

FINAL

HASTINGS WELLHEAD PROTECTION GROUNDWATER MANAGEMENT AREA ACTION PLAN

Little Blue Natural Resources District
Upper Big Blue Natural Resources District
City of Hastings

Effective Date - July 1, 2012

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FORWARD

This Action Plan was prepared in response to concerns about nonpoint source (NPS) groundwater contamination from nitrates. The City of Hastings, Little Blue Natural Resource District (LBNRD), Upper Big Blue Natural Resources District (UBBNRD) and various stakeholders have prepared this action plan. This action plan requires best management practices regarding potential source and activities that could contribute to nitrate contamination of the local aquifer.

DEFINITIONS and ABBREVIATIONS

City means City of Hastings, NE

Hastings Utilities, HU, or Utilities is the utilities department of the City of Hastings responsible for the operation of the Hastings Municipal Water System.

Consultant means a person who has been trained to provide expert or professional advice on matters of crop growth and soil and water management.

District or NRD means the Little Blue and Upper Big Blue Natural Resources District.

Ground water means water which occurs, moves, seeps, filters or percolates through the ground under the surface of the land.

HWMA means Hastings Wellhead Management Area

Monitoring well means a well used for withdrawing a water sample, by the District or person authorized by the District, to determine groundwater quality changes.

Nitrogen fertilizer means a chemical compound in which the percentage of nitrogen is greater than the percentage of any other nutrient in the compound or, when applied, results in an average application rate of more than twenty pounds of nitrogen per acre over the field onto which it is being applied.

Nitrification inhibitor means a chemical product approved by the NRD that is used to slow down the release of nitrate.

Nonpoint source or NPS means any source of pollution resulting from the dissolution and dispersal of widespread, relatively uniform contaminants of a non-specific origin.

Operator means any person who controls the day-to-day operations of agricultural land.

Person means a natural person, personal representative, trustee, guardian, conservator, partnership, association, corporation, municipality, or any agency or political subdivision of the State of Nebraska or federal government.

University of Nebraska (UNL) nitrogen recommendation means the University of Nebraska recommendation for the application of a specific amount of additional nitrogen calculated in pounds per acre to meet the yield goal.

Well means any artificial opening or excavation in the ground from which groundwater flows under natural pressure or is artificially withdrawn. This shall include but not limited to irrigation, municipal, industrial and domestic wells.

Yield goal means the field's five (5) year average crop yield multiplied by 1.05.

Hastings Wellhead Protection Area (HWP) as defined by the approved Hastings Wellhead Protection Plan dated June 17, 2010.

Hastings Wellhead Protection Plan (HWPP) means the wellhead protection plan as adopted on June 17th, 2010, by the City of Hastings, NE.

Hastings Wellhead Protection Area Water Sampling Plan shall mean the water sampling plan prepared by Hastings Utilities on May 3rd, 2010, and all updates or revisions.

Storm Water Management Plan (SWMP) shall mean the City of Hastings, NE Storm Water Management Plan.

Groundwater Management Control Area shall mean the Hastings Wellhead Protection Area Groundwater Management Area and any other Groundwater Management Areas that may overlap the Hastings Wellhead Protection Area.

INTRODUCTION

Nebraska statutes, known as the Nebraska Ground Water Management and Protection Act, authorize political subdivisions to request the study of areas for possible Ground Water Quality Management Area designation to address nonpoint source (NPS) ground water contamination.

Hastings Utilities as authorized by the City of Hastings has prepared a Wellhead Protection Plan to address groundwater contamination. Working with local stakeholders, Little Blue NRD and Upper Big Blue NRD has determined that nitrates are the most pressing and immediate problem facing the Hastings Water System. In 2010, 576 wells and in 2011, 200 wells located in the Wellhead Protection Area were sampled for Nitrates. This sampling showed significant area of nitrate contamination that could impact the Hastings Municipal Wells. See attached Exhibit A for map of nitrate concentrations. The stakeholders have determined that water quality programs need to be enacted to require best management practices regarding the use of nitrogen fertilizers and over watering to prevent nitrate leaching.

This action plan provides details on how best management practices are to be implemented for both urban and rural activities.

