# **WORKING DOCUMENT VERSION 1**

Appendix V - Vaseux Creek





# **APPENDIX V**

# Okanagan Basin Water Board Okanagan Nation Alliance B.C. Ministry of Forests, Lands and Natural Resource Operations

Vaseux Creek



May 2016

ISO 9001 and 14001 Certified | An Associated Engineering Company



# **APPENDIX V**

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# **1** Introduction

The purpose of this appendix is to provide information to support the application of recommended environmental flow needs (EFN)-setting methods for Vaseux Creek following the methods outlined in the accompanying report<sup>1</sup>. This document contains information obtained and collated by Associated Environmental Consultants Inc. (Associated) and will be revised following additional input from Okanagan Nation Alliance. A summary of current available information for Vaseux Creek is provided in Table 6-1 in the accompanying report and Table V-1 at the end of this appendix.

Section 5 in the accompanying report provides an overview of two recommended EFN-setting methods for tributaries within the Okanagan Basin, while Section 6 lists the key steps to implement each of the two methods, in both flowchart and text form.

Environmental flows have been previously recommended for Vaseux Creek by ESSA and Solander (2009) (Table 6-1 in the accompanying report).

# 2 Relevant Information for Setting Environmental Flow Needs

This section summarizes the information available to support EFN-setting in Vaseux Creek. Available information sources for Vaseux Creek are included within Table V-1 at the end of this appendix.

## 2.1 OVERVIEW OF THE WATERSHED

Vaseux Creek has a watershed area of approximately 294 km<sup>2</sup>. Vaseux Creek flows from gently sloping plateau headwaters through a steep-sided canyon before discharging into the Okanagan River, south of Vaseux Lake. The main tributary to Vaseux Creek is Solco Creek. Forestry is the predominant land use within the upper watershed area, while the Bighorn National Wildlife Area is located within the lower reaches of the watershed.

The Vaseux Creek watershed is shown in Figure 1-1 in the accompanying report.

### 2.2 STREAMFLOWS

### 2.2.1 Hydrometric Data

There is currently one active Water Survey of Canada (WSC) hydrometric station within the Vaseux Creek watershed:

<sup>&</sup>lt;sup>1</sup> Associated Environmental Consultants Inc. (Associated). 2016. Collaborative Development of Methods to Set Environmental Flow Needs in Okanagan Streams. Working document, Current Version. Prepared for the Okanagan Basin Water Board, Okanagan Nation Alliance, and B.C. Ministry of Forests, Lands and Natural Resource Operations. May 2016



 Vaseux Creek Above Solco Creek (WSC 08NM171; Drainage area: 117 km<sup>2</sup>; Natural; Period of record: 1970-Present)

In addition, historic records are available from the following hydrometric stations within the watershed:

- Vaseux Creek Above Dutton Creek (WSC 08NM015; Drainage area: 255 km<sup>2</sup>; Natural; Period of record: 1919-1982)
- Vaseux Creek near the Mouth (WSC 08NM246; Drainage area: 296 km<sup>2</sup>; Natural; Period of record: 2006-2010)

### 2.2.2 Naturalized Streamflows

Figure 6-1 in the accompanying report highlights the necessity of producing hydrographs under natural conditions and under actual, licensed, and future proposed water use conditions. Summit (2009) provided naturalized streamflow estimates for Vaseux Creek at the mouth. In addition, as part of the Okanagan Water Supply and Demand Project, net and naturalized flows were modelled for the majority of Okanagan tributaries, including Vaseux Creek (Summit 2010). Figure 2-1 provides a summary of the modelled mean weekly net and naturalized streamflows for Vaseux Creek at the mouth for 1996-2006 (i.e., the model calibration period).

Phases 2 and 3 of the Okanagan Water Supply and Demand Project included modeling of multiple future scenarios for the Okanagan Basin, which considered projected climate change, population growth, change to irrigation efficiencies, and other factors. Net and naturalized streamflow outputs for Vaseux Creek at the mouth are available for each future scenario.



