



*Protecting, maintaining and improving the health of all Minnesotans*

## MEMORANDUM

**DATE:** December 19, 2006

**TO:** Licensed and Registered Well Contractors  
City of Long Prairie  
Todd County  
Advisory Council on Wells and Borings

**FROM:** John Linc Stine, Director  
Environmental Health Division  
P.O. Box 64975  
St. Paul, Minnesota 55164-0975

**SUBJECT:** Notice of Designation of a Special Well Construction Area in the City of Long Prairie, Todd County, Minnesota

The Minnesota Department of Health (MDH) is designating a Special Well Construction Area (SWCA) that includes the central portion of the city of Long Prairie in Todd County, as shown in the enclosed map (Figure 1). The SWCA designation, which becomes effective January 1, 2007, applies to the construction, repair, and sealing of all wells and borings and remains in effect until further notice.

### SITE HISTORY

During 1983, the MDH sampled five municipal wells serving the Long Prairie community public water supply and analyzed the samples for volatile organic chemicals (VOC's). Results indicated the presence of tetrachloroethylene and a variety of degradation products (chlorinated ethylenes and vinyl chloride) in two municipal wells (Number 4 and Number 5) in northeastern Long Prairie. Subsequent testing of private wells and other hydrogeologic investigations delineated a plume of tetrachloroethylene-contaminated groundwater extending approximately 4000 feet from a former dry cleaning site northeast to the two former municipal wells and further northwest towards the Long Prairie River.

In addition to the two municipal wells, approximately 200 private wells, all completed in the upper outwash sand aquifer, were impacted. In 1983-84, the municipal water supply was extended into the 15 square block area originally identified in the area potentially impacted. In 1994, contamination was found to have spread beyond this original area and municipal water was further expanded to serve this area. In 1996, a groundwater recovery system using granular activated carbon (GAC) for treatment began operation in an effort to restore groundwater quality

and to prevent spread of contamination to Municipal Wells 3 and 6. Currently, six recovery wells are operating. Minnesota Pollution Control Agency (MPCA) also installed and operated a soil venting system in the source area during 1997-99. Cleanup goals were achieved for the soils and the system was dismantled in 2000 (Johnson, M. and Gnabasik, B., 2004).

## **SITE HYDROGEOLOGY**

The Long Prairie River is located within a glacial outwash/alluvium valley, which has cut into an upper, clay-rich glacial till unit. Within the outwash channel, the upper aquifer is generally separated from a deeper outwash sand by remnants of till on the order of 10-20 feet thick, thought to be remnants of Wadena Lobe till. A lower outwash unit and lower till unit underlie the upper till. In the central part of the valley, the upper outwash extends completely through the upper till (see Figure 2). The upper outwash/alluvium aquifer extends to a maximum depth of 66 feet within the SWCA, but pinches out towards the edge of the valley and the upper glacial till unit. The lower outwash unit appears to be much more extensive laterally and may approach 120 feet thick near Lake Charlotte, south of the city of Long Prairie (MDH 2006, page 7).

Both aquifer units consist of relatively coarse sand and gravel. The upper outwash aquifer is a very productive aquifer with excellent yield. Static water levels in the upper outwash range in depth from 3 to 22 feet. Many private wells within the SWCA are simply drive-point (or sand-point) wells. Aquifer sensitivity for the upper aquifer is moderate to high and is moderate for the lower outwash aquifer. Wells completed in these aquifers are considered vulnerable to contamination, as reflected in the relatively high tritium levels found in Municipal Wells 6 and 7, indicating relatively young water (MDH 2006, page 18).

Although groundwater flow is probably normally to the west-northwest, discharging towards the Long Prairie River, withdrawals from the former municipal wells, the currently active municipal wells, and, more recently, the remediation wells, have resulted in a complex groundwater flow pattern. The orientation of the contaminant plume may, in fact, be the best reflection of historic groundwater flow patterns due to the influences of varying pumping patterns over time (Terracon 2003, figures 2, 5A, 5B, and 5C). Variations in the character of the upper outwash aquifer may also contribute to the complex flow pattern.

