Comptroller's Guidance for Decisions on Applications for Water Diversion and Use in the Blueberry, Upper Beatton, and Lower Sikanni Chief Watersheds (April 1, 2023)

Purpose

Support decision makers in the BC Ministry of Forests (FOR) and the BC Energy Regulator (BCER) in implementing an interim Environmental Flow Needs (EFN)[1] approach (Interim EFN Approach), starting on April 1, 2023, when reviewing and making decisions under *Water Sustainability Act* s. 10 (Use approvals) in the Blueberry, Upper Beatton, and Lower Sikanni Chief watershed management basins.

Context

On January 18, 2023 Blueberry River First Nations (BRFN) and the Government of British Columbia (Province) reached a historic agreement that will guide them forward in a partnership approach to land, water and resource stewardship. The Blueberry River First Nations Implementation Agreement (Agreement) responds to a 2021 B.C. Supreme Court decision, Yahey v. British Columbia, that found the Province had infringed upon BRFN Treaty 8 rights due to the cumulative impacts of decades of industrial development. The court directed the parties to negotiate a collaborative approach to land management and natural resource development that protects these rights.

BRFN have long expressed concern that water over-extraction, among other factors, impairs their ability to use streams and surface water in their traditional territory in a manner promised in Treaty 8. In response to this concern, BRFN and the Province agreed to jointly develop a quantitative EFN approach and process, described in Schedule P of the Agreement (pages 154-162). The parties agreed to pilot this approach when reviewing and making decisions on applications for new water diversion and use within the basins of the Blueberry River, the Upper Beatton River, and the Lower Sikanni Chief River (pilot area).

Schedule P establishes that implementation will occur in three phases:

- Phase 1: An interim phase during which an Interim EFN Approach will be considered in decision making starting within 45 days of signing the Agreement and lasting until the completion of a new Water Allocation Tool (WAT) for the pilot area;
- Phase 2: A pilot phase starting when the WAT is available for use (scheduled for October 2023);
- Phase 3: A permanent phase starting after review of the pilot phase results (scheduled for late 2024) and any recommended adjustments to the EFN approach.

This guidance applies specifically to Phase 1 and implementation of the Interim EFN Approach. The parties have agreed that this phase starts on April 1, 2023.

[1] Where this interim policy guidance uses the term 'environmental flow needs' it uses it according to the definition set forth in Schedule P of the BC-BRFN Implementation Agreement, which differs from the one in *Water Sustainability Act* s. 1 (Definitions), and does not apply to water allocation decisions outside of the geographical area described in the Agreement.

Key Considerations

During the interim period decision makers are advised to consult with BRFN on all new water use applications within the pilot area and consider:

- The intent of BRFN and the Province to establish quantitative EFN thresholds within the pilot area;
- The agreed-upon Interim EFN Approach and the new calculation methods (provided in separate technical guidance (Lapp, 2023) in reviewing every application within the pilot area;
- Including terms and conditions in authorizations to require streamflow monitoring and curtailment of diversion during specified low streamflow conditions; and
- The commitment in Schedule P to 'require flow monitoring at the POD or at a representative location determined by a qualified person for all new water authorizations for a hydraulic fracking oil and gas purpose (implemented via the specific authorization).'

Application

This guidance applies to the review of applications submitted on or after January 18, 2023 for the short term (no longer than 24 months) diversion and use of water from the Blueberry, Upper Beatton, and Lower Sikanni Chief watersheds, and to authorizations issued, during the interim phase, under WSA s. 10 (Use approvals) for these three watersheds.

FOR and BCER decision makers intend *not* to grant authorizations under WSA s. 9 (Licences) for the diversion and use of water from the Blueberry, Upper Beatton, and Lower Sikanni Chief watersheds until Phase 2, when the WAT is in place (scheduled for October 2023). New policy guidance developed for Phase 2 will apply to both WSA s. 9 and s. 10 authorizations.

