

Minnesota's Source Water Protection Program

Minnesota State Technical Committee
Thursday, July 11th, 2013

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Aaron Meyer, MN Rural Water Association

Minnesota's Drinking Water Sources



Public
Water:
Surface
Water
1.3 million

Private
Wells
1.2 million



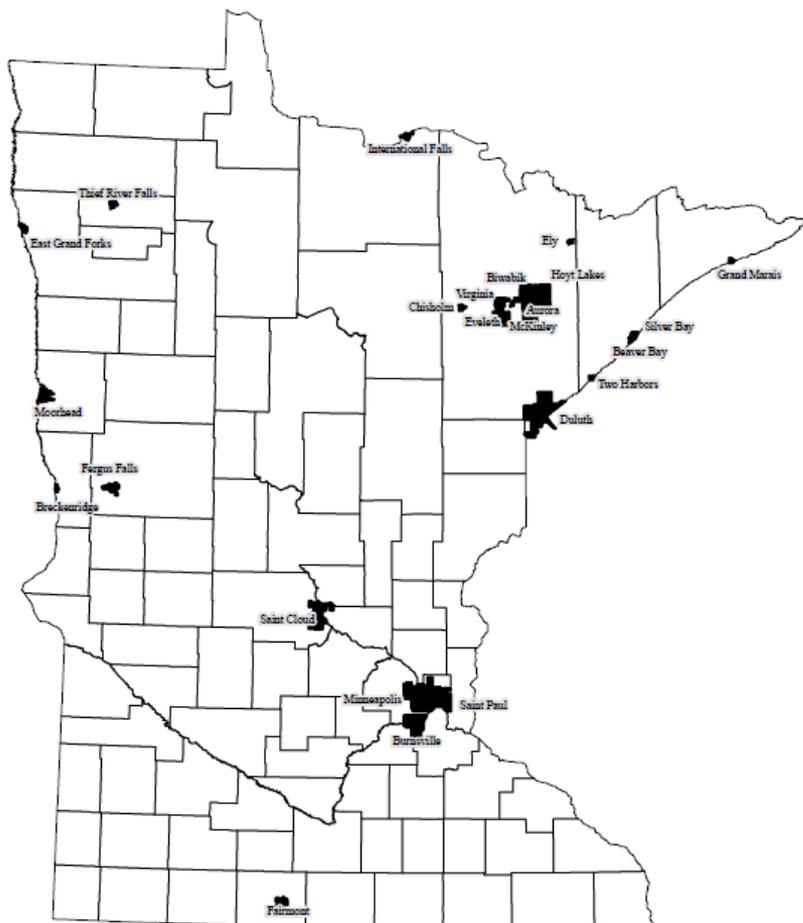
Public Water Supply:
Groundwater
2.7 million people

*73 % from
groundwater*

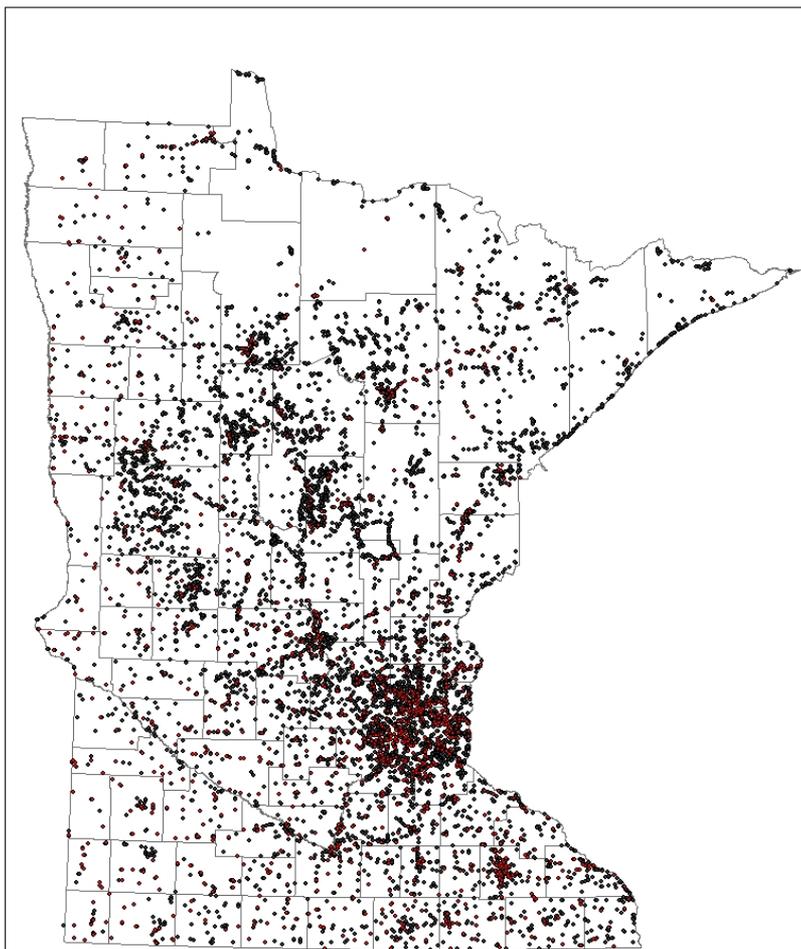


PWS using Surface Water Sources

Roughly $\frac{1}{4}$ of
Minnesotans get
their water from
surface water
supplies



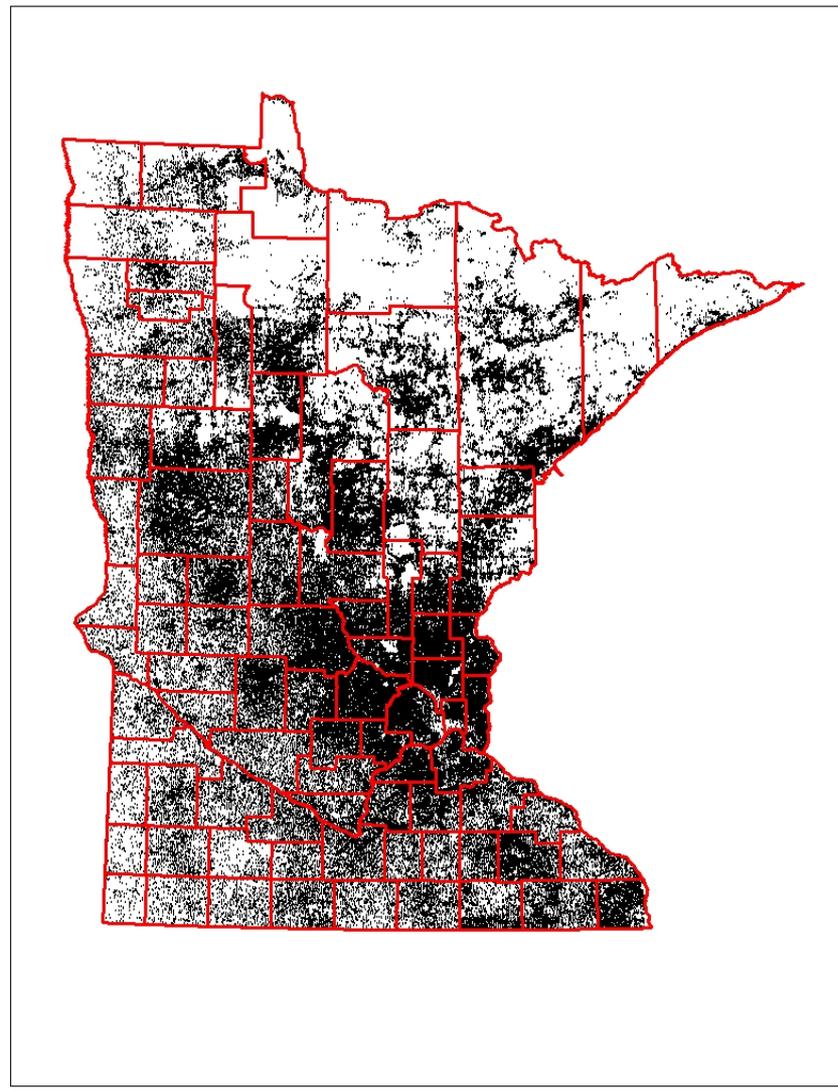
PUBLIC WATER SUPPLY WELLS



There Are More
Public Water
Supply Wells
Than There Are
Lakes In
Minnesota

Water from Groundwater Sources

- Groundwater supplies roughly $\frac{3}{4}$'s of Minnesotans
- 250,000+ Private Wells
- 15,000+ Public Wells



Framework:

How Do We Protect...