Figure 2-1 Mean weekly net and naturalized flows for Vaseux Creek at the mouth, 1996-2006 (Summit 2010)

# 2.3 FISH AND AQUATIC HABITAT

Grainger (2011) completed a fish passage culvert assessment within Vaseux Creek, documenting culverts which present a barrier to fish migration. In addition, ONA (2006) documented a waterfall approximately 5 km from the mouth of Vaseux Creek and identified it as a permanent barrier to fish migration.

Ecoscape (2007) completed sensitive habitat inventory and mapping (SHIM) for Vaseux Creek in 2007.

Since current (and potentially historic) aquatic habitat information is important for developing an EFN flow regime, it is recommended that up-to-date aquatic habitat information be obtained from publically available databases at the time of investigation.<sup>2</sup>

## 2.3.1 Current and Historical Fish Species Presence

Fish species found in Vaseux Creek include rainbow trout, steelhead, sockeye salmon, mountain whitefish, bridgelip sucker, longnose dace, and prickly sculpin (ESSA and Solander 2009).

<sup>&</sup>lt;sup>2</sup> Aquatic habitat information, including fish barriers can be obtained from the Government of B.C. Habitat Wizard: <u>http://www.env.gov.bc.ca/habwiz/</u>.



Since current (and potentially historic) fish presence information is important for developing an EFN flow regime, it is recommended that up-to-date fish presence information be obtained from publically available databases at the time of investigation.<sup>3</sup>

#### 2.3.2 Fish Periodicity and Habitat Suitability

No stream-specific fish periodicity or habitat suitability indices have been developed for Vaseux Creek (Table 6-1 in the accompanying main report). However, Appendix E of the accompanying report provides information on salmonid species-specific life stage periodicities for the Okanagan Basin, as well as habitat suitability index (HSI) curves for select species. The information within Appendix E should be used at a minimum to support EFN-setting for Vaseux Creek.

### 2.4 WATER USE AND STORAGE

There are no major water suppliers within the Vaseux Creek watershed (Dobson 2008 [included in Summit 2010]). However, water is used for irrigation purposes in surrounding areas (Section 2.4.3).

Summit (2010) provides an estimate of actual surface water use within the Vaseux Creek watershed for 1996-2006 in Appendix C of the Okanagan Water Supply and Demand Project – Phase 2. The actual mean annual surface water use over 1996-2006 was estimated to be 30 ML.

### 2.4.1 Storage Reservoirs

There is no developed storage within the Vaseux Creek watershed.

### 2.4.2 Water Licenses and Major Points of Diversion

There are 26 current water extraction licences within the Vaseux Creek watershed. Since knowledge of current water licences are critical in developing EFN flow regimes, it is recommended that up-to-date water licence information be obtained at the time of investigation.<sup>4</sup>

### 2.4.3 Interbasin Transfers

There are no direct diversions of water into or out of the Vaseux Creek watershed; however, Dobson (2008) reported that water is distributed out of the Vaseux Creek watershed to surrounding areas for irrigation purposes.

<sup>&</sup>lt;sup>3</sup> Fish presence information can be obtained from the Government of B.C. Fish Inventory Summary System Database Query: <u>http://www.env.gov.bc.ca/fish/fiss/</u>.

<sup>&</sup>lt;sup>4</sup> Water Licence Information can be obtained from the Government of B.C. Water Licences Query: <u>http://a100.gov.bc.ca/pub/wtrwhse/water\_licences.input</u>.

## 2.5 GROUNDWATER AND SURFACE WATER INTERACTION

Summit (2009) identified that Vaseux Creek likely loses water to groundwater and estimated that streamflow is lost to groundwater at a rate of 0.014 m<sup>3</sup>/s per km of channel on the alluvial fan (Section 3.6 of Summit 2009).

### 2.6 TRADITIONAL KNOWLEDGE

The current version of this document does not include presentation of any Okanagan Nation Traditional Knowledge. However it is anticipated that a future revision will include such information, as well as potentially other technical information held by the Okanagan Nation Alliance Fisheries Department.