Exclusions

The parties to the Agreement have agreed that the Interim EFN approach does not apply to:

- Water use purposes that do not require an authorization (e.g., domestic use) or that are exempt under the Water Sustainability Regulation (e.g., drainage, mineral exploration, placer mining, and firefighting); and
- Applications that were received prior to January 18, 2023, including Existing Use Groundwater applications.

The Interim EFN Approach does not, in addition, apply to water diversion and use from:

- an aquifer that is considered not likely to be hydraulically connected to a stream; or
- an existing dugout or reservoir that is already filled and considered not likely to be hydraulically connected to a stream.

Hydraulic connectivity or its absence can be determined through application of the provincial guidance for determining the likelihood of hydraulic connection (Province of British Columbia, 2016) or other appropriate methods. Diversion and use from sources determined not likely to be hydraulically connected are unlikely to affect environmental flows. (See Definitions.)

Definitions

Schedule P of the BC-BRFN Agreement establishes the following new terms and definitions that currently apply only within the Blueberry, Upper Beatton, and Lower Sikanni Chief watersheds:

> ‘Environmental Flow Needs (EFN)’ in relation to a stream, means the volume and timing of water flow required for the proper functioning of the aquatic ecosystem of the stream (from the WSA). In relation to [Schedule P] and the Water Allocation Tool, EFN is comprised of an Ecosystem Base Flow (EBF) threshold below which no diversion of water is authorized to occur, and a maximum cumulative percentage water allocation value (MWA).[2]
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> ‘Ecosystem base flow (EBF)’ means a flow at which any human-induced reductions in flow would result in not meeting aquatic ecosystem objectives.
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> ‘Maximum cumulative percentage water allocation value (MWA)’ means the cumulative maximum amount of water that can be authorized for use above a point of diversion (POD) as a percent of mean monthly or mean weekly flow.

The following definitions, not included in Schedule P, may help decision makers implement this Interim EFN Approach and guidance:

> ‘Exceedance value’ refers to the probability that a specific stream flow would be equaled or exceeded. For example, the Q80 exceedance value can be interpreted as the flow likely to be equaled or exceeded 80% of the time for a specified time interval. Q80 refers to a flow value for which 80% of recorded flows are equal to or greater than flows for that day or week or month.
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> ‘Hydraulic connection’, for the purpose of water allocation and use, means the reasonable likelihood that pumping of groundwater from a well will eventually result in a change in the flow of a stream or spring or change in the level of a lake, pond, or wetland that overlies or borders the aquifer, over a time period and to an extent that the decision maker must take into account the environmental flow needs of a stream when considering proposed diversion from an aquifer. If a well is considered to be ‘not hydraulically connected’ it implies that the suspension of pumping will not increase stream flow to meet environmental flow needs within a relevant period of time.

Interim EFN Approach

The Interim EFN Approach considers stream size – based on mean annual discharge (MAD) – and monthly exceedance flow values for a proposed point of diversion (POD). Table 1 summarizes threshold exceedance values relevant to this approach.

In small watersheds with MAD less than 2 m^3/s, when stream flow is:

- greater than Q80 the MWA is 10% of the flow; and
- equal to or less than Q80 no water from the stream is available for diversion and use.

In medium-sized watersheds with MAD between 2 and 10 m^3/s, when stream flow is:

- greater than Q80 the MWA is 15% of the flow;
- equal to or less than Q80 and greater than Q95 the MWA is 5% of the flow; and
- equal to or less than Q95 no water from the stream is available for diversion and use.

In large watersheds with MAD of 10 m^3/sec or greater, when stream flow is:

- greater than Q80 the MWA is 15% of the flow; and
- equal to or less than Q80 the MWA is 5% of the flow. The Interim EFN Approach allows some water diversion even at the lowest flows.

[2] Note that this definition describes both what EFNs are and a methodology (i.e., EBF + MWA) for determining EFN. In contrast, neither the WSA nor the provincial EFN Policy describe a methodology for determining EFN.

Table 1. Cumulative percent allocation limits for streams based on natural instantaneous discharge for weekly or monthly exceedance flow data as determined by mean annual discharge.

