protection Area advisory team and technical committee have spent much time and thought while putting this plan together.

Congratulations on a job well done. We strongly encourage you to continue working with the NRDs to get best management practices on the cropland in your WHPA and to continue working with urban landowners within WHPA to implement best management practices. Good luck in the implementation of your plan. Please call either Ryan Chapman or Dave Miesbach of my staff at (402)-471-0096 if we can be of assistance to you.

Sincerely,

Mike Linder
Director

Cc: Marty Stange, Hastings Utilities
Jenny Sidlo, Hastings Utilities
Mike Onen, Little Blue NRD
John Turnbull, Upper Big Blue NRD
Jamie Oltman, The Groundwater Foundation
Randy Gunn, NRCS
Michele Bever, South Heartland District Health Department
Dawn Miller, Adams County
Ralph Pulte, NHHS R&L
Mike Lucas, NeRWA

Acknowledgements

Hastings Utilities gratefully acknowledges the support of the persons involved in the development of the "City of Hastings – Wellhead Protection Plan". Hastings Utilities is especially grateful for the leadership and cooperation of the various agencies and citizens to provide their time and expertise to assist in the development of this plan. It is a testament to the cooperative spirit that each person had to recognize that each stakeholder has specific concerns and yet had a common desire to protect the water supply. This is summed up by the unifying slogan that **"Protecting Drinking Water is Everyone's Responsibility"**.

Hastings Utilities would like to especially thank Dr. Michele Bever of the South Heartland District Department for her outstanding efforts to organize and focus the Wellhead Protection Committee into a cohesive group. Without her skills as a group coordinator the quantity and quality of the Wellhead Protection Committee's efforts would not have been realized.

Hastings Utilities would also like to thank the efforts and assistance from the Upper Big Blue and Little Blue NRDs. Their technical assistance has provided significant support in developing the Wellhead Protection Program.

Hastings Utilities also recognizes efforts of the various local governmental agencies to provide support for the development of wellhead protection. They are as follows:

City of Hastings and the Hastings Planning and Zoning Commission

Adams County Supervisors and the Adams County Area Planning and Zoning Commission

Adams County Public Works

University of Nebraska – Adams County Extension

Village of Juniata

A special thank you goes to all the citizens who took time to participate in the Wellhead Protection Committee; their efforts to bring forth constructive ideas are greatly appreciated.

**AFFIDAVIT AND PROOF
OF PUBLICATION**

Case No. _____

STATE OF NEBRASKA)
) SS.
COUNTY OF ADAMS)

Notice of Meeting

The Board of Public Works will meet in special session on Thursday, June 17, 2010, at 7:00 p.m., in the Board Room, at the North Denver Station, 1228 North Denver Avenue, Hastings, Nebraska, and will hold a Public Hearing on the proposed Hastings Wellhead Protection Plan. The plan is available at the office of the Manager of Utilities, 1228 North Denver Avenue, Hastings, Nebraska. May 10, 2010

Donna Ackerman, being first duly sworn,
deposes and says that he/she is the legal clerk
of the Hastings Tribune, a legal daily newspaper organized under the laws of the State of Nebraska, published in Adams County, Nebraska, and that to his/her personal knowledge, the notice, a true copy of which is hereto annexed, was published in said newspaper for one weeks, on the following dates, to wit:

May 10, 2010

SIGNATURE: Donna Ackerman

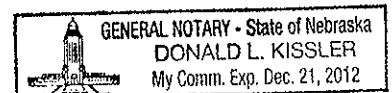
TITLE: Legal Clerk
THE HASTINGS TRIBUNE

SUBSCRIBED AND SWORN to before me this

10th day of May, 2010

Fee \$ 5.89

Donald L. Kissler
Notary Public



**BOARD OF PUBLIC WORKS
RESOLUTION NO. 2010-03**

WHEREAS, the City of Hastings, a municipal corporation of the State of Nebraska, by and through the Board of Public Works and Hastings Utilities, a proprietary function of the City of Hastings, is the owner and operator of a municipal water distribution system; and,

WHEREAS, the Board of Public Works advertised a Public Hearing to be held on Thursday, June 17, 2010, at 7:00 p.m. in the Board Room, at the North Denver Station, 1228 North Denver Avenue, Hastings, Nebraska, on the proposed Wellhead Protection Plan.

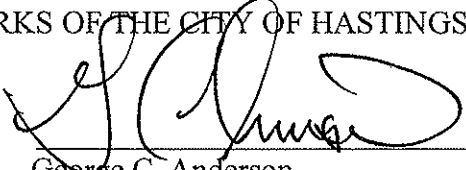
WHEREAS, the City of Hastings Wellhead Protection Plan dated April 21, 2010, has been prepared by Hastings Utilities. This plan was presented to the public for comment on June 17, 2010. The public comments have been incorporated into the Wellhead Protection Plan.

NOW, THEREFORE, BE IT RESOLVED by the Board of Public Works of the City of Hastings that it hereby adopts this Wellhead Protection Plan.

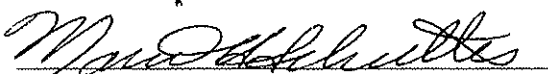
APPROVED on this 17th day of June, 2010, by action of the Board of Public Works of the City of Hastings at its special meeting of the same date.

BOARD OF PUBLIC WORKS OF THE CITY OF HASTINGS,

By: _____


George C. Anderson
Chairman of the Board

Witnessed by: _____


Marvin H. Schultes
Manager of Utilities

RESOLUTION 09-05-05

A resolution adopting the proposed boundary for the Hastings Wellhead Protection Area.

WHEREAS, residents of the City of Hastings, Adams County, Nebraska, rely exclusively on groundwater for their drinking water; and

WHEREAS, public water supply wells are adversely affected by pollution of the land and water surrounding said wells; and

WHEREAS, wellhead protection areas are created to help minimize potential pollution of the land and water surrounding public water supply wells; and

WHEREAS, Hastings Utilities has proposed a boundary for the Hastings Wellhead Protection Area, extending outside the City of Hastings' corporate limits into unincorporated areas of Adams County; and

WHEREAS, the Hastings Wellhead Protection Area includes the surface and subsurface area surrounding all water supply wells or well fields supplying the Hastings public water system through which contaminants are reasonably likely to move toward and reach such wells or well fields; and

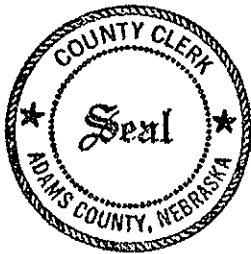
WHEREAS, the Hastings Wellhead Protection Area is necessary and essential to the protection of the Hastings public water supply system; and

WHEREAS, recognition and adoption by Adams County of the proposed boundary for the Hastings Wellhead Protection Area is an essential and important step in the City of Hastings' process of passing and approving an ordinance creating said Area.

NOW, THEREFORE, BE IT RESOLVED by the Board of Supervisors of Adams County that the proposed boundary for the Hastings Wellhead Protection Area, as set forth herein

by the map attached hereto and incorporated herein by this reference, is hereby adopted by the Board of Supervisors of Adams County.

Dated this 5th day of May, 2009.



ATTEST:

Chrisella Lewis

Chrisella Lewis
Adams County Clerk

Larry Woodman

Larry Woodman
Chairman - Board of Supervisors

Moved by Neumann

Seconded by Larsen

Voting Aye Rehe, Larsen, Neumann, Hynes, Baathoff, Woodman

Voting Nay none - Dithmann, absent

Wellhead Protection Plan – Public Hearing Comments

June 17th, 2010 7:00 PM - Hastings Utilities Board Room

Public and other representatives in attendance

Bob Samuelson	Ritbearing (Resident)
Charles Wagner	Village of Juniata, NE
Ron Seymour	UNL – Adams County Extension
Daryl Anderson	Little Blue NRD
Michele Bever	South Heartland District Health Department
William G. Phillips	Phillips Industries (Business Owner/Operator)
Glen Kroeker	Village of Juniata, NE and Adams County Planning and Zoning

Public Comment Summary

Comments in opposition of the proposed Wellhead Protection Plan

NONE

Comments in support of the proposed Wellhead Protection Plan

Glen Kroeker Mr. Kroeker gave testimony in support of the plan and how it brought the different stakeholders together. He commented on the quality of the plan and thanked the Hastings Utilities Board of Public Works for allowing staff to work on this vital project. He also stated he looks forward to working with Hastings Utilities and the Wellhead Protection Committee on enacting Water and Nitrate Conservation as described in the Wellhead Protection Plan.

Comments neutral to the proposed Wellhead Protection Plan

NONE

Action taken by the Board of Public Works with regards to public comments

No action taken as no opposition was noted. Board Chairman thanked the public for their participation and recommend approval of the plan. Board approved the Wellhead Protection Plan via resolution by unanimous vote (4-0 one board member absent).

Samuelson

Bob Samuelson - President
Charles Wagner - Junior

Don Seymour

Daryl Andersen - LBNRD

Michelle Bever - South Highland District Health Dept

William G Phillips - Phillips Inds.

Sam Krocker - Adams S Pt 2

Krocker

ORDINANCE NO. 4221

AN ORDINANCE OF THE CITY OF HASTINGS, NEBRASKA, AMENDING HASTINGS CITY CODE SECTION 32-601, CREATING HASTINGS CITY CODE SECTION 32-616.01 REGARDING WELLHEAD PROTECTION AREAS; AND PROVIDING AN EFFECTIVE DATE AND REPEALING ANY ORDINANCES OR OTHER PROVISIONS IN CONFLICT WITH.

BE IT ORDAINED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF HASTINGS, NEBRASKA:

SECTION 1. That Hastings City Code Section 32-601 be amended by adding the following:

32-601. Definitions.

(22) Wellhead Protection Area. The surface and subsurface area surrounding a water supply well or well field, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water or well field.

SECTION 2. That Hastings City Code Section 32-616.01 be added to read as follows:

32-616.01 Wellhead protection areas.

The City of Hastings designates the Hastings Wellhead Protection Areas for the purpose of protecting the public water supply system. The boundaries of the Hastings Wellhead Protection Areas are as follows:

Township 8 North, Range 11 West of the 6th P.M., Adams County, Nebraska

All of Sections 8, 9, 13 thru 17, 21 thru 27 and 35, the West Half (W ½) of Section 10 and the North Half (N ½) of Section 35.

Township 8 North, Range 10 West of the 6th P.M., Adams County, Nebraska

All of Sections 9, 10 and 15 thru 36, the South Half and the Northwest Quarter (S ½ & NW 1/4) of Section 3, the East Half (E ½) of Section 4, and the West Half (W ½) of Sections 11 and 14.

Township 8 North, Range 9 West of the 6th P.M., Adams County, Nebraska

The West Half (W ½) of Sections 29 and 32, all of Fractional Sections 30 and 31.

Township 7 North, Range 11 West of the 6th P.M., Adams County, Nebraska

All of Sections 1 and 12, the North Half (N ½) of Section 13.

Township 7 North, Range 10 West of the 6th P.M., Adams County, Nebraska

All of Sections 1 thru 18 and the North Half (N ½) Section 24.

Township 7 North, Range 9 West of the 6th P.M., Adams County, Nebraska

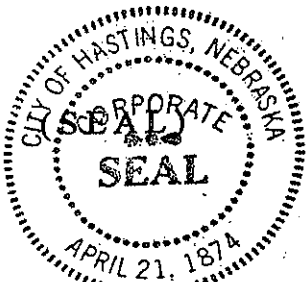
All of Sections 8 thru 11 and 14 thru 17, all of Fractional Sections 6, 7, 18 and the North Half (N ½) of Fractional Section 19, the West Half (W ½) of Sections 5, 12 and 13, the North Half (N ½) of Sections 20 thru 23 and the Northwest Quarter (NW 1/4) of Section 24.

SECTION 3. Any ordinance passed and approved prior to this passage, approval and publication or posting of this ordinance, and in conflict with its provisions, is hereby repealed.

SECTION 4. The provisions of this ordinance are separable, and the invalidity of any phrase, clause or part of this ordinance shall not affect the validity or effectiveness of the remainder of this ordinance.

SECTION 5. This ordinance shall take effect and be in full force from and after its passage, approval and publication or posting as required by law, in its entirety, or in pamphlet form, as the case may be, said effective date being 15 days from and after the date this ordinance is passed approved, said effective date being May 27, 2009. This ordinance shall be included in the Hastings City Code Book.

PASSED AND APPROVED by the Mayor and City Council of the City of Hastings, Nebraska this 11th day of May, 2009.



Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

City Attorney

City Surveyor

Table of Contents

Acknowledgements

Wellhead Protection Plan Approval

- Public hearing advertisement
- Hastings Utilities Board Resolution No. 2010-03
- Public comments and responses
- Minutes of Board of Public Works meeting June 17th, 2010

1.0 Introduction

- 1.1 Hastings Wellhead Protection Plan – Intent and Use
- 1.2 Wellhead Protection Plan Contact Information
- 1.3 Wellhead Protection Plan - Vocabulary and Definitions
- 1.4 Wellhead Protection Plan - Acronyms

2.0 Hastings Water Supply Information and Supporting Documentation

- 2.1 Organization and Contact Information
- 2.2 Water System Connection Data
- 2.3 Water Quality Information
- 2.4 Water System Contingency Plan
- 2.5 City of Hastings Comprehensive Plan
- 2.6 Adams County Comprehensive Plan
- 2.7 Sanitary Survey

3.0 Existing Hastings Wellhead Protection Activities

- 3.1 Hastings Institutional Control Area and Wellhead Protection Ordinance
- 3.2 Water Well Permits
- 3.3 Well and Septic Tank Abandonment Cost Share Program
- 3.4 Rain Sensor Program

4.0 Water Supply Study and Nitrate Trends

- 4.1 Water Source and Infrastructure Recommendations
- 4.2 Nitrate Data and Trends

5.0 Groundwater Modeling and Wellhead Protection Area Delineation

- 5.1 Groundwater Model Development
- 5.2 Wellhead Protection Boundary

6.0 Potential Source Contaminant Inventory

- 6.1 Mapping and GIS

Table of Contents

Acknowledgements

Wellhead Protection Plan Approval

- Public hearing advertisement
- Hastings Utilities Board Resolution No. 2010-03
- Public comments and responses
- Minutes of Board of Public Works meeting July 17th, 2010

1.0 Introduction

- 1.1 Hastings Wellhead Protection Plan -- Intent and Use
- 1.2 Wellhead Protection Plan Contact Information
- 1.3 Wellhead Protection Plan - Vocabulary and Definitions
- 1.4 Wellhead Protection Plan - Acronyms

2.0 Hastings Water Supply Information and Supporting Documentation

- 2.1 Organization and Contact Information
- 2.2 Water System Connection Data
- 2.3 Water Quality Information
- 2.4 Water System Contingency Plan
- 2.5 City of Hastings Comprehensive Plan
- 2.6 Adams County Comprehensive Plan
- 2.7 Sanitary Survey

3.0 Existing Hastings Wellhead Protection Activities

- 3.1 Hastings Institutional Control Area and Wellhead Protection Ordinance
- 3.2 Water Well Permits
- 3.3 Well and Septic Tank Abandonment Cost Share Program
- 3.4 Rain Sensor Program

4.0 Water Supply Study and Nitrate Trends

- 4.1 Water Source and Infrastructure Recommendations
- 4.2 Nitrate Data and Trends

5.0 Groundwater Modeling and Wellhead Protection Area Delineation

- 5.1 Groundwater Model Development
- 5.2 Wellhead Protection Boundary

6.0 Potential Source Contaminant Inventory

- 6.1 Mapping and GIS

7.0 Guardian Well and Water Sampling Program

- 7.1 Water Quality Data
- 7.2 Water Sampling
- 7.3 Groundwater Monitoring Wells

8.0 Wellhead Protection Committee and Activities

- 8.1 Wellhead Protection Committee Members
- 8.2 Wellhead Protection Committee Communications
- 8.3 Wellhead Protection Technical Committee
- 8.4 Wellhead Protection Committee Activities
- 8.5 Funding
- 8.6 Groundwater Controls
- 8.7 Water and Soil Testing
- 8.8 Wellhead Protection Maintenance

Hastings Utilities Wellhead Protection Plan

1.0 Introduction – Nebraska Wellhead Protection Act

Wellhead Protection (WHP) is the management of the land surrounding a water supply well in order to prevent contamination of the water supply. The 1986 Safe Drinking Water Act recommended that public water Supply Systems develop Wellhead Protection Plans (WHPP). In response to this recommendation the State of Nebraska in 1998 adopted the Nebraska Wellhead Protection Area Act, by Nebraska Legislature Bill LB1161. This act has as its main goal to minimize the amount of potentially polluting activities occurring on the designated lands that surround public water supply wells. It also provides authority to water supply systems to create a wellhead protection area.

See attachment at the end of the section for a copy of the "Wellhead Protection Area Act Nebraska Revised Statutes 46-1501 thru 46-1509".

The Nebraska Wellhead Protection Area Act requires activities to:

- (1) Delineate a Wellhead Protection Area (WHPA);
- (2) Inventory potential contaminant sources within the WHPA;
- (3) Describe plans to protect drinking water from contamination and to provide for emergency drinking water supplies;
- (4) Propose controls necessary to provide protection from contamination;
- (5) Submit WHPA plan to Nebraska Department of Environmental Quality (NDEQ);
- (6) Adopt plan by ordinance.

1.1 Hastings Wellhead Protection Plan – Intent and Use

The Hastings Wellhead Protection Plan will be used to develop appropriate plans and programs to protect the City of Hastings Water Supply. It shall address as a minimum those requirements as stated in Section 1.0 above. This plan shall provide a written document of existing conditions and a means to develop programs and activities that will reduce the threat of groundwater contamination.

It is recognized that the local aquifer provides water not only to the inhabitants of the City of Hastings but is also used by inhabitants that live within the WHPA. A major component of this plan is to foster communication and partnership among all stakeholders within the WHPA. As such this WHPP is intended to supplement and join existing wellhead and groundwater management plans. The Wellhead Protection Area for the Hastings Water Supply Wells is located in the Upper Big Blue NRD (UBBNRD) and Little Blue NRD (LBNRD). Both of these NRDs have implemented groundwater management plans. The intent of this WHPP is to coordinate and join the NRD's groundwater management plans to support protection of the Hastings Water Supply System.

This plan also recognizes the efforts and benefits of many other activities that support wellhead protection. This includes but is not limited to zoning regulations, storm water protection, county extension activities, public health education on the proper use of private wells and septic systems, household hazardous waste programs and agricultural pesticide control programs.

The information used to prepare the Hastings Utilities Wellhead Protection Plan (WHPP) was collected during the time frame of 1997-2010. Significant assistance has been provided by the NRDs. It is expected this support will continue. New information also continues to be obtained in the normal operation of the municipal water system. The WHPP is intended to be a dynamic document and to be amended as new information warrants. Information generated by this plan will be provided to the stakeholders. This will be done in cooperation with the local governmental agencies. This shall include but is not limited to:

1. The local NRD represented by both the Upper Big Blue and Little Blue NRDs.
2. Adams County Supervisors and the Adams County Area Planning and Zoning Commission.
3. Hastings City Council and the Hastings Planning and Zoning Commission.
4. University of Nebraska - Adams County Extension
5. Hastings Utilities
6. Hastings Wellhead Protection Committee

1.2 WHPP Contact information

It is the responsibility of Hastings Utilities via the Board of Public Works as the governing body of the Hastings Municipal Water System to maintain and implement this plan. Hastings Utilities staff is responsible for the day to day management of this plan. The following persons are responsible to gather data, provide summaries, present reports and conduct the required activities to protect the water supply:

1. Wellhead Protection Plan Supervisor

Marty Stange, Environmental Supervisor
Hastings Utilities
1228 North Denver Avenue
Hastings, NE. 68901
Phone: 402-462-3651 Cell: 402-831-1399 Fax: 402-462-3666
Email: mstange@hastingsutilties.com

2. Wellhead Protection Plan Coordinator

Jenny Sidlo, Assistant Environmental Engineer
Hastings Utilities
1228 North Denver Avenue
Hastings, NE. 68901
Phone: 402-462-3664 Cell: 402-831-1413 Fax: 402-462-3666
Email: jsidlo@hastingsutilties.com

1.3 Wellhead Protection Plan – Vocabulary and Definitions

The following is a list of vocabulary and definitions used within this plan:

Board: The City of Hastings Board of Public Works, sometimes referred to as Hastings Utilities or the Board, and any department or employee designated by the Board to carry out any of the functions assigned to the Board by the City of Hastings.

Domestic Use: And use of groundwater required for human needs of health and sanitation, including but not limited to drinking, cooking, washing, bathing, showering, and other similar household uses of water.

Domestic Water Well: A water well providing water to any water supply system furnishing water for human consumption other than a public water supply system or for the watering of livestock, poultry, farm and domestic animals used in operating a farm and for the irrigation of lands not exceeding a total of two acres in area.

Institutional Control Area: An area wherein contaminated soils and groundwater are located, and which has been designated by city ordinance as an institutional control area.

Non-Potable Water Well: And water well other than a domestic water well or a public water supply well such as irrigation wells for areas more than 2 acres, geothermal wells and monitoring wells.

Public Water Supply Well: A water supply well designed and used to provide water for a public water supply which provides the public piped water fit for human consumption, where such system has at least 15 service connections or regularly serves at least 25 individuals.

Well Owner: The person who is the record title owner of the real estate upon which a well is located.

Water Well: 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.

1.3 Wellhead Protection Plan – Acronyms

City: City of Hastings

EPA: United States Environmental Protection Agency

HU: Hastings Utilities

NDEQ: Nebraska Department of Environmental Quality

NHHS: Nebraska Department of Health and Human Services

NDNR: Nebraska Department of Natural Resources

LBNRD: Little Blue Natural Resource District

UBBNRD: Upper Big Blue Natural Resource District

WHP: Wellhead Protection

WHPA: Wellhead Protection Area

WHPP: Wellhead Protection Plan

2.0 Hastings Water System Information and Supporting Documentation

The Hastings Water System provides potable water to the City of Hastings, Village of Trumbull, and the Phil Johnson and Associates Water System. The Village of Trumbull is located Northeast of Hastings and serves approximately 185 residents. The Phil Johnson and Associates Water System is a private water system that serves an industrial park east of Hastings. The Hastings water system consists of 25 municipal water supply wells. Treatment is not currently provided. The water system does not provide any water storage. All water demand is met by the operation of the municipal water supply wells. These municipal wells are started or stopped to meet the water demands.

Detailed water system information can be obtained at Hastings Utilities (HU) by contacting the HU Engineering or HU Water Departments. The following sections are brief summaries of information and supporting documents:

2.1 Organization and Contact Information

Order	Name	Position	Phone Numbers (Include Area Code)		E-Mail
			Office	Cellular	
1	Marvin Schultes	Manager of Utilities	402-462-3690	402-461-0459	mschultes@hastingsutilities.com
2	Allen Meyer	Assistant Manager	402-462-3691	402-831-1388	ameyer@hastingsutilities.com
3	Ron Sanders	Director of Operations	402-462-3699	402-831-1375	rsanders@hastingsutilities.com
4	Mark Hemberger	Water Dept. Superintendent	402-462-3621	402-831-1371	mhemberger@hastingsutilities.com
5	Keith Leonhardt	Director of Engineering	402-462-3650	402-831-1360	kleonhardt@hastingsutilities.com
6	Marty Stange	Environmental Supervisor	402-462-3651	402-831-1399	mstange@hastingsutilities.com

2.2 Water System Connection Data

Population: 25,100 (City of Hastings)

Residential connections: 8,029

Commercial connections: 1,226

Industrial connections: 205

Village of Trumbull, NE Population 185

Phil Johnson and Associates Water System

2.3 Water Quality Information

For information on water quality see attached at end of section a copy of the 2008 Consumer Confidence Report. Contact HU Engineering for current copy of the Consumer Confidence Report.