# References

- Dobson Engineering Ltd (Dobson). 2008. Water Management and Use Study. Prepared for Okanagan Basin Water Board as part of the Phase 2 Okanagan Water Supply and Demand Project.
- Ecoscape Environmental Consultants Ltd. (Ecoscape). 2007. Regional District of South Okanagan Sensitive Habitat Inventory and Mapping. SHIM data deliverables (Vaseux Creek).
- ESSA Technologies Ltd. and Solander Ecological Research (ESSA and Solander). 2009. Instream Flow Analysis for the Okanagan Water Supply & Demand Project. Prepared for the Okanagan Basin Water Board.
- Grainger, L. 2011. 2010 Fish Passage Culvert Assessments within Weyerhaeuser Operating Areas in the Okanagan Shuswap and Arrow Boundary Forest Districts: TSA 22, TSA 02, and TFL 59. Prepared for Weyerhaeuser Company Ltd., January 2011.
- Okanagan Nation Alliance (ONA). 2006. Survey of Barriers to Anadromous Fish Migration in the Canadian Okanagan Sub Basin. Prepared for Colville Confederated Tribes, March 2006.
- Summit Environmental Consultants Inc. (Summit). 2009. Surface Water Hydrology and Hydrologic Modelling Study "State of the Basin" Report. Prepared for the Okanagan Basin Water Board as part of the Phase 2 Okanagan Water Supply and Demand Project.
- Summit Environmental Consultants Inc. (Summit). 2010. Okanagan Water Supply and Demand Project: Phase 2 Summary Report. Prepared for the Okanagan Basin Water Board, July 2010.

#### Table V-1 Summary of relevant information for setting environmental flow needs within Vaseux Creek watershed

				Fis	sh and	Aquati	c Habi	itat					Stream	nflow							١	Vater N	Nanage	ement						
Information Source	Current Fish Species Presence	Historic Fish Species Presence	Fish Periodicity Tables	Aquatic Habitat	Channel Characteristics	Channel Cross-Sections	Channel Velocity/Depth Measurements	Habitat Suitability Index	Fish Barriers (Natural/Man-made)	EFN Investigations / Recommended Fish Flows	Other Relevant Information	Streamflow Measurements	Water Quality / Temperature	Streamflow Estimates	Other Relevant Information	History of Water Management	Water License Points-of-Diversion Mapping	Water License Information	Water License – Conservation Storage/Flows	Water Purveyor Intakes	Groundwater Wells Mapping	Groundwater Information	Water Use Information (Actual/Estimated)	Return Flow Information	Land Use and Associated Water Supply Source	Interbasin/Intrabasin Transfers	Flow Regulation	Reservoir Flow Release Patterns	Reservoir Minimum Flow Releases	Other Relevant Information
Online Resources																I		(	I					,						
B.C. Habitat Wizard ( <u>http://www.env.gov.bc.ca/habwiz/</u> )	$\checkmark$								$\checkmark$																					
B.C. Ministry of Forests, Lands, and Natural Resource Operations – Dam Safety Program ( <u>http://www.env.gov.bc.ca/wsd/public_safety/dam_safety/</u> ). Contact: Mike Noseworthy, Dam Safety Officer (Penticton).																											~			
B.C. Water Licences Query ( <u>http://a100.gov.bc.ca/pub/wtrwhse/water_licences.input</u> )																		$\checkmark$												
B.C. Water Resources Atlas ( <u>http://www.env.gov.bc.ca/wsd/data_searches/wrbc/</u> )												$\checkmark$	$\checkmark$				$\checkmark$			$\checkmark$	$\checkmark$	$\checkmark$					✓			
B.C. Water Use Reporting Center ( <u>http://www.obwb.ca/tools/bc-water-use-reporting-centre/</u> )												$\checkmark$											$\checkmark$							
B.C. Water Well Application ( <u>https://a100.gov.bc.ca/pub/wells/public/</u> )																						$\checkmark$								
DataBC ( <u>http://www.data.gov.bc.ca/</u> )												$\checkmark$	$\checkmark$				$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$					$\checkmark$			
Fisheries Inventory Summary System ( <u>http://www.env.gov.bc.ca/fish/fiss/</u> )	$\checkmark$			$\checkmark$																										
Okanagan Historical Society Reports ( <u>https://open.library.ubc.ca/#/collections/ohs</u> )																$\checkmark$														
Water Survey of Canada ( <u>https://www.ec.gc.ca/rhc-wsc/</u> )												$\checkmark$																		
Literature Resources																														
Western Water Associates Ltd., Polar Geoscience Ltd., and ESSA Technologies Ltd. 2014. Okanagan Water Allocation Tool Plan. Prepared for the Okanagan Basin Water Board, May 2014.										~	~																			
Summit Environmental Consultants Inc. 2013. Okanagan Hydrologic Connectivity Model: Summary Report. Prepared for the Okanagan Basin Water Board, May 2013.														$\checkmark$	$\checkmark$															~
Polar Geoscience Ltd. 2012. Projected Water Supply and Use in the Okanagan Basin (2011-2040) – Okanagan Basin Water Accounting Model Results. Prepared for the Okanagan Basin Water Board. March 2012. Note: Several Excel spreadsheets (not attached to the report) are available from the author describing monthly water extraction, water use, and net and natural streamflow for all major tributaries in the Okanagan Basin.														~	~															

