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<b>To:</b>	Kari Bondaroff, P.Ag., MBA, B.Ed., B.Sc. General Manager of Environmental Services	<b>Date:</b>	August 26, 2021
<b>c:</b>		<b>Memo No.:</b>	01
<b>From:</b>	Andrea McMillan, P.Geo.	<b>File:</b>	704-ENW.CENW03650-01
<b>Subject:</b>	Potential Alternate Water Source Evaluation Area B, Rose Prairie Potable Water Facility – Potential Water Source Location Identification		

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## 1.0 INTRODUCTION

The Peace River Regional District (PRRD) retained Tetra Tech Canada Inc. (Tetra Tech) for the provision of environmental consulting services at the Rose Prairie Potable Water and Bulk Loading Facility located at 15615-259 Road, North Pine, B.C. The services were related to the explosive gases that were encountered at the Rose Prairie potable water storage tank and at the well casing and include evaluation of potential alternate water source options.

The current Prairie Rose well (Well ID 102557) is screened from 54.9 to 67.1 mbg in “bedrock”, within aquifer 451. The static water level was reported to be 85.3 m below top of casing (mbtoc). The recommended pumping rate recorded in the water well drilling report is 20 US gallons per minute (gpm).

This technical memo summarizes the review of existing documentation and analysis on potential alternate water source options within the vicinity of the Rose Prairie area.

## 2.0 SCOPE OF WORK

The information obtained during a recent public survey was assessed in conjunction with available geological and hydrogeological information provided in British Columbia’s (BC) Groundwater Wells and Aquifers<sup>1</sup> (BC water well database) to determine any potential alternate water sources.

All potential alternate water source wells identified in the public survey and registered within the BC water well database located within the four potential areas (Areas A to D) were evaluated.

The accessible and viable sources that are identified in this study and selected will subsequently be tested to determine flow rates, treatability, and accessibility by the public in future.

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<sup>1</sup> British Columbia Groundwater Wells and Aquifers database. Accessed July 2021. <https://apps.nrs.gov.bc.ca/gwells/>

## 3.0 SUMMARY OF FINDINGS

### 3.1 Public Survey

A Virtual Town Hall online meeting regarding the Rose Prairie Water Station was held from January 25, 2021 to June 29, 2021. A total of 30 responses were collected in an online survey. The information collected in the survey included the following:

- Electoral area the respondent was located in;
- If the respondent would continue to use the station if the current issue is resolved;
- Where the respondent would prefer a potential new water station location (rating the potential locations in order of preference);
- If the respondent had a water source on their property and be willing to all PRRD to place the bulk fill station on this property; and
- The respondent's contact information.

As part of the survey, the four potential locations, labelled A, B, C and D were rated in order of preference and the top two choices appear to be Areas A and B. Of the 30 respondents, only one answered "yes" [REDACTED], and six answered "not sure" to having a water source on their property that they would be willing to have tested for treatability. [REDACTED] noted in his comments "existing water station already in place with capacity to serve Rose Prairie and Montney, Charlie lake, Red Creek, etc. Licenced, commissioned with proven customer base."

### 3.2 BC Groundwater Wells and Aquifers Search

In July 2021, Tetra Tech conducted a search of BC's water well database for water well records screened within the same aquifer (aquifer 451), where the current Prairie Rose well (Well ID 102557) is installed. The search was conducted for the wells located within the four identified potential new locations (Areas A through D). The identified water well locations are shown on Figure 1. The water well summary report for each identified well is provided in Appendix A.

The three water wells associated with the survey respondent ([REDACTED]) that answered "yes" to having a water source on his property that he would be willing to have tested for treatability are also included in Table 1.

One potable groundwater well is located south of 10828 – 264 Rd (Well ID 62804) as identified in the database and is included in Table 1. Additionally, Pengrowth Corp wells in the area were included in the search, all of which are decommissioned with the exception of one well (105113).

Of the 42 identified water well records in the BC water well database, 21 wells were reported for private domestic use, one for water supply system, 14 for unknown use (7 of which are recorded to be decommissioned), three for commercial and industrial use, and one for other use. Two records were listed as abandoned. In total, there are 33 active water well records available in the BC water well database.

