

RE: East Langley Water Supply, Crossing of Salmon River Corridor at 52 Avenue

Mayor and Council  
Township of Langley

We must thank the Engineering Department at TOL for the 5 June 2014 Memorandum to Council and the two previous Memorandums dated 26 May 2014 and 30 April 2014. They have gone to great lengths to assure us all that qualified consultants and expert contractors will deal with all aspects of geotechnical, environmental, social, economic and operational factors. We appreciate their efforts regarding our concerns.

We must note, however, that several statements made in these memorandums and recent events have only served to reinforce our concerns. We remain unconvinced that the crossing of the Salmon River corridor is effectively understood and, from statements provided by Engineering, continue without a technical plan for construction.

It is understood that the recent pressure test failure between 244 street and 246 street is due to an incorrect seal. There appear to be three parts involved in the pipeline assembly in this section. A pipe, a seal and a clamp. This is a very short list of parts yet one of them is incorrect. This does little to inspire confidence in the assertions made by Engineering that qualified professional consultants and expert contractors should be enough to assure us that all aspects of this project are under control.

We beg your indulgence while we review the 5 June 2014 Memorandum from Engineering:

We agree with general statements made on page 1 of the memorandum (page 46 of items Distributed to Council) regarding the complex hydrogeological system that makes up the Hopington Aquifers. However we must disagree with the analogy that "Over the decades, countless projects – roads, ditches, utility systems, and residential wells – have intersected impervious layers without affecting water levels or the environment". None of this statement is relevant to the proposed crossing of the Salmon River corridor at 52 Avenue. None of these amenities exist below the banks of the corridor at 52 Avenue therefore the complex hydrogeological system at this site has no technical history.

A reference is made to the Memorandums of 30 April 2014 and 26 May 2014 stating that an Environmental plan is in place and that every effort has been made to minimize impact of construction. The Memorandum of 26 May 2014 states that the shallow unconfined Hopington Aquifer ranges between 0-35m while the ELWS project has an average depth of less than 2.2m and that no evidence of ground water has been experienced in the construction 480m west and 280m east of the Salmon river ravine. It must be noted that current construction is 20-30m above the base of the Salmon river ravine and that the letters from Gloria Stelting and Pam Erikson on

20 May 2014 confirm water in the trench at 244 street, approximately 30m above and 150m east of a spring discharging water from the aquifer creating the Salmon River tributary and wetland. If water is encountered 30m above this point, and there is water discharging from the ground at the location of the spring, how much of the water table can be expected to drain by trenching 2.2m below the spring discharge level? It appears possible that 30m worth could be reasonable to expect.

All three Memorandums continue to evade the real technical issues surrounding involvement with the springs, Salmon River tributaries and associated wetland.

### **Question 1**

*Have applications for changes in and about a stream been filed with the BC Ministry of Environment for the trenching and provisions for heavy equipment access through the Salmon River tributaries and surrounding wetland?*

*TOL response: notifications for works in or about a stream have been made to the BC Ministry of Forests, Lands and Natural Resource Operations and to Fisheries and Oceans Canada.*

Further: Thank you, may we have a copy of the applications and the approvals.

### **Question 2**

*What is known about the depth of the clay layer over the aquifer in the area of the Salmon River tributary crossing? The tributaries are fed by water leaking from the aquifer through its covering clay layer.*

*TOL response: Geotechnical testing on the west side of the Salmon River determined that a clayey silt layer is present at the bottom of the Salmon river valley at a depth of approximately 3.2 meters below ground surface, with a thickness of approximately 3.5 meters. Please also refer to Memorandum to Mayor and Council dated 26 May 2014 (attachment B) regarding information available on the Salmon River Uplands hydrology.*

Further: The Salmon River Tributaries and associated wetland drain into the Salmon River mainstream from the east. The test drill site on the west side of the Salmon River is more than 100m west of the tributary location and geologically isolated from the wetland. The springs leaking from the aquifer at the base of the east bank together with the shallow well systems at the top of the east bank, suggest a geotechnical and hydrogeological condition that is distinctly different than what exists at the test drill site and the area around the west bank. Additionally, the test drill site is on a dry sandy bank approximately 2m above the base of the ravine making the overburden of 3.2m inaccurate in terms of the actual base of the ravine, and certainly inconsistent with conditions surrounding the tributaries and wetland. The 26 May 2014 Memorandum suggests some general geotechnical and hydrogeological conditions that are not specific to the tributary and wetland site where there are active springs discharging water from the aquifer at the base of a

very steep 20m bank. It appears that the answer to our question is, very little, if anything at all is known about the area at the Salmon River Tributary and wetlands.