2.4 Water System Contingency Plan

In support of the WHPP, Hastings Utilities maintains a Water Supply Contingency Plan. A copy of this Contingency Plan can be reviewed at the HU Water Department or HU Engineering Department. This plan includes detailed information on water use, well information and provisions for providing water in the case of shortages or contamination.

The contingency plan is a dynamic plan that is updated annually with current water use records, well status, training and certification of water operations, water quality information and contact information.

The Hastings Water System is unique in that it is a totally pressured water system having no water storage. The water system consists of 25 operating wells that are located throughout the city thus reducing the risk from weather related disasters and manmade releases of chemicals.

The water supply wells provide potable water directly to the water distribution system. No storage or treatment is provided. This configuration is beneficial in providing fire protection as the system pressure can be raised by operating additional pumps. The additional water pressure provides more force to "push" more water through the mains when needed for fire protection. This is especially useful for areas having smaller mains which were installed in the early 1900's and did not consider the higher fire flow demands required for modern day construction.

The water system is protected from power outages with 4 standby power units that provide direct pumping of the wells. Diesel Fuel is stored on site and has a capacity of 18 hours. The water system is also fitted with 3 automatic start/stop controllers. These controllers allow wells to be automatically started in the event of a low pressure.

The water system is monitored 24 hours per day by the North Denver Station Control Room (NDS). Wells are stopped and started from NDS using phone and radio communication. Details of the water system can be found in the Contingency Plan. See Section 4 for information on location of future well sites and other infrastructure improvements.

2.5 City of Hastings Comprehensive Plan

In support of the WHPP the City of Hastings Comprehensive Plan delineated wellhead protection areas around each well located within the city's 2 mile jurisdiction. These areas control the type of development and land use near each well.

The City of Hastings completed their last Comprehensive Plan in 2009. This information is available at the City office during normal business hours. The City office is located at 220 North Hastings Avenue, Hastings, NE.

2.6 Adams County Comprehensive Plan

Adams County has also adopted the Hastings Wellhead Protection Area for inclusion in their comprehensive plan. Adams County completed their last Comprehensive Plan in 2010. This plan can be reviewed at the Adams County Planning and Zoning office located at 415 Adams Central Avenue, Hastings, NE.

2.7 Sanitary Survey

A copy of latest sanitary survey can be viewed at the HU Water Department. The Sanitary Survey is an inspection process used by the Nebraska Department of Health to communicate the proper procedures to operate a water supply system. This includes review of activities located within 1000 feet of each wellhead.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and groundwater wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals, and in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

The source of drinking water used by the City of Hastings is groundwater. This water is pumped from wells maintained by the City of Hastings.

Source Water Assessment Availability

The Nebraska Department of Environmental Quality (NDEQ) has completed the Source Water Assessment. Included in the assessment is a Wellhead Protection Area map, potential contaminant source inventory, vulnerability rating, and source water protection information. To view the Source Water Assessment or for more information, please contact the person named on the cover of this report or NDEQ at (402) 471-6988.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at (800) 426-4791.

**Contaminants That May Be Present
In Source Water Include:**

Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.

Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff and septic systems.

Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

The City of Hastings is required to test for the following contaminants:

Coliform Bacteria, Antimony, Arsenic, Asbestos, Barium, Beryllium, Cadmium, Chromium, Copper, Cyanide, Fluoride, Lead, Mercury, Nickel, Nitrate, Nitrite, Selenium, Sodium, Thallium, Alachlor, Atrazine, Benz(a)pyrene, Carbofuran, Chlordane, Dalaapon, Di(2-ethylhexyl)sebacate, Dibromochloropropane, Dinoseb, Di(2-ethylhexyl)phthalate, Diquat, 2,4-D, Endothal, Endrin, Ethylene dibromide, Glyphosate, Heptachlor, Heptachlor epoxide, Hexachlorobenzene, Hexachlorocyclopentadiene, Lindane, Methoxychlor, Oxamyl (Vydate), Pentachlorophenol, Picloram, Polychlorinated biphenyls, Simazine, Toxaphene, Dioxin, Silvex, Benzene, Carbon Tetrachloride, o-Dichlorobenzene, Para-Dichlorobenzene, 1,2-Dichloroethane, 1,1-Dichloroethylethylene, Cis-1,2-Dichloroethylene, Trans-1,2-Dichloroethylene, Dichloromethane, 1,2-Dichloropropane, Ethylbenzene, Monochlorobenzene, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethylene, Vinyl Chloride, Styrene, Tetrachloroethylene, Toluene, Xylenes (total), Gross Alpha (minus Uranium & Radium 226), Radium 226 plus Radium 228, Sulfate, Chloroform, Bromodichloromethane, Chlorodibromomethane, Bromoform, Chlorobenzene, m-Dichlorobenzene, 1,1-Dichloropropene, 1,1-Dichloroethane, 1,1,2,2-Tetrachloroethane, 1,2-Dichloropropene, Chloromethane, Bromomethane, 1,2,3-Trichloropropane, o-p-Chlorotoluene, p-Chlorotoluene, 2,2-Dichloropropane, 1,3-Dichloropropane, Aldrin, Butachlor, Carbarlyl, Dicamba, Dieldrin, 3-Hydroxycarbofuran, Methionyl, Metolachlor, Metribuzin, Propachlor.

This report is intended to provide you with important information about your drinking water and the efforts made by the City of Hastings water system to provide safe drinking water.

For more information regarding this report, contact: Steve Cogley, Hastings Utilities, 463-1371, extension 693.

If you would like to observe the decision-making processes that affect drinking water quality, please attend the regularly scheduled meeting of the Board of Public Works. If you would like to participate in the process, please contact the office of the Manager of Hastings Utilities to arrange to be placed on the agenda of the Board of Public Works meeting.

CROSS-CONNECTION QUESTION AND ANSWER:

Q. What is potentially dangerous about an unprotected sill cock?

A. The purpose of a sill cock is to permit easy attachment of a hose for outside watering purposes. However, a garden hose can be extremely hazardous because they are left submerged in swimming pools, lay in elevated locations (above the sill cock) watering shrubs, chemical sprayers are attached to hoses for weed-killing, etc.

Coliform Bacteria

Maximum Contaminant Level Goal	Total Coliform Maximum Contaminant Level	Highest No. of Positive Total Coliform Samples in any month	Fecal Coliform or E. Coli Maximum Contaminant Level	Total No. of Positive E. Coli or Fecal Coliform Samples in 2006	Violation?	Likely Source Of Contamination
0	1 positive monthly sample	2	Fecal Coliform or E. Coli MCL: A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or E. coli positive	0	Yes	Naturally present in the environment

Lead and Copper Date Sampled: 9/1/2004

Lead MCLG	Lead Action Level (AL)	Lead 90th Percentile	# Sites Over Lead AL	Copper MCLG	Copper Action Level (AL)	Copper 90th Percentile	# Sites Over Copper AL	Likely Source Of Contamination
0 ppb	15 ppb	4 ppb	0	1.3 ppm	1.3 ppm	0.455 ppm	0	Erosion of natural deposits; Leaching from wood preservatives; Corrosion of household plumbing systems.

Regulated Contaminants**Inorganic Contaminants**

	Highest Level Detected	Range of Levels Detected	Unit of Measurement	MCLG	MCL	Violation?	Likely Source Of Contaminant
Arsenic	5.64	2.17-5.64	ppb	0	10	No	Erosion of natural deposits; Runoff from orchards; Runoff from electronics production wastes
Barium	0.209	0.136-0.209	ppm	2	2	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chromium	14.2	1.19-14.2	ppb	100	100	No	Discharge from steel and pulp mills; Erosion of natural deposits
Fluoride	0.36	0.3-0.36	ppm	4	4	No	Erosion of natural deposits; Water additive which promotes strong teeth; Fertilizer discharge
Nickel	5.88	3-5.88	ppb	n/a	100	No	Erosion of natural deposits; Leaching
Nitrate-Nitrite	15	4.6-15	ppm	10	10	Yes	Runoff from septic tanks, sewage; Erosion of natural deposits
Selenium	15.4	6.76-15.4	ppb	50	50	No	Discharge from petroleum and metal refineries; Erosion of natural deposits

Synthetic Organic Contaminants (including pesticides and herbicides)

Atrazine	0.104	0.0811-0.104	ppb	3	3	No	Runoff from herbicide used on row crops
----------	-------	--------------	-----	---	---	----	---

Unregulated Contaminants

Contaminant	Highest Level Detected	Range of Levels Detected	Unit of Measurement
Sulfate	43	39-43	ppm

Note: The state requires monitoring of certain contaminants less than once per year because the concentrations of these contaminants do not change frequently. Therefore, some of this data may be more than one year old. MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology. MCLG (Maximum Contaminant Level Goal): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

Information about Violations/Exemptions of the Nebraska Safe Drinking Water Act for 2006:

Rule of Contaminant	Violation Type	Date Issued	Violation Duration
Nitrate-Nitrite	Average Maximum Contaminant Level Violation	11/20/2006	10/1/2006 To 12/31/2006
Health Effects:	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.		
Total Coliform	Non-Acute Total Coliform Rule Monthly Violation	7/13/2006	7/1/2006 To 7/31/2006
Health Effects:	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.		
Total Coliform	Non-Acute Total Coliform Rule Monthly Violation	9/19/2006	9/1/2006 To 9/30/2006
Health Effects:	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.		

The City of Hastings has taken the following actions to return to compliance with the Nebraska Safe Drinking Water Act:

For the nitrate violation, the well involved was taken out of use and additional samples were taken. Nitrate levels had receded, so the well was placed back in service. Additional water testing and monitoring of the well continues. For the coliform violations, water mains were flushed and additional water samples were taken, which indicated no further presence of coliforms. Additionally, all water wells were sampled for coliform and all results were negative.

HASTINGS UTILITIES

WATER USAGE SUMMARY

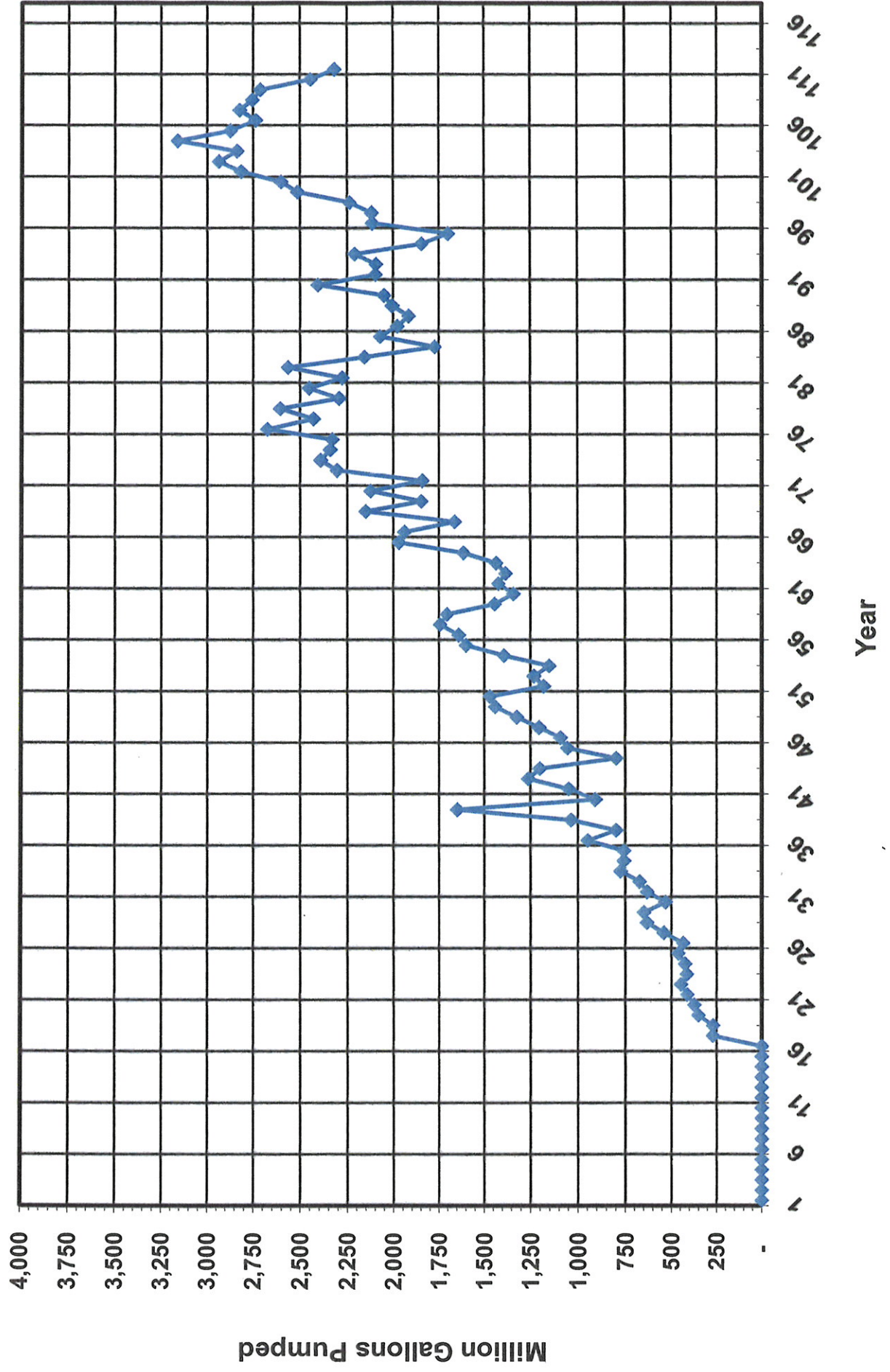
Year	Annual Usage M. Gal.	Ave. Daily Usage MGD	Population Persons	Per Capita Usage GPD	Max Month Date	Max Month M. Gal.	Max Day Date	Max-Day Usage MGD	Max-Day Ave-Day Ratio	Peak Hr. Usage MGD	Peak Hr. Max-Day Ratio	Peak Hr. Ave-Day Ratio
1955												
1956												
1957												
1958	1,392.819	3.82										
1959	1,519.678	4.16										
1960	1,466.747	4.02						12.8297				
1961	1,491.469	4.09						12.2554				
1962	1,667.373	4.57						14.0802				
1963	2,063.653	5.65						13.0408				
1964	1,882.715	5.16						14.8786				
1965	1,611.060	4.41						17.7338				
1966	2,108.407	5.78						15.4668				
1967	1,847.972	5.06	22926	220.84	Aug	320.2170	7/26/1967	18.0710				
1968	2,122.926	5.82	23144	251.31	Aug	311.2650	8/6/1968	15.2997	3.02			
1969	1,841.249	5.04	23362	215.93	July	285.6318	7/14/1969	18.7212	3.22			
1970	2,304.830	6.31	23580	267.79	July	448.1455	7/31/1970	15.2197	3.02			
1971	2,391.415	6.55	23580	277.86	Aug	384.4032	8/23/1971	20.0884	3.18			
1972	2,341.086	6.41	23580	272.01	July	319.2356	6/2/1972	16.8482	2.57			
1973	2,329.835	6.38	23580	270.70	July	350.2135	7/7/1973	15.8708	2.48			
1974	2,670.610	7.32	23433	312.24	July	540.8688	7/20/1974	18.4126	2.89			
1975	2,429.334	6.66	23397	284.47	Aug	400.2044	7/17/1975	19.7319	2.70			
1976	2,606.171	7.14	23360	305.66	July	411.6687	7/14/1976	18.3802	2.76			
1977	2,293.948	6.28	23323	269.47	June	390.0975	7/19/1977	18.7101	2.62			
1978	2,452.237	6.72	23287	288.51	Aug	327.4124	6/16/1978	16.3352	2.60			
1979	2,276.851	6.24	23250	268.30	Aug	312.5589	Aug-79	16.9862	2.53			
1980	2,564.681	7.03	23213	302.70	July	387.6116	6/27/1980	17.3544	2.78			
1981	2,155.848	5.91	23177	254.84	July	289.9240	6/25/1981	15.5321	2.21	20.7936	1.34	2.96
1982	1,772.1329	4.86	23140	209.82	July	244.3651	8/2/1982	13.9696	2.36	18.6336	1.33	3.15
1983	2,070.1935	5.67	23103	245.50	Aug	414.5587	8/17/1983	13.7284	2.82	19.0205	1.39	3.91
1984	1,978.0898	5.42	23067	234.94	Aug	364.4627	8/15/1984	17.6907	3.12	22.2427	1.26	3.92
1985	1,922.0012	5.27	23030	228.65	July	339.7126	7/9/1985	15.2199	2.81	19.4640	1.28	3.59
1986	1,989.6840	5.45	22990	237.11	July	321.8766	6/25/1986	15.0623	2.86	21.1920	1.41	4.02
1987	2,052.0196	5.62	22928	245.20	July	317.4093	7/31/1987	13.8593	2.54	17.9040	1.29	3.29
1988	2,406.0018	6.59	22865	288.29	June	427.3112	6/23/1988	15.7482	2.80	20.5440	1.30	3.66
1989	2,097.8494	5.75	22803	252.05	July	312.4190	6/20/1989	18.9293	2.87	26.4096	1.40	4.01
1990	2,087.8487	5.72	22740	251.55	July	332.9909	7/3/1990	12.5394	2.18	17.0914	1.36	2.97
1991	2,208.3726	6.05	22740	266.07	July	390.2045	7/18/1991	18.9358	3.31	21.2620	1.12	3.72
1992	1,842.0550	5.05	22740	221.93	Sept	255.3884	6/30/1992	17.9271	2.96	25.7227	1.43	4.25
1993	1,697.2708	4.65	22740	204.49	Sept	204.2559	8/9/1993	12.4628	2.47	19.3474	1.55	3.83
1994	2,112.5591	5.79	22740	254.52	June	274.8173	6/17/1994	10.8393	2.33	14.8877	1.37	3.20
1995	2,116.1270	5.80	22740	254.95	July	349.4114	7/13/1995	14.9869	2.59	20.2272	1.35	3.49
1996	2,236.9132	6.13	22740	269.50	June	291.3373	7/18/1996	17.2178	2.97	23.1610	1.35	3.99
1997	2,512.7023	6.88	22740	302.73	July	389.6173	7/25/1997	13.7769	2.25	17.8872	1.30	2.92
1998	2,601.1276	7.13	22740	313.39	July	326.4191	6/27/1998	19.0804	2.77	23.5193	1.23	3.42
1999	2,813.0816	7.71	22740	338.92	July	383.5560	7/29/1999	17.1380	2.40	20.1497	1.18	2.83
								19.3216	2.51	22.4561	1.16	2.91

HASTINGS UTILITIES

WATER USAGE SUMMARY

Year	Annual Usage M. Gal.	Ave. Daily Usage MGD	Population Persons	Per Capita Usage GPD	Max Month Date	Max Month M. Gal.	Max Day Date	Max-Day Usage MGD	Max-Day Ave-Day Ratio	Peak Hr. Usage MGD	Peak Hr. Max-Day Ratio	Peak Hr. Ave-Day Ratio
2000	2,935.8969	8.04	22740	353.72	June	407.8070	6/10/2000	18.2745	2.27	22.0049	1.20	2.74
2001	2,862.2993	7.84	24046	326.12	Aug	403.2233	7/18/2001	19.9130	2.54	25.8725	1.30	3.30
2002	3,159.2467	8.66	24046	359.95	July	526.4874	7/19/2002	21.2741	2.46	25.2914	1.19	2.92
2003	2,871.1472	7.87	24046	327.13	July	398.4898	7/30/2003	20.2641	2.58	21.4968	1.06	2.73
2004	2,734.6476	7.49	25100	298.49	Aug	393.1282	8/3/2004	18.6676	2.49	20.9292	1.12	2.79
2005	2,820.7393	7.73	25100	307.89	July	376.1367	7/15/2005	19.2020	2.48	19.7849	1.03	2.56
2006	2,754.6460	7.55	25100	300.68	July	450.0909	7/19/2006	18.5932	2.46	22.0997	1.19	2.93
2007	2,711.6061	7.43	25100	295.98	July	400.3669	7/6/2007	18.1692	2.45	22.1453	1.22	2.98
2008	2,445.2664	6.70	25100	266.91	July	287.3146	8/4/2008	16.0018	2.39	20.6713	1.29	3.09
2009	2,318.1879	6.35	25100	253.04	Aug	303.3694	7/10/2009	15.4911	2.44		0.00	0.00
2010												
2011												
2012												
2013												
2014												
2015												
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												
2026												
2027												
2028												
2029												
Max	3,159.2467	8.66	25100	344.84	July	526.4874	7/19/2002	21.2741	3.31	26.4096	1.55	4.25

Hastings Municipal Water Production



Section 3.0 Existing Hastings Wellhead Protection Activities

Prior to the 1980's wellhead protection has been limited to the compliance with the Nebraska Department of Health and Human Services for the placement of new water supply wells. This has been limited to an area of 1000 feet around each wellhead. The following is a brief excerpt of the separation required from potable wells and potential sources of contamination:

Category	Separation Distance
Non-Potable Well	1000 Feet
Sewage Lagoon	1000 Feet
Waste Disposal Field	500 Feet
Feed-lot or Feed-lot Runoff	500 Feet
Septic Tank	500 Feet
Sewage Treatment Plant	500 Feet
Sanitary Sewer Manhole	100 Feet
Sanitary Sewer Line	50 Feet

NRD groundwater management plans have been established for the Hastings Wellhead Protection Area. The Hastings Wellhead Protection Area is located within the jurisdiction of the Little Blue NRD and Upper Big Blue NRD. Both NRDs have in place groundwater management plans that address both water quality and quantity issues.

The groundwater supply and quality is monitored within their respective districts. Both quality and quantity triggers have been established which would require additional monitoring and use of best management practice. Their respective groundwater management plans support the efforts being made to further develop Hastings Wellhead Protection activities. For more information on the specifics of the NRD groundwater management programs please contact the Little Blue NRD or Upper Big Blue NRD.

3.1 Hastings Institutional Control Area and Wellhead Protection Ordinance

In the early 1980's contamination was found in several of the water supply wells. This groundwater contamination was principally due to industrial and grain handling activities. The areas of contamination are being investigated and remediated through the EPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The areas of contamination are also known as the Superfund Subsites.

Considerable time, effort and monies have been spent to address the various subsites. Delineation and clean up of the superfund subsites are ongoing. See attached at the end of this section a map showing the location of the Superfund Sites titled "Areas of Groundwater Contamination – Hastings, NE". For detailed information on the Hastings Superfund Sites contact the Hastings Public Library. The Hastings Public Library has copies of the various studies, reports and investigations which provide detailed information on each of the groundwater contamination sub-sites.

The City of Hastings and Hastings Utilities has worked with EPA, NDEQ and the various responsible parties to provide protection of the aquifer and the prohibition of the public from ingesting these contaminated waters. This work includes the adoption of ordinances, well permitting and other activities that supports the development of wellhead protection.

The Hastings Institutional Control Area (ICA) was established to prohibit the public from ingesting contaminated groundwater associated with the various superfund sites. As a function of implementing the ICA a Wellhead Protection Ordinance has been enacted. See a copy of this ordinance at the end of this section.