Hastings Wellhead Protection Groundwater Management Area

The boundaries of the Hastings Wellhead Management Area (HWMA) are as follows:

Township 8 North, Range 11 West

Sections: 1 through 5, 8 through 17, 21 through 27, 35 and 36

Township 8 North, Range 10 West

Sections: 2 through 11 and 14 through 36

Township 8 North, Range 9 West

Sections: 29, 30, 31 and 32

Township 7 North, Range 11 West

Sections: 1, 12 and 13

Township 7 North, Range 10 West

Sections: 1 through 18, and 24

Township 7 North, Range 9 West

Sections: 5 through 8 and 13 through 24 Adams County, Nebraska .

See attached Exhibit B for map of Hastings Wellhead Protection Groundwater Management Area.

LONG RANGE GOALS OF THE GROUNDWATER QUALITY MANAGEMENT AREA

- I. To reduce the potential for nonpoint source contamination of groundwater through education, research, management practices and incentives that would not adversely affect the economy of the area for both urban and rural activities.
- II. To develop and implement an appropriate system of monitoring and evaluation of nonpoint source groundwater contamination including indicators such as nitrates in ground water and the unsaturated zone, use of best management practices and other factors that are indicators of the rate of nonpoint source groundwater contamination.
- III. To encourage the use of best management practices to reduce deep percolation and to support research and adoption of equipment and techniques that have potential for reducing groundwater nitrates.

EDUCATION AND TECHNICAL ASSISTANCE ACTIVITIES

I. Focus of Education and Technical Assistance

A. Educational Objectives

1. Educate the agricultural community on the use of management practices that will reduce nonpoint source nitrate contamination.
2. Educate the public of all ages about health risks related to nitrates and the efforts being made to reduce groundwater contamination.
3. Continue current programs and implement new programs that will assist cooperators with the adoption of best management practices.
4. Educate urban and rural residents on proper lawn management practices that will reduce nonpoint source nitrate contamination.
5. Identify and encourage the elimination of point source nitrate contamination.

II. Education Programs

- A. The information and education section of this plan summarizes several activities the NRDs and Hastings Utilities will implement or continue within the HWMA.

1. On-Farm BMP Demonstrations

On farm demonstrations Water Quality Demonstration Projects provide valuable information covering a variety of irrigation, fertilizer and pesticide management practices through field demonstrations. The Districts and City will continue to support these types of demonstration efforts. Due to limited funding, future projects will focus on areas that have the greatest need based on potential risks to water quality and areas that indicate the highest groundwater nitrate concentrations.

Activity goals:

- a. To secure continued funding of On-Farm BMP demonstrations.
- b. Continue support of funding for nitrate and water conservation programs by Hastings Utilities. This shall include the rain sensor rebates, mulching blade and mulching mower rebates, rain barrels, septic tank and abandoned well cost-share and HWPA water sampling.

2. Incorporate NPS Management Information into Existing Information Sources

There are a variety of information sources currently available to producers. These include county agricultural days, crop protection clinics, field tours, producer organizations, fertilizer dealers, crop consultants, trade magazines and others. Several of these are already including NPS management information in their activities. The NRD will contact those responsible for these information sources and work with them to include or continue information on the management of NPS groundwater contamination.

Activity goals:

- a. Update a list of contacts, ongoing.
- b. Repeat contacts annually.

3. Ground Water Quality Management Area Newsletter

From time to time, information about management area activities will need to be provided to the residents of the area. As needed, the NRD and HU will publish and distribute a newsletter to address the Ground Water Quality Management Areas and related topics.

Activity goals:

- a. Publish newsletter as needed.

4. Presentations to the General Public

The NRD and Hastings Utilities staff routinely make presentations to the public through farm groups, service clubs, chambers of commerce, commercial clubs, women's groups, etc., informing them of the purpose and activities of the NRD. This program has been expanded, with additional focus on the Ground Water Quality Management Area, by assembling a list of groups and organizations. After the list is assembled, each group will be solicited. The groups will be categorized by the frequency needed for contact so that various organizations can be revisited periodically.

Activity goals:

- a. Review list and solicit groups as warranted.
- b. When appropriate, educational materials will be provided as a bill stuffer for Hastings Utilities customers.
- c. Hastings Utilities will provide conservation and management information on its website.

5. Displays

Hastings Utilities and the NRDs will continue to have displays at county fairs, home shows and other similar events. Each NRD has portable displays that can be set up at different events. A section of a display may be dedicated to Hastings Wellhead Water Quality Management Area activities, events or information or an entire display may be developed for specific occasions.

Activity goals:

- a. To set up a displays at two (2) or more locations annually.