### **Question 3**

*Will the aquifer be breached during the trenching operation? There is currently no access to the area due to the steep and unstable bank, preventing test drilling.*

*TOL response: It is not expected that trenching work will interfere with the impervious layers of the aquifer. For the auger boring pits at the bottom of the Salmon River valley, impervious soil may be encountered. The Townships consultants(including qualified environmental and geotechnical professionals) are responsible to ensure the contractor is following best management practices for protection of the environment. Please refer to memorandum of May 26, 2014 (Attachment B).*

Further: As noted in the TOL response to Question 2, there was no testing carried out on the east side in the area of the tributaries or the wetland so technical conditions are entirely unknown. Speculation based on generalities when the geotechnical and hydrogeological conditions of the area are clearly different than the norm is misleading and unreliable. Placing responsibility on TOL consultants should not alleviate a clear requirement for better understanding of the area before indulging in a project without an appropriate plan. The potential risks are not understood therefore the potential reparations and costs are not understood. TOL consultants are not going to be held accountable for the reparations or the costs should this go wrong.

### **Question 4**

*In the event of a breach, what remedial action is available to seal such a breach?*

*TOL response: Auger boring pits shall be constructed to minimize the dewatering requirements. The details of construction method for this portion of the project are currently under development by the contractor for review by the projects consultants and the Township.*

Further: It is difficult to understand or accept how costs for this crossing are quoted when construction method remains unconfirmed or approved. A breach at the Auger pit site is certainly a concern but it is not the only issue. Trenching through the location of the springs feeding the tributaries and the wetlands is equally a concern, if not more so. TOL response to question 2 confirms that nothing is known of the east bank area that would alleviate concerns for a breach of the aquifer which would drain same, or for drainage of the surface water table in the wetlands. Not having a construction plan makes sense, without knowledge of the technical requirement it is not possible to develop one accurately.

### **Question 5**

*What potential cost to repair such a breach?*

*TOL response: It is anticipated that the auger boring pits may intersect non-permeable soils. As such, construction methods to minimize inflow of water into the pits will be employed. The work will also include full re-instatement of the excavated area. All related costs are part of the contract to be borne by the contractor.*

Further: It appears that there will be an effort to control a possible breach in the construction of the auger pits using construction methods as yet undetermined or approved but at the liability of the contractor. This does not address our question and indicates that the nature of the potential problem has not been given due attention.

### **Question 6**

*What potential environmental impact would such a breach have?*

*TOL response: It is anticipated that the auger boring pits would likely require dewatering. This water will be pumped out of the pits with no anticipated impact to aquifer water levels in the area. Based on the information available, the major factor affecting water levels in the area is precipitation.*

Further: Again, the response does not address trenching through the springs, tributaries or wetlands. Information available as quoted relies on generalities in areas 20-30 meters above the concerned construction site and a test drill site west of the Salmon River that is irrelevant in determining the conditions at the base of the east bank. This response appears to be a best case scenario without accurate technical foundation pertinent to the location.

### **Question 7**

*There are serious concerns from residents in the area of 246 Street regarding an anomaly in the aquifer. Will an intrusive breach in the area of the tributaries adversely affect the existing shallow access to water in the area? (Ref: 20 May 2014 from Gloria Stelting and Pam Erikson)*

*TOL response: The ELWS Project has been designed based on best management practices and highest acceptable standards to minimize potential risks to the aquifer. The likelihood of the project impacting the local water table and shallow unconfined wells is considered minimal. Please see Memorandum to Mayor and Council dated May 26, 2014 (Attachment B).*

Further: It appears that the aquifer on the east bank is akin to a large bucket having an open top that refills with precipitation and is emptied through the use of wells and the leaks forming springs that feed the Salmon River tributaries, together with the inter-aquifer hydrology. The bucket is loaded with sand and saturated with water. If the bottom of the bucket is sliced (trenched through the springs, tributaries and wetlands 20-30 meters below well levels) or a hole drilled through the bottom (auger pits) is it not expected that an increase in drainage rate will ensue and that the related water table will lower at an un-natural rate. Is this possible? There is

nothing on which to conclude that it is not. Again, there is no technical knowledge of the area to support a best case scenario. Alternatively, without testing there is no way to assure a worst case scenario will not occur.