The Wellhead Protection Ordinance provided for the permitting of all water supply wells within the Hastings 2 mile jurisdiction. This provides a means to monitor groundwater quality and use. Neither the local NRDs nor the NDNR has required the registering of domestic wells less than 50 gpm. This ordinance provides for a means to locate these wells. The ordinance prohibits specific uses in certain areas to protect the public from ingesting contaminated waters.

The information gathered by the Wellhead Protection Ordinance is shared with the City of Hastings Planning and Zoning Commission and the Adams County Area Planning and Zoning commission to assist them in proper plan of infrastructure and allocation of resources.

An ICA Annual Report is provided to communicate with the public, governmental agencies and the responsible parties' current groundwater quality. This report is prepared by Hastings Utilities. This report summarizes the sampling results of all production wells within the Institutional Control Area and the 2 mile jurisdiction of the City. Copies of past reports can be reviewed at the HU Engineering Department. Located at the end of this section is a copy of the Institutional Control Area – Wellhead Protection Plan brochure and map.

3.2 Water Well Permits

A water well permit program as noted above has been established as required by the Hastings Wellhead Protection Ordinance. See copy of this ordinance at the end of this section. The ordinance requires permitting of all existing and new wells within the 2 mile jurisdiction of the City of Hastings. This permitting activity includes all irrigation, industrial, domestic, geothermal and monitoring wells.

The well permitting process uses the building permit system to notify new property owners of the need for well permitting. This ordinance provides a means to communicate with the public on local groundwater quality issues that may impact their well. By permitting these wells a dialogue also occurs with consultants working on groundwater investigations. This includes activities regarding Superfund Sites, Underground Storage Tank program, and environmental site assessments.

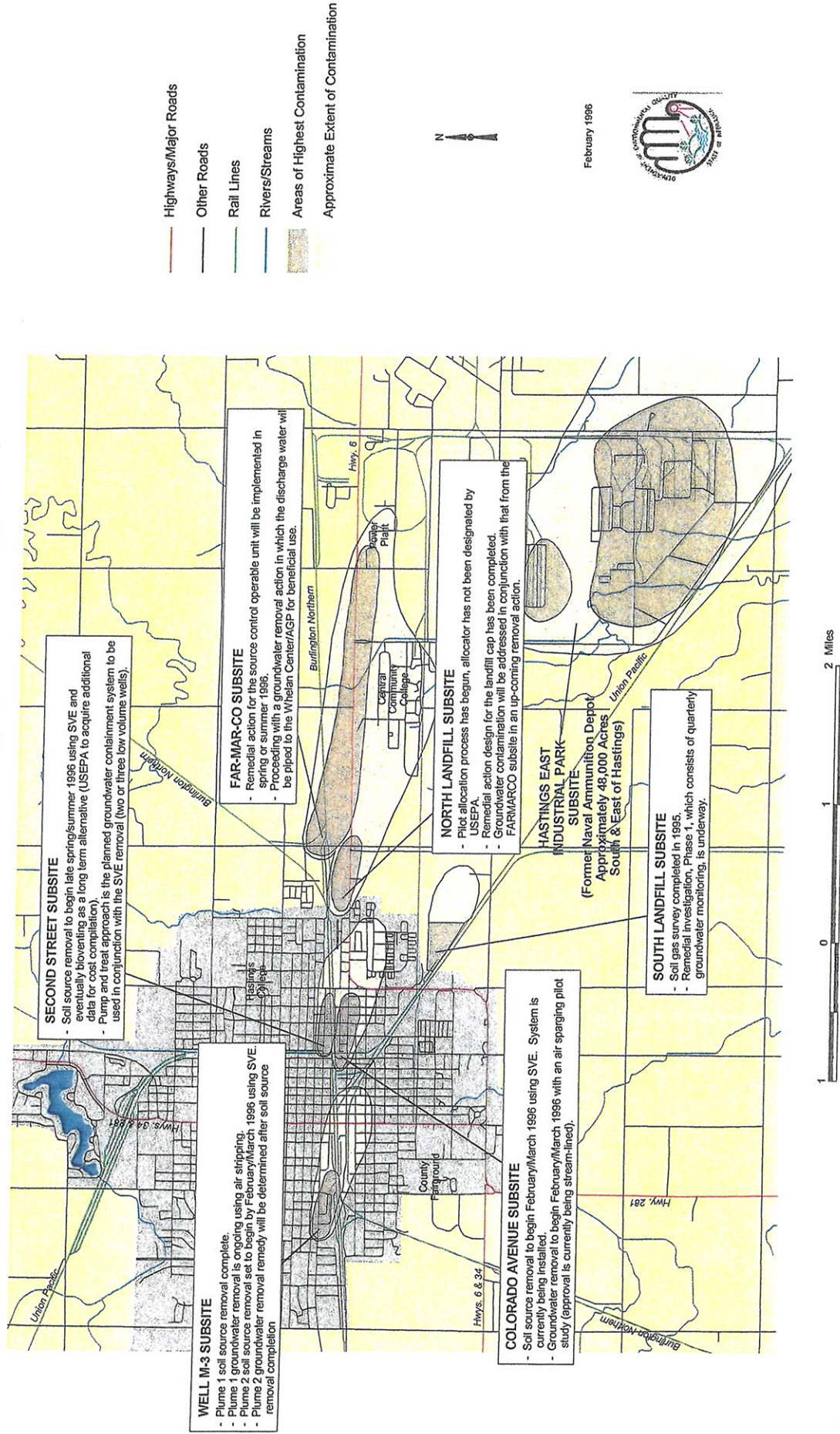
3.3 Well and Septic Tank Abandonment Cost Share Program

The Hastings Utilities Board of Public Works has recognized the benefits of properly abandoning wells and septic tanks. An incentive program has been developed to encourage property owners to properly abandon these systems. Attached at the end of this section is a summary of the incentive program and applicable resolutions.

3.4 Rain Sensor Program

In an effort to support nitrate and water conservation activities HU has developed a Rain Sensor Cost Share Program. This program provides monies to home owners to install a sensor that will de-activate the lawn sprinkler system in the event of rain. These sensors help limit over watering of the lawns and thus the migration of nitrate below the root zone.

Areas of Ground Water Contamination Hastings, Nebraska



ORDINANCE No. 3754

AN ORDINANCE OF THE CITY OF HASTINGS, NEBRASKA, AMENDING CHAPTER 32, ARTICLE VI, OF THE HASTINGS CITY CODE PERTAINING TO WATER, AND CHAPTER 38 PERTAINING TO SUBDIVISIONS; ESTABLISHING THE HASTINGS INSTITUTIONAL CONTROL AREA; PROHIBITING CERTAIN ACTS; REQUIRING REGISTRATION OF CERTAIN EXISTING WELLS; REQUIRING PERMITS FOR ALL NEW WELLS; DEFINING TERMS; REPEALING INCONSISTENT PROVISIONS; AND ESTABLISHING AN EFFECTIVE DATE.

BE IT ORDAINED BY THE MAYOR AND COUNCIL OF THE CITY OF HASTINGS, NEBRASKA:

SECTION 1. That Hastings City Code Section 32-601 be amended to read as follows:

32-601. Definitions.

For the purposes of this Article, the following words and phrases shall have the meanings respectively ascribed to them by this Section:

- (1) Available. A water main shall be deemed to be available to a property when such main lies within two hundred (200) feet of the property line of such property unless, in the judgment of the Board of Public Works, connection to such main cannot be reasonably and practically made.
- (2) Belt Line, Main or Commercial Main. Any pipe, other than a supply pipe, used for the purpose of carrying water to or distributing it in the city.
- (3) Board. The City's Board of Public Works, sometimes referred to as Hastings Utilities, and any department or employee designated by the Board to carry out any of the functions assigned to the Board under the terms of this Article.
- (4) City Engineer. Use of the term "City Engineer" in this Article shall be deemed to include the City Engineer or any designee or representative of the City Engineer.
- (5) Contaminated water or groundwater. Water or groundwater shall be deemed to be contaminated if testing results show that the amount of any element, substance, compound, or mixture, including disease-causing agents, exceeds the maximum contaminant level established for such substance under the drinking water standards established by Title 179, Nebraska Administrative Code, Chapter 2, Section 002.
- (6) Department. The City's Department of Development Services, which is generally charged with the functions of planning, inspections, code compliance and community development.

- (7) **Domestic Water Well.** A water well providing water to any water supply system furnishing water for human consumption other than a public water supply system, or for the watering of livestock, poultry, farm and domestic animals used in operating a farm, and for the irrigation of lands not exceeding a total of two acres in area.
- (8) **Domestic Use.** Any use of groundwater required for human needs of health and sanitation, including but not limited to drinking, cooking, washing, bathing, showering, and other similar household uses of water.
- (9) **Effective Date.** The effective date of this ordinance shall be January 1, 2001.
- (10) **Institutional Control Area.** An area wherein contaminated soils and groundwater are located, and which has been designated by city ordinance as an institutional control area.
- (11) **Institutional Controls.** Non-engineering measures, such as governmental controls, proprietary controls, enforcement tools, and informational devices, intended to affect human activities in such a way as to prevent or reduce exposure to hazardous substances within an institutional control area.
- (12) **Nonpotable Water Well.** Any water well other than a domestic water well or a public water supply well.
- (13) **Person.** This term shall be deemed to include any person, whether one or more, and any corporation, partnership, limited liability company, limited liability partnership, or other entity.
- (14) **Public Water Supply Well.** A water well designed and used to provide water for a public water supply system which provides the public piped water fit for human consumption, where such system has at least 15 service connections or regularly serves at least 25 individuals.
- (15) **Separate Premises.** When considering the expediency of permitting deduct meters or more than one consumer to secure water from the same service or supply pipe shall be construed to mean a separate dwelling or apartment, a building or structure used for a separate business or each distinct business in a business building or structure; provided, that if deduct meters for two or more consumers be allowed or permitted on the same service or supply pipe, each customer shall be billed for and shall pay the monthly minimum; and provided further; that where a separate business and a dwelling are used in connection by the same owner or by the same tenant and are on the same city lot and are occupied by the same person and his family, the same shall constitute a separate premises.
- (16) **Service Pipe.** The pipe extending from the curb cock or valve to the meters.

including the curb cock or valve, to the curb line of the street; and when used in connection with a fire main or sprinkler system shall mean the pipe extending from the main or belt line to the wall of the building.

(18) **Water Main.** A pipe transporting water produced by one or more public water supply wells.

(19) **Water Well.** Any excavation that is drilled, cored, bored, washed, driven, dug, jetted, or otherwise constructed for the purpose of exploring for ground water, monitoring ground water, utilizing the geothermal properties of the ground, obtaining hydrogeologic information, or extracting water from or injecting water into the underground water reservoir.

(20) **Well Owner.** (Also referred to herein as the owner of a well.) The person who is the record title owner of the real estate upon which a well is located.

SECTION 2. That Hastings City Code Section 32-606 be amended to read as follows:

32-606. Connection to public water system required; domestic water wells allowed under certain circumstances.

(1) It shall be unlawful to operate or maintain any domestic water well within the city, or the city's two mile extraterritorial jurisdiction, except as provided hereinafter and in Code sections 32-611 through 32-623.

(2) Any person desiring to install any domestic water well within the city, or the city's two mile extraterritorial jurisdiction shall make application with the Department for the right to install, operate or maintain such well, and shall pay an application fee in the amount established in the City Council Fee Resolution.

(3) The application to the Department shall contain the information described in Code section 32-616. The Department shall forward a copy of said application to the Board for its review.

(4) If the Board determines that (a) the application for the domestic water well is complete; (b) no water main is available to provide the required water; (c) the health and safety of the public and of the users of said water will not be jeopardized or placed at risk; and (d) the well will not be located within any institutional control area, then it shall issue a permit to the applicant authorizing the installation of the said well, and furnish a copy of said permit to the Department. The Board shall keep all well permits on file.

(5) Whenever the Board determines that the applicant's water requirements can be satisfied by connection to a water main, the Board shall notify the property owner of that fact and of the requirements of the following subsection.

(6) Upon receipt of that notice, the owner of the property shall file the application with the Board to connect to the city's water system as described in section 32-605 of this code. The property owner shall pay the proper out-of-district fee and proceed with connection.

(7) Any habitable structure described in subsection (1) above which has an approved private existing domestic water well which does not lie in an institutional control area shall be exempt from the requirement to connect to a public water supply main so long as the well is operable. At such time as replacement of such well is necessary, the property shall become subject to this section, and the property owner shall make the application to the Board as described above.

(8) The Department shall not issue a building permit for any new structure until it is satisfied that the water service to such structure will be connected to the public water supply or that a well permit has been issued.

SECTION 3. That Hastings City Code Section 32-611 be enacted to read as follows:

32-611. Contaminated groundwater; findings and intent.

(1) The Hastings City Council finds and determines that certain contaminants have, for many years, existed in certain areas of the groundwater in and near the City of Hastings, and that certain legislation is necessary and appropriate for the purpose of supplementing the various measures undertaken by the City of Hastings and others, aimed at reducing or eliminating the possibility that humans will come into contact with such contaminants.

(2) It is the intention of the City that existing water wells within the area where contaminated groundwater exists, which area shall be hereafter known as the Hastings Institutional Control Area, shall be allowed to remain in existence only if reasonable safeguards are implemented so that there is no reasonable likelihood of human contact with the contaminants in the groundwater.

(3) It is also the intention of the City that no new domestic water wells may be installed within the Hastings Institutional Control Area.

(4) It is not the intention of the City to prevent the installation of agricultural irrigation wells, or the installation of wells for non-contact use by businesses within the Institutional Control Area, so long as adequate safeguards are in place to prevent human consumption of the water from said wells.

SECTION 4. That Hastings City Code Section 32-612 be enacted to read as follows:

32-612. Declaration of Hastings Institutional Control Area.

The controls described in Code Sections 32-601 and 32-611 et seq., shall apply within the bounds of the Hastings Institutional Control Area, which boundaries are hereby defined as follows:

Beginning at the intersection of 12th Street and Crane Avenue in Hastings; thence East on 12th Street to Maxon Avenue; thence South on Maxon Avenue to J Street; thence West on J Street to Crane Avenue extended; thence North on Crane Avenue extended to the point of beginning.

SECTION 5. That Hastings City Code Section 32-613 be enacted to read as follows:

32-613. Registration of existing wells within Institutional Control Area.

Within sixty days after the effective date of this ordinance, all existing water wells within the Hastings Institutional Control Area, other than public water supply wells, shall be registered in the office of the Board or of the Department by the owner of the real estate upon which the well is located. There shall be no fee for registering an existing water well. The Department shall forward all registrations to the Board, where they shall be kept on file.

SECTION 6. That Hastings City Code Section 32-614 be enacted to read as follows:

32-614. Registration of existing water wells; information required.

The following information shall be furnished in connection with registering a water well in existence in the Institutional Control Area on the effective date of this ordinance:

- (1) The name and address of the person owning the real estate upon which the well is located.
- (2) The address and legal description of the property on which the well is located.
- (3) The address of all properties being served by groundwater pumped from the well.
- (4) A description of the uses of the water pumped from the well. The application shall state whether the groundwater is being, or will be, used for human consumption including, but not limited to, drinking, cooking, washing, or other household uses.
- (5) The location of the nearest public water main to the property served by the well.
- (6) The depth of the well.

- (7) An accurate diagram showing the location of the well in respect to the boundaries of the property, the nearest street, road, or highway intersection, and any on site septic or waste disposal system.

SECTION 7. That Hastings City code Section 32-615 be enacted to read as follows:

32-615. Permitting of nonpotable water wells.

After the effective date of this ordinance, no person may drill or install a nonpotable water well within the City of Hastings or its two mile extraterritorial jurisdictional area prior to applying for and obtaining a well permit in the manner described in this chapter. Any person filing an application for a new nonpotable water well shall pay an application fee in the amount established in the City Council Fee Resolution.

SECTION 8. That Hastings City Code Section 32-616 be enacted to read as follows:

32-616. Permitting of water wells; application for well permit.

The following information shall be submitted to the Department in connection with applying for a well permit for a domestic water well or a nonpotable water well within the City of Hastings or its two mile extraterritorial jurisdictional area:

- (1) The name and address of the person owning the real estate on which the proposed well is to be located.
- (2) The address and legal description of the property on which the proposed well is to be located.
- (3) The address of all properties to be served by groundwater pumped from the proposed well.
- (4) A description of the uses to be made of water to be pumped from the proposed well. The application shall state whether the groundwater will be used for human consumption including, but not limited to, drinking, cooking, washing, or other household uses.
- (5) The location of the nearest public water main to the property served by the proposed well.
- (6) The depth of the proposed well.
- (7) An accurate diagram showing the location of the proposed well in respect to the boundaries of the property, the nearest street, road, or highway intersection, and any on site septic or waste disposal system.

The well for which a permit has been obtained must be installed within six (6) months after issuance of the permit, unless the Board, for good cause, grants an extension of the permit. The well permit shall expire unless the well is installed within such six month period, or any extension thereof.

SECTION 9. That Hastings City Code Section 32-617 be enacted to read as follows:

32-617. Standards for considering application for a nonpotable water well.

The Board shall approve the application for a nonpotable water well within the City of Hastings or its two mile extraterritorial jurisdictional area if it is satisfied that:

- (1) the required information contained in the application is complete;
- (2) the well is not a domestic water well;
- (3) the proposed use of the nonpotable water well will comply with the requirements of this Article.
- (4) the location of the well does not violate any well spacing or encroachment regulations or restrictions established by any federal, state, or local authority.

SECTION 10. That Hastings City Code Section 32-618 be enacted to read as follows:

32-618. Special exceptions for drinking water wells in the Institutional Control Area.

(1) Any drinking water well in existence within the Institutional Control Area on the effective date of this ordinance may remain in use so long as the water, either at the wellhead, or after point of use treatment, meets the drinking water standards established by Title 179, Nebraska Administrative Code, Chapter 2, Section 002. The determination of whether the water meets such standards shall be made by the Board.

(2) All point of use treatment devices shall be installed and maintained at the expense of the property owner; provided that nothing herein shall prevent the property owner from pursuing damages or other relief from any party responsible for contamination of groundwater available to the property owner.

(3) Any such existing domestic water well may be redrilled or replaced so long as the redrilled or replaced well meets one of the above exceptions; provided however, such right shall exist only if an existing water main is not available to the property served by such domestic water well. Any replacement well may be drilled or installed only within one hundred (100) feet of the original domestic water well, and the location must first be approved by the Department and the Board.

SECTION 11. That Hastings City Code Section 32-619 be enacted to read as follows:

32-619. Required warning signs in Institutional Control Area.

(1) Every owner of real estate located within the Hastings Institutional Control Area upon which a well is now or may hereafter be located, shall conspicuously post and maintain a warning sign on or near such well, and at all water service points where water may be obtained from said well for human consumption.

(2) The warning sign shall, at a minimum, bear the following wording: "WARNING. THIS WATER IS NOT FOR HUMAN CONSUMPTION." The signs will be uniform in appearance, and shall be designed and produced by the City Engineer. The cost of such signs shall be borne by the City.

The foregoing sign requirement shall not apply to a domestic water well or a service point which meets the special exception provisions of Section 32-618.

SECTION 12. That Hastings City Code Section 32-620 be enacted to read as follows:

32-620. Institutional Control Area; access; sampling and testing.

(1) Every owner of a well within the Hastings Institutional Control Area shall, upon reasonable notice, grant access to said well to any local, state or federal official who requests access for the purpose of inspecting, sampling, testing, or inventorying said well.

(2) All existing domestic water wells in the Hastings Institutional Control Area, remaining in use after the effective date of this ordinance, shall be inspected and tested for contamination by the Board. Testing shall be conducted in accordance with testing protocol designed by the Board establishing the contaminants of concern and the frequency of testing.

(3) The testing costs for wells within the Institutional Control Area shall be borne by the Board.

SECTION 13. That Hastings City Code Section 32-621 be enacted to read as follows:

32-621. Nuisance.

All wells which:

- (1) are not registered or permitted as required by this Article;
- (2) produce contaminated water which is made available in any way for human consumption; or
- (3) provide a conduit for contamination into the aquifer for any reason, such as being in a state of disrepair, or the manner in which the well was constructed, are hereby declared to be a

public nuisance, and shall be immediately brought into compliance with this Article, or capped and closed at the owner's expense in accordance with all local, state, and federal rules and regulations governing the closing and capping of wells.

SECTION 14. That Hastings City Code Section 32-622 be enacted to read as follows:

32-622. Prohibited acts.

(1) It shall be unlawful for any person to install a well within the City of Hastings or its two mile extraterritorial jurisdiction without obtaining a permit for said well from the Board.

(2) It shall be unlawful to fail to register any well as required by this Article....

(3) It shall be unlawful for a person to fail to erect or maintain any warning sign required by the terms of this Article.

(4) It shall be unlawful for a person to remove, deface, or cover any warning sign required by the terms of this Article.

SECTION 15. That Hastings City code Section 32-623 be enacted to read as follows:

32-623. Violation.

(1) Any person found to be in violation of this Article shall be fined in an amount not to exceed one hundred dollars. Each day that the violation continues shall be deemed to be a separate and distinct offense.

(2) In the event that the Board determines that any well is a nuisance within the meaning of Hastings City Code Section 32-621, it shall send a written notice to the owner by certified mail, return receipt requested, notifying the addressee of the violation. The written notice shall contain the following information:

(a) The street address and legal description sufficient for identification of the premises on which the well is located.

(b) A brief and concise description of the acts or circumstances constituting the nuisance.

(c) A brief and concise description of the corrective action required to be taken to eliminate the nuisance.

(d) A brief and concise statement advising the addressee that if the nuisance is not remedied within seven days (excluding weekends and holidays) after receipt of the certified letter, the Board may order electrical power to the well disconnected and will request the City Attorney to file an action to abate the public nuisance.

(3) If the addressee of the notice referred to above fails to abate said nuisance within the time specified, the City Attorney shall, upon written request of the Board, proceed to abate said public nuisance pursuant to the Hastings City Code, and take all steps to have the costs of said action assessed against the owner or the real estate upon which the well is located.

(4) In the event the use of the groundwater in violation of this Article might cause irreparable harm or pose a threat to public health, safety, or welfare, the written notice to abate as set forth above, shall not be required as a condition precedent to commencing a legal action to obtain abatement of the nuisance. The City of Hastings may, with the consent of the Mayor, immediately file an action requesting such temporary and permanent orders as are appropriate to expeditiously and permanently abate said public nuisance and protect the public health, safety and welfare.

SECTION 16. That Hastings City Code Section 38-117 be amended to read as follows:

38-117. Required improvements.

(1) Generally. Except as provided hereinbelow, the owner or developer of a tract to be subdivided shall install, at its own expense, satisfactory curb, gutter, and sidewalks on all property abutting streets or roadways; pavement on roadways; and all water and sanitary and storm sewer lines within the subdivision which are necessary to serve the subdivision. Installation of the above improvements shall be in accordance with the specifications of the city. Water and sewer lines installed will require the approval of an on-the-job inspector before acceptance by the city. The cost of providing this inspection will be the responsibility of the owner or developer of the tract to be subdivided. Sewer lines shall have flow elevations as directed by the city; provided, the requirement that the owner or developer install improvements at its own expense may be satisfied by compliance with any City Council or Board of Public Works policy pertaining to funding of improvements.

(a) In a subdivision of lots, as defined in Section 38-101, located within one (1) mile of the city limits, the requirements for public sewer and water installations, curb, gutter and sidewalk, plus concrete paved road may be waived only by the City Council after a recommendation by the Planning Commission. Individual water supply and waste disposal systems may be installed when no public water supply system or public sanitary sewer system are available to the property, but such individual systems must be installed in compliance with applicable city ordinances.

