APPROVED PART I LETTER TO LGUs/PUBLIC INFORMATION MEETING NOTICE

Date: 2-9-2016

To: Joan Lee, Commissioner, Polk County Board
Kerry Winkelmann, Chairperson, Rosebud Township
James Offerdahl, Mayor, City of Fosston
Lisa Newton, District Manager, East Polk Soil and Water Conservation District
Daniel Wilkins, Administrator, Sandhill River Watershed District
Dr. Joe Bouvette, Chairperson, Northwest Regional Development Commission
Jenilynn Marchand, Planner, Minnesota Department of Health

From: Cassie Heide, City of Fosston

Re: Wellhead Protection Plan, Part 1, for the City of Fosston

The City of Fosston is in the process of developing a wellhead protection plan for its drinking water supply wells. As required by the Minnesota Wellhead Protection Rule (part 4720.5330, subpart 6), the Minnesota Department of Health approved Part 1 of the wellhead protection plan for our system. This portion of the plan includes information pertaining to:

1. The delineation of the wellhead protection area,
2. The drinking water supply management area boundary, and
3. The well and drinking water supply management area vulnerability assessment.

Enclosed please find the items listed above. If you would like a complete copy of the Part 1 plan containing the technical information used to delineate the wellhead protection area, drinking water supply management area, and vulnerability of the wells and aquifer, please contact me at 218-435-1959.

Consistent with the Wellhead Protection Rule (part 4720.5330, subpart 7), a Public Information Meeting has been scheduled on April 11th at 7pm at Fosston City Hall (220 1st St E) to discuss issues and concerns with this portion of the plan. We welcome your participation at this event.

If you have any questions concerning this matter, please contact me.