Drinking Water?

- Federal Safe Drinking Water Act
 - 1986 & 1996 Amendments
- 1989 MN Groundwater Protection Act
 - MN Dept. of Health (MDH) primacy for developing State Program to protect community drinking water supplies

Drinking Water Protection: Key Terms

What is Source Water Protection?

“Refers to water from streams, rivers, lakes and underground aquifers used as a source for drinking.”

Drinking Water Protection: Key Terms

What is Wellhead Protection?

“Methods of managing potential contaminants in a well’s recharge area.”

Locate & Seal Wells...



Properly Manage
Contaminant Sources...



Agronomic Rate & Timing...



MDH Source Water Protection (SWP) Program

MDH SWP Program:

1) Wellhead Protection (WHP) Program:

- ❑ 1997 State Wellhead Protection Rule
- ❑ Community (963) & *Non-Community Non-transient* (657) Public Water Suppliers required to develop plans

2) Surface Water Systems:

- ❑ Ad Hoc Advisory Group develops guidance for surface water PWS (23) to develop plans

Minnesota WHP Program

Wellhead Protection Plan – PART I:

- Developed by licensed hydro-geologists
- Delineate / Model groundwater flow & movement
- Factor existing / future water use of the PWS.
- Identify / Evaluate geology & vulnerability of the aquifer & PWS Wells to land use contamination.
- Minimum of 10 year time of travel is delineated

R 32 W | R 31 W

Royalton

*Drinking Water Supply
Management Area
(DWSMA) MN-00369
10 year Time of Travel*

Public Water Supply Well

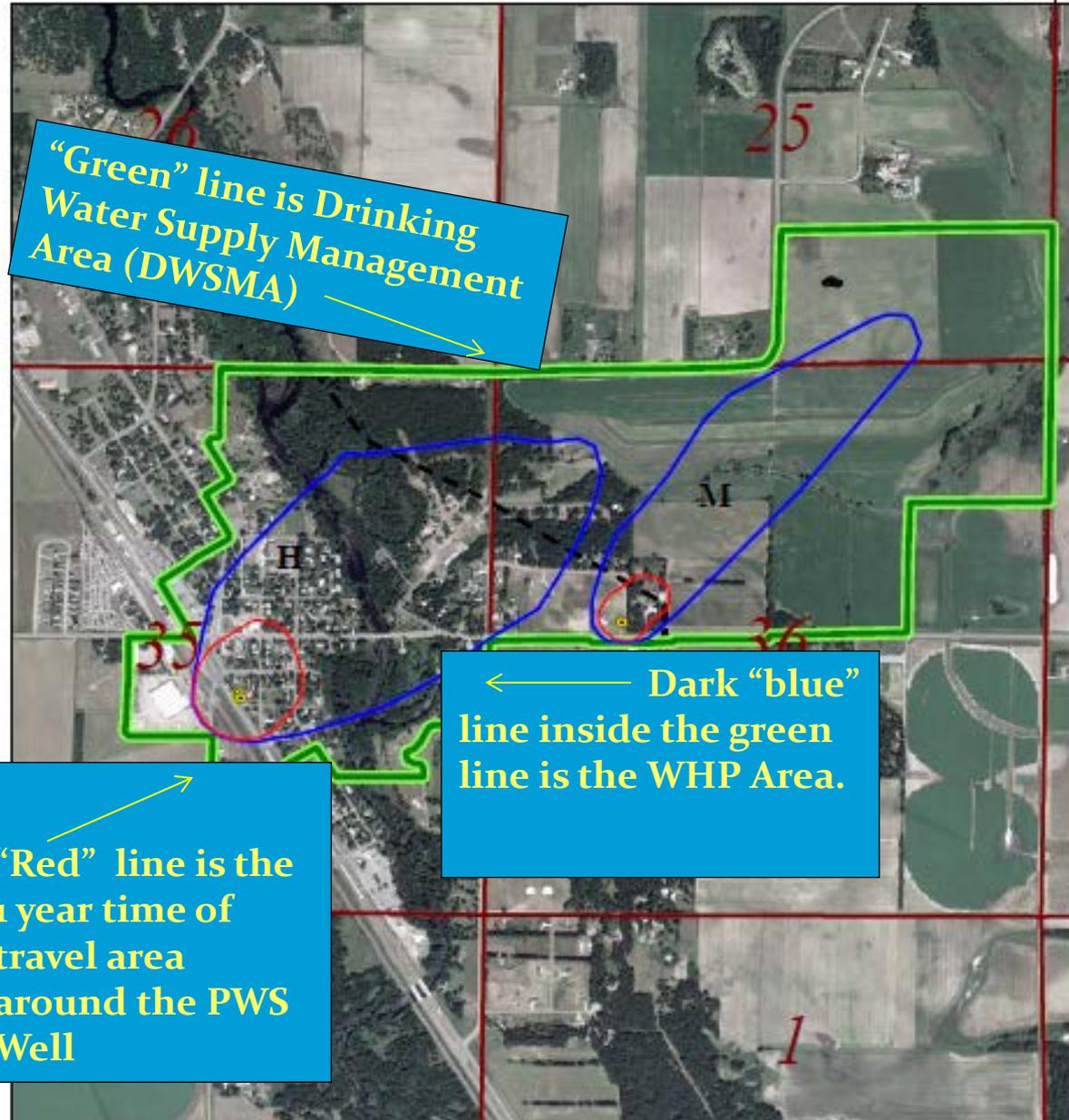
- Primary
- Emergency Response Area
- Wellhead Protection Area (WHPA)
- DWSMA
- ▲ DWSMA Vulnerability Boundary