6. Irrigation Efficiency Check Program

Both NRDs have an Ultrasonic flow meter available for use to help determine irrigation efficiency. Staff can use the flow meter to check gravity and pivot systems for leaks, pumping rates, and the accuracy of a flow meter. Staff may also estimate the irrigation system water use efficiency and suggest ways that improvement can be made in the irrigation system. Irrigators may sign up for this service at no cost.

Activity goals:

- a. To conduct efficiency checks on producers as requested.
- b. Flow meters are encouraged on all wells within the management area for more accurate reading of water consumption.

7. Crop Water Use Program

The NRDs have cost-share on equipment that provides daily crop water use and related crop growth information for corn, soybeans and sorghum. This information can be published in the Hastings Tribune, KHAS-TV, KLIQ radio and is used by several extension educators on hot lines and in weekly newspapers. Farmers with Internet access can get this data directly from NRD or Extension Websites.

Activity goals:

- a. To provide crop water use data during the growing season.
- b. To provide equipment to all producers.
- c. Obtain equipment to monitor daily lawn water use to be shared with interested residents as an educational tool.
- d. Hastings Utilities in conjunction with UNL County Extension will continue to support the lawn and garden demonstration project.

8. Brochures

There are a variety of informational materials available on BMPs, however some of this information needs to be tailored to the specific needs of the Hastings Wellhead Water Quality Management Area. Additional brochures describing the water services, land treatment programs and programs for citizens of the Hastings area have been published and distributed.

Activity goals:

- a. To publish new brochures as new topics relevant to the Hastings Wellhead Water Quality Management Area arise.
- b. Revise and reprint existing brochures as needed.

9. News Releases

The District sends news releases to area media outlets on a wide range of natural resources topics.

Activity goals:

- a. Produce news releases on relevant nonpoint source or groundwater issues.

10. Well Abandonment Program

Cost-share assistance is offered to well owners for proper well decommissioning through the Water Well Decommissioning Programs of both NRDs and Hastings Utilities.

Activity goals:

- a. Plug all abandoned wells.
- b. Continue the Hastings Utilities well abandonment program. Hastings Utilities' water system will currently pay 75% of the cost not reimbursed by the NRD, up to \$200. This is for wells located within the Hastings Wellhead Protection Area.
- c. Continue the Hastings Utilities Septic Tank abandonment program. Hastings Utilities will pay 75% of the cost to abandon the septic tank, up to \$200.

BEST MANAGEMENT PRACTICES

It is the intent of the NRDs and the City of Hastings to give citizens of the area the opportunity to reduce NPS groundwater contamination voluntarily through the adoption of measures commonly referred to as best management practices (BMPs). It is recommended that each resident of the area consider adoption of those BMPs that are applicable to his or her situation. The following is a list of several of the BMPs and other activities which should be considered. This is not intended to be all inclusive. As new innovations and management techniques become practical, producers are encouraged to consider using them.

1. **Record keeping.** It is recommended that records be kept on each field that a producer controls. Keeping complete and concise records over a long term will assist the producer in making proper management decisions relating to irrigation and nutrient needs. At a minimum, these records should include the following information for each field.
 - a. Residual soil nitrogen
 - b. Nitrates in irrigation water
 - c. Applied fertilizer (nitrogen and others)
 - d. Water applied in inches per acres
 - e. Types and amounts of herbicides and insecticides used
 - f. Yield goal
 - g. Actual yield
2. **Soil sampling.** Annual soil sampling provides the most accurate information on the amount of carryover nitrogen that will be available to the next crop. It is recommended that a minimum of eight (8) cores be combined into one (1) sample per each forty (40) acres.
3. **Set realistic yield goals.** The production capability of a given field is limited by a variety of factors. A realistic yield goal should be established based on the production history. It is recommended that the yield goal be the average yield of the past five (5) years plus five (5) percent.
4. **Split nitrogen application.** A split application of commercial nitrogen fertilizer is recommended when the total application intended is greater than one-hundred (100) pounds per acre on fine textured soils and greater than seventy (70) pounds per acre on coarse textured soils. It is recommended that split applications be applied at a rate of sixty (60) percent first application and forty (40) percent final application. Sidedress or fertigation methods are recommended for final application.
5. **Full nutrient analysis.** Certain undetected nutrient deficiencies may cause the over application of nitrogen fertilizer to mask such inadequacies. It is recommended that operators request full nutrient analysis of soil samples so that the actual nutrients needed may be applied.