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Information Source	Current Fish Species Presence	Historic Fish Species Presence	Fish Periodicity Tables	Aquatic Habitat	Channel Characteristics	Channel Cross-Sections	Channel Velocity/Depth Measurements	Habitat Suitability Index	Fish Barriers (Natural/Man-made)	EEN Invocientiana / Documented Eich Elauro	EFN Investigations / Recommended Fish Flows	Other Relevant Information	Streamflow Measurements	Water Quality / Temperature	Streamflow Estimates	Other Relevant Information	History of Water Management	Water License Points-of-Diversion Mapping	Water License Information	Water License – Conservation Storage/Flows	Water Purveyor Intakes	Groundwater Wells Mapping	Groundwater Information	Water Use Information (Actual/Estimated)	Return Flow Information	Land Use and Associated Water Supply Source	Interbasin/Intrabasin Transfers	Flow Regulation	Reservoir Flow Release Patterns	Reservoir Minimum Flow Releases	Other Relevant Information
Epp, P. 2012. HSI tables in Microsoft Excel Files: Glide Habitat Template and Riffle Habitat Template.								√																							
Grainger, L. 2011. 2010 Fish Passage Culvert Assessments within Weyerhaeuser Operating Areas in the Okanagan Shuswap and Arrow Boundary Forest Districts: TSA 22, TSA 02, and TFL 59. Prepared for Weyerhaeuser Company Ltd., January 2011.				√	√				$\checkmark$																						
Rayne, S., and K. Forest. 2010. Historical trends in annual water yields for the Okanagan Basin, British Columbia, Canada. Nature Proceedings: doi: 10.1038/npre.2010.4946.1																$\checkmark$															
van der Gulik, T., Neilsen, D., and R. Fretwell. 2010. Agriculture Water Demand Model – Report for the Okanagan Basin. February 2010.																								$\checkmark$		$\checkmark$					
Summit Environmental Consultants Ltd. 2009. Surface Water Hydrology and Hydrologic Modeling Study – "State of the Basin" Report. Prepared for the Okanagan Basin Water Board, September 2009. <i>Note:</i> detailed spreadsheets supporting the findings of the report are available from the author.												√	√		$\checkmark$	$\checkmark$															
Polar Geoscience Ltd. 2009. Okanagan Basin Water Supplier Sources. Excel spreadsheet identifying water use areas in the Okanagan and the associated source(s) and water supplier. Digital file: Water supplier sources ver 15.xls.																	~				~		$\checkmark$	~		$\checkmark$					~
ESSA Technologies Ltd. and Solander Ecological Research. 2009. Instream Flow Needs Analysis for the Okanagan Water Supply and Demand Project. Prepared for the Okanagan Basin Water Board, November 2009.	$\checkmark$		$\checkmark$							V	1		√		$\checkmark$																
Golder Associates Ltd. and Summit Environmental Consultants Ltd. 2009. Groundwater Objectives 2 and 3 – Phase 2 Okanagan Water Supply and Demand Project. Prepared for the Okanagan Basin Water Board, July 2009.																							$\checkmark$								
Neilsen-Welch, L., and D. Allen. 2007. Groundwater and Hydrogeological Conditions in the Okanagan Basin, B.C. A State of the Basin Report. Prepared for the Okanagan Basin Water Board, December 2007.																							$\checkmark$								
Ecoscape Environmental Consultants Ltd. 2007. Regional District of South Okanagan Sensitive Habitat Inventory and Mapping. SHIM data deliverables (Vaseux Creek).				✓	✓	✓	~	~	~			~																			✓
Okanagan Nation Alliance. 2006. Survey of Barriers to Anadromous Fish Migration in the Canadian Okanagan Sub Basin. Prepared for Colville Confederated Tribes, March 2006.	$\checkmark$			~	~				~																						
Long, K. 2006. Steelhead Spawner Enumeration in the Okanagan River Mainstem and Tributaries: Inkaneep, Vaseux and Shuttlework Creeks - 2006. Okanagan Nation Alliance, July 2006.	$\checkmark$																														