H = High Vulnerability
M = Moderate Vulnerability



R 32 W | R 31 W

Approved December 12, 2005

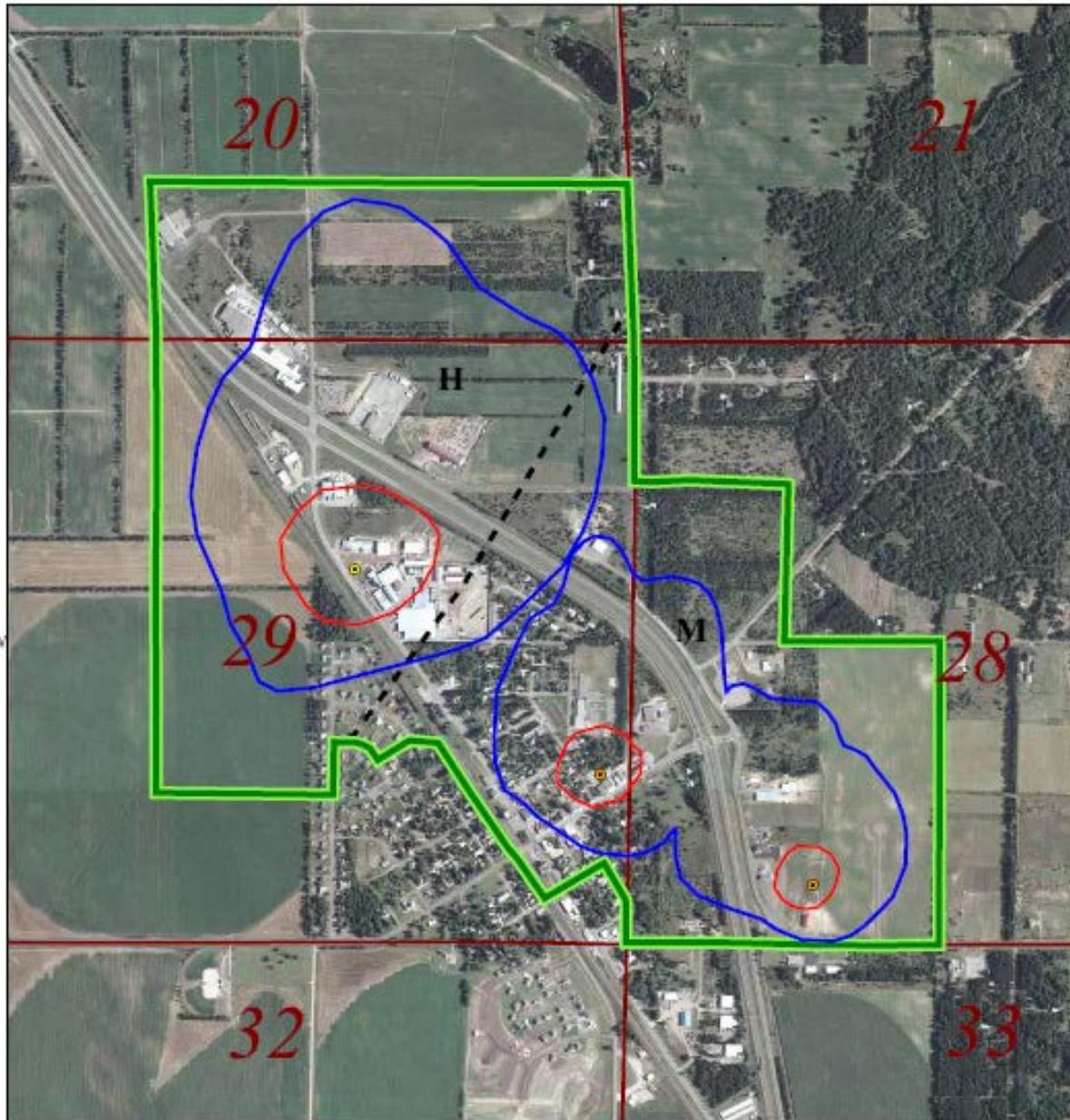


“Green” line is Drinking Water Supply Management Area (DWSMA)

Dark “blue” line inside the green line is the WHP Area.

“Red” line is the 1 year time of travel area around the PWS Well

R 31 W



R 31 W

Rice

Drinking Water Supply Management Area (DWSMA) MN-00352 10 year Time of Travel

Public Water Supply Well

- Primary
- Seasonal

- Emergency Response Area
- Wellhead Protection Area (WHPA)
- DWSMA
- DWSMA Vulnerability Boundary

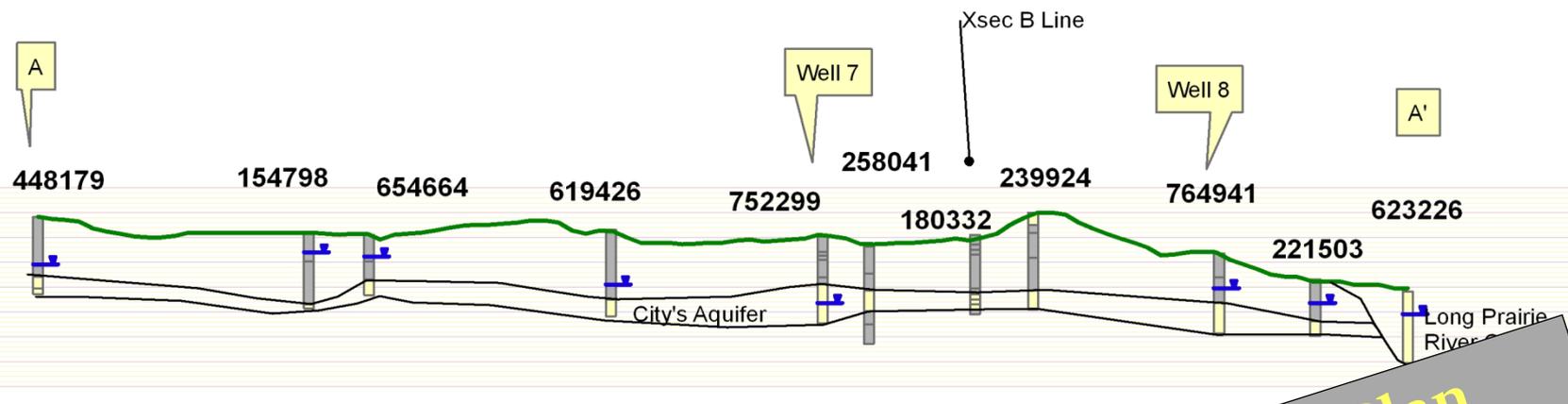
H = High Vulnerability
M = Moderate Vulnerability

0.2 0 0.2 Miles



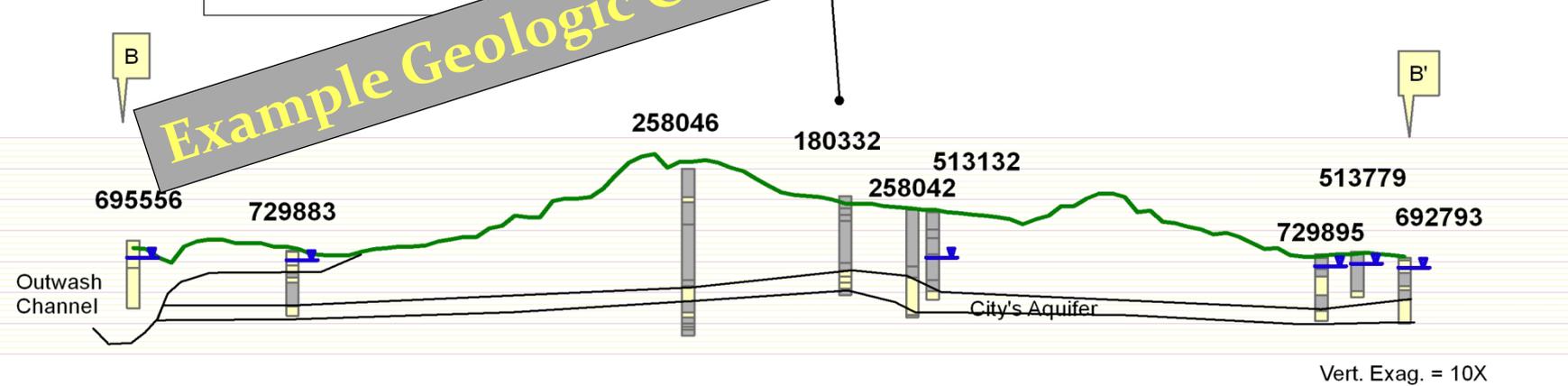
Approved July 21, 2005

Elevation (feet Above Sea Level)



Example Geologic Cross Section: Part I, WHP Plan

Elevation (feet Above Sea Level)



Vert. Exag. = 10X

Minnesota WHP Program

Wellhead Protection Plan – PART II:

- Part II, WHP Plan identifies issues and plan of action to protect the water supply.
- Apply science and vulnerability of Part I, WHP Plan:
 - “Vulnerable” – No geologic protection / short recharge time; consider all land uses & potential contaminants.
 - “Moderately Vulnerable” – Some protection & months / years recharge time; focus on wells, tanks & significant threats to groundwater.
 - “Non-Vulnerable” – Significant geologic protection. Years / decades recharge time; focus on managing wells.

