

The French Creek Water Budget Phase 3 Summary

The **French Creek Water Budget – Phase 3** study by the RDN assessed the risk of current and future water usage and climate to the Environmental Flow Needs (EFN) of French Creek. The EFN of a stream are defined as the volume and timing of water flow required for proper functioning of the aquatic ecosystem.

Under current climate conditions and water withdrawal, the risk to the EFN is low (Risk Level 1) from October to May, moderate (Risk Level 2) in June, and high (Risk Level 3) from July to September.

Ministry of Water, Land, and Resource Stewardship requires Risk Levels be considered when deciding to issue a water licence or use approval application on a stream or on an aquifer that is hydraulically connected to a stream. The Risk Levels identify the risk management measures for assessing or mitigating the potential effects of withdrawals from a stream.

- **Risk Management Level 1** – For that specific flow period (e.g., month) there is sufficient water available to provide for EFN as well as for proposed water diversion and use. While Level 1 does not mean ‘no risk’ (i.e., lower risk of negatively influencing EFN), it indicates that supplementary information may not be required, unless the presence of sensitive species or habitats suggests the need for Special Considerations.
- **Risk Management Level 2** – Risk Level 2 means that the aquatic environment is flow-limited for the proposed withdrawal period or that cumulative water withdrawals are greater than a specified threshold of concern. A result of Risk Level 2 suggests that more information may be required prior to a decision to grant or decline an application, or that the authorization (if granted) may include terms and conditions to minimize potential impacts to EFN.
- **Risk Management Level 3** – Risk Level 3 means that the aquatic environment may be severely flow-limited for the proposed period of withdrawal, or cumulative water withdrawals would be greater than a specified threshold of concern, that varies depending on flow sensitivity. A result of Risk Level 3 suggests that more extensive analysis of the potential impacts of the proposed application on EFN may be appropriate prior to the decision to grant or decline the application; and/or the inclusion of comprehensive terms and conditions in the authorization (if granted).
- **Special Consideration** – If ‘sensitive species or habitats’ are present within the watershed of interest it is recommended that the review of the application consider information about these sensitive values in addition to information relevant to the identified risk level. This may involve development or review of an existing regional fish periodicity table.

25

Future impacts to the EFN were predicted by estimating the change in baseflows in the creek under the following scenarios.

- Scenario 1 – Potential Climate Change: potential effects of longer, drier summers in the future (year 2050)

- Scenario 2 – Future Build-Out: increased water demand from all properties that will be developed as part of the RDN’s future build-out plan
- Scenario 3 – Changes in Landcover: changes to land cover (i.e., increase in impervious surfaces that reduce groundwater recharge) under future development
- Scenario 4 – Combined Future Conditions: combined effects of Scenarios 1 to 3

Changes in Predicted Baseflow from Future Base Case							
Scenario 1 Climate Change		Scenario 2 Future Build-Out		Scenario 3 Changes in Land Cover		Scenario 4 Combined Scenario	
Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry
-11%	-19%	+4%	+9%	-9%	-10%	-13%	-15%

All scenarios predict a decrease in baseflows except for Scenario 2 which predicts an increase, This scenario is based on a portion of agricultural land becoming residential resulting in a reduction in water withdrawal for agricultural use which is significantly greater than residential use.

Both the wet and dry seasons in the Combined Scenario and Scenarios 1 and 3 are predicted to experience a reduction in baseflows. This will likely increase the number of months that the risk to Environmental Flow Needs are at Levels 2 and 3.