cc: Trudi Witkowski, Minnesota Department of Health

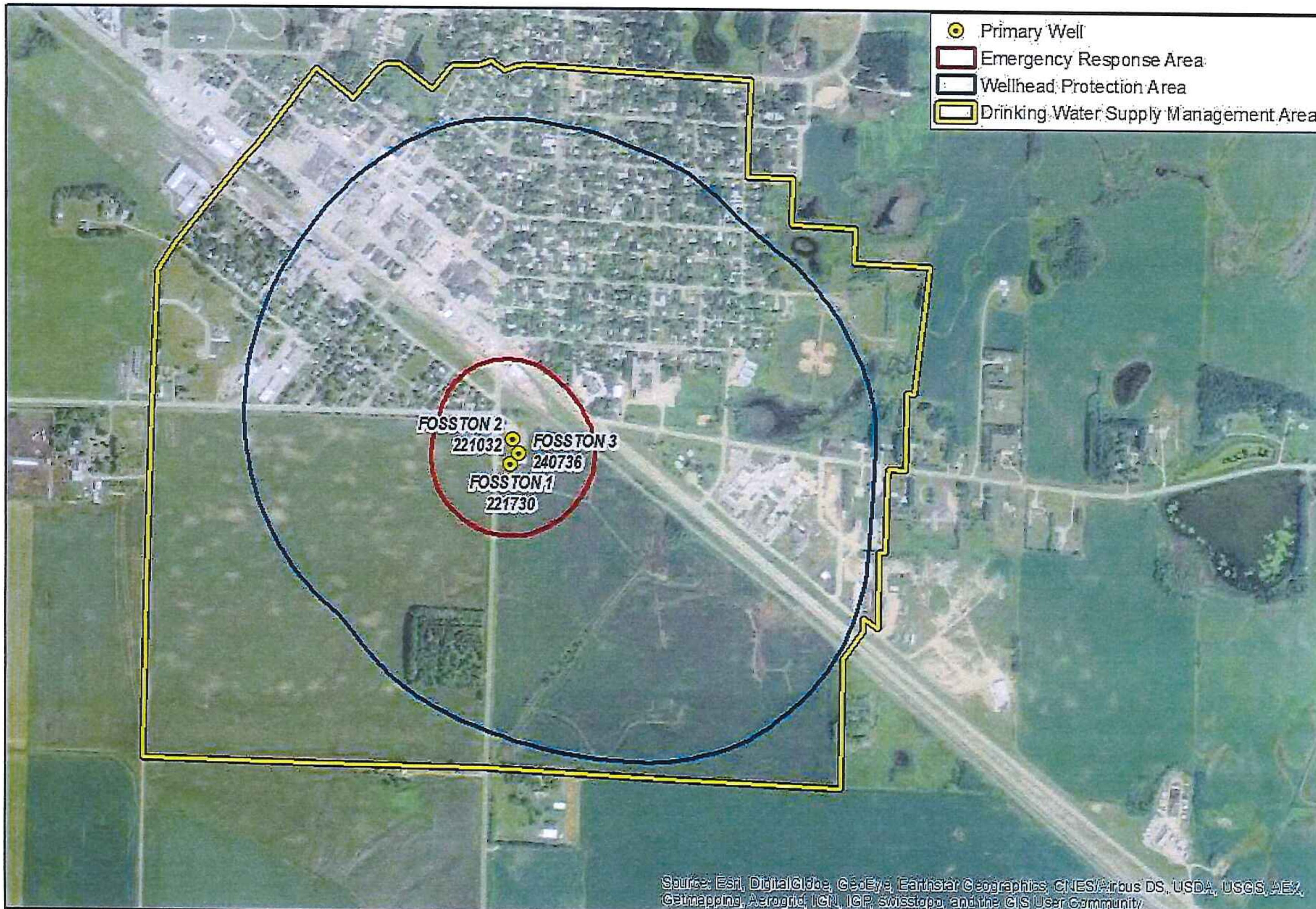

Figure 1
Wellhead Protection and Drinking Water Supply Management Area
City of Fosston

Assessment of Drinking Water Supply Management Area Vulnerability

The vulnerability of the DWSMA is low and is based upon the following information:

1) Water chemistry data from wells located within the DWSMA indicate the aquifer contains water that has no detectable levels of tritium or human-caused contamination.
2) Review of the geologic logs contained in the CWI database, geological maps, and reports indicate that the aquifer exhibits a low geologic sensitivity throughout the DWSMA and is isolated from the direct vertical recharge of surface water.
3) The stable isotope results (Appendix A) show that groundwater from the city wells plots near the meteoric water line. This indicates either no or weak hydraulic connection between surface water and the city's aquifer.

Therefore, given the information currently available, it is prudent to assign a low vulnerability rating to the DWSMA, in accordance with the Minnesota Wellhead Protection Rule (parts 4720.5100 to 4720.5590). The principal threats to such protected aquifers are unsealed abandoned wells that reach the same depth.

Assessment of Well Vulnerability

Table 1 - Water Supply Well Information

Local Well ID	Unique Number	Use/ Status[1]	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Aquifer[2]	Well Vulnerability
Well 1	221730	P	12	208	243	1967 / December 2005	QBAA	Not Vulnerable
Well 2	221032	P	12	226	274	1964 / December 2005	QBAA	Not Vulnerable
Well 3	240736	P	12	227	267	1974	QBAA	Not Vulnerable

Note: 1. Primary (P)
2. Quaternary Buried Artesian Aquifer (QBAA)

The vulnerability assessments for each well used by the **Error! Reference source not found.** are listed in Table 1 and are based upon the following conditions:

1) Well construction does not meet current State Well Code specifications (Minnesota Rules, part 4725) at Wells 1, 2, and 3 because no grouting information is known. If the wells were not grouted, they have the potential for acting as a conduit for flow of surface water and contaminants into the buried aquifer. To date, no evidence of this has been identified and it is likely that the cable tool method was used during construction of these wells, which minimizes that risk.
2) The geologic conditions at the well sites include a cover of clay-rich geologic materials over the aquifer that is sufficient to retard or prevent the vertical movement of contaminants.

3) None of the human-caused contaminants regulated under the federal Safe Drinking Water Act have been detected at levels indicating that the wells themselves draw contaminants into the aquifer as a result of pumping (Alexander and Alexander, 1989).

4) Water samples were collected from Wells 1 (221730), 2 (221032) and 3 (240736) in 2011, 2014, and 2015 and were analyzed for tritium, nitrate, chloride and bromide (Table 2). No tritium or nitrate was detected in the samples, confirming the non-vulnerable nature of the wells (Alexander and Alexander, 1989). In addition, the chloride and bromide results confirm that the wells have not been impacted by land-use activities (Mullaney, et.al, 2009).

5) Observations have shown the presence of Arsenic (Table 2), a naturally occurring contaminant, in all three city wells. The Safe Drinking Water Act has established 10 mg/L as the maximum allowed in public water systems.

Table 2 - Isotope and Water Quality Results

Unique Number (Well Name)	Tritium (TU)	Nitrate (mg/L)	Chloride/Bromide ratio	Chloride (mg/L)	Bromide (mg/L)	Arsenic (mg/L)
221730 (Well 1)		<0.05 (8/6/14)	99	1.97 (6/14/11)	0.02 (6/14/11)	13.1 (6/14/11)
221032 (Well 2)		<0.05 (8/5/14)	54	1.07 (6/14/11)	0.02 (6/14/11)	9.53 (6/14/11)
240736 (Well 3)	<0.8 (7/14/15)	<0.05 (8/6/14)	79	1.58 (6/14/11)	0.02 (6/14/11)	10.5 (6/14/11)

The above information is an excerpt from Fosston's Part I plan:

Wellhead Protection Plan

Part I

Wellhead Protection Area Delineation
Drinking Water Supply Management Area Delineation
Well and Drinking Water Supply Management Area Vulnerability Assessments

For

City of Fosston

December 2015

Trent Farnum, P.G, Hydrologist
Source Water Protection Unit

MDH Minnesota Department of Health

CLEAN WATER LAND & LEGACY AMENDMENT