Minnesota WHP Program

Wellhead Protection Plan – PART II - Plan Development:

- Community forms a local “**WHP Team.**”
(landowners, resource partners, etc.)
- *Identify activities needed to protect or improve the water supply . (Education, well sealing, Ag BMP’s, etc.)*
- **Local ownership and involvement is key!**
- ***WHP Plan Implementation*** of activities identified is required by MDH.
- **Focus on technical assistance and coordination with local resource partners & landowners is needed for success!**

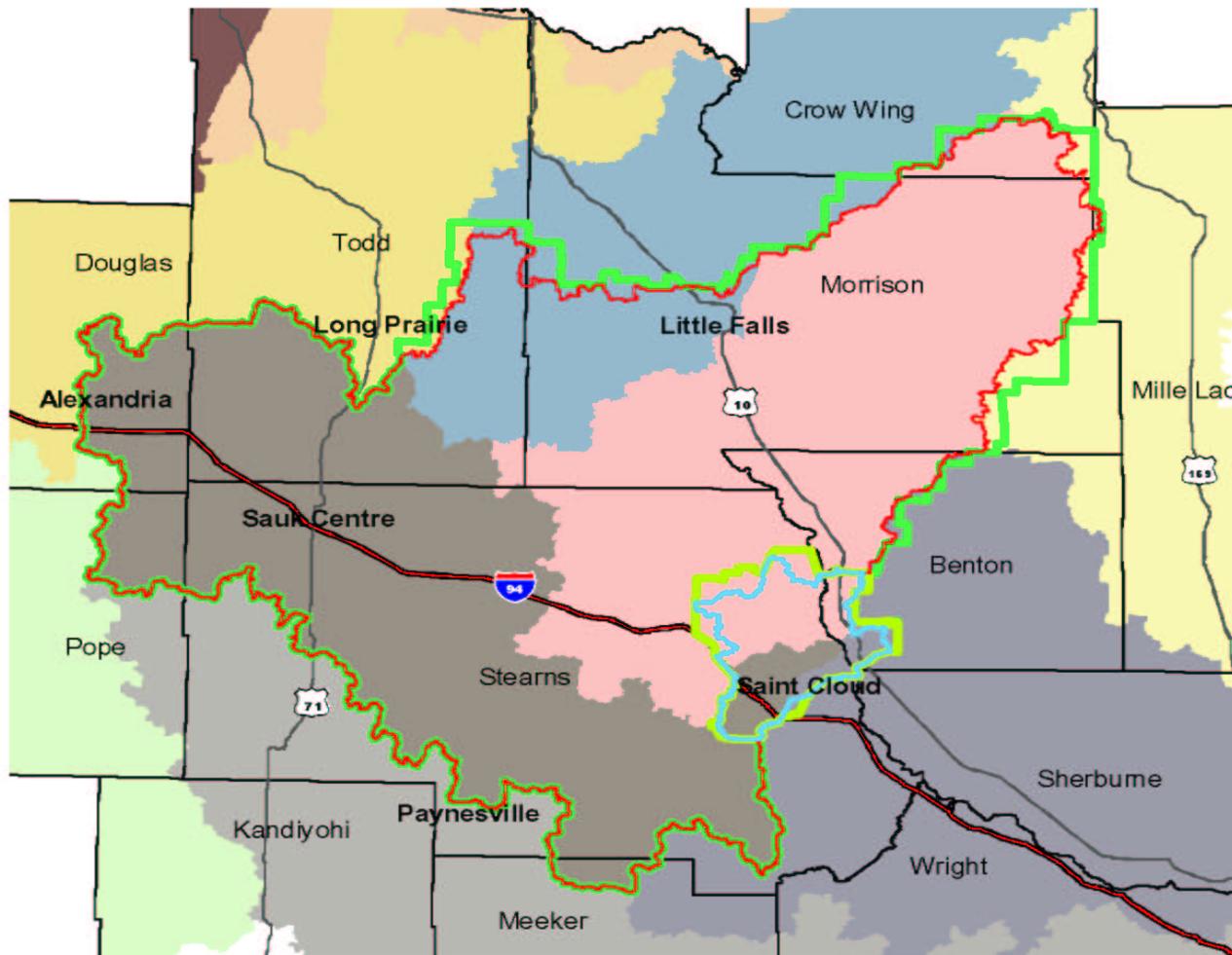
SWP (Surface Water) Protection

- ❑ Identify / Protect Surface Water used as a source of drinking water –
- ❑ Follow MDH (Surface Water) SWP Guidance document & developed similar to WHP Plans–
- ❑ Minneapolis, St. Paul, St. Cloud are examples of 3 PWS that have developed SWP Plans & are actively implementing protection efforts working with State, local and Federal agencies to protect the Mississippi River as a drinking water source.

City of St. Cloud

Example - Surface SWP Area

St. Cloud Source Water Protection Area



- Priority A Source Water Protection Area
- Priority B Source Water Protection Area
- DWSMA (A)
- DWSMA (B)
- Interstate Highway
- U.S. Highway
- County Lines
- Watersheds**
- Chippewa
- Clearwater-Elk
- North Fork Crow
- Crow Wing
- Elk-Nokasippi
- Long Prairie
- Platte-Spunk
- Redeye
- Rum
- Sauk