Well depths of the identified water well records ranged from 6.1 to 201.2 mbg. The top of aquifer number 451 ranged from 2.7 to 73.2 and the static water level ranged from 4.3 to 96.0 m bgs.

Of the 33 identified active water wells, 9 contained hydrogeological information (including well completion details, lithology, and static water level data) and also contained pumping test information as discussed in the followings sub-section.

### 3.3 Water Source Evaluation

As mentioned earlier, the current Prairie Rose well (102557) is screened from 54.9 to 67.1 mbg in “bedrock”, within aquifer 451. The static water level was reported to be 85.3 mbtoc and the recommended pumping rate of 20 US gpm.

Based on the available information provided in the BC water well records, the recommended pumping rate for the identified water wells ranged from 0.5 gpm to 200 gpm (111096 located in Area C). Due to the fractured flow of this sandstone and shale aquifer, the recommended pumping rate varied significantly within each Area. It is recognized that the short-term pump tests given on the water well drilling reports may not be indicative of longer-term pumping test results and sustainable flow rates. Site-specific well testing is required to confirm an adequate groundwater supply. A summary of water well records with the recorded recommended pumping rate greater than 20 gpm is provided in Table A.

**Table A: Water Well Records with the Recommended Pumping Rate Greater Than 20 gpm**

Area	Well Number	Owner	Recommended Pumping Rate (gpm)
A	104719	[REDACTED]	30
South of B	102679	Montney Fair Grounds North Peace Fall Fairgrounds	20
	116514	[REDACTED]	72
Area C	111096	[REDACTED]	200
Outside preferred areas and in the vicinity of the existing water source well	105113	Pengrowth Energy Trust	50
	102977	Pengrowth Corp	88
	113684 (licensed)	[REDACTED]	50
	113671	[REDACTED]	120
	115101	[REDACTED]	30

Notes:

	Green highlighted cells signify viable alternatives subject to discussion with owners (where applicable)
	Yellow highlighted cells signify possible alternative
	Red highlighted cells signify not really viable as they are too far outside the area

A waste pond, approximately 40 m x 40 m in size, is required to be installed at the suitable water source site. Based on the review of the aerial photographs in Google Earth, the viable options highlighted in green seem to have the required space for the construction of the waste pond. This, however, needs to be confirmed with the landowner.

Among the green highlighted sites, Montney Fair Grounds North Peace Fall Fairgrounds may be considered to be the most feasible option among others as it is already owned by the district and will require the least amount of effort to obtain an approval for use.

## 4.0 CONCLUSIONS

Based upon the findings of this evaluation, the following is concluded:

- There are nine groundwater wells, as listed in Table A, with the potential to produce 20 gpm or greater within the four potential areas (Areas A to D) as well as in the vicinity of the existing water source well.
  - The viable alternate water sources are limited to Area A and South of Area B (green colour coded in Table A). These sites have enough area available for the construction of the required pond size of 40 m x 40 m, based on aerial photographs review, which needs to be confirmed.

- The Montney Fair Grounds North Peace Fall Fairgrounds is already owned by the district and will require the least amount of effort to obtain approval for use, and therefore, could be the most preferred alternate water supply source.
- Site-specific testing will be required to confirm the groundwater supply potential.

## 5.0 NEXT STEPS

As discussed with PRRD, the next steps in the evaluation of alternate water source options include the following:

1. Inquiring as to the potential to use the Montney Fair Grounds North Peace Fall Fairgrounds water well.
2. Contacting the owners of the two water wells highlighted green in Table A ( [REDACTED] and [REDACTED] ) to confirm if they are willing to allow PRRD to have a public potable water facility on their land.
3. Presenting the most viable option to the Directors.
4. Proceed with testing of the selected viable alternate water source.

## 6.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Peace Region Regional District and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Peace Region Regional District, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

## 7.0 CLOSURE

We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,  
Tetra Tech Canada Inc.

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Attachments: Table (1)  
Figure (1)  
Appendix A: Water Well Summary Reports  
Appendix B: Limitations on the Use of this Document