(b) In a subdivision of lots, as defined in Section 38-101, located more than one (1) mile from the city limits, the requirements for public sewer and water installations, curb, gutter and sidewalk, plus concrete paved road may be waived only by the City Council, after a recommendation by the Planning Commission, and the following be accomplished:

(i) Individual water supply and waste disposal systems may be installed when no public water supply system or public sanitary sewer system are available to the property, but such individual systems must be installed in compliance with applicable city ordinances.

(ii) Subdivision streets, other than county roads, shall be constructed and surfaced with asphaltic concrete, in accordance with specifications of the City Engineer. Curb, gutter and sidewalk may be omitted.

(2) Pavement. The minimum width of roadway service shall be thirty-six (36) feet from back of curb to back of curb including cul-de-sacs. The pavement width in a cul-de-sac shall be exclusive of the center island. (See Figure 1 Typical Street Section.) Portland cement concrete, or asphaltic concrete may be used for the roadway surface. Curb and gutter shall be of Portland cement concrete. All curb and gutter and roadway surface shall comply with the specifications of the city. Storm water run-off shall be adequately handled through inlets, catch basins or other drainage constructions in accordance with a drainage plan.

(3) Sidewalks. All sidewalks shall be constructed of Portland cement concrete on both sides of all streets shown on the final plat. Sidewalks shall comply with the specifications of the city.

(4) Inspection. The City Engineer shall make three (3) inspections of all pavement construction:

(a) First inspection to check compaction of subgrade before subbase is applied.

(b) Second inspection to check subbase for compaction, material, sizes, thickness, etc., before prime coat is applied.

(c) Final inspection after roadway is completed.

(d) Twenty-four hours' notice shall be given to the City Engineer regarding any requested inspection.

(5) Bond provisions. After a plat has been duly approved by the Planning Commission and Council, as required in these rules, and after said plat has been duly recorded with the Register of Deeds as required by law, construction may begin on buildings within the subdivision. No building permit shall be issued for a building within such subdivision until the owner or developer has extended all required improvements to and in front of such lot, provided for such improvements pursuant to any City Council or Board of Public Works policy pertaining to funding of improvements as permitted in subparagraph (1) above, or furnished a surety bond conditioned upon the completion of all required improvements in compliance with the specifications of the city. Such surety bond shall be in an amount to be calculated by the

City Engineer. Such calculation shall be reasonable and shall not be less than the estimated actual cost of the installation of the required improvements.

(a) The above surety bond shall guarantee the proper installation of the required improvements for the entire block upon which a lot for which a building permit is requested, fronts. Such installation shall be completed within two (2) years of the effective date of the bond unless the City Council, after recommendation of the Planning Commission, gives special permission to the developer to extend the period for a specific time. In case installation of required improvements is not completed as specified, the city may proceed to construct, reconstruct or install all or any portion of the required improvements using proceeds from the surety bond. Any excess money shall be refunded to the guarantor.

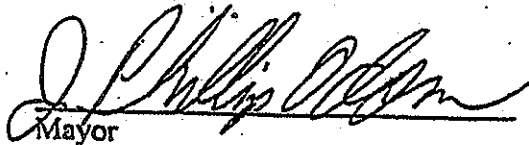
(b) Upon final inspection and approval by the city, such surety bond or unused portion thereof shall be released, provided the owner or developer shall first furnish or cause to be furnished a surety bond conditioned upon the endurance of the improvements, excluding normal wear and damage beyond the control of the owner. Said guarantee shall remain in effect for a period on one (1) year from the date of final approval. The amount of such maintenance bond shall not be less than twenty percent (20%) of the amount of the bond guaranteeing the installation. If, at the end of one (1) year, following the date of final approval, there has appeared to be no failure due to faulty or substandard construction of required improvements, then said maintenance bond shall be refunded in full.

SECTION 17. That existing Hastings City Code Sections 32-601, 32-606, and 38-117 and all other ordinances or provisions in conflict with this ordinance are hereby repealed.

SECTION 18. The provisions of this ordinance are separable, and the invalidity of any phrase, clause or part of this ordinance shall not affect the validity or effectiveness of the remainder of this ordinance.

SECTION 19. This ordinance shall take effect and be in full force from and after its passage, approval and publication or posting as required by law, in its entirety, or in pamphlet form, as the case may be, said effective date being January 1, 2001, and this ordinance shall thereafter be included in the Hastings City Code Book.

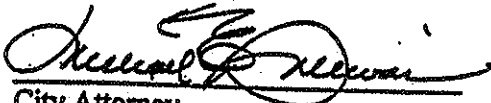
PASSED AND APPROVED this 13th day of November, 2000.


Mayor



City Clerk

APPROVED AS TO FORM:


City Attorney

Program Goals

1. Locate all sources of private water usage in the Hastings Institutional Control Area.
2. Provide water testing of all water use in the Hastings ICA.
3. Provide public education of water quality being used by persons in the Hastings ICA.
4. Provide appropriate signage on all wells.

WATER TESTING PLAN

1. Contaminates of concern.

Nitrates, Coliforms, Volatile Organic Compounds (VOCs), Solvents, Grain Fumigants, & Gasoline compounds.

All tests collected & provided by HU at no charge to the water user.

2. Testing Frequency as Provided by HU

No detection of VOCs or Nitrates less than 5 mg/l.

Test once every three years.

Detection of VOCs or Nitrates less than 5 mg/l & 7.5 mg/l.

Test once per year.

Detection of VOCs above one half of EPA Maximum.

Contaminate levels or nitrates above 7.5 mg/l.

Test twice each year.

For more information on permissible water quality standards and related health effects contact Hastings Utilities.

For More Information Contact:

General Program Information

Mr. Steve Cogley
Public Relations Coordinator
Hastings Utilities
Ph# 402-462-3693
Fax# 402-463-1705

Water Sampling Information

Mr. Marty Stange (Ph# 402-462-3651)
Environmental Engineer or
Mr. Jason Redding (Ph# 402-462-3660)
Environmental Engineer Assistant
Hastings Utilities
Fax# 402-462-3666

Drinking Water and Public Health

Nebraska Dept. of Health & Human Services
Domestic Well Division
Lincoln, NE
Ph# 402-471-0598

Water Resources

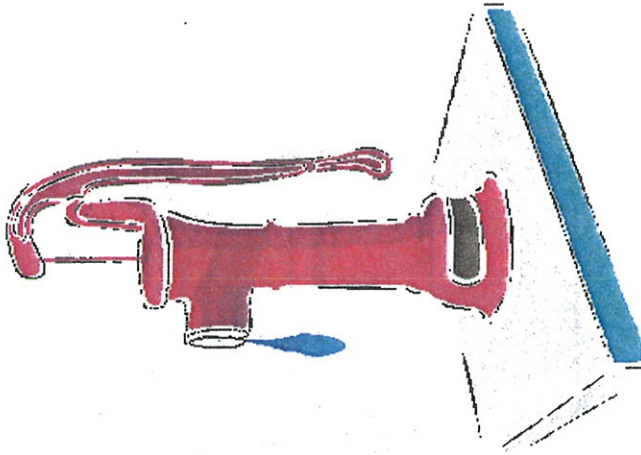
Little Blue Natural Resources District
Davenport, NE
Ph# 402-364-2145

Upper Big Blue Natural Resources District
York, NE

Ph# 402-362-6601

Revised 11/2/07

HASTINGS INSTITUTIONAL CONTROL AREA - WELLHEAD PROTECTION PLAN



1228 North Denver Avenue
Hastings, NE 68901
Phone: 402-462-3651
Fax: 402-462-3666
E-mail: mstange@hastingsutilities.com

Hastings Utilities / City of Hastings, NE Water Well Registration

1228 North Denver Avenue
Hastings, NE 68901

Please print

Hastings Permit No. _____

Date _____

App'd By _____

1. Name of Owner:

Name _____ Address _____ City _____ State _____ Zip _____
Phone No. _____ E-mail Address _____

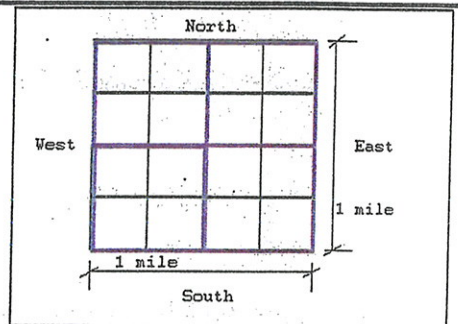
2. Indicate the Use: Please place "x" in appropriate box(es)

☐ Irrigation ☐ Municipal ☐ Industrial ☐ Domestic
☐ Closed Loop Heat Pump ☐ Heat Pump w/Water Discharge ☐ Heat Pump w/Re-injection Well

If the well is for more than one purpose or for a purpose other than indicated above, explain below.

3. Identify the Location of the Well:

_____ County, Township _____ North,
Range _____ West, Section _____
The box at right represents one square mile,
(section). Indicate with an "x" the location of
the well. If the well is for irrigation, indicate the
location of lands irrigated.
How many acres will be irrigated? _____



4. Specifications of Well and Pump:

Pump column diameter: _____ inches. Well Depth _____ feet.
Pumping rate under normal operating conditions: _____ gallons per minute.

5. Well Registration and Construction Schedule:

If the well is registered with another agency, such as NRD or NWR,
give the registration number: _____

Indicate the date construction was begun: _____

Indicate the date construction was completed: _____

6. Well Driller's Name:

Address: _____

Bus Ph# _____

E-Mail Address _____

Fax _____

Cellular _____

7. Certification: I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete and accurate.

Date _____

Signature of Applicant _____

NOTICE: Hastings Utilities has not conducted any independent testing regarding the water to be produced by this well. Therefore, issuance of this permit should not be construed as any guarantee or representation that the water produced by this well can or will meet drinking water quality standards. Water quality varies throughout our region. It is therefore strongly recommended that, prior to consuming or using the water for domestic purposes, the water produced by this well should be tested by a qualified laboratory, following established sampling and testing protocols.

Please provide as much information as possible. If any information as requested is not known, please leave blank.

INSTITUTIONAL CONTROL ORDINANCE SUMMARY

1) Definitions

- a) Domestic Water Well: A water well providing water to any water supply system furnishing water for human consumption other than a public water supply system or for the watering of livestock, poultry, farm and domestic animals used in operating a farm and for the irrigation of lands not exceeding a total of two acres in area.
- b) Public Water Supply Well: A water well designed and used to provide water for a public water supply which provides the public piped water fit for human consumption, where such system has at least 15 service connections or regularly serves at least 25 individuals.
- c) Non-potable Water Well: Any water well other than a domestic water well or a public water supply well such as irrigation wells for areas more than 2 acres, geothermal wells, and monitoring wells.
- d) Well Owner: The person who is the record title owner of the real estate upon which a well is located.

2) Connection to Public Water System Required

- a) It shall be unlawful to operate or maintain any domestic water well within the City's extra-territorial jurisdiction (2 miles), unless the requirement is waived by the Board of Public Works. Waiver may be granted, at the discretion of the Board, (except in the Hastings Institutional Control Area) if a water supply main is not available, and the water supply for the domestic well does not pose a risk to health and safety.
- b) The City Building Inspector shall not issue a building permit for any new structure until he or she is satisfied that the water service to such structure will be connected to the public water supply or to an approved domestic water well.

3) Well Registration

- a) All existing wells within the ICA shall be registered at no cost.
- b) All new wells within the ICA and/or with the City's extra-territorial jurisdiction (2 miles) shall be registered with the City Building Inspector or Hastings Utilities unless registered with the UBBNRD or LBNRD. Provide copies of NRD registration to Hastings Utilities. All wells greater than 50 gpm register with NRD. All wells less than 50 gpm register with City Building Inspection or Hastings Utilities.

4) Water Testing

- a) All new domestic water wells shall be tested by Hastings Utilities upon notification by the water well owner that the well is completed and is fully operational. Hastings Utilities will conduct a household suitability test at no charge to the water well owner.



CUSTOMER INCENTIVE PROGRAM FOR ABANDONMENT OF PRIVATE WATER WELLS

1. The Well Owner is responsible for hiring a well driller with a valid Nebraska Water Well Standards & Construction License.
2. Contact your local Natural Resources District (NRD) for a well abandonment application. The well driller may have copies of these forms as well for you to use.
3. Approval from the Nebraska Department of Natural Resources (NDNR) is required prior to closure of your well. The well driller is responsible for this approval.
4. Your well driller will close the well according to the guidelines set forth by the Nebraska Department of Health & Human Services as found in State of Nebraska regulations Title 178, Chapter 12.
5. The landowner has 90 days to insure the well driller completes the work after receiving approval from the NDNR.
6. The Well driller shall complete the NRD abandonment application for cost-share and submit the application to the NRD. The Little Blue NRD pays 75% of the cost up to \$300.00. The Upper Big Blue NRD pays 65% up to \$300. This does not include payment for removal of any exposed or buried pipes, pumps, towers, well house or other apparatus. The well driller will know which NRD applies to your well location.
7. If you are connected to the Hastings Utilities' water system, a copy of the NRD cost-share application and proof of payment by the NRD needs to be sent to Jenny Sidlo to apply for Hastings Utilities incentive program. Hastings Utilities will pay 75% of the cost not reimbursed by the NRD, not to exceed \$200.00. Does not include payment for removal of any exposed or buried pipes, pumps, towers, well house or other apparatus.

**If you have any questions please do not hesitate to contact
Jenny Sidlo at 402-462-3664**

**BOARD OF PUBLIC WORKS
RESOLUTION NO. 2004-08**

**CUSTOMER INCENTIVE PROGRAM FOR THE
ABANDONMENT OF PRIVATE WATER WELLS**

WHEREAS:

The Board of Public Works has a desire to eliminate existing customer water wells in the interest of safeguarding the underground water supply, and

WHEREAS:

The Board of Public Works acknowledges that the water well is owned and is the responsibility of the property owner, and

WHEREAS:

The Board of Public Works has a desire to encourage and assist in the process of the proper abandonment of water wells, and

WHEREAS:

The Board of Public Works has included in its 2005 Hastings Utilities Budget monies to fund a customer incentive program for the abandonment of water wells.

NOW, THEREFORE:

Be it resolved by the Board of Public Works of the City of Hastings, Nebraska that:

1. The Board will continue with its current program of locating and assisting in the proper abandonment of water wells, and
2. The Board is aware of the program sponsored by the local Natural Resources District (NRD) to assist in the cost of properly abandoning old water wells, and
3. The Board, to further encourage the proper abandonment of water wells by those customers who are connected to the Hastings Utilities' water system, will pay 75% of the costs not reimbursed by the NRD to abandon a water well, not to exceed \$200. The well must be abandoned in accordance with all applicable rules and regulations and copies of all documentation and forms required by the NRD must be supplied to Hastings Utilities, and
4. The effective date of this resolution will be November 3, 2004.

PASSED AND APPROVED by the Board of Public Works on December 17, 2004.



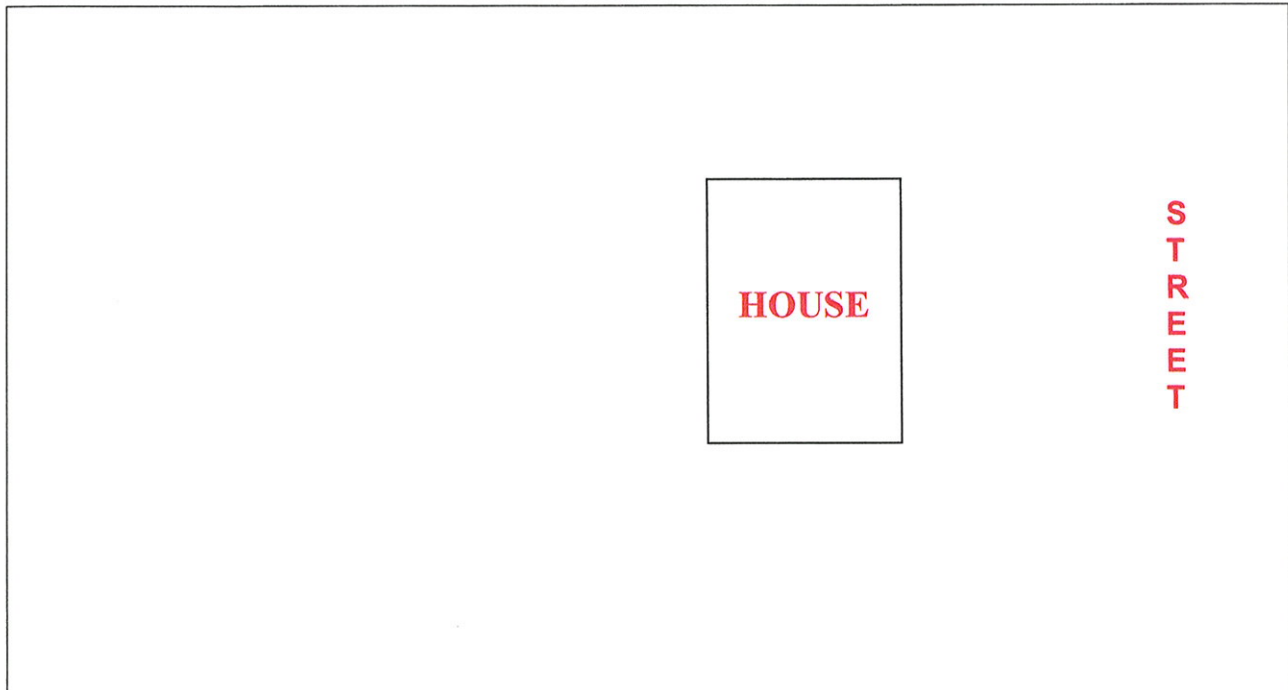
George C. Anderson
Chairman
Board of Public Works

HASTINGS UTILITIES WELL DECOMMISSIONING FORM

Page 2 of 2

Sketch Location Of Well Location Before Decommissioning:

Note: Show North Arrow



Signature of Licensed Well Driller _____

Date _____

**Return To: Hastings Utilities Engineering Dept.
1228 N. Denver Avenue / PO Box 289
Hastings, NE 68902-0289**



CUSTOMER INCENTIVE PROGRAM FOR ABANDONMENT OF PRIVATE SEPTIC TANKS

1. The Septic tank owner is responsible for hiring a plumber or contractor with a valid Nebraska Septic Tank Contractor License.
2. Your plumber or contractor shall abandon the septic tank according to the guidelines set forth by the Nebraska Department of Health & Human Services as found in State of Nebraska regulations Title 124, Chapter 17.
3. The plumber or contractor shall complete the HU Septic Tank and Leach Field Abandonment Form.
4. To be eligible for the Hastings Septic Tank Abandonment Incentive Program you must be connected to the Hastings water or sewer system. To apply for the incentive send a completed copy of the HU Septic Tank and Leach Field Abandonment Form with proof of payment to Jenny Sidlo at Hastings Utilities. Hastings Utilities will pay 75% of the cost to abandon the septic tank, not to exceed \$200.00.

**If you have any questions please do not hesitate to contact
Jenny Sidlo at 402-462-3664**

**BOARD OF PUBLIC WORKS
RESOLUTION NO. 2004-09**

**CUSTOMER INCENTIVE PROGRAM FOR THE
ABANDONMENT OF PRIVATE SEPTIC TANKS**

WHEREAS:

The Board of Public Works has a desire to eliminate existing customer septic tanks in the interest of safeguarding the underground water supply, and

WHEREAS:

The Board of Public Works acknowledges that the septic tank is owned and is the responsibility of the property owner, and

WHEREAS:

The Board of Public Works has a desire to encourage and assist in the process of the proper abandonment of septic tanks, and

WHEREAS:

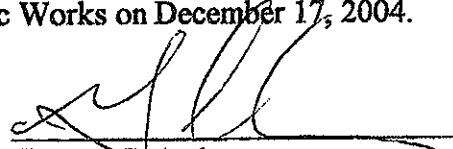
The Board of Public Works has included in its 2005 Hastings Utilities Budget monies to fund a customer incentive program for the proper abandonment of septic tanks.

NOW, THEREFORE:

Be it resolved by the Board of Public Works of the City of Hastings, Nebraska that:

1. The Board will continue with its current program of locating and assisting in the proper abandonment of septic tanks, and
2. The Board, to encourage the proper abandonment of septic tanks for those customers who are connected to the Hastings Utilities' sanitary sewer system, will pay 75% of the costs not reimbursed by any other entity to abandon a septic tank, not to exceed \$200. The septic tank must be abandoned in accordance with all applicable rules and regulations and copies of all documentation and forms required by any other entity must be supplied to Hastings Utilities, and
3. The effective date of this resolution will be November 3, 2004.

PASSED AND APPROVED by the Board of Public Works on December 17, 2004.


George C. Anderson
Chairman
Board of Public Works



SEPTIC TANK AND LEACH FIELD ABANDONMENT FORM

To Be Filled Out By Licensed Plumber

Owner's Name & Address:

Property Address: _____

Owner's Name _____

Address (if different than above) _____

Septic Tank Abandonment Details:

Name of Contractor: _____ License No. _____

Business Name: _____

Address: _____

Telephone No. _____

Mobile/Cell No. _____

Abandonment Procedure:

i.e. Example: Tank pumped of sludge & filled tank w/ _____ cyds. of gravel and _____ lbs. of chlorine, removed leachfield. Disconnected sewer service _____ ft. from house.

Sketch location of septic tank prior to abandonment w/notes of what was done:

Note: Show North Arrow

HOUSE

STREET

Signature of Licensed Plumber: _____ Date _____

Return to Hastings Utilities Engineering Department, 1228 N. Denver Avenue, Hastings, NE 68901

4.0 Water Supply Study and Nitrate Trends

In 1996 Hastings Utilities commissioned a Water Supply Study to evaluate the future water needs for the City of Hastings and the surrounding service areas. This study addressed water quality and quantity issues. A copy of the report can be viewed at the HU Engineering Department. This report recognized the benefits of wellhead protection and recommended that a Wellhead Protection Plan be developed.

4.1 Water Source and Infrastructure Recommendations

The Water Supply Study was commissioned to address the issue of wells lost due to contamination by Volatile Organic Compounds and Nitrates. The study recommended development of a new well field. The study concluded the water system should locate new water supply wells up gradient and away from the Superfund Sub-sites. The study recognized the potential of nitrate contamination in the area and investigated the potential sources of nitrates. It was determined that Hastings Utilities should proceed with the development of the Hastings Airport Well Field and the City Well Field. The Hastings Airport Well Field is various property located adjacent to the Hastings Airport located in the northwest quadrant of the city. The City Well Field consisting of existing wells located in the northwest areas of the city.

The study also concluded that nitrate contamination will continue to be a concern due to non-point source contamination in the area. It is understood that nitrate contamination may take several years to decades to travel through the soil before it enters the aquifer. Given that future nitrate concentrations are uncertain and that any nitrate control plan may not be effective on past releases it was recommended that Hastings Utilities proceed with plans to develop an infrastructure to implement centralized treatment.

The Airport Well Field and City Well Field will allow for an economical transmission of waters to a centralized treatment plant. This work has been ongoing since 1997. The planned infrastructure is reviewed by Hastings Utilities Board of Public Works in conjunction with the annual budget preparation. This is done to insure adequate infrastructure is being provided to meet the current and future water demands of the City of Hastings.

The study also recognized the benefits of Wellhead Protection. The reduction of nitrate contamination even if not below drinking water standards will still provide benefits in reducing treatment costs. This is consistent with the intent of this Wellhead Protection Plan to promote activities that will reduce further contamination of the aquifer and thus reduce future water treatment cost.