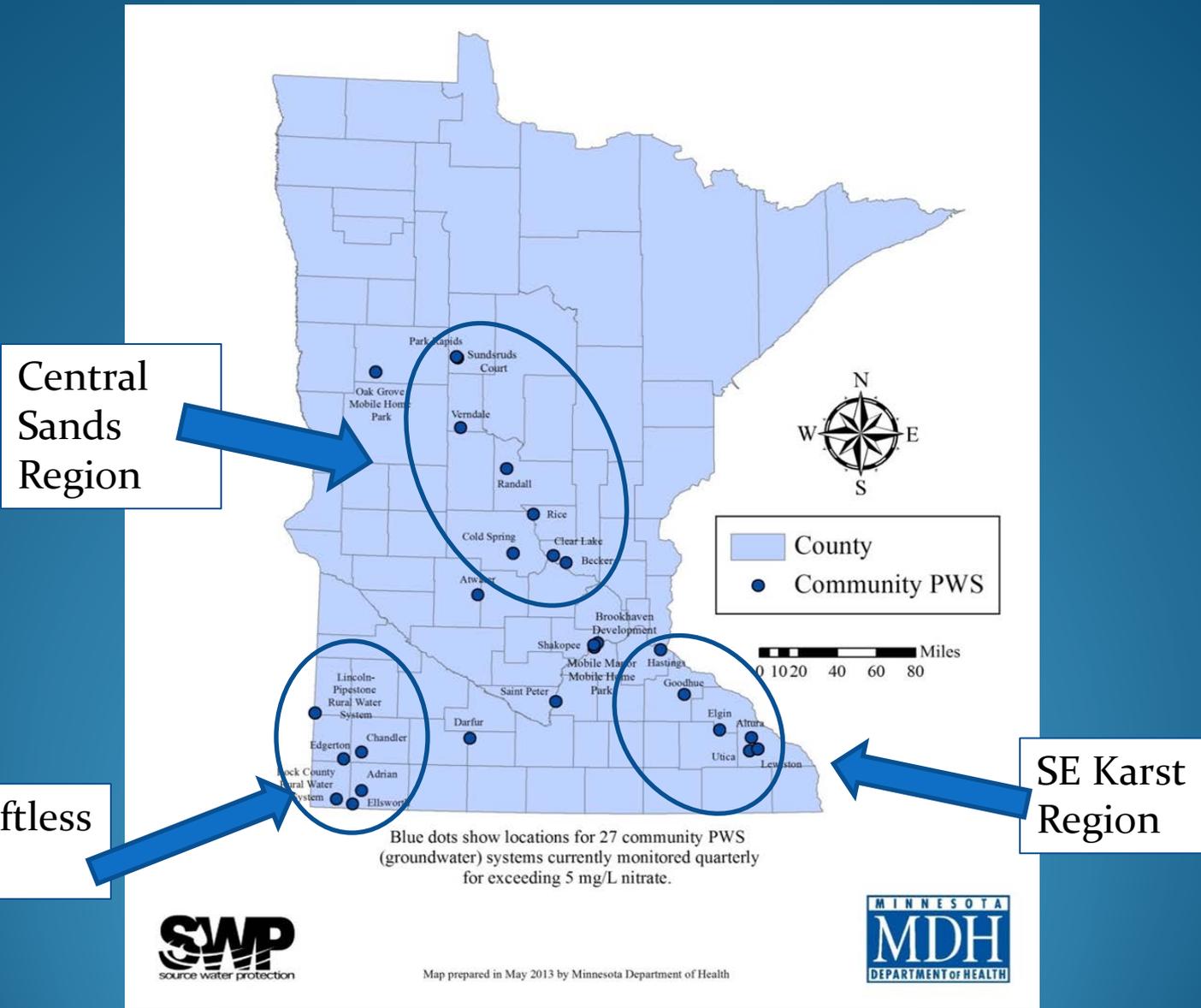
RELATIONSHIP TO UPPER MISSISSIPPI BASIN



Case Studies & Targeting SWP Efforts

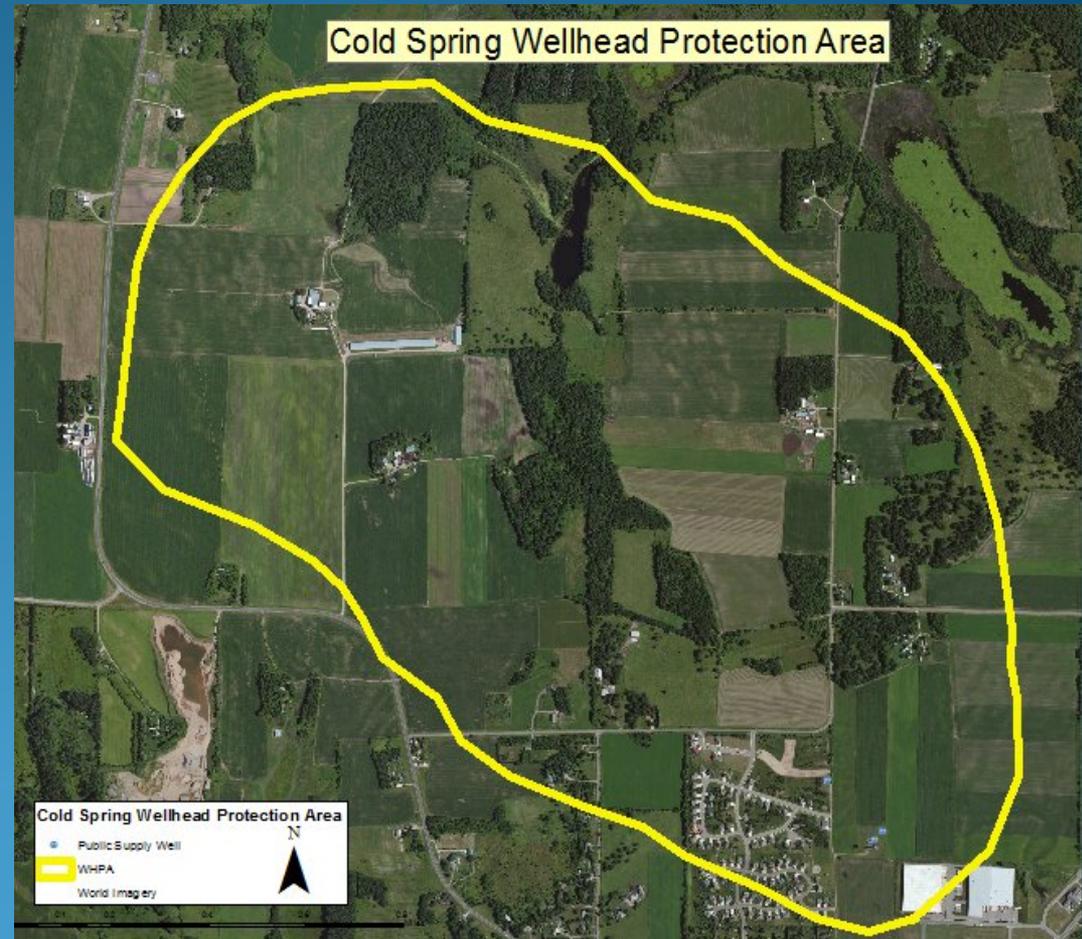
Working with Resource Staff & Local Partners!

Nitrate Areas of Concern



City of Cold Spring – Stearns Co.

- Operate 4 Drinking Water Wells
- Elevated Nitrates (7-9ppm)
- Unfriendly Geology Sand and Granite



