



Exhibit 1

MEMORANDUM

Date: March 14, 2024

To: Alan Neer – Willmar Municipal Utilities

From: Jim de Lambert, CPG, PG – Carlson McCain, Inc. 

Re: Southwest Wellfield Development Activities
Willmar, Minnesota

The purpose of this Memorandum is to briefly review potential impacts to water quality at the southwest wellfield from development in the area along with potential mitigation strategies, if needed. The memo also addresses some of the challenges in preserving future well sites during development of the wellfield property for other uses.

Background

The Southwest Wellfield has been an important source of potable water supply for the City of Willmar (City) since at least the 1960s when the initial wells were developed in the area known as Swansson Field on the north side of Willmar Avenue SW. The last well (W-18) was completed in this portion of the wellfield in 1989 when it was determined that available well sites had been utilized for production wells and the wellfield was nearing complete development.

In the early 2000s a program was initiated to assess the feasibility of expanding the wellfield to the south of Willmar Avenue SW. This program initially involved a test drilling program that included test hole drilling and logging, observation well development, and aquifer testing that is summarized in a memorandum titled *July 2004 Test Hole Drilling Report* prepared by Liesch Associates, Inc. Figure 1 from this report is attached to this memo for reference.

Since the test drilling revealed favorable geologic conditions at several of the test hole locations, Willmar Municipal Utilities (WMU) authorized development of a computer model to assess hydrogeologic conditions and to assist in determining the additional capacity of the wellfield south of Willmar Avenue SW. The modeling results were summarized in a memorandum titled *Summary of MLAEM Modeling Results for the Willmar Southwest Wellfield*, prepared by Liesch Associates, Inc., and dated April 15, 2005. It was determined that the area could support additional water supply production and wells W-23 and W-24 were drilled in 2005. After testing, the wells were added to the City's water supply system and have been in production since that time.

The modeling indicated that two to four additional production wells may be possible in the area south of Willmar Avenue SW but recommended monitoring and testing during construction and operation of wells W-23 and W-24 as an efficient means to assess additional water supply production. The 2-inch observation well installed during the test drilling program in 2004 was also utilized for this analysis.

The Southwest Observation Well has been used to monitor the combined effects of wellfield operations and aquifer recharge trends since 2007. Routine water level measurements are collected through the use of a data logging pressure transducer at six-hour intervals (midnight, 6:00 am, noon, and 6:00 pm) every day. The data is downloaded approximately twice per year, summarized for WMU, and reported to the Minnesota Department of Natural Resources (MDNR) annually as a condition of the City's water appropriation permit. The water level data indicates that the effects of the additional production from W-23 and W-24 stabilized years ago and that the more recent fluctuations reflect varying recharge and precipitation patterns as well as overall wellfield production. This information indicates that the wellfield south of Willmar Avenue SW can support additional well sites and water supply production.

Proposed Development

This portion of the Southwest Wellfield primarily consists of open space, park land and sports facilities. Additional development has been proposed for the site including multi-family residential buildings and associated infrastructure.

All of Willmar's municipal wells are included in a Minnesota Department of Health (MDH) required Well Head Protection (WHP) plan intended to protect the wells from contamination that could occur from existing potential contaminant sources and from future development activities around the wells. The computer model that was developed for assessment of the new well sites (W-23 and W-24) was adapted to delineate the area where land use activities could impact the wells, then this area was analyzed to determine the risk based on the hydrogeology of the area, construction of the wells, geochemistry of water coming from the wells, and other factors in a process developed by the Minnesota Department of Health (MDH) and the MDNR. The results of this analysis are summarized in a report titled *Wellhead Protection Plan for the City of Willmar – Part 1*. This report concludes that the wellhead protection area delineated for the Southwest Wellfield is low to moderately vulnerable to contamination based on the factors listed above, including geochemistry data that indicates the water pumped from some of the wells shows indications of relatively recent infiltration into the aquifer. This indicates that the Southwest Wellfield is moderately vulnerable to contaminants that could infiltrate into the subsurface and reach the aquifer in a time frame that could impact Willmar's source of potable water supply. Part 2 of the City's Wellhead Protection plan (*Wellhead Protection Plan for the City of Willmar – Part 2*) provides guidance for managing potential contaminant sources, and for future development in and around the wellfields.

We understand that a residential development is proposed for the Southwest Wellfield that could include stormwater management features such as infiltration ponds. These features could pose a risk to the aquifer if potential contaminants reached the stormwater system and subsequently infiltrated the aquifer. Potential contaminants are known to occur in typical municipal stormwater but could also occur as the result of spills or leaks of items such as gasoline and diesel fuels and other materials in bulk transport tankers such chemicals, milk, and other products. It is recommended that intentional infiltration within a delineated Wellhead Protection Area for a community water supply take this into consideration and should be avoided if possible. Mitigating measures could include utilization of a

stormwater design that includes a lined retention pond in place of an infiltration pond or basin, or to site the structure in an area beyond the designated Wellhead Protection Area.

In addition to introducing potential contaminant sources, development in the immediate area of the wells could eliminate potential sites from future consideration. MDH has specific, required isolation distances for all wells and specific potential contaminant sources. The isolation distances are mandatory minimum distances and water suppliers are encouraged to develop plans and take advantage of opportunities to go beyond the minimum requirements.

There are several layers of protection for the area surrounding a public water supply well. The first is the minimum distance between a public supply well and the property line which is 50 feet, this implies a minimum parcel size for a well of just over 100 X 100 feet. However, this minimum parcel size is too small to install a replacement well and additional land would need to be purchased or the site may need to be abandon. A minimum parcel size of approximately 200 X 200 feet will allow room for one or more replacement wells when needed. This size also matches up with the MDH mandated Inner Well Management Zone (IWMZ) which is defined as a 200-foot radius around the well. The Wellhead Protection Plan for Willmar also includes an emergency response zone around each of the wellfields, which is defined by a one-year time of travel. In other words, it is the area within which water in the aquifer could reach the wells in less than one year. The overall wellhead protection area for the Willmar wellfields is based on a ten-year time of travel.

Figure 1 Illustrates the southern portion of the Southwest Wellfield along with the eight test hole locations and the test holes that have already been developed as production wells. Since the test drilling in 2004, the location TH-5-04 is no longer available due to the stormwater infiltration pond constructed nearby and TH-4-04 is too close to the center of pumping with four existing wells within approximately 650 feet. This leaves four additional potential well sites out of the initial eight test hole locations. Test holes TH-6-04, TH-7-04, and TH-8-04 are the preferred locations for potential future production wells because these sites could be developed with a well spacing of approximately 500 feet. TH-3-04 would also be a good candidate if it could be installed further south to increase the distance from well W-24 to 500 feet. The further these potential well sites are from each other, and from the existing wells and pumping center for the existing wellfield, the greater the chance that they would be able to produce sufficient quantities of water without adversely impacting the yields from the existing wells.

Given the difficulty and expense of locating, permitting, and developing new wellfields and well sites, protection of existing and known sources of potable water supply is a priority for most water suppliers. WMU has taken significant steps over a long period of time to protect existing potable water sources and to identify potential future potable water sources to assure a high quality and stable water supply as the city continues to develop in the future.



Source: <http://www.lmic.state.mn.us/chouse/index.html>