6. **Measure irrigation water use.** Flow meters are the most accurate method for measuring the amount of irrigation water pumped. It is recommended that all wells have a flow meter for determining water consumption. Periodic flow rate measurements and the use of an hour meter can also provide an estimate of water use.
7. **Irrigation scheduling.** Knowing when the crop needs water is important to prevent crop stress. It is also necessary to minimize excess irrigation that will leach nutrients below the root zone. Irrigation scheduling should be done using electrical resistance sensors and/or similar soil moisture measurement devices.
8. **Conversion of flood irrigation to more efficient irrigation methods.** Gravity irrigation is very inefficient compared to other methods. It is difficult to prevent deep percolation in fields with long rows and flat slopes. Irrigators are encouraged to implement alternative methods such as sprinkler irrigation and sub-surface drip irrigation.
9. **Fertigation/Chemigation.** The application of fertilizer through a center pivot provides the opportunity to apply fertilizer when the crop needs it, reducing the leaching potential. Proper safety equipment must be installed on the irrigation and chemical injection systems to prevent directly contaminating the groundwater. A permit is required for each chemigation site. The applicator must attend chemigation training and pass a test to become certified.
10. **Use nitrogen flow regulators.** It is recommended that nitrogen flow regulators be used to obtain accurate and uniform nitrogen application.
11. **Lawn and garden care.** It is recommended that label instructions be followed when applying lawn and garden fertilizer. While application of fertilizers to any one lawn or garden involves small amounts of nitrogen, the cumulative effect of over application across a community can be significant. It may also be advisable to consider grasses other than blue grass for lawns. There are a variety of grass species that need less water and nutrients.
12. **Crop rotation.** The rotation of corn with crops that require less nitrogen is recommended, where possible.
13. **Land leveling or grading** is recommended on surface irrigated fields in such a manner that the irrigation efficiency and uniformity are increased, deep percolation is minimized and consumptive requirements of the crops are met throughout the length of the field.
14. **Irrigation reuse systems** are recommended for surface (gravity) irrigation. Uncontrolled irrigation runoff is a violation of state law. If the rate of water flowing in each furrow is slowed down to prevent runoff, deep percolation is likely to occur. This will carry nitrogen below the root zone. A properly used reuse system will permit irrigation with flow rates in the furrow that minimize deep percolation and allow runoff to be recycled.

MANAGEMENT ACTIVITIES

I. MANAGEMENT REQUIREMENTS FOR FARMING ACTIVITIES

A. When Initiated

1. The following requirements will be initiated on July 1, 2013.

B. Requirements

1. Nitrogen Application.

- a. Anhydrous ammonia may not be applied prior to November 1.
a-1. A nitrification inhibitor must be applied with all anhydrous ammonia applications made between November 1 and March 1 at the manufacturer's recommended rate.
- b. Liquid and dry nitrogen fertilizers may not be applied between September 1st and March 1.
- c. All pre-plant nitrogen applied on or after March 1 at a rate greater than 100 pounds of actual nitrogen per acre, must be applied with a nitrification inhibitor at the manufacturer's recommended rate.

2. Fertilizer Application Exceptions. The following fertilizer application activities are exempt from the provisions of paragraphs 1 (a) and (b).

- a. The application of nitrogen fertilizer for any purpose other than fertilization for spring planted crops.
- b. The application of nitrogen fertilizer for spring planted small grains such as barley, oats, and rye.
- c. The application of nitrogen fertilizer on pastures.
- d. The application of a fertilizer that is not considered a "nitrogen fertilizer" as defined.
 1. **Nitrogen fertilizer** means a chemical compound in which the percentage of nitrogen is greater than the percentage of any other nutrient in the compound or, when applied, results in an average application rate of more than Twenty Five (25) pounds of nitrogen per acre over the field onto which it is being applied.
- e. The spreading of animal manure, septage, biosolids and other by-products conducted in compliance with state and federal laws and regulations.

3. Soil sampling. At least one 0-8 inch soil sample per 40 acres shall be taken and tested for residual nutrients and organic matter each year and at least one 8-24 inch soil sample per forty (40) acres shall be taken and tested for residual nitrogen each year in which corn or sorghum will be grown following a non-legume crop and/or when livestock, municipal or industrial waste was applied within the last twelve (12) months.

It is recommended that soil samples be collected as described in University of Nebraska NebGuide G1740.

a. It is recommended that a minimum of eight (8) cores be combined into one (1) sample per each forty (40) acres.

b. Deep soil sampling (8-24 inches) exemptions will be given for corn-soybeans rotations as referred to by NebGuide G74-174-A.