Figure 1. Special Well Construction Area  
City of Long Prairie, Todd County

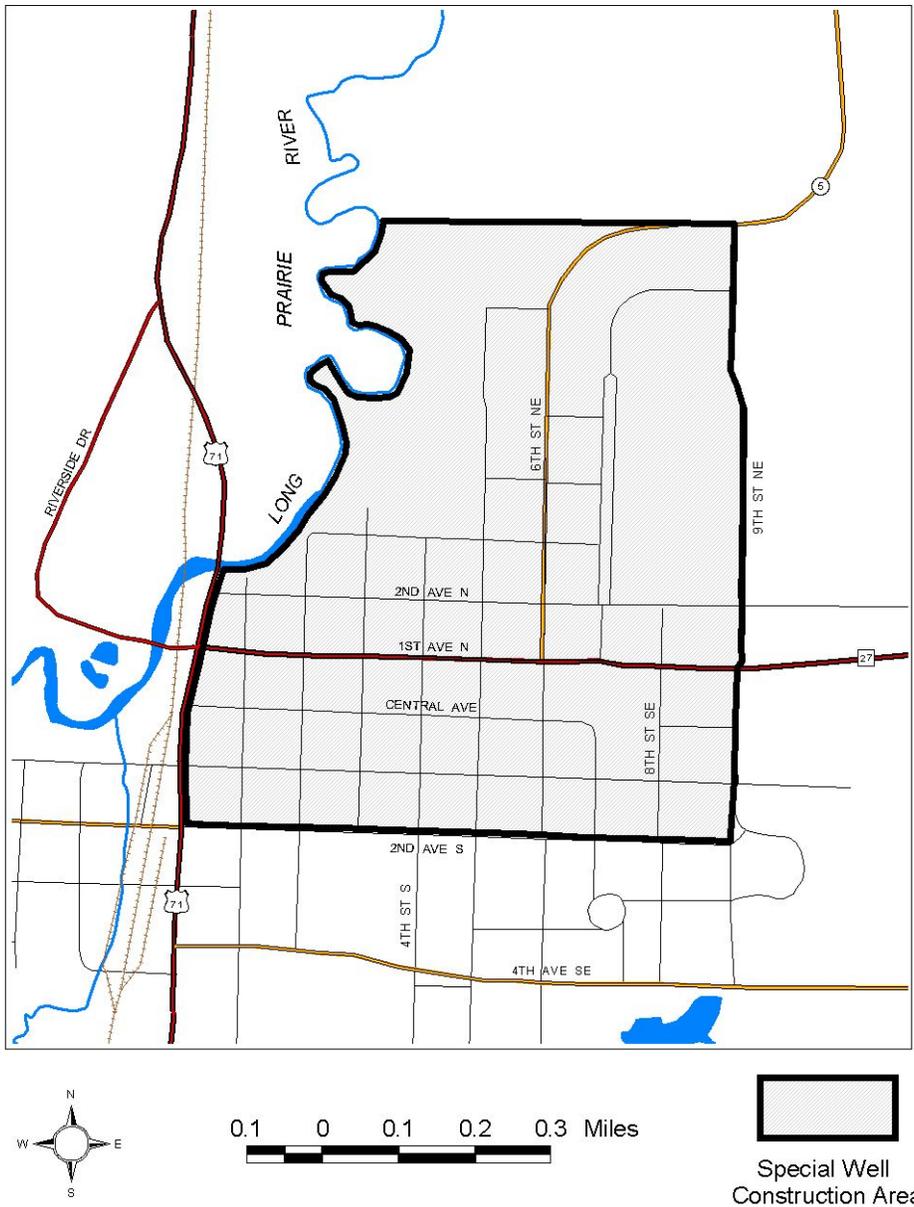
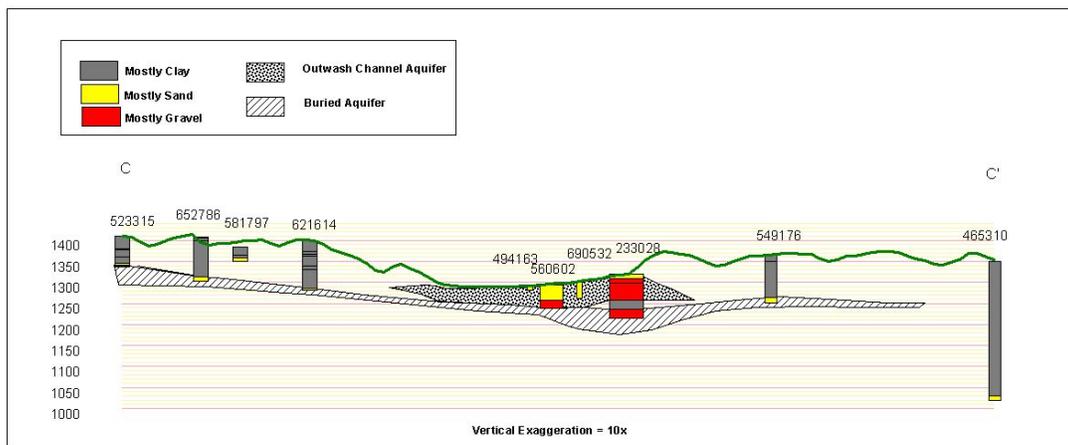


