

February 24, 2012

Mr. Stefan Higgins, PE, Assistant City Engineer  
Engineering Department  
City of Blaine  
10801 Town Square Drive NE  
Blaine, MN 55449

**Re: Well Siting Proposal and Supplemental Agreement**

Dear Mr. Higgins:

This letter is intended to serve as a proposal and definition of scope of engineering services that Barr Engineering Co. (Barr) will provide for the City of Blaine (City). The services to be provided are generally described as an engineering study to assist the City in siting future municipal wells needed for water supply. The services include groundwater modeling, a preliminary potential contaminant sources assessment, preliminary well interference study, a review of potential well impacts upon nearby wetlands, and a preliminary wellhead protection area delineation for proposed Wells 18 and 19. The work described in this document will be performed under a master contract agreement that will be developed between the City and Barr should you elect to hire us for this work. This letter would then serve as a subagreement between Barr and the City. This letter includes:

- Project Understanding
- Project Team
- Assistance Provided by the City of Blaine
- Scope of Services
- Cost
- Project Schedule

## **Project Understanding**

The City of Blaine is interested in planning out future well locations in its proposed Northeast Well Field so that a series of wells can be drilled to meet water demands as the City grows. It is our understanding that the City intends to transition Well 7 from seasonal use to emergency use in the near future and augment current supply with Wells 18 and 19 which would be located in the Northeast Well Field that is the subject of this proposal. Following the installation of Wells 18 and 19 the City would eventually install additional wells until the total flow generated by this well field is approximately 6,000 gpm. Flow from the wells would then be fed to a new water treatment plant that would be constructed in the vicinity of the Northeast Well Field.

It is our understanding that there are five main goals of this study. They are:

1. Site Wells 18 and 19 so they can move to plans and specifications for construction.
2. Provide a qualitative assessment of the total capacity of the well field to see if it can likely produce the desired amount of water for the new treatment plant.
3. Identify potential sources of contamination that might affect the siting of wells in this area.
4. Estimate the impacts of the proposed wells and well field on nearby existing wells
5. Estimate the impact of the well field on water levels beneath nearby wetlands of concern

It is our understanding that the drift aquifer and the Franconia-Ironton-Galesville (FIG) aquifer will both be considered, if needed, to obtain the desired yield. Any additional work that might be needed to validate this assessment will be recommended in the conclusions of the study. All well locations will be selected to meet City water demands while meeting safe yield requirements listed in the State Rules.

In order to achieve the goals of the study Barr will perform a series of groundwater model runs using our existing groundwater model that was prepared for Blaine and that has now been incorporated into the Metro Model II. Model runs will include:

1. **Baseline:** A model run to establish baseline conditions that will then be used for comparisons of other runs. The baseline condition run will include average water demand for the City for the last 5 years distributed among existing wells according to data provided by the City so that well pumping modeled reasonably approximates actual conditions.
2. **Modified Baseline:** Next another model run will be performed that eliminates Well 7 and distributes the demand associated with that well equally among all remaining existing wells. This will create a new baseline condition as if no new wells were installed.
3. **Wells 18 and 19:** Model the installation of Wells 18 and 19 alone in the Northeast Well Field.
4. **Northeast Well Field:** Finally we will model a series of wells in the Northeast Well Field that will generate up to 6,000-gpm. This will include one run attempting to obtain all water from the quaternary, one run attempting to obtain all water from the FIG, and one run with a blended option obtaining water from some wells completed in each aquifer.

All wells in the Northeast Well Field will be modeled within an area defined by the City as viable for this well field. This is generally described as the water tower site and a few selected additional sites near there which the City either owns, has an option to purchase, or an option to work with the developers to obtain sites needed. Each of the runs will be compared back to the Baseline run. Data will be depicted as impacts to groundwater shown as either additional drawdown or rebound as compared to the baseline. Maps showing the impacts will include National Wetland Inventory wetlands so that general implications of impacts to wetlands can be discussed.

The scope of services listed below is based on the following assumptions. This is not a complete listing of all assumptions just those most critical to the work and the cost estimate.

- Work will be based on existing data only
- No additional field data will be gathered for this study.
- The current version of the new Metro MODFLOW groundwater model (i.e., Metro Model II) developed by Barr Engineering for MCES will be used for this study. In other words, no new model construction or modifications will occur.

## **Project Team**

Barr proposes to utilize staff who have been involved in the planning, design, and construction of numerous similar well fields such as those for the cities of Lakeville, Brooklyn Park, Bemidji, Chanhassen, the Joint Water Commission (New Hope, Golden Valley and Crystal), East Bethel, Egan and Rosemount to list a few. Staff dedicated to this project will also include those who have worked on projects with the City of Blaine in the past. Staff that will be dedicated to this project include: partner in charge and primary project contact, Brian LeMon, PE, project management will be performed by John Greer, PG, who will also oversee groundwater modeling. The bulk of the actual modeling will be performed by Evan Christianson who helped prepare the Metro Model II and Jonathon Carter who has performed similar well field studies for other cities. Ray Wuolo, PE, PG who performed the earlier work for Blaine, will be a technical resource.

## **Assistance Provided by the City**

This proposal is based on the assumption that the City will provide the needed information requested by Barr to perform the tasks required to meet the stated goals. Once the project is initiated, and following the project kickoff meeting, a full list of data needed will be sent to the City along with a further clarification of scope, if warranted. At this time we expect that the following data/tasks will be provided:

1. Work with Barr to select a preliminary list of prospective well locations for Wells 18 and 19 and additional wells in the Northeast Well Field.
2. Water demand for the City for the last five years.
3. Water pumped by each City well each month over the last five years.
4. Information pertaining to any groundwater contaminant plumes, spills or leaking underground storage tanks that are learned about as the project proceeds.
5. Projected water demand for the time period during which the Northeast Well Field will be developed. This will include: maximum instantaneous demand (peak day demand) and annual average demand expected from all City wells during this period in five year increments.
6. An estimate of when the Northeast Well Field Water Treatment Plant will be put into operation. This is needed to help in modeling when demand from other locations can be reduced.

