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To: Mrs. Sandy Buxton, Midhurst Ratepayers' Association
From: Mr. Tim Lotimer, FGC, P.Geo.,
Date: September 8, 2018
Subject: Midhurst Class EA, Draft Environmental Study Report

In accordance with your request we have reviewed the Ministry of the Environment and Climate Change (MOECC) comments, dated April 30, 2018, on the draft Environmental Study Report. Our review was limited to those aspects related to hydrogeology, water supply and resultant surface water impacts that will occur as a result of the water supply taking.

We have not discussed these comments with the MOECC and would be pleased to meet with them to provide clarification or further explanation.

Section	MOECC Comment	Response of Midhurst Ratepayers Association
1.1	The MOECC indicates that the study (Golder 2016) did not measure the effect of pumping on surface water features but used a groundwater model to predict impacts.	No direct monitoring of stream flow etc. was undertaken during the study. Yet, It is common practice to determine impacts on surface water features by actually measuring changes to stream flow and hydraulic gradients beneath streams during pumping tests. This has been routinely done in other S. Ontario jurisdictions with significant groundwater takings, e.g. Regions of Waterloo and Halton. Their assessments of very large groundwater takings, like the one proposed in Midhurst, used aquifer tests which extended much longer than occurred in this study. Such field monitoring can then confirm the predictions made by other methods, including groundwater and/or surface water models.
1.1	The MOECC notes that the study forms a good basis for the additional hydrogeological studies that will be necessary when applying for a Permit to Take Water for the use of the proposed wells.	With this statement, the MOECC is essentially confirming that more work/hydrogeological study is essential to adequately assess the impacts of the proposed water supply taking. We note that the study consisted of short tests of individual wells and not a combined test with all of the wells pumping for a sufficient duration. As a result, drawdown of water levels in the shallow groundwater system (aquifers A1 and A2) was just starting. Consequently, trends that would allow an assessment of impacts to the shallow

		component of the groundwater flow system connected to the multiple tributaries, Willow Creek and the Minesing Wetlands were not fully developed.
2.3i	The MOECC indicates that significantly more detailed information will be required on the environmental effects of the proposed taking when applying for a Permit to Take Water	The MOECC confirms that more work/hydrogeological study is necessary to adequately assess the impacts of the proposed taking. The environmental impacts to be further evaluated include: • Water availability and sustainable yield • Interrelationships between surface water and groundwater, including the impact or potential impact on water quality and quantity
2.3ii	The MOECC notes that the study suggests that the proposed water supply aquifer discharges directly to Nottawasaga Bay	The conclusion that the proposed water supply aquifer discharges directly to Nottawasaga Bay is contradicted by Golders groundwater model. The model output of the deep A3/A4 aquifer equipotentials illustrate that Willow Creek is the regional groundwater discharge boundary for this aquifer. This is also consistent with the groundwater model output of the Barrie Tier 3 study. The consequence of the groundwater flow system is that water pumped from the proposed new wells will intercept groundwater that normally discharges to Willow Creek. This impact will be significant, particularly during periods of low baseflow, as the reduction will be equivalent to the volume of water pumped by the new wells.
2.3ii (con't)	The MOECC expects that further verification will be required to show that there are no surface water reaches (such as the multiple tributaries and shallow wetlands connected to Willow Creek) where there is a significant interconnection between shallow and deep systems that could result in ecological impacts due to the proposed water taking.	The MOECC confirms that more work/hydrogeological study is necessary to adequately assess the impacts of the proposed water taking.
2.3iii	The MOECC does not agree that the model predicted impacts to baseflow in Willow Creek are insignificant	The MOECC points out that in its experience the prediction of stream flow losses using large scale groundwater models may be inaccurate. This is a very serious concern as the potential impact of

		the proposed taking during low flow periods and/or drought could be very serious to stream and wetland ecology.
2.3iii (con't)	The MOECC notes that "the results (of large scale groundwater models such as the one that was used by Golder) should not be relied upon to provide estimates of potential baseflow reductions and should not be used as the basis to determine if the proposed water taking is acceptable or not"	The MOECC confirms that more work/hydrogeological study is necessary to adequately assess the impacts of the proposed water taking.
2.3iii (con't)	The MOECC "strongly disagrees" with Golder that the estimated baseflow reduction would be considered acceptable.	The MOECC confirms that more work/hydrogeological study is necessary to adequately assess the impacts of the proposed taking.
2.3iii (con't)	The MOECC notes that sewage discharge may result in greater dry weather flows than currently exists	The MOECC neglects to point out that the area of potential stream low-flow impacts is mostly upstream of the point of sewage discharge. Consequently, impacts on these sensitive surface water features will not be mitigated by the discharge of sewage. Furthermore the use of sewage, as a replacement of groundwater discharge to streams and wetlands, is never a preferred mitigation strategy.