### **Question 8**

*Trenching and road construction down the bank and through this area will require foundation building, extensive drainage, retention of disturbed silt, removal of trees. This intrusion is permanent and will need to be maintained ad infinitum. What are the planned costs for ongoing maintenance?*

*TOL response: This project does not include road construction down the bank of the Salmon River valley. No road foundations are required in this area. Dewatering may be required for open trenches during construction if water is encountered. Valley banks will be stabilized with erosion control blankets and re-vegetated after construction. Once the vegetation is re-established on the banks, minimal monitoring is anticipated. Maintenance of the water main infrastructure will generally consist of periodic pedestrian access to inspection of the pipeline by Township personnel. Capital costs are included in the construction contract. Operational costs are part of the water utilities operations budget.*

Further: The TOL reply suggests that trenching through the springs, Salmon River tributaries and wetland may not encounter water. The tributaries are running surface water fed by springs from the aquifer. The wetland is a bog about 70 meters wide and of undetermined depth as no testing has been carried out in the area (TOL response to Question 2). Saturated mud may be 1m to several meters deep. Trenching may not even be possible within a 2.2 meter depth. The need for a foundation to move equipment through this area and to work from in the trenching process is apparent and not planned for (TOL response to Questions 4,8). To bring fill into the area to build a working foundation and provide the substrate surrounding the pipeline will require access down the east bank. Any future requirement to access the area with equipment will require that this foundation remain in place so adequate permanent drainage in the form of culverts etc will be required. The drainage system will need to be maintained. It has been explained by TOL Engineering that no tree with a tap root will be permitted to grow in the area of the trenched pipeline, requiring ongoing maintenance and disruption of the natural development of habitat in all areas where trenching has occurred (down both banks, through the springs, tributaries and wetlands). Costs associated with these requirements are real and must be included in decision making regarding best construction alternatives (not yet determined, TOL response to Question 4). TOL reply to Question 8 confirms that the technical conditions in the area of the east bank are not understood and are not planned for. Additionally, of significant importance, this will permanently disrupt the microbiology of the tributaries and wetland as an essential food supply for fish in the Salmon River mainstream thereby creating a permanent HADD in accordance with Section 35 of the Fisheries act.

**Question 9**

*There is substantial risk due to potential variables due to disturbing the tributaries and the surrounding wetland. What are the contingencies and projected costs?*

*TOL response: Potential risks have been identified in the Environmental Assessment Report prepared by the projects consulting team. There are risks inherent with any construction project that are typically the responsibility of the contractor to manage through the construction contract. The contractor must comply with all applicable municipal, provincial, and federal requirements, as well as follow best management practices for protecting the environment.*

Further: There can be no greater risk than to embark on a project without first understanding the technical requirement (TOL response to Questions 2,3,4,5,6,7,8). Conditions in the area of the east bank, springs, tributaries and wet land has not been tested or planned for so it is not possible to accurately or responsibly determine risks or contingencies. Projected costs, therefore are unknown. May we have a copy of the Environmental assessment report prepared by the projects consulting team?

**Question 10**

*There are 34 trees indicated on Attachment C that are within the pipeline right-of-way and the working right-of-way. Will all of these trees be removed? If not, which ones will?*

*TOL response: The number of trees that will have to be removed has not been determined, as the intent is to try and minimize tree removal, based on sited conditions and arborists recommendations. Trees within 30m of the Salmon River have been Identified as being required to be retained. There is also a comprehensive landscaping plan for the reinstatement of the affected area upon completion of the construction activity. Please Memorandum to Mayor and Council dated April 30, 2014 (Attachment C).*

Further: It is good to understand that TOL is trying to retain as many trees as possible, this is a significant environmental concern in the microbiology of the area. TOL states that all trees within 30m of the Salmon River are to remain. It must be noted that the springs, Salmon river tributaries and the surrounding wetland are also subject to streamside protection regulation. The trees on the east bank and the full distance across the bottom of the ravine to the site for the auger pit, are within this area. To apply streamside protection regulation, the only trees that are outside of protected zones are the trees on the west bank.

**Question 11**

*Coniferous trees have struggled to re-establish and survive since the last time the area was clear cut. Removing mature coniferous trees is highly degrading, adversely*

*affecting slope stability and the microbiology of the area. Exactly which trees are affected and what is the reparation?*

*TOL response: Please see response to questions 8 and 10 above.*

Further: There is little doubt that the engineering and technology exists to retain the steep banks both east and west. These banks are approximately 20m high and have a natural grade of 45 degrees. If the terrain slips additional trees will be lost. There are homes built close to the edge of these banks on both sides of the right of way that would suffer if the terrain slips. The issue here is cost. It is essential to ensure that the terrain is stable, minimal concern is not acceptable. To avoid disruption of these banks altogether is best from all standpoints. Does the current plan make sense when alternative construction methods are available that would eliminate the need to disrupt the stability and environment of these banks.

