

**PACIFIC HYDROLOGY CONSULTANTS LTD.**  
CONSULTING GROUNDWATER GEOLOGISTS

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June 12, 1992

Walemco Engineering Ltd.  
33167B North Railway Avenue  
MISSION, B.C. V2V 1E3

Attention: Mr. Ian Smith, P. Eng.

Subject: Evaluation of Possible Impacts to the Wansbrough Well Water Source  
from the Proposed Friesen Subdivision  
District of Mission Subdivision Application S92-002 and File  
PRF 15-40

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Dear Sirs:

This letter, concerning the above subject, is further to: a telephone discussion on May 28, 1992 between Mr. Len Friesen, Property Owner and Developer, and Mr. Ed Livingston, P. Eng., of Pacific Hydrology Consultants Ltd.; and, also, to several telephone discussions between Mr. Ian Smith, P. Eng., of Walemco Engineering Ltd. and Mr. Ed Livingston.

## 1.0 INTRODUCTION

The purpose of this letter is to discuss our assessment of the hydrogeology of the subject area in order to evaluate the possible impacts to the Wansbrough Well water source which might result from storm water and/or wastewater disposal on the adjacent proposed Friesen Subdivision at 34211 Hartman Avenue in the southeast part of the District of Mission. From the aforementioned telephone discussions between Friesen and Livingston and

Walemco Engineering Ltd.

**Evaluation of Possible Impacts to the Wansbrough Well Water Source from  
the Proposed Friesen Subdivision**

June 12, 1992 - Page 2

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and Smith and Livingston and, also, from the plans and other background information forwarded with Walemco Engineering Ltd's Memo' of May 2, 1992, we understand that the situation with respect to the proposed Subdivision and the concerns of the Wansbroughs is as follows:

1. The proposed Friesen Subdivision of Lot 11, Sec. 34, Tp. 17, N.W.D., Plan 1668, consists of four lots, as shown on a 1:1250 scale Plan (M2536) by J.M.C. Wade and Associates.
2. As shown on the J.M.C. Wade and Associates Plan, the proposed Friesen Subdivision is located on the southeast slope of a small hill on the south side of Hartman Avenue.
3. Walemco Engineering Ltd. have prepared a design for a stormwater outfall to handle water from paved areas and building roofs on Lot 1 of the proposed Friesen Subdivision, as shown on an undated drawing (No. E3189) by Walemco titled "Storm, Hartman Ave.".
4. The concrete outlet structure for the storm drain is located along the west boundary of Lot 1, at a location a short distance north of a shallow dug well used by the Wansbroughs, adjacent Property Owners who reside at 34170 Hartman Avenue, on Lot 20 to the west.
5. At a "Public Hearing on District of Mission Zoning Bylaw 1831-1989 Amending Bylaw 2470-1992" which was held on May 4, 1992, Mr. Bob Wansbrough "...expressed concern about the drainage path..." and "...he was also concerned about how this would affect the water table and the existing spring, and what affect this would have on his water source."

## **2.0 SITE INVESTIGATION**

Ed Livingston visited the site on two occasions and, although no one was home at the Wansbrough Residence at either time, he located the dug well which is used for water supply. The Wansbrough House is located on

Walemco Engineering Ltd.

Evaluation of Possible Impacts to the Wansbrough Well Water Source from  
the Proposed Friesen Subdivision

June 12, 1992 - Page 3

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the lower slope of the hill, at a break in the slope below the steepest part of the hill. The subject dug well is located in a bushy area at the foot of the steep slope south of the house. The area of the Wansbrough Well is clearly one of groundwater discharge.

The dug well which supplies the existing Friesen home is also a dug well located in the bush at the foot of the steep slope below the house, and is similarly located in a groundwater discharge area. The Friesens report that their Well supplies ample water of good quality.

From the local topography shown on the Wade and Associates Plan (M2536) of the proposed Friesen Subdivision, and from Ed Livingston's site reconnaissance, the following is evident and has a bearing on a consideration of the matter under discussion:

1. Only activity on Lot 1 of the proposed Friesen Subdivision could have any effect, as far as drainage and water supply are concerned, on the Wansbrough Property.
2. A purchaser of Lot 1 of the proposed Friesen Subdivision, which directly adjoins the Wansbrough Property, would logically build an house on the north end of the Lot, near the top of the hill.
3. Because of the topography of the Lot and, perhaps, also because of the depth of overburden over rock on the top of the hill, a wastewater disposal field for an house on the north end of Lot 1 would also have to be at the north end of the Lot or, perhaps, in the gently sloping area south of the middle part of the Lot.
4. For water supply, the owner of Lot 1 would have a choice between drilling a deep rock well at the north end, near the logical home site, or constructing a dug well in the southern part of the Lot similar to those which supply the Friesen and Wansbrough Residences. Since the existing dug wells are satisfactory and the cost is less than for a drilled well, a dug well is the most likely choice for water supply.

