



March 8, 2017

Dr. Kamran Golmohammadi,  
Medical Health Officer  
Interior Health Authority  
505 Doyle Avenue  
Kelowna BC V1Y 0C5

VIA EMAIL: [Kamran.Golmohammadi@interiorhealth.ca](mailto:Kamran.Golmohammadi@interiorhealth.ca)

Dear Dr. Golmohammadi,

Re: Nitrate Sources in Hullcar Valley

Further to your request during the webinar on Friday, February 24, 2017, the Comprehensive Monitoring Program and Environmental Impact Assessments which were completed per the Pollution Abatement and Pollution Prevention Orders issued to Grace-Mar Farm Ltd, H.S. Jansen & Sons Farm Ltd, and Ken Regehr Farm indicated the following:

GraceMar Farm Ltd

- a) Post-Harvest Nitrate Study – had five fields included in the study. One field was planted in alfalfa and had ‘high’ residual nitrate. Four fields were planted in corn: one was ‘very high’ and three were ‘medium’ for residual nitrate. Ministry of Agriculture recommendations were to reduce nitrate applications for the ‘high’ and ‘very high’, and consider changes to nitrate application for the ‘medium’ fields. This amount of post-harvest nitrate is indicative of nitrate remaining in the soil and possible leaching to ground. Groundwater contamination would occur in future years.
- b) Unsaturated zone – soil samples from one borehole created for installation of a monitoring well were collected at 30 cm. intervals from surface to the water table. Deep soil samples from the unsaturated zone indicated nitrate present throughout the soil column which suggests downward movement of nitrate from surface applications.
- c) Groundwater samples were collected in three monitoring wells located at the water table. Nitrate sampling results were as follows:  
MW1 21.0 mg/L,  
MW3 16.6 mg/L  
MW2 7.82 mg/L

### H.S. Jansen & Sons Farm Ltd

- a) Post-Harvest Nitrate Study – had 15 fields included in the study. Eight fields were planted in alfalfa and had ‘medium’ or ‘low’ residual nitrate. Seven fields were planted in corn – six were ‘high’ and one was ‘medium’ for residual nitrate. Recommendations were to reduce nitrate applications for the ‘high’ and consider changes to nitrate application for the ‘medium’ fields. This amount of post-harvest nitrate is indicative of nitrate remaining in the soil and possible leaching to ground. Groundwater contamination would occur in future years.
- b) Unsaturated zone – soil samples from three boreholes created for installation of monitoring wells were collected at 30 cm. intervals from surface to water table. Deep soil samples from the unsaturated zone indicated nitrate present throughout the soil column for boreholes MW1D and MW5, as well as presence of ammonia in the lower depths of MW1D and 2.29m to the water table in MW5. MW3 had lower levels of nitrate (between 0.9-2.2 mg/kg) and below detectable limit for ammonia. These results suggest downward movement of nitrate from surface applications of agricultural waste.
- c) Groundwater samples were collected from six MWs and three industrial wells. Nitrate sampling results were as follows:

MW1 Deep	21.6 mg/L,
MW1 Shallow	35.8 mg/L
MW5	36.6 mg/L.

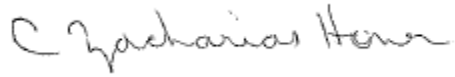
### Ken Regehr Farm

- a) Post-Harvest Nitrate Study – had nine fields included in the study. Two fields were planted in alfalfa and had ‘medium’ and ‘low’ residual nitrate. Seven fields were planted in corn – one was ‘high’, four were ‘medium’ and one was ‘low’ for residual nitrate at the end of the growing season. Recommendations were to reduce nitrate applications for the ‘high’ and consider changes to nitrate application for the ‘medium’ fields. This amount of post-harvest nitrate is indicative of nitrate remaining in the soil and possible leaching to ground. Groundwater contamination would occur in future years.
- b) Unsaturated zone – was not monitored as a part of this study as groundwater monitoring wells were not installed.
- c) Groundwater samples were collected from seven industrial wells and one domestic well. These wells are installed in the unconfined aquifer and measure 51-76 feet below ground, and 16 to 32 feet from ground to the water table. Nitrate of 2.51 mg/L was found in Project Well 13 that measures 30 feet below the water table. This is indicative of the bottom of a plume which would measure at much higher concentrations at the water table. As well, Project Well 13 is located in the industrial well field adjacent to Purple Springs Tree Nursery. Therefore delineation of nitrate pollution has not been confirmed for lands utilized by Ken Regeher’s farm operations, and may be attributable to another operation.

As you are aware, the maximum acceptable concentration of nitrate for human consumption is 10.0 mg/L. Therefore, one can conclude that pollution is occurring from agricultural waste at

Grace-Mar Farm, and fields 103A Hullcar and 101 Barns at H.S. Jansen and Sons Farm Ltd. as the usefulness of the environment is impaired. More studies are required to determine pollution at Ken Regehr Farm/Purple Springs Tree Nursery.

Please contact me if you have any questions or require further clarification.



Christa Zacharias-Homer

Deputy Director

Cc: Jennifer McGuire, Executive Director, Regional Operations Branch

Roger Parsonage, Corporate Director, Population Health, Interior Health  
([Roger.Parsonage@interiorhealth.ca](mailto:Roger.Parsonage@interiorhealth.ca))

J. Ivor Norlin, Manager, Infrastructure Programs, Population Health, Interior Health