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Cohen, S., and T. Neale. 2006. Participatory Integrated Assessment of Water Management and Climate Change in the Okanagan Basin, British Columbia. Environment Canada and University of British Columbia, Vancouver.														√	√								~							~
Ptolemy, R. 2005. HSI Charts and Tables in Microsoft Excel File: WUP-HIS.								$\checkmark$																						
Rae, R. 2005. The State of Fish and Fish Habitat in the Okanagan and Similkameen Basins. Prepared for the Canadian Okanagan Basin Technical Working Group, Westbank, B.C.	~			$\checkmark$							$\checkmark$																			
B.C. Ministry of Environment, Lands and Parks. 2004. Water Rights Information System Demand Report #2 for the Okanagan Basin. December 23, 2004.																		~	$\checkmark$											
Cohen, S., Neilsen, D., and R. Welbourn (eds.). 2004. Expanding the Dialogue on Climate Change & Waste Management in the Okanagan Basin, British Columbia. Final Report (January 1, 2002 to June 30, 2004). Environment Canada, Agriculture and Agri-Food Canada.														$\checkmark$									$\checkmark$							~
Matthews, S., and C. J. Bull. 2003. Selection of Focal Watersheds for the Protection and Restoration of Fish Stocks and Fish Habitat in the Okanagan Region.	~	$\checkmark$																												
Northwest Hydraulic Consultants. 2001. Hydrology, Water Use, and Conservation Flows for Kokanee Salmon and Rainbow Trout in the Okanagan Lake Basin, B.C. Prepared for B.C. Fisheries, Fisheries Management Branch, August 2001.			$\checkmark$								$\checkmark$				$\checkmark$															
Talayco, N. (ed.). 2001. Okanogan/Similkameen Subbasin Summary. Prepared for the Northwest Power Planning Council. Golder Associates LTd. September 2001.											$\checkmark$																			
Snowy River Resources Ltd. 2000. Fish Collection Permit Reports for 2000. Prepared for the B.C. Ministry of Environment, Lands, and Parks, December 2000.	$\checkmark$			$\checkmark$	$\checkmark$				$\checkmark$																					
Wildstone Engineering Ltd. 2000. Reconnaissance (1:20,000) Fish and Fish Habitat Inventory for Damfino Creek Watershed, and selected Sub-basins of Inkaneep Creek and Vaseux Creek Watershed. Prepared for Weyerhaeuser Canada Ltd., February 2000.	~			√	$\checkmark$				$\checkmark$																					
Obedkoff, W. 2000. Interior Community Watershed Streamflow Inventory. Water Inventory Section, Resources Inventory Branch, March 2000.												$\checkmark$		$\checkmark$	$\checkmark$															
Dobson Engineering Ltd. 1999. Watershed Assessment Report for the Vaseux Creek Watershed. Final Report, Parts 1, 2, and 3. Prepared for Weyerhaeuser Canada Ltd., March 1999.					~																									
Coulson, C. H., and W. Obedkoff. 1998. British Columbia Streamflow Inventory. B.C. Ministry of Environment, Lands, and Parks. March 1998.												$\checkmark$			$\checkmark$															