4. **Irrigation scheduling.** Irrigation scheduling must be conducted on one irrigated field by soil moisture measurements collected with electrical resistance sensors or similar devices at least one farm per operator. Other methods may be approved by the NRD.

5. **Training requirement.** Within 1 year of July 1, 2012, all operators of crop land in the designated Management Area must attend a NRD approved training session and be certified by the NRD. NRD certification must be renewed every four (4) years. The NRD will accept certification by other NRDs. Renewal certification may be received by NRD approved methods. Approved methods may include items such as attending another training session, passing a test or completing an approved home study course.
 - A. Required to attend
 1. Yes – Owner/Operator.
 2. Yes – Operator/Tenant – if decision maker.
 3. Yes – Family Farm Operator – all who make management decisions.
 4. Yes – Hired Hand – if he or she is responsible for making decisions about fertilizer rates and irrigation operations.
 5. Yes – Crop consultants – if serving operators and making recommendations.
 6. No – Hired hands working under direction of decision maker.
 7. No – Custom Operator – if working at the direction of the decision maker.

6. **Annual Reports.** By April 1st of each year, each operator in the Management Area is required to report information regarding the use of best management practices. Forms will be provided by the NRD. The report must include the following information:
 - A. The nitrogen application rate must be calculated for each field where corn is grown. Calculations shall be based on University of Nebraska recommended procedures and must account for soil analysis and all other nitrogen credits.
 1. Nitrogen credits include, but are not limited to:
 - 1a. Irrigation water nitrates (if known)
 - 1b. Previous crops
 - 1c. Livestock, municipal and industrial waste
 2. A copy of the soil sample must accompany the annual report.
 3. Farmers are encouraged to apply no more than the amount of nitrogen needed as determined by the University of Nebraska recommendation.

II. MANAGEMENT REQUIREMENTS FOR URBAN AND RURAL HOME OWNERS

A. The following requirements will be initiated on July 1, 2013:

1. Within one (1) year of July 1, 2012, all lawn care services that apply nitrogen to lawns are required to complete a lawn nitrogen course recommended by the NRD every four (4) years.
 - a. This would include operators and employees.
2. Annual reports will be required by all lawn care services on nitrogen use. These reports will be due on December 1st of each year.
 - a. Total nitrogen use within the Wellhead Management Area.
 - b. Total number of acres or square footage nitrogen is applied.
3. All persons who apply nitrogen fertilizer to more than one (1) acre of grass or turf in the Hastings Wellhead Groundwater Management Area are required to attend a lawn nitrogen course or other approved training. This may include web based training. Certification must be renewed every four (4) years
4. The utilization of mulching mowers and blades are encouraged to reduce the nitrogen use for lawns.
5. Soil sampling is encouraged before applying nitrogen to a lawn or turf.
6. All home owners shall adhere to the City of Hastings Storm Water Management Plan.

MONITORING PROGRAM

I. Monitoring Objectives

- A. Monitor nitrates in drinking water.
- B. Monitor changes in NPS groundwater nitrate contamination.
- C. Develop methods that accurately measure the effectiveness of information and education activities.

II. Monitoring Plan

A. Water Quality Monitoring

- 1. Domestic - The NRD will continue to monitor domestic wells in the Hastings Wellhead Protection Area for nitrate contamination. The findings from these wells will not be used to determine median nitrate values used to determine different phases of management. The purpose of this monitoring is to obtain the basic understanding of what quality of water rural residents are drinking. The NRD also offers nitrate and bacteria testing for any District resident.
- 2. Irrigation - The NRD will continue to monitor irrigation wells in the Hastings Wellhead Protection Area for nitrate contamination. These findings will be used to determine the median nitrate values and used to determine the different phases of management.

B. Annual Monitoring Reports

- 1. Reports of all monitoring activities and groundwater analysis will be reported to the Hastings Utilities Board of Public Works, the Little Blue NRD, Upper Big Blue NRD and the Nebraska Department of Environmental Quality. Such reporting will occur no less than once per year. This reporting shall be in accordance with the Hastings Wellhead Protection Area Water and Soil Sampling Inter-local Cooperation Agreement dated May 10, 2010.