## Scope of Services

The scope of services is further described below.

### 1. Kick-Off Meeting

The purpose of this task will be to meet with you to and make sure that we agree to the objectives and direction of this study so that we can deliver to you what you need with respect to planning for Wells 18 and 19 and the Northeast Well Field. John Greer and Brian LeMon will meet with you at your offices and go over the project plan and respond to any questions you may have regarding the project. If the meeting results in any changes we will modify the project scope schedule and budget accordingly.

**Deliverable:** Meeting minutes, modification to project scope, schedule and budget as appropriate.

### 2. Preliminary Potential Contaminant Sources Assessment

The intent of this task is to review existing data to the extent that it is reasonably available (e.g., data from the MPCA’s “What’s In My Backyard” website) to identify known contaminant plumes or other sources of contamination in and near the City. This work may have been done in the past but with each new planning effort it is important to check to see if new information has become available since the last time an assessment of potential contaminant sources was generated. As part of this task Barr will identify those potential contaminant sources that may have significance with respect to the proposed well field.

This task will be limited to reviewing information that is in the MPCA “What’s In My Backyard” database, County Environmental Services databases, the MDH database, and data, if any, available from MGS. We will use the information currently available to us and only sites spills and plumes identified in these files will be covered in this task. If the City has information on any existing groundwater contaminant problems in the region that are not contained in one of these databases then we assume that such information will be provided to us. It is important to note that the data bases that we will review are constantly being changed and updated. We cannot be responsible for changes to data bases that occur after the time we review them.

**Deliverables from Barr to City:** A map showing the identified potential contaminant source locations in the vicinity of the new well field will be generated and included in the final report. Note that no known significant plumes exist in the City and this proposal is based on that assumption. If a new major plume is identified it will impact the scope schedule and budget of this proposal.

### **3. Coordination with Regulatory Agencies**

The purpose of this task will be to contact the DNR and MDH and the Watershed District regulating the wetlands that may be affected by the well field and work with them to identify specific issues that they may have with respect to development of the Northeast Well Field. It is important to know their concerns early in case they would impact the modeling task. It is important to note that large well fields such as the one that is the subject of this proposal often come under intense scrutiny from some State Agencies depending on specific issues that are not always widely known. Among the expected items that the DNR will request is a new monitoring well(s) to track groundwater levels in the affected aquifers and in the vicinity of natural resources of concern. A phone call with each Agency and the Watershed District is planned to go over their concerns. This task is not intended to result in any permits or a guarantee of approval from any Agency. Rather it is intended to identify issues that may arise in future permitting efforts that could be addressed in this work.

**Deliverable:** Minutes for phone calls and a brief discussion in the final report summarizing issues noted by each agency.

### **4. Evaluate Proposed Wells 18 and 19 and other Well Locations for the Northeast Well Field**

Barr will use the groundwater flow model noted earlier in this proposal to estimate the impact of new wells in the Northeast Well Field on water levels in the Quaternary and FIG aquifers and check to see if the wells are producing a safe yield as defined in the Minnesota Rules. The model conditions identified above will be run. These runs will include a sustained maximum demand scenario where most or all City wells will be run at full capacity for a period of 4 weeks. This will simulate a summer draught condition. In addition, average annual demand runs will also be performed. Future demand scenarios will be run in five year increments from now to build out of the Northeast Well Field.

We will then model the field's impact on nearby known wells to see if there would be significant interference that may be a concern to the City. We will also model the impact to water levels beneath identified wetlands of concern as compared to baseline conditions. Results from this task will be used in a qualitative analysis of whether or not Wells 18 and 19 should be constructed and then whether the Northeast Well Field will likely be able to produce 6,000 gpm. Finally, we will use the model to prepare a preliminary wellhead protection map for Wells 18 and 19.

**Deliverables:** A series of maps for the final proposed well locations showing the impacts of those wells on groundwater levels as compared to baseline water levels. Two maps for each run will be prepared one for the average annual impact and one for the four week peak.

## 5. Prepare Project Report

Barr will summarize the results of the work performed into a report that will be submitted to the City. A DRAFT report will be submitted first followed by a final report that will be based upon comments received from the City.

**Deliverables:** Electronic PDF files of a DRAFT report will be submitted to the City for review followed by electronic PDF files of a final report along with one hard copy and one CD copy. The final report will incorporate changes resulting out of the review.

## Cost

The tasks listed in this subagreement will be performed for a cost not to exceed \$22,000 without prior approval from the City. Bills will be sent once every 4 weeks according to Barr's billing schedule.

## Project Schedule

The intention of this project is to have as much of the work described in this subagreement completed, as is reasonable, by the end of May of 2012. Work can be completed earlier if needed.

If the terms of this subagreement are acceptable to the City of Blaine, please date and sign in the space provided below. Keep one copy for your records and return the other to Barr Engineering Co. If you have any comments or questions, please contact me at 952-832-2774.

Sincerely yours,

BARR ENGINEERING COMPANY

By 

\_\_\_\_\_  
Brian K. LeMon  
Its Vice President

Accepted this \_\_\_ day of \_\_\_\_\_, 2012

CITY OF BLAINE

By \_\_\_\_\_

Its \_\_\_\_\_