4.2 Nitrate Data and Trends

Nitrate data has been collected from various municipal, monitoring, irrigation, domestic, and industrial wells. This information is kept current by Hastings Utilities. Updates on trends are provided to the Hastings Utilities Board of Public Works as needed and during annual budget preparations. As noted in the introduction, nitrate data is provided to the various governmental agencies and committees assisting the development and maintenance of the Hastings WHPP.

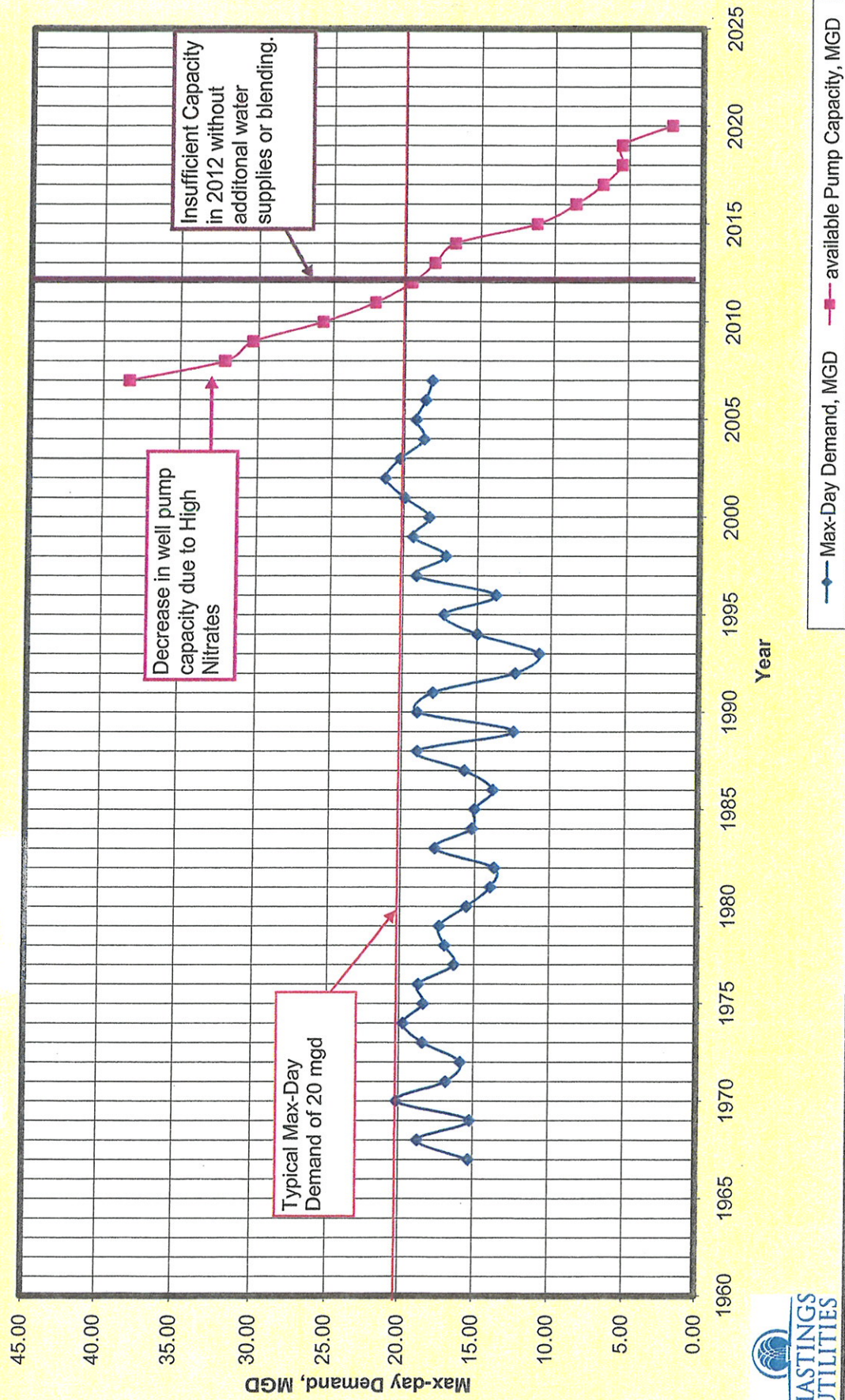
The nitrate contamination is increasing in all the municipal wells. Some wells are increasing faster than others. These variations are due to proximity to the nitrate contamination, well usage, and well construction. Nitrate data and graphs showing the nitrate trends for each municipal well can be viewed at the HU Engineering Department.

To assist in the planning for future nitrate treatment and /or the development of new water supply wells a prediction of future nitrate concentrations has been extrapolated. The "High Nitrate Capacity Trend vs. Max-Day Demand" found at the end of this section shows the nitrate capacity for future years based upon the peak nitrate trend of each well. The current water system configuration does not facilitate mixing of water from the various wells. Hence once a well has 10 mg/l of nitrates it is shut down to protect the public.

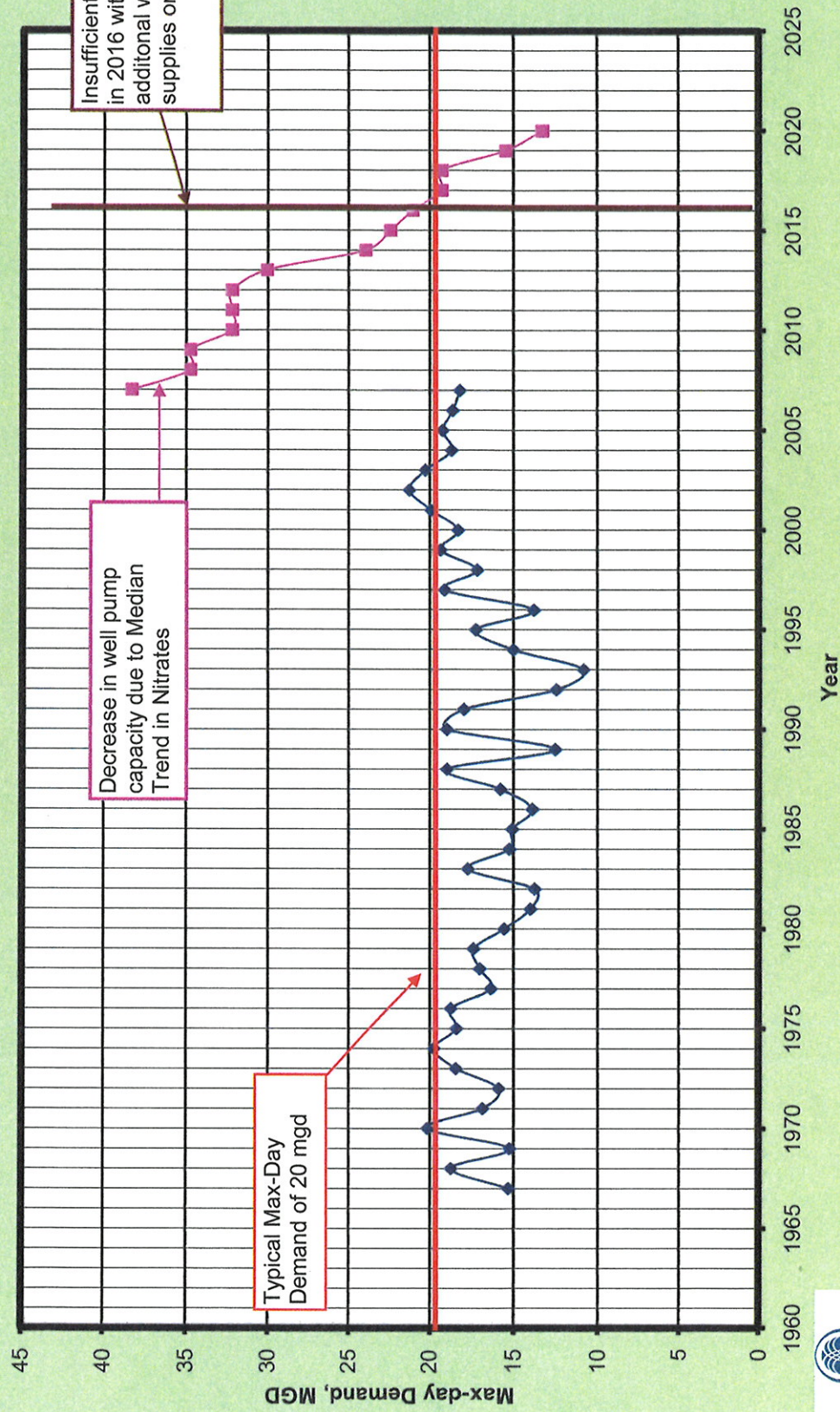
The graph titled "Median Nitrate Capacity vs. Max-Day Demand" represents a median nitrate level of the wells. These data represent a water system configuration that can mix the water from various wells prior to being released into the water system for consumption. A form of "treatment" is to mix high nitrate water with low nitrate water to a nitrate level less than 10.0 mg/l.

The data on future nitrate trends clearly indicate that some form of treatment or securing of a new water source low in nitrates will be needed in the next 2 to 6 years. The likelihood of finding a water source that remains low in nitrates and within an economical distance to Hastings appears to be remote.

High Nitrate Capacity Trend vs Max-Day Demand



Median Nitrate Capacity Trend vs Max-day Demand



5.0 Groundwater Modeling and Wellhead Protection Area Delineation

Prior to the development of the Airport Well Field and as proposed in the 1996 Water Supply Study a groundwater modeling was developed. This model was commissioned to better understand the zone of influence of the existing wells. The Groundwater Modeling Study and Well Head Protection Area Delineation for Hastings Utilities Municipal Well Field were completed in 1997. A copy of this study can be viewed at the HU Engineering Department.

5.1 Groundwater Model Development

The Groundwater Modeling Study and Well Head Protection Area Delineation used a computer model to determine the zone of influence of each municipal well. The computer modeling used data from municipal well pumping history, geological logs, irrigation well logs, hydraulic conductivity and hydraulic gradient records, surface water flows, and information from various groundwater studies of the Hastings Area. The modeling determined a zone of influence based upon various travel times. This included 5 to 20 years of travel.

To assist in the development of the 1997 groundwater model a technical advisory group was established. This group included technical staff from the Hastings Planning and Zoning Department, Adams County Area Planning and Zoning Department, Adams County Extension, City of Hastings Landfill, Hastings Utilities, Little Blue NRD and Upper Big Blue NRD. The technical advisory group provided peer review of the study. The technical advisory group also provided valuable input of the water use in the WHPA.

The groundwater study determined that water recharge for the municipal wells includes rainfall within the WHPA, recharge from irrigation, groundwater influx from the Platte River and influx from irrigation canals located North of Minden, NE. The technical advisory group also recognized that surface runoff can move contaminants into the path of a well's influence even though potential groundwater contaminants may have originated outside the capture zone of the well. These contaminants can enter the aquifer through seepage within man made or natural retention areas. The technical advisory group also recognized that irrigation seepage below the root zone and improperly constructed or abandoned wells can be a source of groundwater contamination.

The Hastings Wellhead Protection Boundary has been delineated and mapped. See a copy of this map and legal description at the end of this section. The WHPA includes the expected 20 year zone of influence for the municipal wells and the local ground surface drainage area.

The Hastings WHPA as delineated is unique in that it addresses the potential of surface runoff carrying contamination into the path of the 20 year travel time of influence. It also recognizes the water system which is the life blood of the City of Hastings needs to be secured for more than 20 years. The Surface drainage boundary closely matches a 50 year travel time.

5.2 Wellhead Protection Boundary Ordinance

As per the attached map found at the end of this section the Hastings Wellhead Protection Area was adopted by NDEQ January, 1999. This area encompasses the 20 year travel time for the municipal wells. In March of 1999 an addendum was adopted by NDEQ to include the Community Municipal System that was gifted to the City of Hastings and became part of the Hastings Water System.

In 2008 to further develop wellhead protection activities the Board of Public Works requested staff to develop a Wellhead Protection Boundary Ordinance. As a condition of obtaining approval for the Wellhead Protection Boundary Ordinance the Board of Public Works required consent by Adams County. This boundary ordinance was presented to the Adams County Area Planning and Zoning Commission for approval. It was approved and the commission recommended approval by the Adams County Board of Supervisors. The commission also recommended inclusion of the boundary in their comprehensive plan. On September 5, 2009 the Adams County Board of Supervisors approved a resolution adopting the Hastings Wellhead Protection Boundary. A copy of this resolution can be found at the end of this section. A copy of the Adams County Comprehensive Plan can be viewed at the Adams County Public Works Department.

To facilitate the approval by the City of Hastings Council, the Wellhead Protection Boundary Ordinance was presented to the City of Hastings Planning and Zoning Commission. The City of Hastings Planning and Zoning Commission recommended approval by the Hastings City Council. See copy of minutes at the end of this section. The Adams County Board of Supervisors approved the Wellhead Protection Area by Resolution 09-05-05 dated May 5th, 2009. See a copy at the end of this section.

In preparation to adopt a Wellhead Protection Boundary Ordinance by the Hastings City Council it requires approval and recommendation by the Hastings Planning a Zoning Commission. The commission recommended approval by the City Council. The City of Hastings held a public hearing on May 11, 2009 and adopted Ordinance No. 4221. This ordinance delineates the boundary of the Hastings Wellhead Protection Area. See copy of ordinance at end of this section.

EXECUTIVE SUMMARY

Purpose and Approach

- The purpose of the Hastings Water Supply Study is to evaluate the City's existing water system and determine the improvements required to accommodate system growth through the design period and identify treatment requirements based on the evolving criteria of the Safe Drinking Water Act regulations.
- The Study includes seven (7) Technical Memorandums (chapters). These TM's address the issues related to the increasing demands and regulatory requirements which are impacting the Hasting Utilities (HU) system. The alternative analysis, recommended plan and implementation plan outline the required system improvements. Following is a summary of the key conclusions and recommendations for each Technical Memorandum.

Technical Memorandum No. 1 - Population/Water Use Forecast

- The total projected service population is projected to increase to approximately 26,600 by the year 2015. A portion of this growth includes expansion of the service area to existing systems adjacent to the existing HU system.
- Water demands including AGP are projected to increase to 27 MGD and 36 MGD for maximum day and peak hour demands, respectively.

Technical Memorandum No. 2 - Water Supply Evaluation

- Five existing wells have high levels of VOC's or nitrates and are currently out of service.
- The well vulnerability analysis estimates that VOC or nitrate contamination may impact five (5) more wells within approximately 5 years and an additional three wells in the next 10-20 years.
- The loss of existing wells and the increasing demands will require the construction of approximately 10 wells in the next 20 years if no storage is added to the system. With a reservoir for storage, the number required is approximately 5 new wells.
- Development of the future water supply using a wellfield concept is recommended to minimize costs to meet near term treatment requirements and allow optimum flexibility for possible requirements in the future.

- A wellhead protection program should be considered as an integral part of the water supply system in order to minimize long term risk of groundwater contamination.
- A wellfield concept will result in increased development of wells in a specific portion of the aquifer. Prior to extensive development of wells in the airport area, HU should complete an analysis (groundwater model) of the aquifer to evaluate the safe yield of the proposed wellfield.

Technical Memorandum No. 3 - Water Quality/Treatment Evaluation

- The current system includes 26 wells which are uniformly distributed across the system. Treatment is not provided. Five of the wells are out of service or used on an emergency basis only due to contamination.
- HU's water supply is in compliance with current drinking water regulation; however, the Safe Drinking Water Act regulations are likely to impact the system in the future.
- The water exceeds the action limit for copper which may require corrosion control actions. Additional discussion on this issue is in TM No. 4.
- The future groundwater disinfection rule may impact the system. The source water appears to comply with "natural disinfection" criteria as evaluated by the VIRALT model; however, distribution system disinfection may be required. This rule is several years from being finalized and should be monitored to determine the impact and timing.
- VOC's or nitrate contamination may impact several wells in the future as identified in summary for TM No. 2.
- A future radon limit of 200 pCi/l and a future arsenic limit of 2 µg/l would impact several additional wells; however, the final regulations for these parameters are not anticipated to be as stringent as initially discussed. HU should monitor the status of these regulations.
- Treatment requirements include carbonate passivation with caustic to reduce copper levels and sodium hypochlorite for disinfection.
- Long term nitrate levels do pose some concern and efforts to change the upward trend in nitrates would be beneficial. Nitrate removal would require processes such as reverse osmosis or ion exchange which would dramatically increase treatment costs.

Technical Memorandum No. 4 - Corrosion Control Study

- The Lead and Copper Rule establishes limits for these parameters and requires a corrosion control plan if the limits are exceeded.
- HU water system had a 90th percentile lead concentration of 4 µg/l (well below the 15 µg/l limit); however, the 90th percentile copper level of 1.63 mg/l exceeded the action limit of 1.3 mg/l.
- Corrosion control strategies reviewed and evaluated seven chemicals as possible alternatives. Carbonate passivation by increasing the pH with caustic addition is recommended.
- An evaluation by Center for Disease Control and NDOH on the effects of copper is underway. HU should monitor the progress and potential changes to the copper limits.
- HU has submitted the corrosion control study in accordance with NDOH requirements.

Technical Memorandum No. 5 - Alternative Analysis

- Nine alternatives were evaluated including various combinations of wellhead treatment and central treatment and distribution storage versus no storage.

The recommended plan includes:

- Three treatment units and piping to treat nine existing wells. Nine new wells in a northwest wellfield and existing northwest wells would be connected to a central treatment facility with booster pumping capabilities.
- Several transmission mains to facilitate transfer of water through the system particularly from the northern to southern areas of the system.
- Distribution main improvements are required to provide the required pressure during peak flow conditions and for fire flow requirements.

Technical Memorandum No. 6 - Implementation Plan

- Supply, treatment, and piping improvements have an estimated cost of \$14,313,000 (1996 dollars) over the design period. If treatment is not required the estimated cost is reduced to \$10,985,000.

- The approximate costs for improvements requiring treatment are as follows:

Thru 1998	-	\$6,169,000
1999-2004	-	\$6,321,000
2005-2015	-	\$1,823,000

- The plan recommendations include:
 - Monitor Safe Drinking Water Act status
 - Proceed with expansion of supply in northwest area. An aquifer model and wellhead protection would evaluate the safe yield and aid in protecting the quality of the water supply.
 - Construction of transmission main to facilitate the distribution of water from the north to the south will be necessary as southern wells are shut down.
 - Maintain flexibility in the use and routing of piping until treatment requirements are defined.
 - Continued modeling to the water system improvements. HU modeled the piping improvements outlined in the alternative analysis and should model the main improvements to allow evaluation of benefits and optimization of the various projects.
 - Maintain flexibility to allow construction of future reservoirs which could increase system capacity and reliability without constructing new wells or transmission mains.

GROUNDWATER RESOURCE EVALUATION AND WELLHEAD PROTECTION MODELING STUDY FOR WATER MUNICIPALITY IN AGRICULTURAL SETTING

Tiraz Birdie
Layne GeoSciences, Inc., Mission Woods, KS

Marty Stange
Hastings Utilities, Hastings, NE

Glenn Dostal
HDR Engineering, Omaha, NE

Abstract

Hastings Utilities (HU) initiated a groundwater modeling study of the aquifer underlying the City of Hastings, Nebraska. The project goals were pro-active in nature. Although the aquifer did not appear to be mined, significant water level declines had occurred in the past. HU was therefore interested in determining the capability of the aquifer to support present and future demand for potable water. Additionally, the land surrounding Hastings is under heavy agricultural cultivation. Therefore, the impact of agriculture on the groundwater quality is of concern to HU. The objectives of the modeling study were therefore specifically defined to:

- Estimate the aquifer safe yield in the area.
- Delineate Well Head Protection Areas (WHPA) for municipal wells in order to ensure appropriate utilization of land in the contributing zone, and to develop a monitoring well program for providing adequate warning of deteriorating water quality.
- Identify suitable locations and spacing of new wells to replace existing wells rendered in-operational due to water quality problems and deteriorating well condition.
- Assess impact of advective-dispersive processes on migration of nitrates in groundwater.

The study was conducted in two distinct and sequential phases. Phase 1 involved the construction of a regional groundwater flow model to estimate the aquifer safe yield. The majority of the groundwater withdrawal in the area is for irrigation purposes and the subsurface hydrology is strongly affected by flow in the Platte River and diversion of water

from the Platte River upstream of Hastings. Because of these factors, a relatively large area was modeled for estimating the aquifer safe yield.

Phase 2 of the study involved construction of a local site model in the immediate vicinity of Hastings. The model boundary conditions were obtained from the larger regional model constructed for Phase 1 of the project. The smaller area of the Phase 2 model permitted use of a finer model grid. This was required to delineate the WHPA precisely and also to assess the impact of mutual well interference for optimal placement of new wells. A particle tracking module was coupled with the groundwater flow model to delineate the wellhead protection areas. Finally, a representative transport model was developed to assess the need for simulating advective-dispersive processes for estimating future nitrate levels in the municipal wells.

The model results revealed some interesting changes in the groundwater dynamics in the area. Mass balance computations indicated that the fluxes into and out of the study area have increased by approximately 60 percent with development. This is attributed mainly to increased stress on the system due to irrigation withdrawals. Recharge from infiltration appears to have increased by 25 percent, primarily due to irrigation return flow. Seepage from irrigation canals further upstream of the study area has resulted in an approximate doubling of base flow entering the study area. The lowering of the water table has however caused a decrease of streamflows in the area.

Several hypothetical groundwater development scenario runs were conducted to determine the capability of the aquifer to support increased future withdrawals in the area. Simulation results indicated that the aquifer could support anticipated withdrawals for both municipal and irrigation purposes without mining the aquifer assuming no deviation in long-term climatic trends. Additionally, the model supported the development of a new wellfield (to replace the existing wellfield) in a portion of the study area less susceptible to contamination from nitrates.

Wellhead protection areas were delineated for various times of travel. Sensitivity simulations were conducted to estimate the impact of uncertainty in the model-specified effective porosity on the delineated capture zones. Hypothetical simulations were conducted with an advective-dispersive model to estimate the potential for nitrate contamination at the municipal wells from point and nonpoint sources in the area.

RESOLUTION 09-05-05

A resolution adopting the proposed boundary for the Hastings Wellhead Protection Area.

WHEREAS, residents of the City of Hastings, Adams County, Nebraska, rely exclusively on groundwater for their drinking water; and

WHEREAS, public water supply wells are adversely affected by pollution of the land and water surrounding said wells; and

WHEREAS, wellhead protection areas are created to help minimize potential pollution of the land and water surrounding public water supply wells; and

WHEREAS, Hastings Utilities has proposed a boundary for the Hastings Wellhead Protection Area, extending outside the City of Hastings' corporate limits into unincorporated areas of Adams County; and

WHEREAS, the Hastings Wellhead Protection Area includes the surface and subsurface area surrounding all water supply wells or well fields supplying the Hastings public water system through which contaminants are reasonably likely to move toward and reach such wells or well fields; and

WHEREAS, the Hastings Wellhead Protection Area is necessary and essential to the protection of the Hastings public water supply system; and

WHEREAS, recognition and adoption by Adams County of the proposed boundary for the Hastings Wellhead Protection Area is an essential and important step in the City of Hastings' process of passing and approving an ordinance creating said Area.

NOW, THEREFORE, BE IT RESOLVED by the Board of Supervisors of Adams County that the proposed boundary for the Hastings Wellhead Protection Area, as set forth herein

by the map attached hereto and incorporated herein by this reference, is hereby adopted by the Board of Supervisors of Adams County.

