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July 21, 2005

Mr. Fred Campbell
Hydrogeologist
Minnesota Pollution Control Agency
Metro District Office
Site Remediation Section
520 Lafayette Road
St. Paul, MN 55155-4194

Mr. Nile Fellows
Project Manager
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Re: Groundwater and Residential Well Evaluation – North Oaks, Minnesota
Prepared by: Conestoga-Rovers & Associates, June 2005

Dear Mr. Campbell:

Barr Engineering Company (Barr) submits this letter on behalf of its client, North Oaks Citizens for Clean Groundwater, including Tom Vogt ("Client").

This letter responds to the report prepared by Conestoga-Rovers & Associates (CRA) entitled Groundwater and Residential Well Evaluation – North Oaks, Minnesota (hereafter referred to as the June 2005 Report). This report was submitted to the Minnesota Pollution Control Agency (MPCA) on June 30, 2005. Despite requests for all copies of technical documents submitted to MPCA relating to this matter, Barr and its Client did not receive a copy of the June 2005 Report until July 7, 2005 and the report was not made available on the City of North Oaks website until July 19, 2005. Barr has prepared this response letter in a timely manner given the short time period allowed for our review.

At the request of our Client, Barr sent Dr. Fletcher Driscoll documents prepared by CRA and other pertinent MPCA-file documents. Dr. Driscoll reviewed these materials and spoke with the mayor of North Oaks, Thomas Watson. Dr. Driscoll then met with CRA staff to discuss some data gaps that he identified in his review. CRA expressed a willingness to work with Barr in identifying a mutually acceptable path forward and arranged to meet with Barr technical staff and Dr. Driscoll on the morning of July 21, 2005 to work out a plan for collecting additional data groundwater at the site. The Client and Barr enthusiastically agreed to this meeting of technical staff on the very next day.

We met with Dr. Driscoll on the morning of July 21 to compare professional opinions and learn from Dr. Driscoll the concurrences he apparently obtained from CRA so that later in the morning/early afternoon when we met with CRA, the parties (i.e., Driscoll, CRA, and Barr) could quickly find an acceptable study approach. Dr. Driscoll graciously agreed to assist, even though he was scheduled to leave the country later that day. We waited well into the afternoon for CRA staff only to be informed that they would not meet under our initially agreed upon arrangement.

It is Barr's understanding that Mayor Watson has given the Client a deadline of Thursday July 21, 2005 to prepare a letter to the North Oaks City council to inform it of what Barr intends to present at the special City Council meeting that is scheduled for July 28, 2005. If we do not provide the Mayor with this information we will not be given time to present. It was our intention to work with CRA so that we could present a letter to Mayor Watson and the City Council with a mutually agreed-upon approach. Time constraints and the above-described circumstances have prevented this outcome.

Therefore, Barr has prepared this letter to communicate its concerns and present the minimal scope of technical activities that it believes (and it believes Dr. Driscoll concurs with based upon our meeting with him this morning) are necessary in order to move forward on this project. It is our understanding from Dr. Driscoll that CRA (subject to Client approval) also agreed, at least in principle, to the activities described in this letter during the meeting held between Dr. Driscoll and CRA staff.

The comments contained in this letter are based on Barr's review of the CRA June 2005 Report, as well as our review of the file and technical documents available at the MPCA and other documents made available by the MPCA pursuant to the Minnesota equivalent of the Freedom of Information Act Request to the MPCA.

Based on our review of the available documents, it is our opinion that insufficient data has been collected and the evaluation of existing data cannot, in itself, form the basis of the recommendations outlined in the June 2005 Report.

Barr believes that a lack of data has prevented the development of a hydrogeological model to characterize, evaluate, and predict groundwater flow patterns and determine the extent and magnitude of groundwater contamination. Given the known impacted residential wells, and the number of residential wells that may be impacted in the future, a technically sound understanding of the hydrogeologic conditions is necessary. The ability to predict groundwater flow patterns or contaminant plume migration tendencies is severely limited due to the lack of a robust monitoring well network. Barr strongly believes that the existing monitoring network is insufficient to fully characterize the hydrogeological conditions of the site and surrounding area. There simply is no good substitute for monitoring wells. Without monitoring wells, neither the extent of contamination nor the direction of groundwater flow can be adequately characterized.

Given the lack of appropriate data collected to date regarding the hydrogeological conditions of the site and surrounding area, many of the conclusions that have been drawn by CRA and the MPCA are speculative, at best. A few key issues related to this are summarized below.

- The opinions of CRA concerning the nature, extent, and magnitude of the contaminant plume are not based on confirmatory data that support CRA's opinions.
- The lack of a monitoring network prevents the reliable prediction of the potential risks associated with the offsite plume. Given the actual and potential receptors in close proximity to the dump site, predictive capabilities are imperative. These predictive tools (models) are widely recognized (and have been for more than 10 years) and implemented on most sites that pose far less risk than this site.
- The recommendation to replace the impacted well at 13 West Shore Road with a deep well installed in the Prairie du Chien aquifer (PdC) is premature at this time due to the lack of

water quality data in the PdC or an evaluation of how pumping in the PdC would affect vertical migration of contaminants.