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Agrodev Canada Inc. 1994. Preliminary Design and Cost Estimates for Vaseux Creek Fish Passage Facilities. Prepared for Okanagan Region Wildlife Heritage Fund Society, October 1994.					~				~		~																			
Letvak, D.B. 1988. Runoff in Okanagan Valley 1983-87. Memorandum dated May 3, 1988. B.C. Ministry of Environment and Parks, Water Management Branch. File S2109, Study 272.												$\checkmark$		$\checkmark$																
B.C. Ministry of Environment. 1982. Coldstream and Vaseux Creek Watersheds: Analysis of Channel Stability and Sediment Sources. APD Bulletin 27.	$\checkmark$			$\checkmark$	$\checkmark$							$\checkmark$	$\checkmark$																	
Letvak, D.B. 1980. Annual Runoff Estimates for West Side of Okanagan Valley, B.C. Ministry of Environment. January 1980.															$\checkmark$															
Cheng, J.D. 1979. Low Flow Characteristics of Tributary Streams in the Okanagan Basin. Cohen, S. (ed.) and Kulkarni, T. (ed.). 2001. Water Management & Climate Change in the Okanagan Basin. Environment Canada & University of British Columbia.												V			$\checkmark$															
Coulson, C.H. 1978. Vaseux Creek Water Supply for April 15 to June 15.																		$\checkmark$												
Canada-British Columbia Okanagan Basin Agreement. 1974. Technical Supplement I: Water Quantity in the Okanagan Basin. Office of the Study Director, Penticton, B.C.															$\checkmark$															
Canada-British Columbia Okanagan Basin Agreement. 1974. Technical Supplement II: Water Quantity Computer Models. Office of the Study Director, Penticton, B.C. March, 1974.															$\checkmark$															
Canada-British Columbia Okanagan Basin Agreement. 1974. Technical Supplement III: Water Quantity Alternatives and Supporting Water Quantity Data. Office of the Study Director, Penticton, B.C.															~															
Canada-British Columbia Okanagan Basin Agreement. 1974. Technical Supplement VII: Value and Demand for Consumptive Use of Water in the Okanagan Valley. Office of the Study Director, Penticton, B.C. March, 1974.																							1							~
Pinsent, M. E., Koshinsky, G. D., Willcocks, T. J., and J. O'Riordan. 1974. Fisheries and Sport Fish Potentials of the Okanagan Basin. Technical Supplement IX(A). Office of the Study Director, Penticton, BC.		✓									~																			
Canada-British Columbia Okanagan Basin Agreement. 1974. Technical Supplement IV: Water Quality and Waste Loadings in the Okanagan Basin. Office of the Study Director, Penticton, B.C., March 1974.													~																	
Koshinsky, G. D. 1972. Estimates of Minimum Flow Requirements for Okanagan Tributary Streams for the Propagation of Salmonid Fish Species Endemic to the Main Lakes.											~																			

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Anonymous. Undated. Okanagan Watershed Dscriptions for Chute Creek, Eneas Creek, Equesis Creek, Kelowna (Mill) Creek, Lambly Creek, Mission Creek, Naramata Creek, Naswhito Creek, Okanagan lake, Peachland Creek, Penticton Creek, Powers Creek, Robinson Creek, Shingle Creek, Similkameen River, Trepanier Creek, Trout Creek, Vaseux Creek, Vernon Creek. Ecocat Report ID 32362.	~			$\checkmark$	$\checkmark$						$\checkmark$		V	$\checkmark$																