Dated this 5th day of May, 2009.



ATTEST:

Chrisella Lewis

Chrisella Lewis
Adams County Clerk

Larry Woodman

Larry Woodman
Chairman - Board of Supervisors

Moved by Neumann

Seconded by Larson

Voting Aye Rohae, Larson, Neumann, Hynes, Baathoff, Woodman

Voting Nay none - Dithmann, absent

ORDINANCE NO. 4221

AN ORDINANCE OF THE CITY OF HASTINGS, NEBRASKA, AMENDING HASTINGS CITY CODE SECTION 32-601, CREATING HASTINGS CITY CODE SECTION 32-616.01 REGARDING WELLHEAD PROTECTION AREAS; AND PROVIDING AN EFFECTIVE DATE AND REPEALING ANY ORDINANCES OR OTHER PROVISIONS IN CONFLICT WITH.

BE IT ORDAINED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF HASTINGS, NEBRASKA:

SECTION 1. That Hastings City Code Section 32-601 be amended by adding the following:

32-601. Definitions.

(22) Wellhead Protection Area. The surface and subsurface area surrounding a water supply well or well field, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water or well field.

SECTION 2. That Hastings City Code Section 32-616.01 be added to read as follows:

32-616.01 Wellhead protection areas.

The City of Hastings designates the Hastings Wellhead Protection Areas for the purpose of protecting the public water supply system. The boundaries of the Hastings Wellhead Protection Areas are as follows:

Township 8 North, Range 11 West of the 6th P.M., Adams County, Nebraska

All of Sections 8, 9, 13 thru 17, 21 thru 27 and 35, the West Half (W ½) of Section 10 and the North Half (N ½) of Section 35.

Township 8 North, Range 10 West of the 6th P.M., Adams County, Nebraska

All of Sections 9, 10 and 15 thru 36, the South Half and the Northwest Quarter (S ½ & NW 1/4) of Section 3, the East Half (E ½) of Section 4, and the West Half (W ½) of Sections 11 and 14.

Township 8 North, Range 9 West of the 6th P.M., Adams County, Nebraska

The West Half (W ½) of Sections 29 and 32, all of Fractional Sections 30 and 31.

Township 7 North, Range 11 West of the 6th P.M., Adams County, Nebraska

All of Sections 1 and 12, the North Half (N ½) of Section 13.

Township 7 North, Range 10 West of the 6th P.M., Adams County, Nebraska

All of Sections 1 thru 18 and the North Half (N ½) Section 24.

Township 7 North, Range 9 West of the 6th P.M., Adams County, Nebraska

All of Sections 8 thru 11 and 14 thru 17, all of Fractional Sections 6, 7, 18 and the North Half (N ½) of Fractional Section 19, the West Half (W ½) of Sections 5, 12 and 13, the North Half (N ½) of Sections 20 thru 23 and the Northwest Quarter (NW ¼) of Section 24.

SECTION 3. Any ordinance passed and approved prior to this passage, approval and publication or posting of this ordinance, and in conflict with its provisions, is hereby repealed.

SECTION 4. The provisions of this ordinance are separable, and the invalidity of any phrase, clause or part of this ordinance shall not affect the validity or effectiveness of the remainder of this ordinance.

SECTION 5. This ordinance shall take effect and be in full force from and after its passage, approval and publication or posting as required by law, in its entirety, or in pamphlet form, as the case may be, said effective date being 15 days from and after the date this ordinance is passed approved, said effective date being May 27, 2009. This ordinance shall be included in the Hastings City Code Book.

PASSED AND APPROVED by the Mayor and City Council of the City of Hastings, Nebraska this 11th day of May, 2009.



Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

City Attorney

City Surveyor

GROUNDWATER RESOURCE EVALUATION AND WELLHEAD PROTECTION MODELING STUDY FOR WATER MUNICIPALITY IN AGRICULTURAL SETTING

Tiraz Birdie
Layne GeoSciences, Inc., Mission Woods, KS

Marty Stange
Hastings Utilities, Hastings, NE

Glenn Dostal
HDR Engineering, Omaha, NE

Abstract

Hastings Utilities (HU) initiated a groundwater modeling study of the aquifer underlying the City of Hastings, Nebraska. The project goals were pro-active in nature. Although the aquifer did not appear to be mined, significant water level declines had occurred in the past. HU was therefore interested in determining the capability of the aquifer to support present and future demand for potable water. Additionally, the land surrounding Hastings is under heavy agricultural cultivation. Therefore, the impact of agriculture on the groundwater quality is of concern to HU. The objectives of the modeling study were therefore specifically defined to:

- Estimate the aquifer safe yield in the area.
- Delineate Well Head Protection Areas (WHPA) for municipal wells in order to ensure appropriate utilization of land in the contributing zone, and to develop a monitoring well program for providing adequate warning of deteriorating water quality.
- Identify suitable locations and spacing of new wells to replace existing wells rendered in-operational due to water quality problems and deteriorating well condition.
- Assess impact of advective-dispersive processes on migration of nitrates in groundwater.

The study was conducted in two distinct and sequential phases. Phase 1 involved the construction of a regional groundwater flow model to estimate the aquifer safe yield. The majority of the groundwater withdrawal in the area is for irrigation purposes and the subsurface hydrology is strongly affected by flow in the Platte River and diversion of water

from the Platte River upstream of Hastings. Because of these factors, a relatively large area was modeled for estimating the aquifer safe yield.

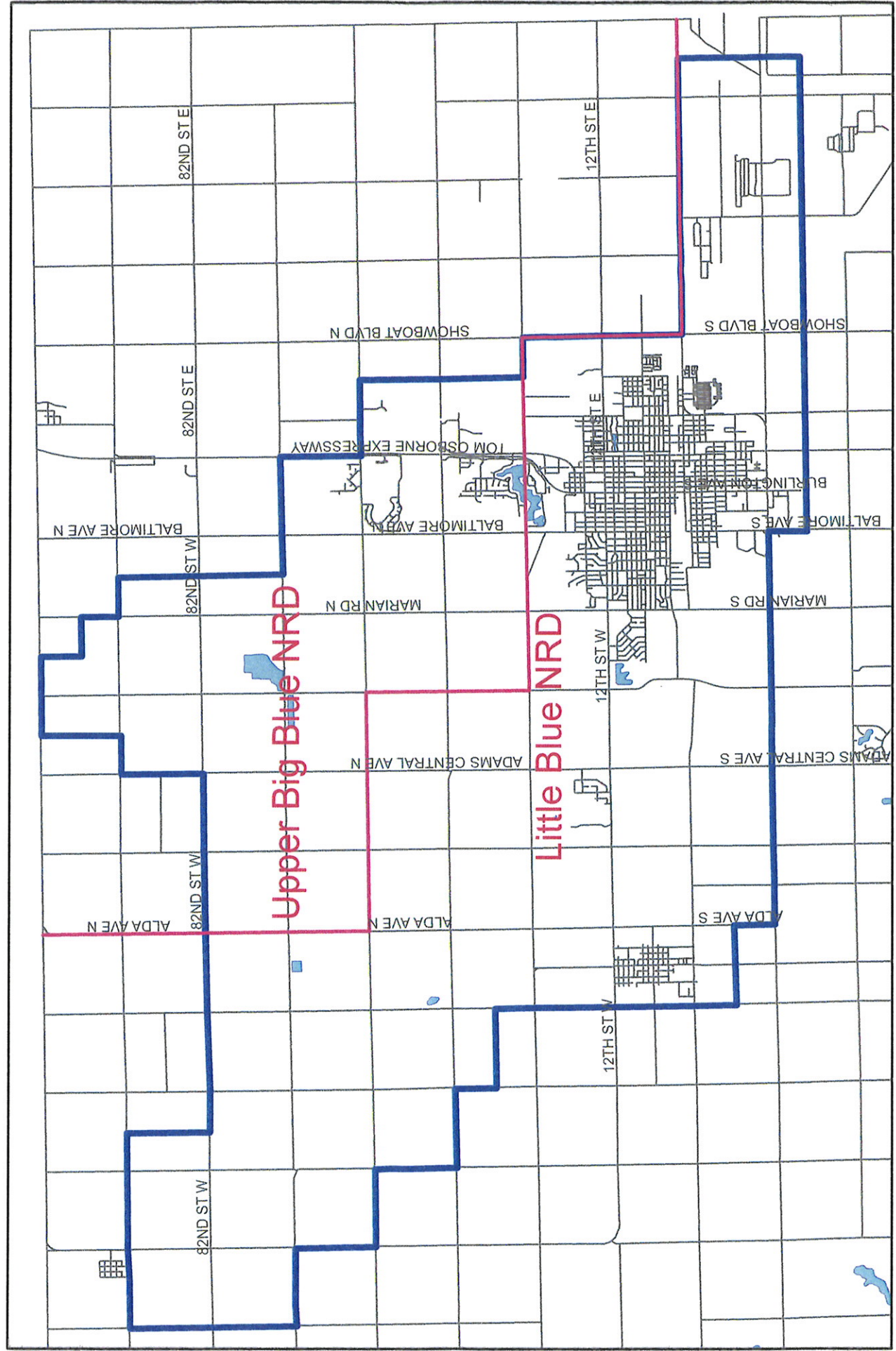
Phase 2 of the study involved construction of a local site model in the immediate vicinity of Hastings. The model boundary conditions were obtained from the larger regional model constructed for Phase 1 of the project. The smaller area of the Phase 2 model permitted use of a finer model grid. This was required to delineate the WHPA precisely and also to assess the impact of mutual well interference for optimal placement of new wells. A particle tracking module was coupled with the groundwater flow model to delineate the wellhead protection areas. Finally, a representative transport model was developed to assess the need for simulating advective-dispersive processes for estimating future nitrate levels in the municipal wells.

The model results revealed some interesting changes in the groundwater dynamics in the area. Mass balance computations indicated that the fluxes into and out of the study area have increased by approximately 60 percent with development. This is attributed mainly to increased stress on the system due to irrigation withdrawals. Recharge from infiltration appears to have increased by 25 percent, primarily due to irrigation return flow. Seepage from irrigation canals further upstream of the study area has resulted in an approximate doubling of base flow entering the study area. The lowering of the water table has however caused a decrease of streamflows in the area.

Several hypothetical groundwater development scenario runs were conducted to determine the capability of the aquifer to support increased future withdrawals in the area. Simulation results indicated that the aquifer could support anticipated withdrawals for both municipal and irrigation purposes without mining the aquifer assuming no deviation in long-term climatic trends. Additionally, the model supported the development of a new wellfield (to replace the existing wellfield) in a portion of the study area less susceptible to contamination from nitrates.

Wellhead protection areas were delineated for various times of travel. Sensitivity simulations were conducted to estimate the impact of uncertainty in the model-specified effective porosity on the delineated capture zones. Hypothetical simulations were conducted with an advective-dispersive model to estimate the potential for nitrate contamination at the municipal wells from point and nonpoint sources in the area.

WELLHEAD PROTECTION AREA MAP



Note:

Total WHPA - 75.75 sections

WHPA within LBNRD - 53.5 sections

WHPA within UBBNRD - 22.25 sections

— Natural Resources District (NRD) Divided Boundary

□ Wellhead Protection Area



6.0 Potential Source Contaminant Inventory

A Potential Contaminant Source Inventory Report for the Wellhead Protection Area was prepared in 2005 and then updated in 2009. The Contaminant Source Inventory is intended to provide a summary of the sources and activities that could potentially contribute to pollution of the groundwater supplies.

Please note the potential contaminant sources identified in the report do not necessarily indicate a pollution problem exists they are only identified to indicate these activities if conducted improperly could contribute to pollution of the groundwater supply.

The Potential Contaminant Inventory Report provides for a narrative on the extent of the research and depth of investigation completed. The report has been written to meet the needs of the Hastings Wellhead Protection Area and to address the relationship of surface runoff to groundwater recharge. See a copy of the report at the end of this section.

6.1 Mapping and GIS

Maps referred to in the report are being developed and maintained on a Geographical Information System technology (GIS). The GIS is being supported and maintained by Hastings Utilities. The GIS data will be used to organize and analyze future groundwater and WHPA data. This data will include well inventories, land use, water quality, water use and other information in support of the Hastings Wellhead Protection Plan. This information will be utilized for future groundwater modeling and public education. A copy of these maps can be reviewed at the HU Engineering office.

Hastings Utilities Water System

Wellhead Protection - Potential Contaminant Inventory Report

Prepared 8/4/05
Revised 1/26/09

Prepared by: Marty Stange
Environmental Engineer
Hastings Utilities
1228 North Denver Avenue
Hastings, Nebraska 68901
Phone 402-463-1371
Fax 402-462-3666
Web site www.hastingsutilities.com
Email mstange@hastingsutilities.com



Foreword

This report has been prepared by Hastings Utilities staff to summarize the types and sources of contaminants found within the Hastings Wellhead Protection Area. The wellhead protection area was delineated upon the completion of the "Groundwater Modeling Study and Wellhead Protection Area Delineation for Hastings Utilities Municipal Well Field" in 1997.

This report of potential contaminate sources has been prepared to assist Hastings Utilities in its effort to insure that a safe supply of potable water is provided the City of Hastings. This report will serve as a tool to assist in the monitoring of activities within the wellhead protection area that could potentially impact the water supply. This information will be provided to local and state regulatory agencies having an interest in this information. It is also available to the general public.

The intended use of this data is to provide information for continued public education efforts by Hastings Utilities as well as state and local regulatory agencies to promote the use of "Best Management Practices". This includes proper handling of hazardous chemicals, wastes, engineering controls, design and use of septic systems, lawn and garden chemicals use, agricultural practices. Currently various agencies have "Best Management Practices" regulations that are sufficient to protect the Hastings water supply. This assumes these regulations are adequately enforced. This report is intended to help assist the various agencies better understand the activities within the wellhead protection area.

Table of Contents

Introduction	Page 1
Wellhead Protection Delineation	Page 2
Potential Source Inventory Assessment	Page 6
Potential Source Inventory Summary	Page 8
Signage	Page 10

Introduction

The land use within the Hastings Wellhead Protection Area (WHPA) is used for agricultural, industrial, municipal and domestic purposes. The water supply historically has experienced industrial contamination that has prompted several municipal wells to be abandoned. Within the City of Hastings several groundwater plumes have been identified. These plumes are associated with various USEPA Superfund sites. These Superfund sites are collectively called the Hastings Superfund Site. Contaminates for these sites has been principally industrial solvents. These include solvents such as trichloroethylene, carbon tetrachloride and ethylene dibromide. Some explosives associated with the Hastings Naval Ammunition Depot located southeast of Hastings have been found. This contamination is not expected to impact the Hastings WHPA.

Groundwater adjacent and within the city limits of Hastings has experienced a rise in nitrate levels. Nitrate contamination has become more of a problem as many wells are near the Maximum Contaminate Level (MCL) of 10 mg/l. The MCL of 10 mg/l for nitrates has been determined by USEPA and NHHS as the safe drinking water level. Nitrate contamination is a concern for infants as it interferes with the oxygen carrying capacity of the blood. This is an acute condition that requires immediately medical attention. This is known as the Blue Baby Syndrome. Several municipal wells have been shut down due to nitrate contamination.

Hastings Utilities has monitored the groundwater contamination for many years. This effort has been accomplished with the assistance of various regulatory agencies. The USEPA and NDEQ have been involved in the groundwater water contamination associated with the Hastings Superfund sites. The Upper Big Blue and Little Blue Natural Resources Districts have provided assistance in monitoring nitrate contamination.

The purpose of this report is to summarize potential sources of contamination that could be found within the Hastings WHPA. It should be noted that a potential contaminate source does not mean that it is a source of contamination. It simply means that similar activities have been associated with contamination of groundwater supplies. The potential for groundwater contamination to occur is dependent upon the contamination, the source, exposure, amount released, geological conditions and many other factors. The potential for a specific contamination to occur is outside the scope of this report. This report is only intended to assist in the identification of various activities within the wellhead protection area that may require monitoring. With respect to all activities that could potentially contaminate groundwater supplies the best use of this data is to promote the use of best management practices. The cost of containing, treating or mitigating existing contamination is very expensive. Prevention of future groundwater contamination is much more cost effective than treatment.

Wellhead Protection Area Delineation

A study was commissioned by Hastings Utilities to determine the source of groundwater for the municipal water production wells. In addition the study determined the source of recharge for the local groundwater supply. The study was completed in 1997. The study was presented to the Hastings Utilities Board of Public Works and upon review established the Hastings Wellhead Protection Area. See figure 1 for boundaries of the Hastings Wellhead Protection Area (Hastings WHPA).

The area consists of 68.25 square miles. The land use is agricultural with urban and industrial activities in and around the City of Hastings, Nebraska. The Hastings WHPA is located in both the Upper Big Blue NRD and Little Blue NRD. The Upper Big Blue NRD regulates 22.25 square miles of the Hastings WHPA. The Little Blue NRD regulates 46 square miles of the Hastings WHPA. The Hastings WHPA lies within Adams County.

Groundwater flow is generally from the northwest to the southeast. However, pumping by irrigation and industrial wells will impact the direction of local groundwater flows. The study determined a 20-year travel distance and direction of flow for each municipal well. The recharge for this zone is from groundwater flow originating from northwest of Hastings along the Platte River near Gibbon, NE and a groundwater mound located north of Minden, NE. Rainfall and irrigation return also recharge this aquifer. Local storm water retention areas provide sufficient detention to allow infiltration to occur. This storm water runoff originates from lands located as far west as Prosser, NE and north to the Hall / Adams County line. Contamination from these storm water runoff areas could travel to retention cells located within the 20-year time of travel zone as such these areas of runoff are included in the Hastings WHPA. A copy of the Wellhead Protection Study is kept on file at Hastings Utilities Engineering Department.

Potential Contaminant Source Assessment

Within the Hastings Wellhead Protection Area (WHPA) agricultural, domestic, and urban activities abound. This is typical of rural Nebraska with an urban economic center. The area receives approximately 26 inches of rain annually and has approximately 54 inches of evaporation. The area is considered semi-arid as such irrigation for both urban, domestic and agricultural activities are the major source of groundwater use. The highest demand for groundwater is in the summer months. Groundwater is also used for electrical power production. Cooling is the major groundwater use for industries. Municipal, domestic and livestock also consume groundwater for potable use.

These uses of groundwater are also associated with activities that could potentially contaminate the groundwater supplies. The disposal of cooling water, sewage discharge, and irrigation runoff could potentially carry contamination into the aquifer. The groundwater is approximately 120 feet deep. This provides some natural protection of the groundwater supplies. Improperly abandoned wells have been recognized as significant sources of groundwater contamination. The proximity of domestic and irrigation wells to septic systems can also allow contamination to enter the groundwater. These wells provide a conduit for contamination to enter the groundwater supply without the benefits of filtration from the substrate.

The potential sources of contamination that are found in the Hastings WHPA originate from both urban and agricultural sources. The following is a summary of the general types of contamination that may be found:

<u>Type of Contamination</u>	<u>Sources</u>	<u>Chemistry</u>
Industrial solvents	Metal fabrication Industrial painting	Trichloroethylene Carbon Tetrachloride
Pesticides	Grain fumigation Insect control both Urban and Agricultural	Ethylene Dibromide Carbon Tetrachloride Pesticides
Herbicides	Lawn, gardens, farming	Atrazine, 2-4, D Other farm herbicides
Sewage	Municipal and Domestic	Nitrates, Pathogens Industrial wastes
Animal Waste	Feed lots	Nitrates, Pathogens
Petroleum products	Bulk Fuel Storage	Gasoline, Diesel

The Potential Contaminant Source Assessment list as noted above certainly is not complete for all types of activities that can be found within the Hastings WHPA. The intent of the list is to provide a general understanding of the types of contaminants that could potentially impact the aquifer. By knowing the types of contamination that could be found appropriate monitoring can be conducted. This monitoring may include water testing of up gradient wells, testing of municipal wells, field surveys, and coordination with state and federal agencies.

An example of coordination with state agencies is the monitoring of underground fuel storage tanks. The State Fire Marshal's office and NDEQ are responsible for monitoring underground fuel storage tanks. Information is provided by these agencies on the installation of new tanks, removal of existing tanks, site investigations and locations reporting spills.

Potential Contaminant Source Inventory

The activities within the Hastings WHPA potentially involve many types of contamination. The amount of material used will vary greatly. For example fuel storage may be as little as 500 gallon to several thousand gallons. The potential for groundwater contamination is just as great for a small facility as it is for a large facility if leaks and spills are not controlled. Detailed assessment on the degree which each facility has the potential to contaminate the aquifer is beyond the scope of this report.

The following is a general discussion of the types of activities that warrant monitoring by the Hastings Water System:

Industrial Solvents Industrial solvents are used in metal fabrication, painting, dry cleaning and other industries for chemical cleaning. Industrial solvents may be found in ready to use quantities and in bulk quantities. Ready to use amounts typically do not have sufficient quantities to contaminate the aquifer. Bulk storage of industrial solvents generally poses the greatest risk to groundwater contamination.

Several plumes of contamination have been identified within and adjacent to the City of Hastings. These are associated with the Hastings Superfund sites. The efforts by the City of Hastings and Hastings Utilities to maintain the Hastings Institutional Control Area (ICA) should be continued, as it is means to monitor existing plumes. This is confirmed with the recent investigations associated with the Hastings ICA that indicate additional plumes are also present. These plumes are associated with the Dana and Garvey sub-sites.

The industrial solvents are compounds that are volatile and are typically chlorinated. These include Trichloroethylene, Tetra-chloroethylene, and Carbon Tetrachloride. The EPA scan 524 is used to test for volatile organic compounds. Heavy metal contamination can also occur with industrial solvents as the solvents are used in the preparation of metals for painting or fabrication. Metals such as chromium, cadmium, arsenic and copper should also be monitored. An inorganic scan would be appropriate to monitor heavy metals.

See figure 2 for location of the plumes of contamination associated with the Hastings ICA. Please also see figure 3 for location of industrial parks and transportation routes. The areas are locations that have activities that could potentially have industrial solvent usage. These areas also have the potential for spills due to accidents.

Petroleum Fuel Storage The storage of petroleum fuels has been associated with leaks and spills that could potentially enter the aquifer. The contaminants of concern are gasoline and diesel. Several locations of groundwater contamination from gasoline storage have been found in the City of Hastings. Petroleum storage does occur in many locations throughout the Hastings WPA. A commercial gas station will have several 1000 gallon tanks of fuel storage. Bulk storage of petroleum fuels is found at

power plants, asphalt plants, truck service centers, and fleet vehicle support facilities. Storage on farms can and does exceed 1000 gallons. Diesel powered irrigation wells may have up to 1000 gallons of diesel fuel stored.

Gasoline has volatile compounds such as Benzene, Ethyl-benzene, Toluene and Xylene. This group of compounds is collectively known as BTEX compounds. The EPA scan 524 is the standard test for volatile organic compounds which include BTEX compounds. Diesel is a hydrocarbon mixture that contains poly-aromatic hydrocarbons like naphthalene. The appropriate test for naphthalene would be a standard test for Poly-Aromatic Hydrocarbons.

Pesticides and Herbicides Pesticides and herbicides are stored and used throughout the entire Hastings WHPA. The uses include lawn and garden use, agricultural use, commercial fumigation, grain fumigation and public pest control. Pesticides and herbicides are placed into the environment by liquid sprays, aerosols, and granular applications. Newer pesticides and herbicides are organic in composition and break down in the environment. However residual and daughter products can potentially contaminate the aquifer. Some pesticides have used metals such as Arsenic and Cyanide. The use of pesticides and herbicides is so wide spread that contamination may be considered non-point. However certain locations such as bulk storage facilities, aerial application facilities and commercial application facilities can be sources of spills and leaks.