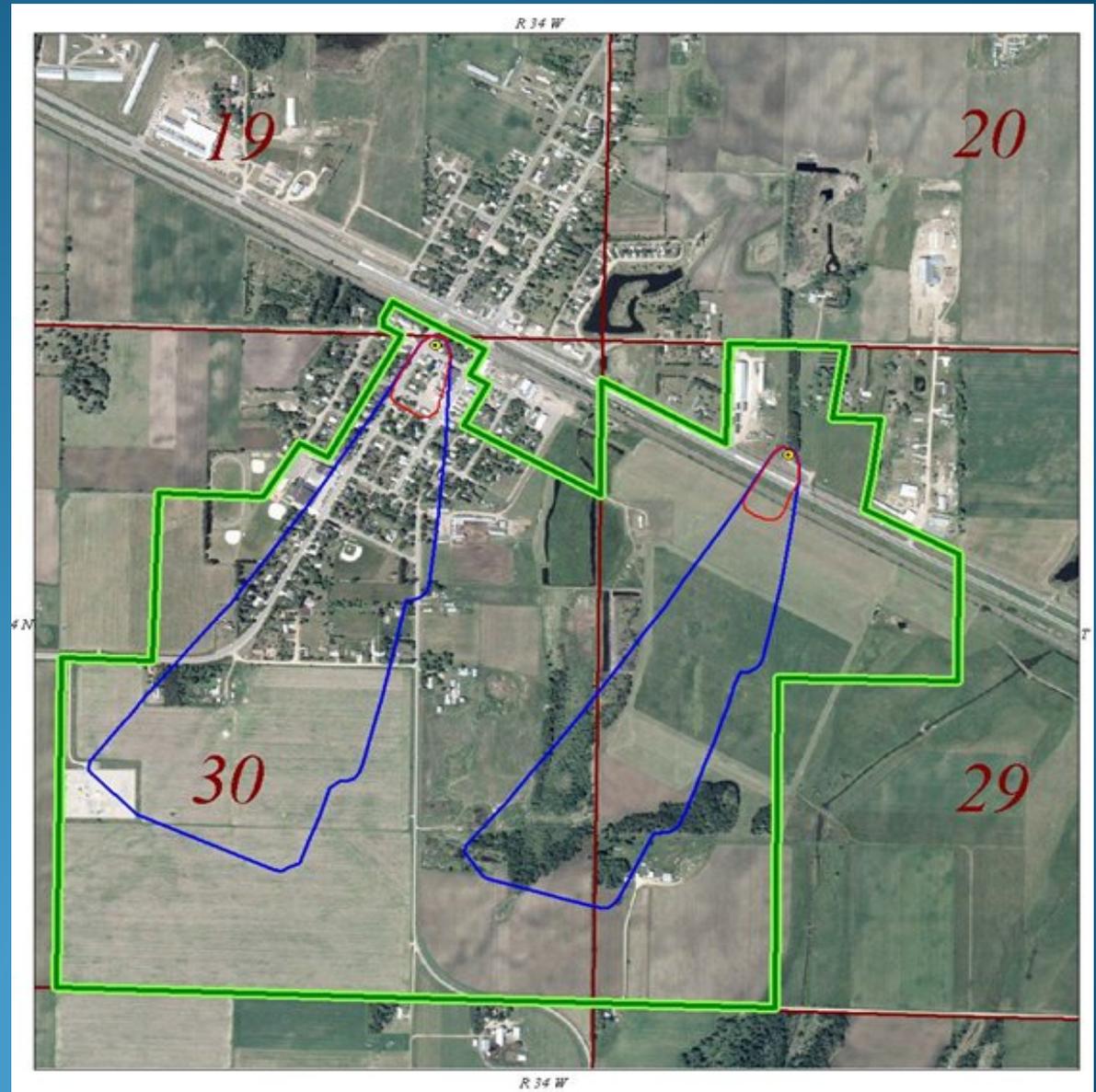
Cold Spring Ag. Approach

- Input from farmer meetings
- City and MDH funds provide cost share for nitrogen inhibitor products, side dressing etc...
- Promoting cover crops and CRP
- Promoting perennial cropping systems (alfalfa, clover etc...)
- City winning battle...however exploring options



City of Verndale – Wadena Co.

- Two Shallow Wells
- Elevated Nitrates
- Intensive Agriculture and Irrigation
- Sandy Outwash Aquifer



Verndale Ag. Approach

Nutrient Management Initiative (NMI) Program

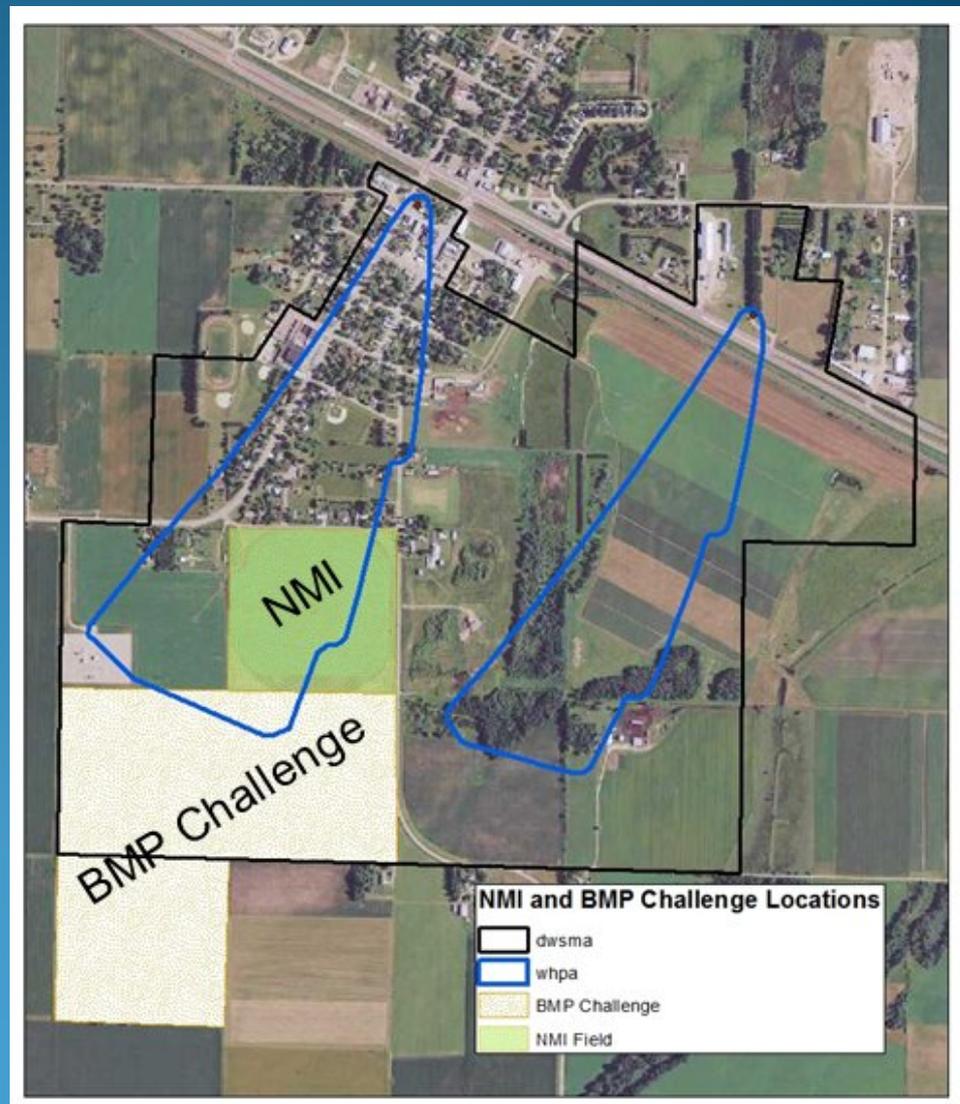
40 Ac

BMP Challenge Program

120 Ac

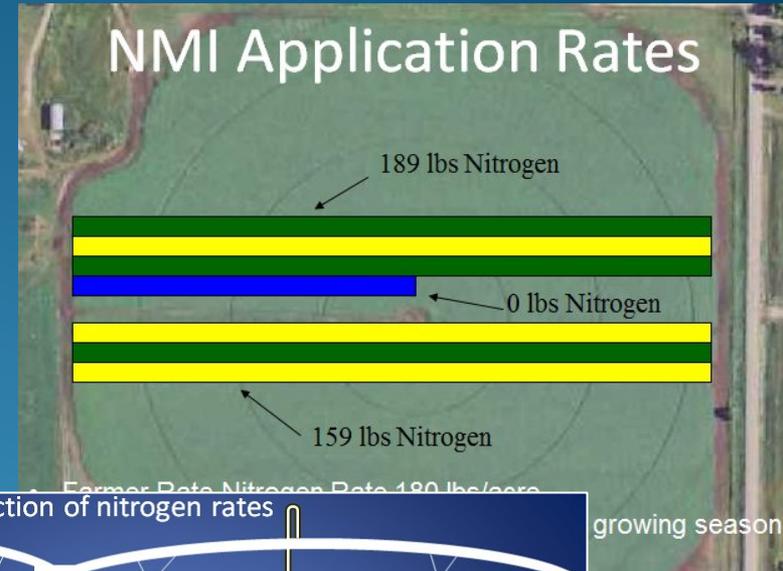
City Receives MDH Grant

- Soil Testing
- Basal Stalk Tests
- Nutrient Management
- Irrigation Management
- Nitrogen Inhibitor Products Instinct and Agrotain