Figure 2



## PUBLIC HEALTH CONCERNS

The primary contaminant of concern is tetrachlorethylene, which is a solvent used in dry cleaning and high-quality printing. The source of contamination is a former dry cleaner located in the downtown area of the city of Long Prairie. Associated contaminants include a number of degradation/dechlorination products or impurities, including cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, 1,1-dichloroethane, 1,1-dichloroethylene, 1,1,2-trichloroethylene, and vinyl chloride.

Tetrachlorethylene, as well as some of its degradation products (e.g. trans-1,2-dichloroethylene and trichloroethylene), have been shown to be toxic to the liver and kidneys in laboratory animals. The Health Risk Limit (HRL), which is the reference for domestic wells, for tetrachloroethylene is 7 µg/l. In addition, some degradation products are known (vinyl chloride) or probable (trichloroethylene) human carcinogens.

## **BOUNDARIES OF THE SPECIAL WELL CONSTRUCTION AREA**

The location of the SWCA is shown on the attached map (Figure 1). This area is bounded on the north by a line beginning at the intersection of County Road 5 and Ninth Street Northeast and extending due west to the Long Prairie River (the city of Long Prairie boundary), Ninth Street Northeast/Ninth Street Southeast on the east, Second Avenue Southeast on the south, and the Long Prairie River and State Aid Highway 71 on the west. The SWCA is within the limits of the city of Long Prairie and is within the west half of the southwest quartile of Section 16, the southeast quartile of Section 17 (that portion east of the Long Prairie River), the northeast quartile of Section 20, and the west half of the northwest quartile of Section 21 of Township 129 North, Range 33 West, Todd County.

## **REQUIREMENTS OF THE SPECIAL WELL CONSTRUCTION AREA**

1. All wells and borings regulated by the MDH are subject to the requirements of this SWCA. These include water-supply wells (domestic, public, irrigation, commercial/industrial, heating/cooling, remedial), monitoring wells, and dewatering wells. Borings include environmental bore holes, elevators, and vertical heat exchangers. Notifications, permit applications, and plans for wells must be submitted to the MDH.
2. Construction of a new well or boring, or modification of the depth or casing of an existing well, may not start until plans have been reviewed and approved, in writing, by the MDH. In addition to the normally required notification of permit application, the plan must include the following information: street address; well depth; casing type, diameter(s), and depth; construction method, including grout materials and grout method; pumping rate; and well use.
3. Special well construction and/or monitoring requirements may be imposed depending on well location and use in order to protect public health and groundwater quality and to prevent contaminant migration. These requirements will be based on available knowledge of groundwater contamination and movement near the well site and the proposed use and pumping rate of the well.
4. Water-supply wells will not be approved for completion in the upper outwash unit and the lower outwash unit in the SWCA for any consumptive or potable uses, including drinking, cooking, or processing of food, drink, or pharmaceuticals, or to supply water to plumbing fixtures available for human consumption. Completion of a potable water-supply well into a deeper aquifer may be considered.