Currently several locations of pesticide contamination have been identified within the City of Hastings. These are associated with the use of Ethylene Dibromide a grain fumigation product. The use of Ethylene Dibromide is typically associated with Carbon Tetrachloride as it was used as a dispersing agent for the Ethylene Dibromide.

To monitor for this type of contamination EPA scan 524 is used to test for volatile organic compound Carbon Tetrachloride. To monitor for Ethylene Dibromide EPA Scan 504 is used. The monitoring of pesticides and herbicides can range significantly as many different products are used. However a Nebraska Scan has been used which tests for several of the commonly agricultural and home use pesticides and herbicides.

Sewage The impact of sewage on the aquifer is difficult to detect, however changes in inorganic chemistry can give an indication that sewage has impacted the aquifer. Biological testing can also be used to indicate the presence of sewage. Testing for Nitrates may also indicate the presence of sewage. The use of household suitability tests which include nitrates, total dissolved solids, chlorides, sulfates, and pH is an inexpensive method used to monitor changes in water quality.

Signage

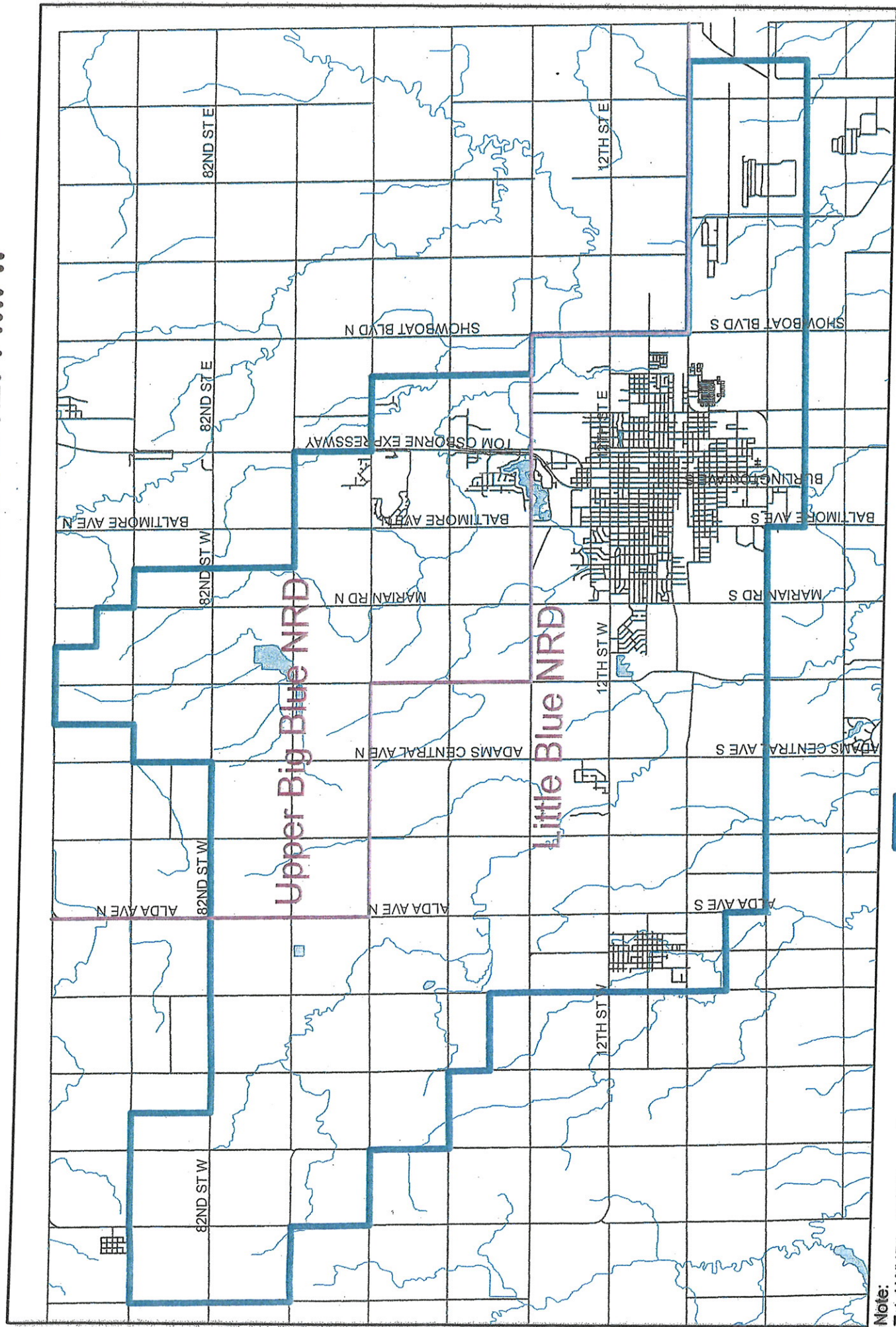
To aid in the identification of the wellhead protection area, signage has been placed on major roadways in the area. Attached figure 8 shows the location of these signs.

Potential Contaminant Sources Maps

The following activities have been mapped and are attached:

- | | |
|-----------------|--|
| Figure 1 | Wellhead Protection Area and NRD District Boundaries |
| Figure 2 | Urban and Rural zoning |
| Figure 3 | Industrial Parks and Transportation Routes |
| Figure 4 | Private domestic wells, septic tanks, and Irrigation wells |
| Figure 5 | Farmsteads, and feedlots |
| Figure 6 | Petroleum Fuel Storage Greater than 1000 gallons |
| Figure 7 | Superfund sites and groundwater plumes |
| Figure 8 | Wellhead Protection Area Signage |

WELLHEAD PROTECTION AREA MAP



Note:
 Total WHPA - 68.25 sq. mi.
 WHPA within LBNRD - 46 sq. mi.
 WHPA within UBBNRD - 22.25 sq. mi.

North
 Not to Scale

Hastings Wellhead Protection Area

- LEGEND**
- NRD Boundary Line
 - Wellhead Boundary
 - Two Mile Hastings
 - Prosser
 - Juniata
 - Hastings
 - Rural Zoning

Upper
Big Blue
NRD

Little Blue NRD



Hastings Utilities
Hastings, NE

1/16/2010

Figure 2



Hastings Wellhead Protection Area

- LEGEND**
- Wellhead Boundary
 - NRD Boundary Line
 - Railroad
 - Hwy Commercial
 - Light Industrial
 - Industrial
 - Road



Upper
Big Blue
NRD

Little Blue NRD



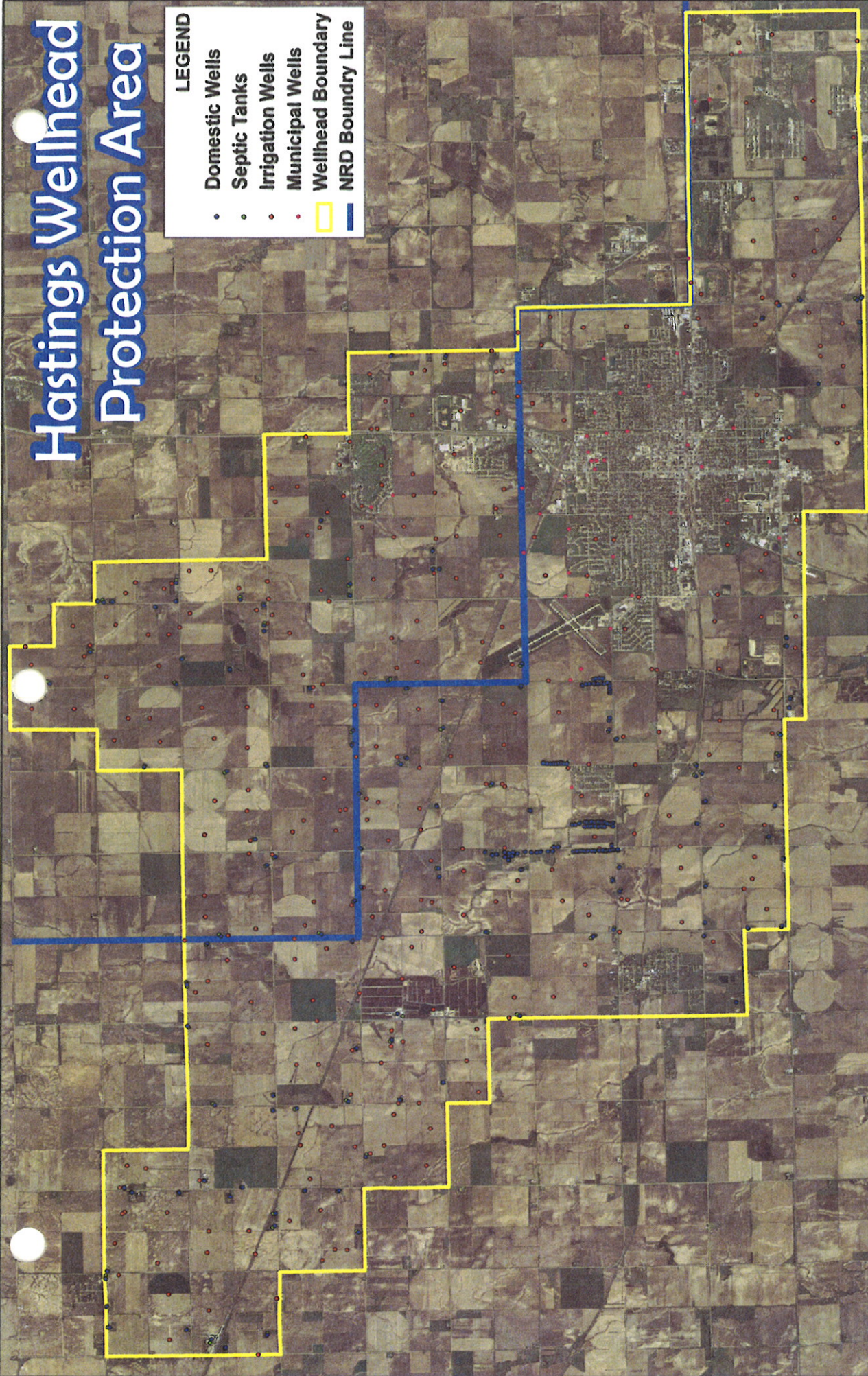
Hastings Utilities
Hastings, NE

9/22/2009

Figure 3

Hastings Wellhead Protection Area

- LEGEND**
- Domestic Wells
 - Septic Tanks
 - Irrigation Wells
 - Municipal Wells
 - Wellhead Boundary
 - NRD Boundary Line



Hastings Utilities
Hastings, NE

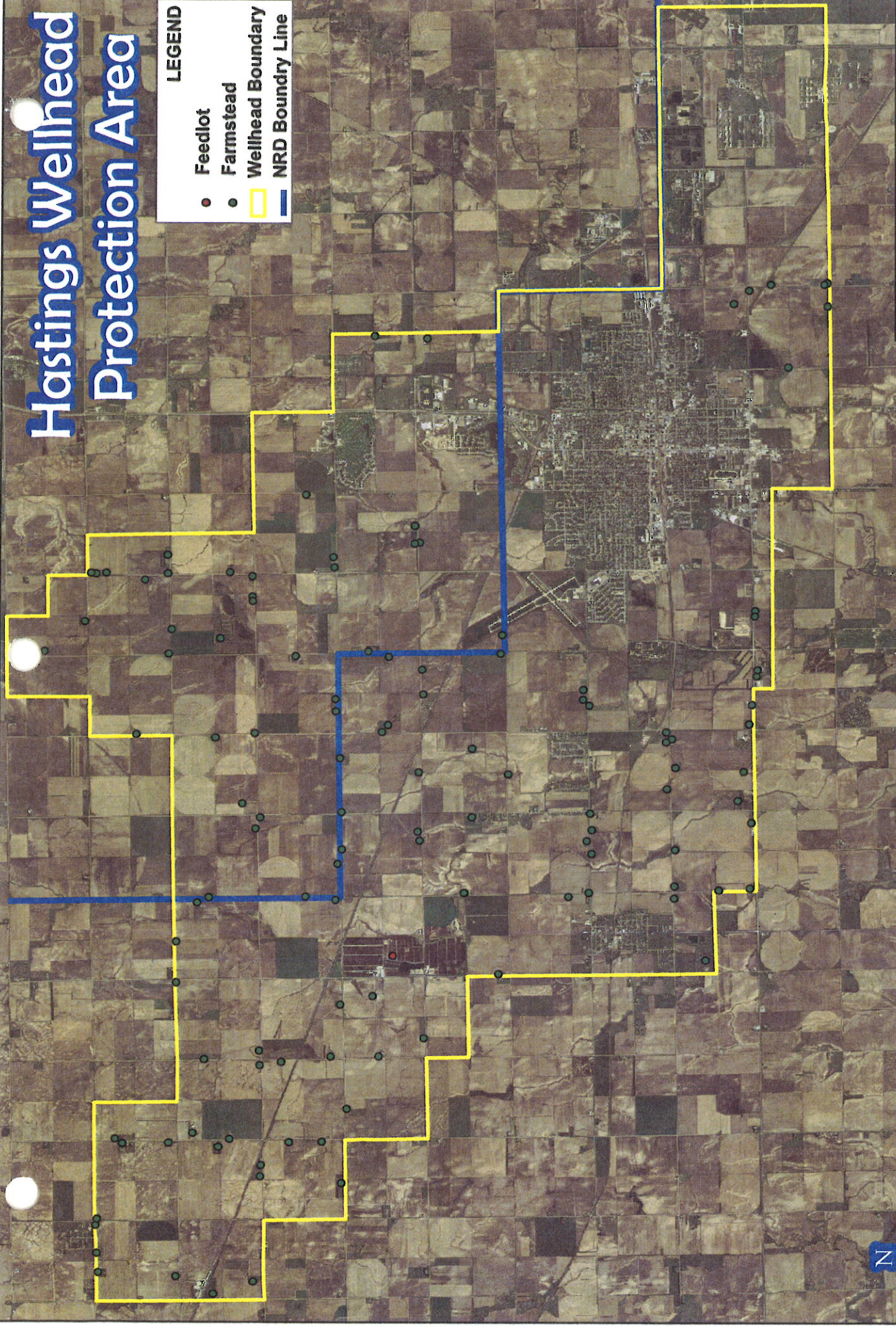
9/23/2009

Figure 4

Hastings Wellhead Protection Area

LEGEND

- Feedlot
- Farmstead
- Wellhead Boundary
- NRD Boundary Line

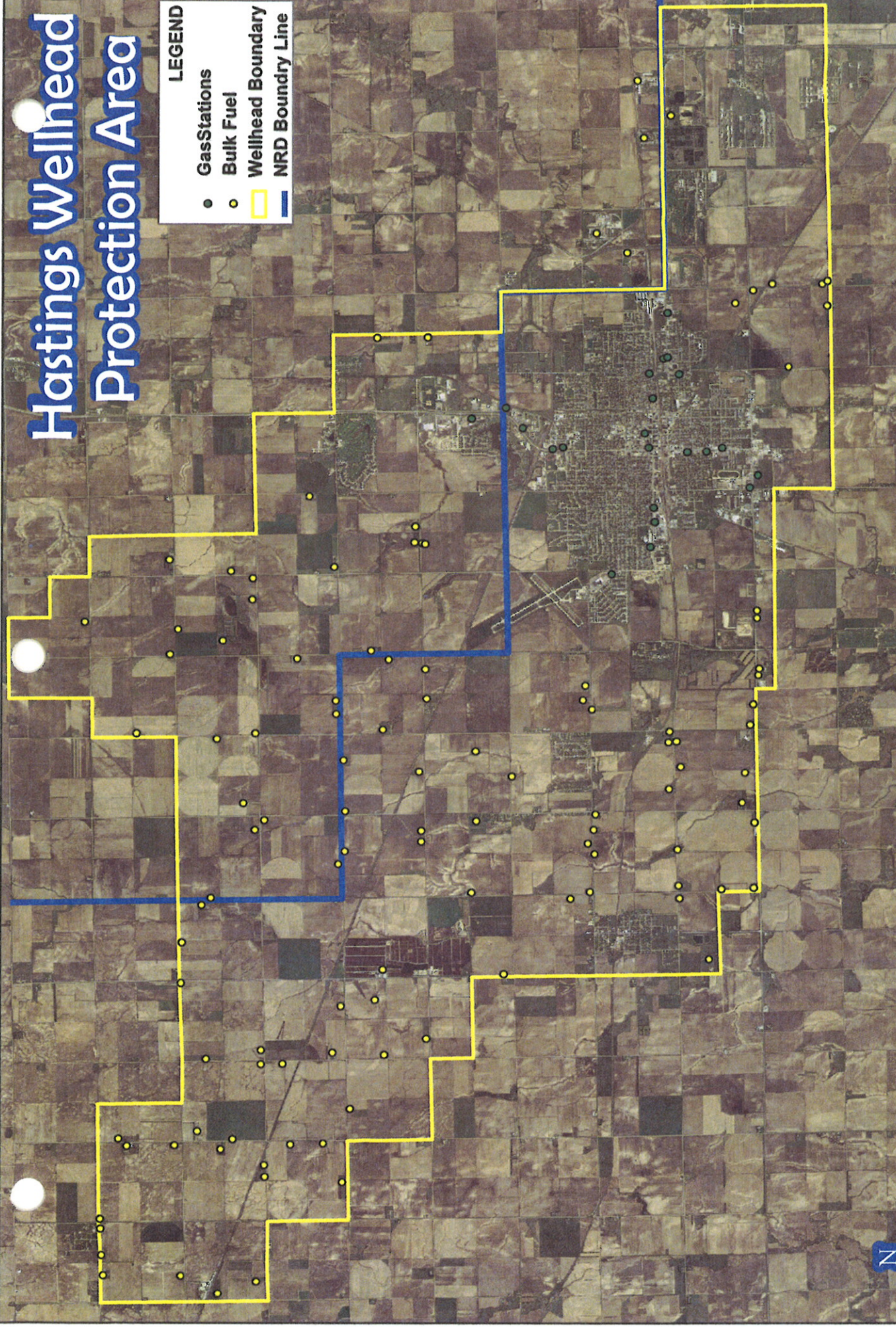


 Hastings Utilities Hastings, NE	9/23/2009
Figure 5	

Hastings Wellhead Protection Area

LEGEND

- Gas Stations
- Bulk Fuel
- Wellhead Boundary
- NRD Boundary Line



Hastings Utilities
Hastings, NE

9/23/2009

Figure 6

Areas of Ground Water Contamination Hastings, Nebraska

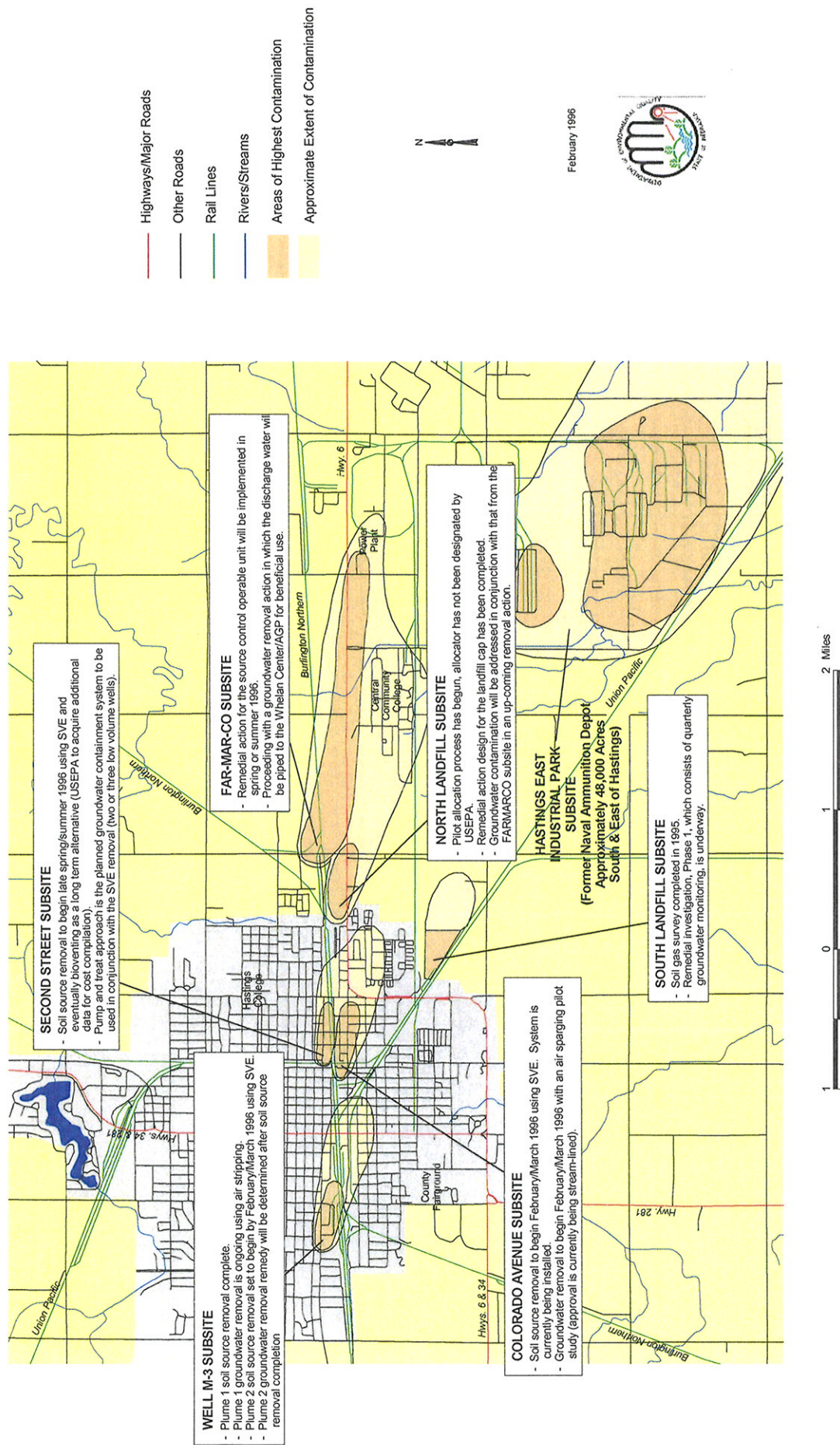


Figure 7

Hastings Wellhead Protection Area

LEGEND

- Signs Locations
- Wellhead Boundary
- NRD Boundry Line



Hastings Utilities
Hastings, NE

1/16/2010

Figure 8



7.0 Guardian Well and Water Sampling Program

An essential part of any wellhead protection program is the monitoring of the groundwater supply. Hastings Utilities has had a Guardian Well program in place since 1997. The guardian wells have been located in an area that provides water quality information for each of the municipal wells. These guardian wells are located up gradient at a location that samples water that would have to travel 5 to 10 years before entering the well. The location of these wells and water quality data is integrated into the GIS data base and maps. This information can be viewed at the HU Engineering Department.

7.1 Water Quality Data

Water quality data collected from the guardian wells are used to help forecast nitrate trends of the municipal wells. This data is also used to determine potential sources of contamination. This data along with other water sampling will be used to manage individual well usage. It is anticipated a municipal well use plan will be developed to minimize the movement of nitrates and other contaminants into the well capture zone as a result of groundwater modeling to be completed in 2010.