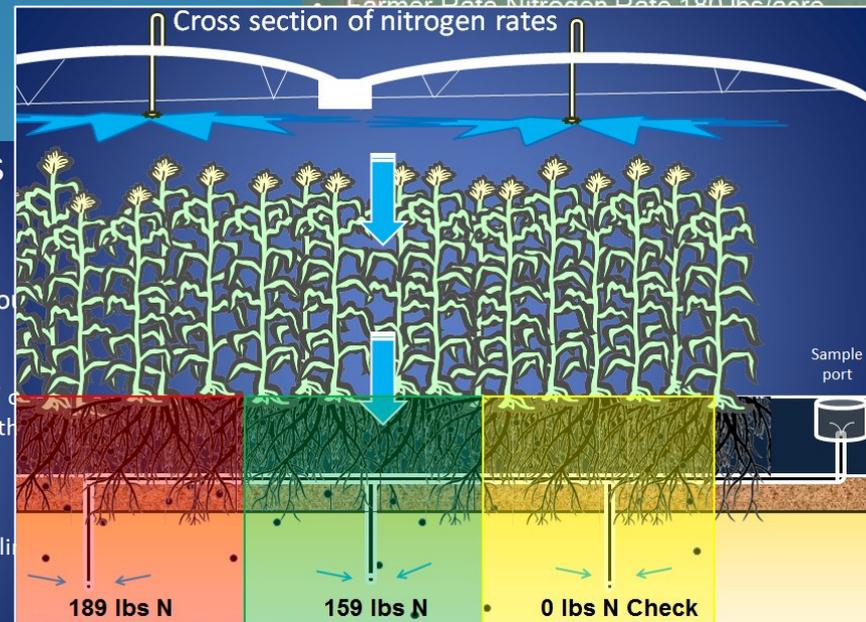
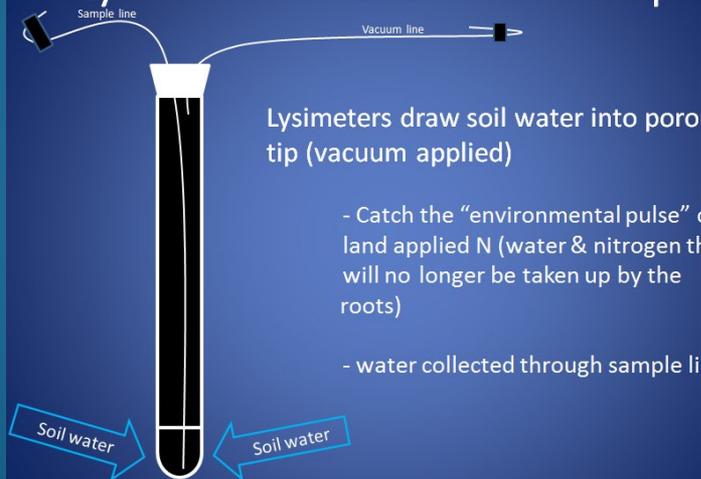


Verndale Ag. Approach Cont.

- Same yields (160 bu) independent of fertilizer rates however likely weather dependent
- Fall 2013 - planting cover crops via EQIP

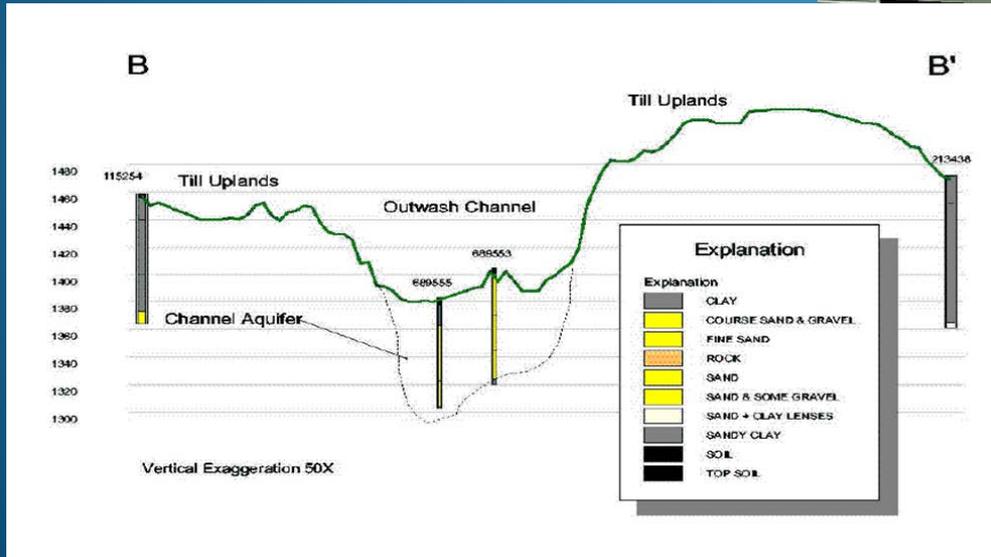
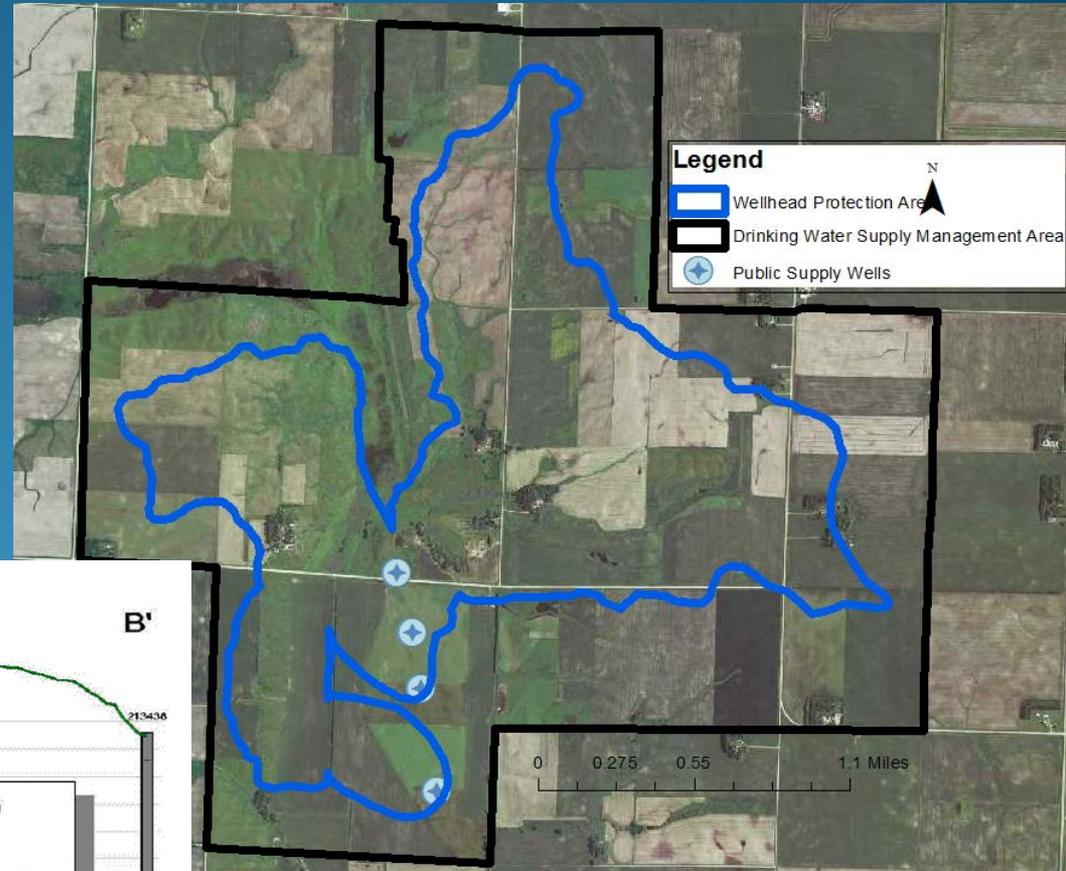


Lysimeters Installed Under Strips



Red Rock Rural Water – Cottonwood Co.

- Regional Water Supplier – 8000 Pop.
- 3 Shallow Wells
- Geology – Aquifers Located along Stream Valleys



Red Rock Rural Water

Ag. Approach

Public Education – “Drinking Water Resources and Agriculture Field Day”

Purpose

Create awareness among Farmers, Landowners, Crop Consultants & public in Cottonwood County and surrounding area. Highlight what Ag community can do to protect local water supplies.



Red Rock Rural Water

Ag. Approach Cont.

Flyer mailed to local crop consultants, farmers & landowners in the area.