### 3.0 GEOLOGY

Geological Survey of Canada Map 1485A, **Surficial Geology Mission British Columbia**, of scale 1:50,000, shows that the general area of the subject Friesen/Wansbrough Properties is underlain by "Recessional glaciofluvial deposits: Sa, recessional channel and floodplain deposits laid down by proglacial streams; gravel and sand up to 40 m thick, normal range of thickness 5-25 m". Experience shows that these granular sediments probably do not cover the top and steep slopes of the hill; rather, the top and steep slopes are probably covered with glacial till. G.S.C. Map 1485A shows that the bottom land on the south side of the hill is underlain by "Bog, swamp and shallow lake deposits: SAe upland, peat up to 8+ m thick". The south end of the proposed Friesen Subdivision and the south end of the Wansbrough Property probably both extend into the bog area. The bog deposits overlie the glaciofluvial deposits. The Wansbrough dug well is located in the bog area; it has probably been excavated through the bog deposits to draw water from the underlying glaciofluvial sand and gravel.

### 4.0 DISCUSSION

In our opinion, the development of the proposed Friesen Subdivision will not affect the Wansbrough Well for several reasons:

1. The information on geology indicates that the Well is obtaining water from a granular aquifer which receives adequate recharge from the uplands to the north. There is more than sufficient water moving through the aquifer to supply water to three additional dug wells which may be constructed in the same aquifer on the three new lots of the proposed Friesen Subdivision.
2. Water quality will not be impaired by the operation of three additional septic tank/disposal field systems on the proposed Friesen Subdivision. Properly constructed and operated domestic septic tank/disposal field

systems produce effluent which contain nitrate; in large amounts, nitrate may be an health hazard but even then only for infants. However, under the prevailing conditions, dispersion and dilution are more than sufficient to keep the nitrate content very low.

3. The concern about drainage from the Wansbrough Property is only of concern from activity on proposed Lot 1 of the Friesen Subdivision, as Lots 3 and 4 do not slope toward the Wansbrough Property. The two main sources of drainage water from Lot 1 are:

- a. storm water to be discharged, as previously discussed, by the proposed drain along the west boundary of Lot 1. The proposed stormwater drain will convey the water to the bog area at the south end of the Property, and;
- b. treated effluent from a wastewater disposal field.

Part of the effluent which enters the disposal field, especially in winter months when evapotranspiration is very low, recharges groundwater. Part of this water flows downslope through the surficial sediments and part moves down into fractures in bedrock. The saturated zone through which the water moves is likely to be quite thin, especially in permeable sediments on a steep slope, so it is unlikely to appear at surface or cause problems. By carefully locating the drain field, it should be possible to avoid disposal directly above the Wansbrough Buildings and, by constructing curtain drains above and below the field, to eliminate the possibility of drainage problems on the Wansbrough Property.

4. Since the Wansbrough Well is located in a groundwater discharge area, where groundwater is moving toward surface, it is vitually certain that storm water from the drain could not adversely effect the water source.

## 5.0 CONCLUSION

All things considered, and assuming that storm water and wastewater disposal facilities are properly constructed and maintained, it is our opinion that the proposed Friesen Subdivision at 24211 Hartman Avenue in Mission will not have any negative impacts on the Wansbrough shallow well water source.

Walemco Engineering Ltd.

Evaluation of Possible Impacts to the Wansbrough Well Water Source from  
the Proposed Friesen Subdivision

June 12, 1992 - Page 6

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We trust that this letter contains the information you require. However, please do not hesitate to contact us if you wish to further discuss any aspect of the contents of the letter or if you wish to have further discussion of any of the issues.

Yours truly,

PACIFIC HYDROLOGY CONSULTANTS LTD.

A handwritten signature in cursive script that reads "Ed Livingston". The signature is written in dark ink and is positioned above the printed name.

Ed Livingston, P. Eng.