### **Question 12**

*Attachment A describes the proposed augering process as requiring a large pit for the equipment to set up in. The area where the pit is required is in the wetland surrounding the Salmon River tributaries and will be below the surface water table. What are the plans and associated costs for draining the water table, estimated volume of water, silt control, and estimated area required to support it all?*

*TOL response: There are no plans to drain the water table. It is not currently known how much water will inflow into the auger pits, due to the variable depth and thickness of the clayey silt layer. Construction methods will be utilized to minimize dewatering. The contractor is responsible for removing water from the construction area and associated sediment control. Lands to support the project construction have been secured as per response to question 14 below.*

Further: The area has not been tested (TOL response to Question 2), construction methods have not been determined (TOL response to Question 4), TOL is unaware of the need to evacuate water (TOL response to question 8). TOL has considered that given the location of the pit in the bottom of the ravine, that work may interfere with the impervious layers of the aquifer (TOL response to Questions 3,5). Yet TOL does not believe aquifer or surface water tables will be affected (TOL response to Question 6). Remedial action was not determined in the event that the aquifer is breached (TOL response to Question 4).

### **Question 13**

*What is the environmental impact associated with draining the water table?*

*TOL response: There are no plans to drain the water table.*

Further: It is apparent that TOL does not have a plan that is adequate to prevent the possibility of draining either the aquifer or the spring fed water tables.

**Question 14**

*Will all project activities for construction, water retention, and remedial action remain within the boundaries for right-of-ways?*

*TOL response: The Township has acquired the land required for permanent rights-of-way and temporary working easements to enable construction. There may be a need for additional working easements, based on site conditions, in which case the contractor may negotiate with private property owners for additional working space.*

Further: Given the level of unknowns, the undetermined volume of water, and underdeveloped plan for construction. It would be prudent to prearrange agreements with property owners to support emergency contingencies in the event that the unexpected/unplanned should happen. Prearranging approvals may assist with reaction time required thereby restricting potential environmental damages.

**Question 15**

*What are the “admixtures” and are they environmentally safe?*

*TOL response: There are no admixtures used for augering. For directional drilling, which is not being used on this project, drilling fluid additives in general may include a wide variety of chemicals including various types of dilute acids, biocides, breakers, corrosion inhibitors, cross-linkers, friction reducers, gels, potassium chloride, oxygen scavengers, PH adjusting agents, scale inhibitors, and surfactants.*

Further: Thank you, it can be assumed then that the admixtures required to support directional drilling through the Salmon River corridor, should it be considered the preferable alternative to the currently underdeveloped plan, are environmentally safe.

**Question 16**

*Will the inevitable requirement for draining water from the Salmon River Tributaries and wet land water table require continuous running pumps for drainage and water retention handling during trenching and augering?*

*TOL response: Due to uncertainties with the amount of water that may have to be pumped, we will not know until project commences. If pumping is required, it will be completed in such a way to minimize impact to the residents and the environment.*

Further: Continuous operation was a potential drawback with directional drilling (April 30, 2014 Memorandum to Mayor and Council Attachment A). Augering has essentially the same potential at least in association with possible water removal requirements.

**Question 17**

*Will augering under the Salmon River require continuous operation?*



*TOL response: Previous experience with augering has not required continuous operation, so continuous operation is not expected.*

Further: Thank you, good news for the fish, deer, raccoons, owls, eagles, cranes, otter, coyotes, beaver... etc.

### **Question 18**

*Finally, what is the total cost of the ELWS project? This figure is needed to determine the relative importance of the alleged \$1 million saved from not using directional drilling.*

*TOL response: The total cost for the ELWS project is estimated at \$33.5 Million.*

Further: Costs associated with the crossing of the Salmon River corridor are not yet established as risks are undetermined, water evacuation volume is unknown, additional ongoing operational costs and construction design is unresolved. \$33.5 million estimate could be affected but we will assume the use of this figure, given TOL estimate of additional \$1 million to directional drill (30 April 2014, Memorandum to Mayor and Council Attachment A) an increase in cost of less than 3% in order to directional drill the only crossing of the Salmon River corridor, and reduce environmental impact to zero.

In conclusion:

Ongoing reluctance to study and test the east bank, springs, tributaries and wetland leaves a gap in geotechnical understanding required for determination of appropriate construction design and deployment for trenching and augering. Answers to our questions have been generalized using technical knowledge of construction in areas unlike the terrain and hydrogeology in the corridor, more specifically the east side, undermining accuracy of understanding relevant to conditions.

There are too many variables without answers and reliable plans to establish a level of comfort for control of the crossing project.

We implore TOL to pursue the directional drilling alternative.

We continue to believe that by the time current plans are accomplished, the cost will be a wash with directional drilling. At worst, the 3% estimated increase in the cost of the total ELWS project is a small price in comparison to the many environmental risks that remain without clear solutions and the potential for future costs and problems.

To reiterate, of significant importance, this will permanently affect the microbiology of the area surrounding the Salmon River tributaries and wetland supplying food for fish in the Salmon River mainstream in accordance with Section 35 of the Fisheries Act, thereby creating a permanent HADD.