Ed. Credits provided to Certified Crop Consultants & Water Operators attending.

Multiple partners; MDH, MRWA, USDA, MDA, SWCD, U of M etc...



Drinking Water Resources & Agriculture Field Day

Come & learn about our area's drinking water resources and how agriculture practices & programs can protect groundwater!

Tuesday, July 29th, 2008

New Red Rock Rural Water Treatment Plant Site

Jeffers, MN



Register by July 28th
for chance to **WIN**
\$100 Cabela's Cash!
Call: (507) 628-4201

QUESTIONS?
Call: (507) 628-4201

Schedule of Events

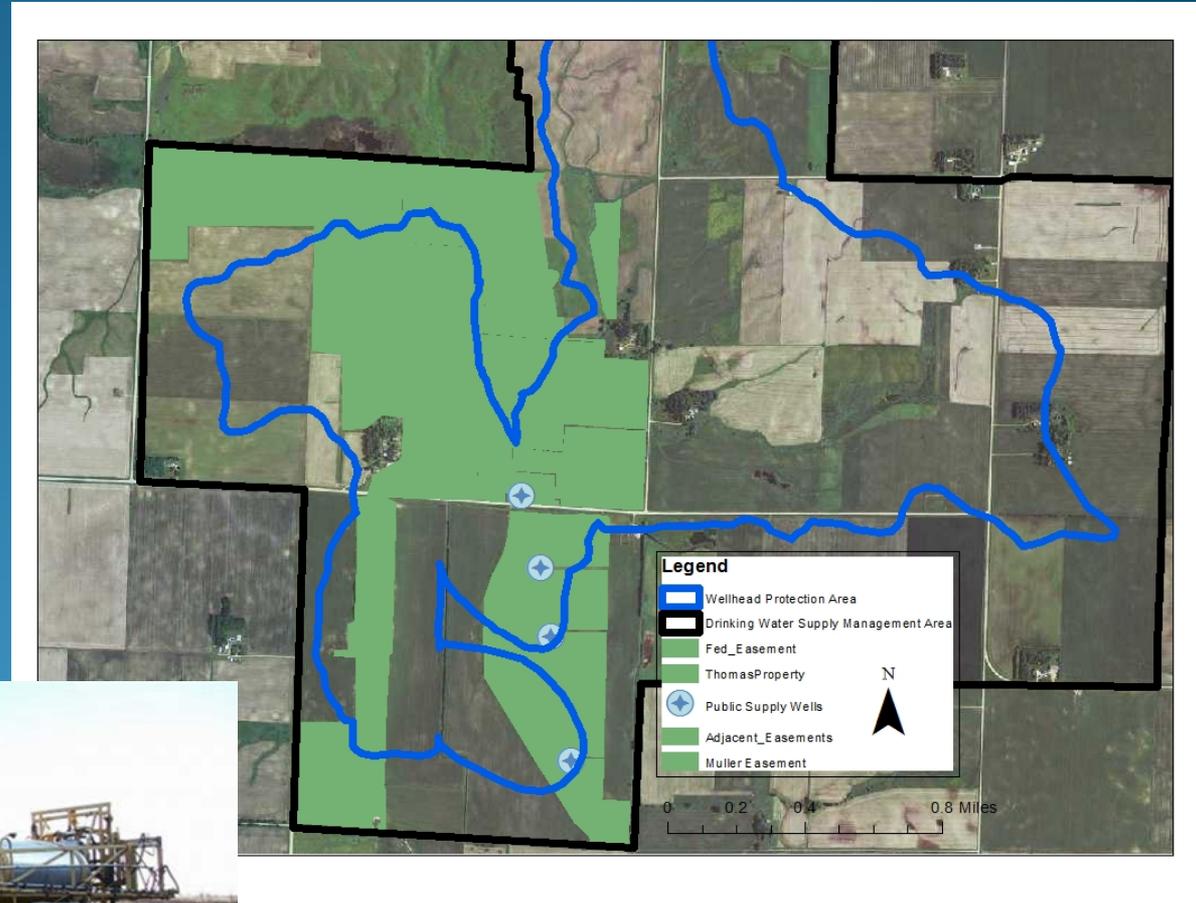
- 9am** **Welcome & Opening Remarks**
- 9:10 – 12** Morning Small Group Rotating Sessions (50min each):
1. Water Treatment Plant Tour:
Dominic Jones, Red Rock Rural Water & Mike Haugen, City of Windom
 2. Area Soils & Geology:
Tom Jackson, USDA NRCS & Terry Bovee, MN Dept. of Health
 3. Protecting Public Drinking Water:
Dave Neiman & Mark Wettlaufer, MN Rural Water Association
- 12pm – 12:45** **Lunch**
- 12:45pm** Afternoon Small Group Rotating Sessions (30min each):
1. Recommended Nitrogen Rates & Profitability:
Jeffrey Vetsch & Liz Stahl, University of Minnesota
 2. On-Farm Nitrogen Field Trials:
Nick Muller, Farmer & Brian Williams, MN Dept. of Agriculture
 3. Crop Practices & Programs to Protect Drinking Water:
Russ Derickson, MN Dept. of Agriculture & Cottonwood Co. SWCD
- 2:45pm** **Wrap Up**

Directions to the Site: From Jeffers; travel south on Co. Rd. # 52 four miles to Co. Rd. # 3, turn west and travel one mile & watch for signs noting parking area along road. Opening remarks will be at tent area next to Red Rock Rural Water Treatment Plant.

Continuing Education credits provided for Crop Consultants & Water System Operators attending.

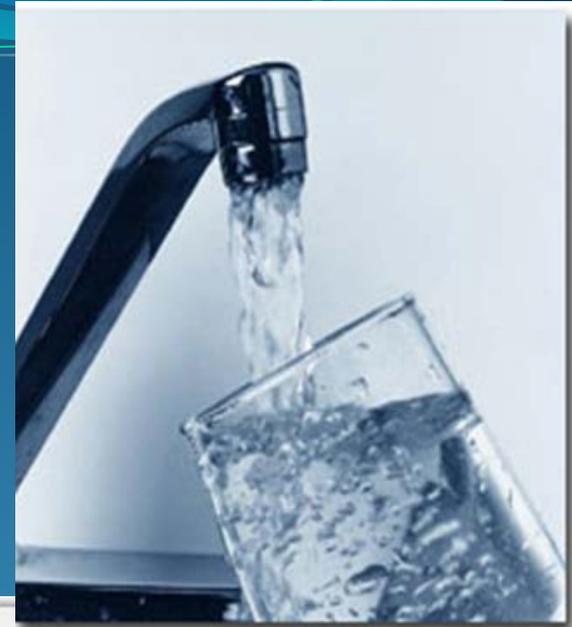
Red Rock Rural Water Approach

- Local Growers Enrolled in EQIP, NMI etc...
- Promotion of CRP
- Perpetual Easements on Critical/High Priority Areas



Closing Thoughts

- Groundwater is becoming more and more of a hot topic.
- High commodity prices will continue to drive groundwater concerns.
- Groundwater usage will continue to rise (Ag. and Non Ag.)
- Local ownership and partnerships are the key!!!
- Safe reliable drinking water is a priority for MN residents and our economy.



Opportunities

New opportunities to explore;

NRCS

- Targeted EQIP funds based on groundwater vulnerability (Possible practices include nutrient mgmt., irrigation scheduling, cover crops etc...)
- Targeted EQIP on “Sourcewater Protection Areas /Surface Water Protection Areas”
- Promotion of perennial crops, cow/calf operations etc...
- Precision conservation for groundwater

NRCS/MDA

- MN Certainty Program - Consideration/inclusion of public drinking water supplies

Habitat Organizations (gov. and non-gov.)

- Strengthen partnerships in order to stack conservation benefits