Mean Annual Discharge (MAD)	Maximum Cumulative Withdrawal % of Natural or Naturalized Weekly or Monthly Exceedance Flow		
m^3/s	>Q80	≤Q80 - >Q95	≤Q95
≥10	15%	5%	5%
≥2 - ≤10	15%	5%	0%
<2	10%	0%	0%

More information about the Interim EFN Approach is available in a separate technical document, the *Interim EFN Tool User's Guide* (Lapp, 2023).

Schedule P specifies that 'the new EFN framework does not prevent an alternative EFN approach or methodology being applied by the Provincial statutory decision maker instead of the geographically specific EFN Policy[3], where the alternate approach or methodology is produced by a Qualified Professional.'

Implementation of the Interim EFN Approach

Implementation of the Interim EFN Approach is based on the use of the new Interim EFN Tool (Interim Tool), developed as a component of the BC-BRFN Agreement.

The Interim Tool is an Excel workbook that incorporates information extracted from the Northeast Water Tool (NEWT), the Water Survey of Canada (WSC) and the BC e-Licensing system, and reflects the methodology developed by Alberta Environment and detailed in: A Desk-top Method for Establishing Environmental Flows in Alberta Rivers and Streams (2011); and Surface Water Allocation Directive (2019).

The Interim Tool allows users to input details about existing and proposed water use at a proposed Point of Diversion (POD) on a stream within the pilot area. It identifies Water Survey of Canada (WSC) hydrometric stations likely to best represent stream flows at the proposed POD and allows users to input data from a selected station. It uses these inputs to generate information related to the variability of water supply and demand expressed as both monthly and instantaneous values.

For any proposed POD, the Interim Tool will generate:

- The potential MWA value for each month, ranging from 0% to 15% based on the natural instantaneous discharge for monthly exceedance and existing upstream authorized diversions;
- An EBF value for each month based on mean annual discharge (MAD) and an exceedance percentile corresponding to low (Q80) and extremely low (Q95) stream flows (Table 1).

Details on the Interim Tool and guidance on its use are available in a separate technical document, the *Interim EFN Tool User's Guide* (Lapp, 2023).

[3] The term 'geographically specific EFN Policy' in Schedule P, refers to the policy developed for application within the watersheds described in Schedule P i.e., the Blueberry, Upper Beatton, and Lower Sikanni Chief watersheds.

Review of Applications

The recommended approach when reviewing applications during the interim phase is to consider the information on the variability of water supply generated by the Interim Tool.

The Interim Tool uses a reference WSC stream flow gauge for each user-selected POD, using the similarity metric used by NEWT to estimate flow variability. This reference gauge will ideally be as hydrologically consistent with the selected POD as can be achieved (based on proximity, drainage area, watershed elevation, etc.). In most cases, the 'default' reference flow gauge identified by the Interim Tool will be the best and most appropriate to use. The Interim Tool also provides a drop-down list of real-time flow gauges from which the user can select an alternative reference gauge. Where a Water Officer or Natural Resource Officer selects and uses an alternative reference gauge for a WSA authorization decision, it is important to document the hydrologic rationale for this choice as part of the decision record.

The Interim Tool also uses WSA authorization data extracted from NEWT. It allows users to adjust this authorized use data to correct any known errors in the NEWT allocation data. Where a Water Officer or Natural Resource Officer makes an adjustment to the NEWT allocation data when using the Interim Tool, it is important to document the rationale for this choice as part of the decision record.

The Interim Tool will generate monthly EBF values at the proposed POD.

The Interim Tool also generates monthly MWA values at the proposed POD. Monthly MWAs will vary from year to year depending on stream flows; for a given month, water availability in a wet year (e.g., Q20) will be greater than in an average year (Q50) or a dry year (e.g., Q80). The Interim Tool also provides information about the reliability of water supply; the quantity of water represented by the Q50 MWA, for example, is only available once in every two years, on average.