5. Approval of plans and specifications for construction or modification of a community public water-supply well and of the well site is required by Minnesota Rules, part 4725.5850. The MDH may approve completion of a public water-supply well within the designated SWCA if the system operator/owner can demonstrate that the water delivered to the distribution system meets Maximum Contaminant Levels (MCLs) established by the U.S. Environmental Protection Agency, either through treatment, blending with other sources, monitoring, or other mechanisms. The MDH regularly monitors public water supplies for regulated contaminants. The MCL for tetrachlorethylene is 5µg/l. Many of the other chlorinated ethanes and ethylenes also have established MCLs.
6. A well or boring used for nonpotable purposes may be completed into the upper outwash unit or the lower outwash unit anywhere within the SWCA, provided that the MDH and the MPCA determine the use of the well will not interfere with remediation efforts, cause further spread of contamination, or result in human exposure to contaminants at concentrations exceeding HRLs or other relevant public health standards.
7. No well or boring may be permanently sealed until the MDH has received, reviewed, and approved (in writing) the plans for the proposed sealing. In addition to the required notification, the plan must include the following information: street address; original well/boring depth; current well/boring depth (if different); casing type(s), diameter(s), depth(s); methods of identifying and sealing any open annular space(s); methods of identifying and removing any obstructions; grout materials and sealing methods.
8. Contractors must contact the MDH, St. Cloud district office by phone at least 24 hours and one business day (Monday – Friday) prior to the start of drilling a new well or boring, modification of an existing well or boring, or sealing of a well or boring.
9. All provisions of Minnesota Rules, Chapter 4725, are in effect.

## **PERSONS TO CONTACT**

For additional information regarding this SWCA, please contact:

Mr. Michael Convery, P.G.  
Minnesota Department of Health  
Well Management Section  
P.O. Box 64975  
St. Paul, Minnesota 55164-0975  
651/201-4586

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Plans for construction, modification, or sealing of wells and borings within the SWCA must be submitted to:

Mr. Curtis Wunderlich  
Minnesota Department of Health, St. Cloud District Office  
3400 North First Street, Suite 305  
St. Cloud, Minnesota 56303-4000  
Curtis.wunderlich@health.state.mn.us  
320/255-4216

Notifications and permit applications for the construction, modification, or sealing of wells and borings must still be faxed or mail to:

Minnesota Department of Health  
Well Management Section  
P.O. Box 64975  
St. Paul, Minnesota 55164-0975  
651/201-4600  
Fax 651/201-4599

For information regarding health effects, please contact:

Carl Herbrandson  
Minnesota Department of Health  
Site Assessment and Consultation Unit  
P.O. Box 64975  
St. Paul, Minnesota 55164-0975  
Carl.herbrandson@health.state.mn.us  
651/201-4906

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For information regarding the investigation, monitoring, and remediation of the Long Prairie groundwater contamination site, please contact:

Nile Fellows  
Superfund Unit 1  
Superfund & Emergency Response  
Remediation Division  
Minnesota Pollution Control Agency  
520 Lafayette Road North  
St. Paul, Minnesota 55155-4194  
651/296-7299  
nile.fellows@pca.state.mn.us

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Superfund Unit 3  
Superfund & Emergency Response  
Remediation Division  
Minnesota Pollution Control Agency  
525 Lake Avenue South, Suite 400  
Duluth, Minnesota 55802  
218/529-6266  
barb.gnabasik@state.mn.us

## **REFERENCES**

Johnson, M., and Gnabasik, B., 2004, Memorandum - Request for Establishing a Special Well Construction Area at the Long Prairie Ground Water Contamination Site, 12p.

Minnesota Department of Health, 2006, Wellhead Protection Plan for the City of Long Prairie, 44p.

Terracon, Inc., 2004, 2003 Annual Monitoring Report, Long Prairie Ground Water Remediation System.

JLS:MPC:jmw