7.2 Water Sampling

Currently municipal wells are sampled on regular frequency as determined by the Safe Drinking Water Act and Nebraska Department of Health and Human Services regulations for operation of public water supply systems. Additionally, water sampling is routinely completed as per the Institutional Control Area Program. Water sampling data from these activities are used to support Wellhead Protection and the Guardian Well Program

Additional sampling within the Hastings WHPA is planned for 2010. A plan is being implemented to sample all the domestic and irrigation wells located in the Hastings WHPA. This is approximately 700 wells. The primary focus is nitrate contamination however, as information is collected and deemed appropriate other contaminants will be addressed.

Future re-sampling of these wells is also being planned. Re-sampling of all the wells is expected to be completed in 2015. Annual sampling of specific wells will be determined based upon past sampling results. Water sampling will address hot spots and areas specifically associated with each municipal well. Water quality data and groundwater modeling will be used to refine the sampling and location of guardian wells.

7.3 Groundwater Monitoring Wells

Groundwater Monitoring wells may be used to fill in data gaps to more accurately calibrate the groundwater model. Location and number of wells will be determined based upon consultation with the NRD's and the groundwater modeler.



Hastings Wellhead Protection Plan

Guardian Well Location Summary

Owner	Contact Person	Well Identification	Legal S-T-R	DNR registration number	Down Gradient Municipal Well(s)
Ted Herman	Ted Herman	Residential / Domestic	33-8-10		17, 26, 27
Dale Hamburger	Dale Hamburger	Residential / Domestic	5-7-10	G-087437	1, 2, 4, 19, 22, 23, 24, 28, 29, 33, 34, 35
Bill McKay	Bill McKay	Residential / Domestic	5-7-10	G-081933	1, 2, 4, 19, 22, 23, 24, 28, 29, 34, 35
Adams County Public Works	Dawn Miller	Residential / Commerical	8-7-10		3, 6, 9, 10, 11
Lee Vrooman	Lee Vrooman	Residential / Domestic	26-8-11		North 1/2 of City Wells
Paul Swanson	Paul Swanson	Residential / Domestic	9-7-10		8, 16, 21, 23
Animal Clinic	Front Desk	Residential / Commerical	22-7-10		13
Linda Waldron	Linda Waldron	Residential / Domestic	4-7-10		1, 2, 4, 19, 22, 23, 24, 28, 29, 34, 35
Zion Lutheran Church	Pastor	Church / Institutional	14-7-01		9
Jim Hardy	Jim Hardy	Residential / Domestic	5-7-10	G-124412	1, 2, 4, 7, 8, 15, 23
Ron Hoagland	Ron Hoagland	Residential / Domestic	4-7-10	G-148787	1, 2, 4, 19, 22, 24, 28
Randy Witt	Randy Witt	Residential / Domestic	8-7-10		9
Mark Barfknecht	Mark Barfknecht	Residential / Domestic	5-7-10	G-098619	1, 2, 4, 19, 22, 23, 24, 28, 29, 34, 35
Darrel Stromer / Pivot	Darrell Stromer	Irrigation	5-7-10	G-068359	22, 28, 29, 34, 35
Alan Anderson / Pivot	Alan Anderson	Irrigation	5-7-10	G-060892	8, 21, 23, 35

8.0 Wellhead Protection Committee and Activities

To support the development of appropriate and applicable wellhead protection programs and activities a Hastings Wellhead Protection Committee has been established. This committee represents the stakeholders within the Wellhead Protection Area. This committee provides a means to communicate between the various stakeholders and the City of Hastings. This committee reports to the Hastings Utilities Board of Public Works. As a basis for creating the Wellhead Protection Committee it was understood the nitrate issues are both a rural and urban issue; are both a county and city issue; and involves two natural resources districts. It is the committee's responsibility to address the issues by the various stakeholders and unite the existing groundwater management programs.

8.1 Wellhead Protection Committee Members

The members of this team represent the various stakeholders within the WHPA. A current list of the participating members and their representation is maintained by Hastings Utilities. A copy of the member list is attached at the end of this section. The committee does not have a limit to its size and anyone is welcome to join.

8.2 Wellhead Protection Committee Communications

The Wellhead Protection Committee is responsible for maintaining communication with the public through the Board of Public Works. Communication shall be maintained with other public agencies such as the City of Hastings, LBNRD, UBBNRD and Adams County. Presentation at the Board of Public Works is filmed and broadcast on the local public television. A record of these communications is kept as part of the Board of Public Works minutes.

8.3 Wellhead Protection Technical Committee

A Technical Committee has also been set up to provide the Wellhead Protection Committee technical information and technical analysis. A current list of the Technical Committee members and their responsibilities is maintained and included at the end of this section.

8.4 Wellhead Protection Committee Activities

As noted in Section 3.0 – Existing Hastings Wellhead Protection Activities; Hastings Utilities and the City of Hastings have been addressing various groundwater contamination issues. It should be noted the nitrate contamination is not the only contaminant of concern and that any wellhead protection activities should address all types of contamination. Currently the Wellhead Protection Committee's focus is nitrates.

The Wellhead Protection Committee has met several times in 2009. A list of potential activities has been developed and is attached at the end of this section. These projects address best management practices to reduce future releases of nitrates, public education, nitrate and water conservation and contaminant source inventory through water and soil testing.

To help the committee assess the nitrate issues an "interaction diagram" was developed. A copy is attached at the end of this section. The committee recognized that the issues and proposed remediation activities are interconnected. Water conservation coupled with management of the nitrate sources is the most prudent method to control or at least slow down the rate at which nitrates are released. It is generally understood that nitrates have migrated into groundwater through the vadose zone. Water conservation will reduce the rate at which nitrates enter the aquifer. By reducing the amount of water recharging the aquifer and the exposure to nitrates at the surface the rate at which nitrates are entering the aquifer can be reduced. This will translate into a reduction of future water treatment costs in both capital and operating costs. By using best management practice, by both rural and urban irrigation operations the loss of water due to recharge is greatly off set by the reduction of groundwater withdraws for irrigation.

Some of the activities being developed include; demonstration garden to promote various water management techniques, cost share and incentives for various water conservation tools such as Rain Barrels, Rain Sensors, Rain Gardens, Evapo-transpiration Gauges, Soil Moisture Sensors, and the conversion of lawn mowers to mulching mowers. All of the activities will support the key theme of nitrate and water conservation.

8.5 Funding

The committee is currently working on acquiring funds to facilitate nitrate remediation activities. In addition Hastings Utilities is addressing the funding needs as an integral part of its water system operation. Assistance from the Upper Big Blue NRD and Little Blue NRD is seen through their specific programs.

8.6 Groundwater Controls

Groundwater or other controls are **not** being contemplated by the Wellhead Protection Committee as the Upper Big Blue NRD and Little Blue NRD already have existing groundwater management programs in place. These programs provide sufficient controls for the reporting and management of the local aquifer. The goal of the committee is to find methods and practices that can reduce the nitrate contamination and yet not burden the stakeholders with increased operating costs. The goal is to promote practices that reduce nitrates and reduce operating costs.

8.7 Water and Soil Testing

The committee has recommended water and soil testing to better understand the location and concentration of nitrates in both the groundwater and the vadose zone. The data will be used to predict future trends and to help guide prevention and best management activities. These activities will provide both urban and rural stakeholders with the knowledge and means to manage and minimize nitrate contamination. Applicable information will be included in the GIS data base and incorporated into the groundwater modeling.

In 2010 all domestic and irrigation wells will be sampled for nitrates. A nitrate sampling plan and quality assurance plan will be developed for this sampling. Sampling of the storm water will be conducted in 2010. Vadose sampling will also be performed at various sites throughout the wellhead protection area.

Future sampling will also be completed. A plan will be developed to sample guardian wells and to complete another area wide sampling event for all irrigation and domestic wells in 2015. In 2015 soil sampling will be repeated in areas showing high levels of nitrate contamination. This sampling will be done at shallower levels to show the impact of best management practice. Due to the depth of the aquifer and the travel time into the deeper zones, re-sampling in the deeper zones will occur in 2020. A copy of the water and soil sampling plans and their associated quality assurance plans can be viewed at the HU Engineering Department.

8.8 Wellhead Protection Plan Maintenance

To support the enactment of the Wellhead Protection Plan it is recognized this document will require updating and maintenance. It is understood this is a dynamic document and shall be periodically reviewed to insure that all information is complete and up to date. With the help of a Wellhead Protection Committee and the Wellhead Technical Committee, Hastings Utilities shall as a minimum review the Wellhead Protection Plan annually.

Hastings Wellhead Protection Area Advisory Team

Michele Bever-Facilitator	South Heartland District Health Dept.
Chuck Neumann	Adams County Supervisor / Cattle Producer
Clark Haberman	College / Citizen
Ron Seymour	County Extension
Dawn Miller	Adams Co. Public Works Dept.
Glen Kroeker	Adams Co. Area Planning and Zoning
Jack Newlun	City of Hastings
Jeremy Groves	City of Hastings
Mark Hemberger	Hastings Utilities
Charles Wagner	Village of Juniata
Robin Vodenhal	Citizen
Tom Krueger	Citizen
Ed Fleharty	Hastings Utilities / LBNRD
Chuck Rainforth	LBNRD / Farmer
Warren Brakhahn	LBNRD / Farmer
Willis Hunt	BPW
Ruben Wehnes	Farmer
Bill McLeod	Farmer
Stan Knudson	Citizen
Lonnie Lipsack	Citizen
Butch Hughes	Citizen

Hastings Wellhead Protection Area Technical Committee

Daryl Andersen	Little Blue NRD
Russ Gierhart	Upper Big Blue NRD
Jamie Oltman	The Groundwater Foundation
Randy Gunn	NRCS, South Central Nebraska RC&D
Marty Stange	Hastings Utilities
Jenny Sidlo	Hastings Utilities
Michele Bever	South Heartland District Health Dept.

Main ideas generated to focus on

Provide or Generate Education to Specific Groups:

- Educate the advisory group
- Education via public forum and workshops
- Keep the public informed
- Educate young generation and have their input

Identify All Sources of Nitrates Within the Area of Influence:

- Source timing determined
- Identify sources up and down gradient
- Testing existing wells
- Unseen contamination areas
- Identify the source
- Livestock influences
- Find the source of high levels in a specific area

Promote, Encourage, and Monitor Best Management Practices:

- Livestock influence
- Reduce nitrogen application (city and rural)
- Use crops that fixate or are efficient nitrogen users
- Create and keep buffers natural
- Sample soil for nitrogen/apply only what is needed for lawn and field
- Storm water BPM's
- Install buffer strips
- How is the land being used/irrigated/what crops are planted
- Grow crops and lawn that are efficient water users
- Testing programs (urban and rural)
- Recreational applications, i.e golf courses
- Invite agronomist participation
- Use for the Advisory Group GIS info to recommend direction
- Recycling/mulching lawns.
- Lawn fertilizer education/soil samples
- Best management practices (farming and residential)
- Use newest scientific info

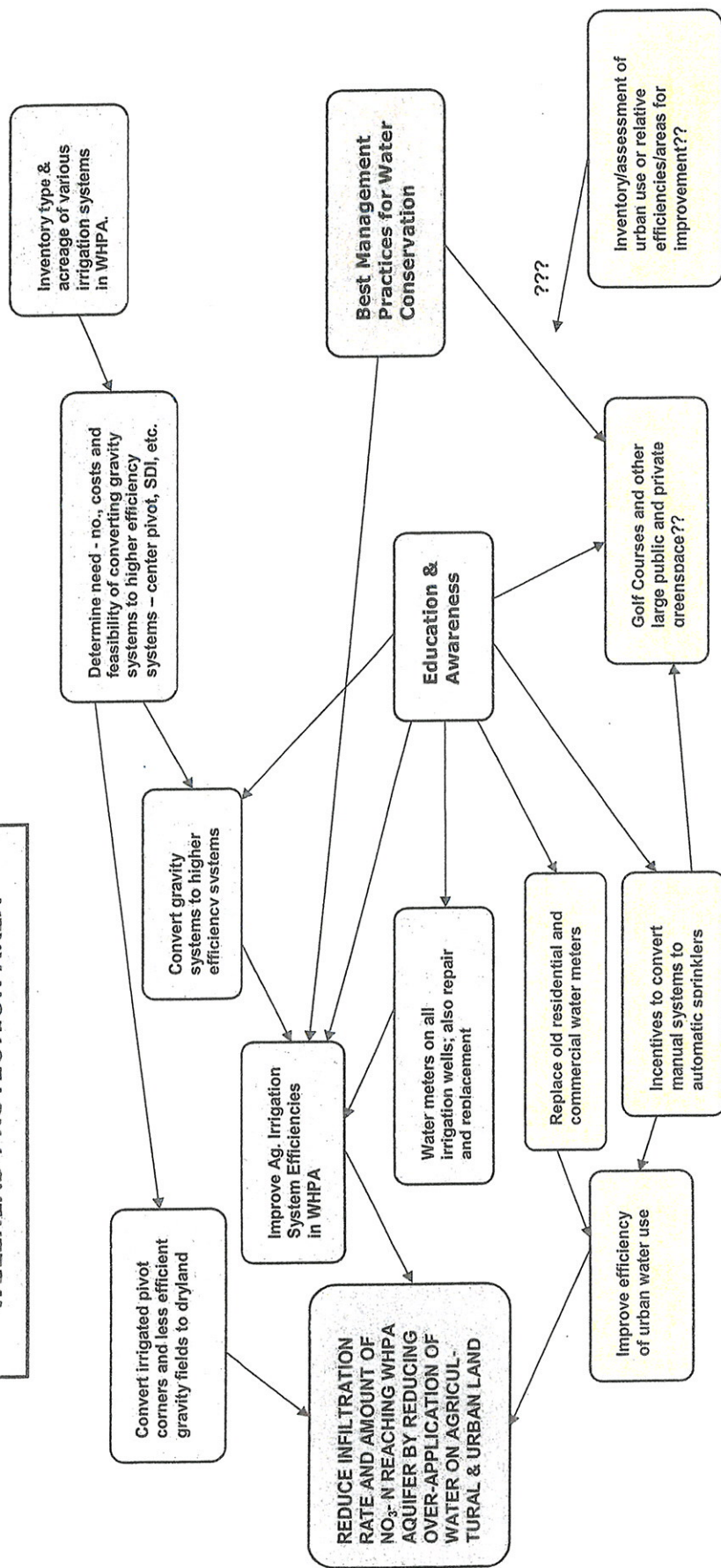
Conserve Water Use:

- Limit deep water percolation
- Reduce water use – by all
- Surface water controls
- Limit aquifer drawdown
- Water conservation

Other Solutions:

- Use bottled water for high risk individuals
- Collaborative with other NRDs
- Find funding sources – EPA/NRD/DEQ/Federal etc.)
- New well field

WATER CONSERVATION AGRICULTURAL LAND IN HASTINGS WELLHEAD PROTECTION AREA



WATER CONSERVATION URBAN AREAS IN HASTINGS WELLHEAD PROTECTION AREA

Hastings Wellhead Protection Area Water and Soil Sampling Inter-local Cooperation Agreement

THIS AGREEMENT is made and entered into by and between the Little Blue Natural Resource District ("LBNRD"), the Upper Big Blue Natural Resource District ("UBBNRD") and the City of Hastings, Nebraska, a Municipal Corporation ("Hastings"), hereinafter referred to collectively as the "Parties".

WHEREAS, residents of the City of Hastings, Adams County, Nebraska, rely exclusively on groundwater for their drinking water; and

WHEREAS, public water supply wells can be adversely affected by pollution of the land and water surrounding said wells; and

WHEREAS, wellhead protection areas are created to help minimize potential pollution of the land and water surrounding public water supply wells, and Hastings has created what is known as the Hastings Wellhead Protection Area; and

WHEREAS, the Hastings Wellhead Protection Area encompasses areas outside of the City of Hastings jurisdictional boundaries; and

WHEREAS, the Hastings Wellhead Protection Area lies within the jurisdictional boundaries of LBNRD and/or UBBNRD;

WHEREAS, LBNRD and UBBNRD each have authority by virtue of Nebraska Statutes to collect and analyze water and soil samples;

WHEREAS, water and soil analysis data is used to monitor groundwater quality for public purposes; and

WHEREAS, each Party wishes to authorize the other Parties to this Agreement to conduct sampling and analysis of water and soil within their respective jurisdictions, with the understanding that each Party shall share the results of any sampling and analysis with the other Parties to this Agreement (which effort shall be referred to herein as the "Cooperative Undertaking").

NOW THEREFORE, it is agreed by and between the Parties as follows:

1. **Authority.** This Agreement is made and entered into by the parties pursuant to the authority conferred upon the parties by the Inter-local Cooperation Act, Neb. Rev. Stat. § 13-801 through § 13-827, as amended from time to time.
2. **Duration of Agreement.** This Agreement shall remain in effect until such time the Parties hereto are not engaged in wellhead protection activities or until terminated as provided herein below.

3. **Organization.** No separate legal entity shall be created by this Agreement. The Parties shall each act independently pursuant to the authority of this Agreement as outlined herein. This Agreement shall encompass the Hastings Wellhead Protection programs of the LBNRD, UBBNRD and Hastings. Each Party shall have full and independent control of all issues that the Party undertakes related to water and soil sampling within the Hastings Wellhead Protection Area as adopted or revised by the City of Hastings, NE.
4. **Purpose.** The purpose of this Agreement is to delegate legal authority so that each Party may conduct water and soil sampling within and throughout the Hastings Wellhead Protection Area, regardless of which Party has primary responsibility for any particular jurisdiction, and to provide that the results thereof be shared.
5. **Financing.** The cost of carrying out the various activities hereunder shall be borne by the respective Party conducting such activity within the confines of its existing budget, and there shall be no separate appropriation of funds to or for the benefit of this Cooperative Undertaking.
6. **Objectives.** The objective of this Agreement is to monitor and assess groundwater quality in support of wellhead protection. The collection of water and soil data is for the mutual benefit to LBNRD, UBBNRD and Hastings.
7. **Authority; Responsibilities.** Each Party hereby grants to the other the authority to conduct water and soil sampling throughout the Hastings Wellhead Protection Area. Each Party shall be responsible for all sampling and analysis conducted by it. All data collected shall be shared with the other Parties to this Agreement. The parties shall meet as and when necessary to develop any necessary sampling plans and testing procedures.
8. **Administrator.** Pursuant to the requirement of Neb. Rev. Stat. § 13-804 (4) (a), LBNRD shall act as the Administrator.
9. **Property.** It is not anticipated that the Parties will jointly or collectively acquire title or possession of any real or personal property. Each Party will utilize its own personnel, equipment, and other resources to carry out any sampling and analysis. In the event that the Parties determine that it is necessary to jointly acquire title to any property, this Agreement shall be amended to the extent required by Neb. Rev. Stat. § 13-801 et seq.
10. **Termination.** This Agreement may be terminated by any Party hereto for any reason upon 30 days written notice to the other Parties.
11. **Effective Date.** This Agreement shall become effective on that date that the last of the three Parties executes this Agreement.



LITTLE BLUE NATURAL RESOURCE DISTRICT

By: Richard Kahman

Dated: 5-11-10



UPPER BIG BLUE NATURAL RESOURCE DISTRICT

By: _____

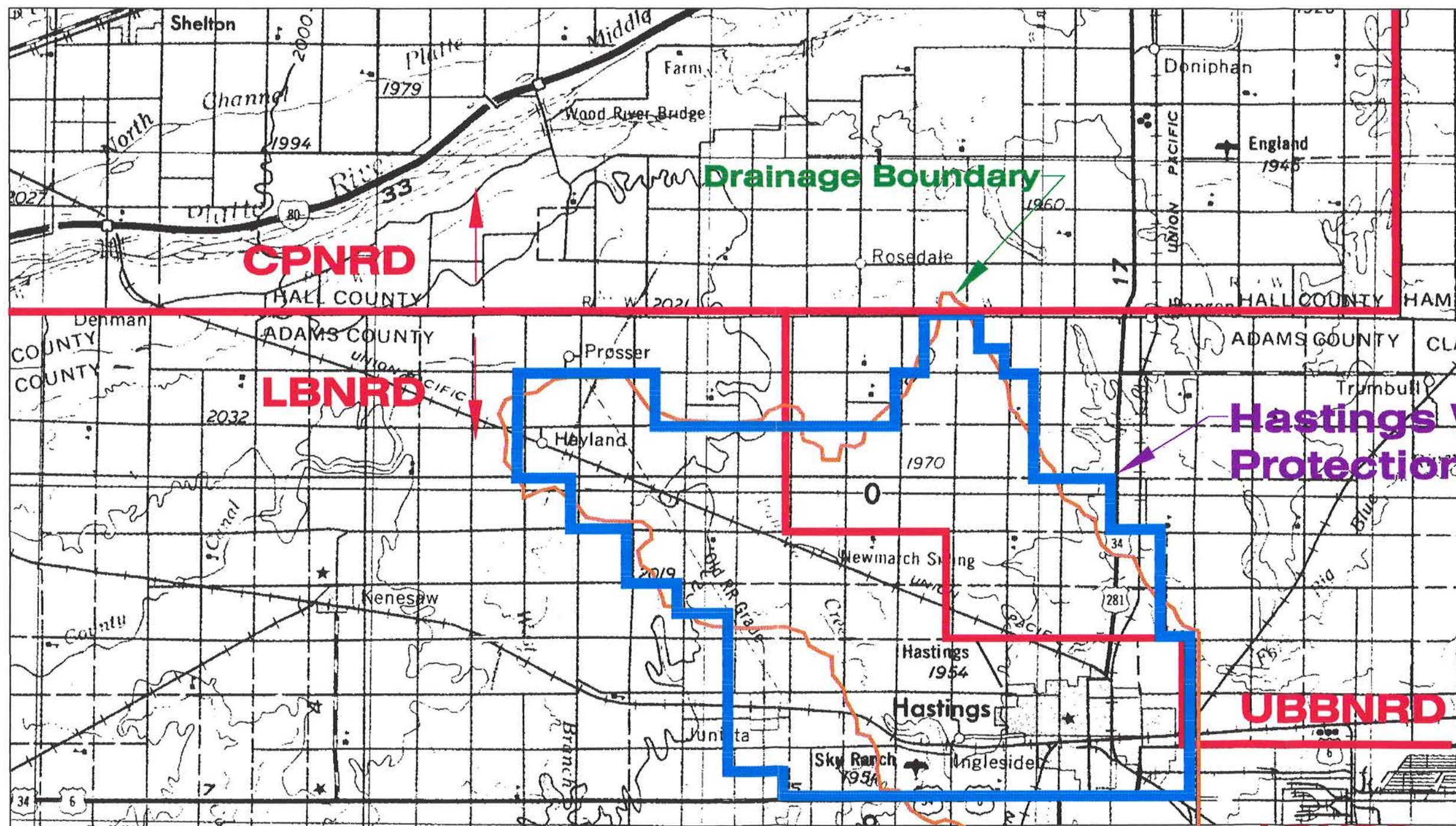
Dated: _____



CITY OF HASTINGS, NEBRASKA

By: Tom F. Pauw

Dated: 5/10/10



Hastings Wellhead Protection Area

Hastings Wellhead Protection Area Level 2

UBBNRD

LBNRD



Note:
 Total WHPA 68.25 sq. mi.
 WHPA within LBNRD 46.0 sq. mi.
 WHPA within UBBNRD 22.25 sq. mi.

HASTINGS UTILITIES			
HASTINGS, NEBRASKA			
Hastings Wellhead Protection Area			
DSN: M. Stange	SUPT	CKD:	No.
DRN: T. Waite	W.O. No.	CKD:	1 of 1
DATE: 1-21-98	RET. No.	APP:	