C. Evaluation of Action Plans Effectiveness - How we determine if it's getting better

1. Short Term Evaluation

a. Public participation. The management section does require reporting by producers, the actions of every producer will be readily available in the Ground Water Quality Management Area program. In order to judge the short term impact of the Ground Water Quality Management Area and related programs the NRD will log the number of persons attending workshops, meetings and other activities at which the Ground Water Quality Management Area message is presented.

b. Review activity goals and time table. The Hastings Utilities Board or appointed liaison will review the public information activity goals and time table of activities at least once a year to evaluate the progress of each task.

c. Action plan review. The Action Plan review will involve the advisory committee, which assisted in the initial Action Plan development. These individuals represent a large number of producers and other citizens. The opinions of the advisory committee members will provide valuable insight into the success or failure of the program. The review will include, but not be limited to, changes needed to monitor nonpoint source contamination and evaluate the implementation of best management practices and changes in management activities. The Action Plan will be reviewed at least once every five (5) years. The next review is scheduled for 2015. The District may ask the advisory committee for input on issues prior to the next scheduled review if it is deemed necessary.

2. **Long-Term Evaluation**

a. Management reports. Reporting will be required in the Hastings Management area.

b. Annual reports. Annual reports will be required in the Management Areas. Evaluation of these reports will indicate whether BMPs are being used as intended.

c. Groundwater monitoring. Long term trends in nitrate levels should provide an indicator of program effectiveness; however, this may not occur for several years.

ADMINISTRATION

I. Programs and Activities

A. Enforcement

1. No violation of the Ground Water Quality Management Area rules and regulations will be referred to a county attorney for enforcement without a request thereof by the NRD board of directors of the district in which the violation occurs.
2. The District may grant variances to the Ground Water Quality Management Area rules and regulations for specialty crops, research, and special circumstances not covered by these exemptions.

B. **Relaxation of controls** should be considered if the problem which had existed in a sub-area has been remediated and that the lessons and practices learned during the remediation process, employed by the residents of that sub-area, will continue to maintain and improve water quality without the burdens and restrictions imposed by a higher level of controls.

1. The following has to be met for relaxation of controls:
 - a. If the average of the irrigation wells and domestic wells sampled are less than 5 mg/l over a five (5) year average or
 - b. If the average of City of Hastings wells 16, 17, 22, 23, 25, 26, 27, 28, 29, 34, and 35 known as the Hastings Airport Well Field and Well 33 are less than 5 mg/l over a five (5) year average.
2. If, however, in any subsequent year, in a sub-area in which controls have previously been relaxed, a higher triggering level for the same problem is reached, the controls in that sub-area will be re-instated at that higher level and will remain there until the following conditions are met:
 - a. The monitored problem level in the sub-area has dropped to a lower triggering level and remained there for at least seven (7) subsequent years; and
 - b. The Boards act to remove the higher level controls and reinstate a lower level of controls as appropriate for the existing triggering level.

C. Starting in 2015, all operating irrigation and domestic wells will be sampled and re-sampled every five (5) years until 2026. This shall be known as the major water sampling year events. On December 31st, 2025, this plan terminates. This plan will be revised and re-authorized as jointly determined by the City of Hastings, LBNRD, UBBNRD and such other persons or groups as appointed by the LBNRD, the UBBNRD or the City of Hastings. For non-major sampling events a minimum of forty (40) irrigation and forty (40) domestic wells will be sampled each year. Where applicable, the sample sites on the non-major sampling years shall vary to monitor nitrate contamination throughout the Wellhead Protection Area. A sampling plan shall be prepared and approved in cooperation with Hastings Utilities and NRD staff.

D. Information received from the operators by the NRDs annual report cannot be used for profit or released without written consent by owner/operator.

E. Time Table of Activities

Initial Operator Training	February 2012 – March 2013
Initial Lawn Nitrogen Training	February 2012 – March 2013
Initial Operator Reports	April 1, 2013
Irrigation Management	Summer 2013
Nitrogen Inhibitor Required	November 1, 2013
Soil Sampling Required	Begin Fall/Winter 2013-14
Lawn Service Annual Report	December 1, 2013
Annual Report	April 1, 2014

PLAN ADOPTION

This Plan of Action was duly adopted by the governing boards of respective sponsors of the plan on the dates set forth below:

- Upper Big Blue Natural Resources District January 19, 2012
- Little Blue Natural Resources District February 14, 2012
- City of Hastings February 28, 2012

EXHIBIT B

HASTINGS WELLHEAD PROTECTION GROUNDWATER MANAGEMENT ACTION AREA