- The proposed "non-permanent" vertical profiling method proposed in two impacted areas east and west of Lake Gilfillan is not sufficient to adequately characterize the extent and magnitude of contamination.
- The two proposed permanent monitoring wells north of the Consolidated Waste Area are an encouraging start, but we believe more wells may be necessary to fully characterize the extent and magnitude of the contamination in this area.

To address these issues, Barr strongly believes that, at a minimum, the following activities must be implemented:

- ***Permanent monitoring well nests*** need to be installed to gain a better understanding of hydrogeological conditions. Well nests consisting of three wells each and screened across the following horizons:

    - the Lower Sand Aquifer; a 5 to 10-foot screened interval
    - the interval of the transmissive portion of the St. Peter Aquifer which is immediately above the basal St. Peter Aquifer; a 5 to 10-foot screened interval, and
    - the upper portion of the Prairie du Chein Aquifer; a 5-foot screened interval

- ***A minimum of seven (7) well nest locations*** are recommended, as described with associated rationale below:

    - 17/22 Gilfillan Road; Rationale – former 'kidney-bean' high concentration area; presumed centerline of plume
    - 12/13 West Shore Road/2 Hummingbird; Rationale – current impacted area; presumed centerline of plume
    - 6 Badger; Rationale – Downgradient in presumed centerline of plume. May be the horizontal extent of the contaminant plume
    - 3/7/14 Duck Pass; Rationale – Evaluate plume geometry East of Lake Gilfillan (north of centerline); also to evaluate potential northern migration of plume
    - 14 Dove Lane/14 Gilfillan Road; Rationale – Evaluate plume geometry East of Lake Gilfillan (south of centerline)
    - 1/3/4 Poplar Lane; Rationale – Evaluate plume geometry West of Lake (north of presumed centerline)
    - 4/5/6 West Shore Road; Rationale – Evaluate plume geometry West of Lake (south of presumed centerline)

    It should be noted, however, that in discussions with Dr. Driscoll this morning, Barr indicated that 5 well nest locations would the minimum number required. Dr. Driscoll agreed. However, upon reconsideration of the current information available (or not available) and after placing the first 5 well nests on the map, Barr believes that 2 additional well nests are necessary. These are the two well nests located at 1/3/4 Poplar Lane and 4/5/6 West Shore Road (the last two bulleted locations). Therefore, in fairness to Dr. Driscoll, Barr Engineering does not know Dr. Driscoll's position on the two additional well nests.

- ***Fate and transport analysis of the contamination beneath North Oaks*** should be initiated in order to enhance the ability to predict groundwater flow patterns and contaminant plume

migration and to make sense of the data in terms of physical processes. Scientists and the public cannot be expected to have confidence in predictions of no future impacts if no predictive evaluations have been performed.

- ***Re-evaluation and renovation of the Highway 96 Dump Site onsite extraction and monitoring system*** to ensure that off-site migration of contaminants from the Consolidated Waste Area is not occurring.

- ***Presentations by CRA to the public would be greatly enhanced through the use of 3-D visualization software*** to assist the public in understanding the issues associated with this site and the North Oaks Community. It is clear that the public needs to be provided with clear, concise, and accurate information on the conditions in the area.

- ***CRA should refrain from speculation and innuendo*** regarding potential septic influence on the Highway 96 plume unless data exists to support these claims.

Barr strongly believes that the recommendations presented above are absolutely necessary to gain a better understanding of the hydrogeological conditions and contaminant plume characteristics. The recommendations presented above must be considered the minimum activities necessary to obtain an acceptable level of understanding regarding the nature and extent of the groundwater contaminant plume. Investigations of this type are usually an iterative process. Additional investigation activities to fully characterize hydrogeological conditions may be required based on the data collected The ability to predict the groundwater flow patterns and contaminant plume migration is essential, given the number of known impacted wells and the potential for future impacts.

Based upon our detailed discussions with Dr. Fletcher Driscol, we believe that he concurs with Barr's recommendations. There is a basic need for this additional data collection. The data and information generated by the implementation of these recommendations are essential to making informed decisions and policy and in deciding upon a technically sound, safe, and permanent remedy for the residential wells that have already been impacted to date and to predict future potential impacts.

Barr and its Client respectfully request the MPCA take our comments and recommendations into account in its review of and response to CRA's June 2005 Report.

Sincerely,

Mark Deady

Mark A. Deady, P.E.

c: Tom Vogt
Daniel Colton, Esq.
Dr. Fletcher Driscoll
George Rux (City Council Member)
Mark Owens-Kurtz (City Council Member)
Beth Cliffe (City Council Member)
Tim Dunleavy (City Council Member)
Tom Watson (Mayor)