If the decision maker were to authorize the full amount of water represented by these MWAs, the supply to the most junior authorization-holders would be unreliable. For this reason, decision makers are advised to continue to use existing methodologies to evaluate the potential of a proposed source to provide the quantity of water the applicant requests until the development of a clear methodology for using the MWAs generated by the Interim Tool in allocation decisions.

Authorization Terms and Conditions

The information generated by the Interim Tool is intended to inform terms and conditions in authorizations issued under WSA s. 10 (Use approvals) during the interim phase.

Authorized quantity

The Interim EFN Approach recommends that terms and conditions in all use approvals granted during the interim period specify – for *each month* during which the authorization holder may divert and use water:

- a maximum monthly or daily rate of diversion (in units of m^3/month or of m^3/day applied uniformly over the month); and
- a maximum instantaneous rate of diversion (in units of m^3/s).

In addition, the Interim EFN Approach recommends that decision makers not authorize winter (December to March) water diversion from small and medium watersheds for which winter flow records are unreliable.

Suspension of water diversion

The Interim EFN Approach recommends that terms and conditions in all use approvals granted within the pilot area specify instantaneous streamflow thresholds below which the authorization holder must reduce or suspend water diversion, irrespective of maximum authorized quantity.

The recommended approach is to base these specified instantaneous streamflow thresholds on the monthly EBF values generated by the Interim Tool for the POD. The thresholds may vary from month to month. Where the decision maker includes alternative values for such thresholds in authorization terms and conditions, it is important to document the rationale for such a choice as part of the decision record.

Monitoring of stream flows

The Interim EFN Approach recommends that terms and conditions in all use approvals granted within the pilot area require the authorization-holder to monitor instantaneous flows before and/or during times they divert water, in order to ensure that there is adequate water in the stream to meet authorization conditions. The decision maker may specify the location, form, timing, and frequency of such monitoring, taking into consideration factors including but not limited to:

- the quantity of water diverted;
- the size of the source;
- the timing of diversion and use;
- proximity to an appropriate WSC or other hydrometric station;
- the cost of monitoring; and
- any history or expectation of consecutive use approvals.

The decision maker may specify, for example, that the authorization holder review instantaneous flow information from a specified WSC station, carry out spot measurements, or install a measuring device at the POD or an alternative location, and may specify data collection standards. The decision maker may also require the authorization-holder to submit a satisfactory measurement and monitoring plan prepared or approved by a Qualified Professional. It is important that the decision maker document a clear rationale for the choice of monitoring location, methodology, timing, and frequency as part of the decision record.

Records and record-sharing

The Interim EFN Approach recommends that terms and conditions in all use approvals granted within the pilot area require the authorization-holders keep adequate records related to streamflow values and the timing and duration of water diversion, and make such records available to the decision maker if required to do so. Schedule P specifies the intent of the Province and the Blueberry River First Nations to improve hydrometric data within the pilot area. To this end, the Interim EFN Approach also recommends that if authorization terms and conditions specify that the authorization-holder must carry out their own measurements, they also specify how and when the authorization holder is to submit streamflow data.

Communication with Applicants and Authorization-holders

The Interim EFN Approach recommends that Water Officers, NROs, and decision-makers communicate early with applicants and ensure that persons granted new use approvals within the pilot area understand that their maximum authorized quantity is variable and linked to stream flows and that they understand any terms and conditions related to monitoring and reporting.

References

Alberta Environment and Parks, Government of Alberta (2019). Surface Water Allocation Directive. Re-issued December 2021 to include data sources. 27 pages.

Locke, A. and A. Paul (2011). A Desk-top Method for Establishing Environmental Flows in Alberta Rivers and Streams. Alberta Environment and Alberta Sustainable Resource Development. 100 pages.

Lapp, S. (2023). Interim Environmental Flow Needs Tool User's Guide.

Province of British Columbia (2016). Determining the Likelihood of Hydraulic Connection – Guidance for the Purpose of Apportioning Demand from Diversion of Groundwater on Streams. Version 1.0. Water Science Series, WSS2016-01. Prov. B.C., Victoria B.C. 22 pages.