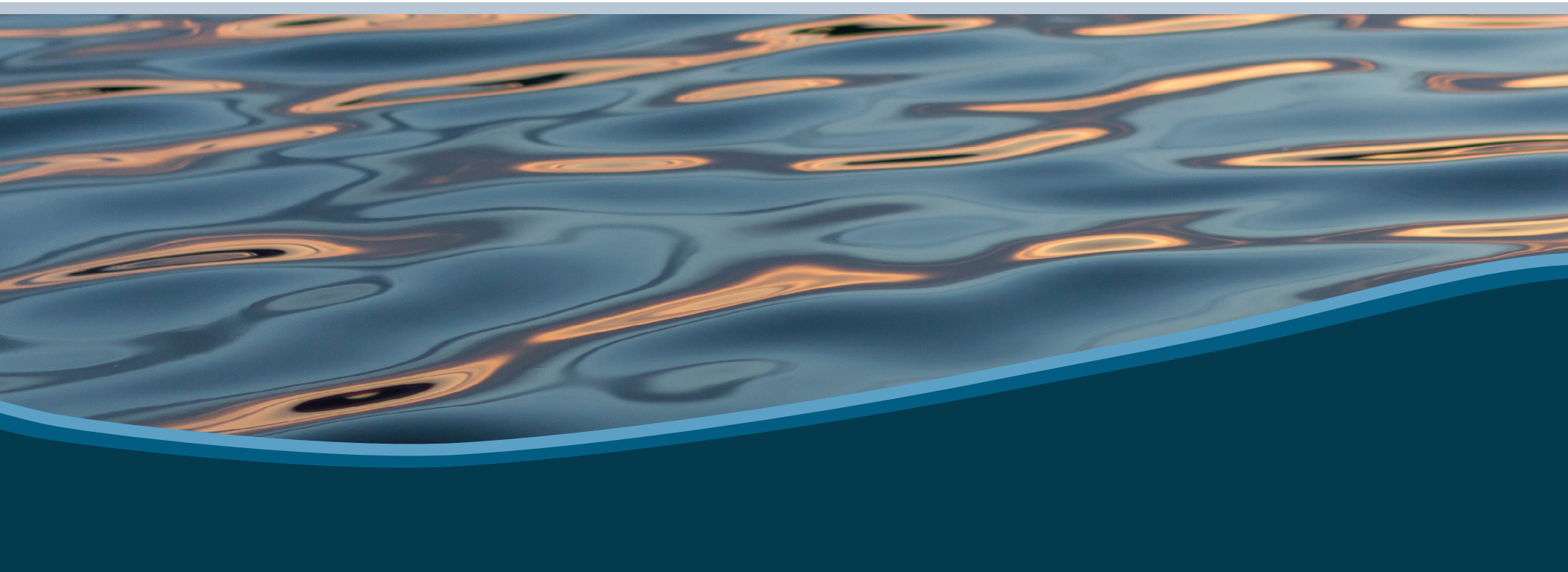


Quarterly Oil and Gas Water Management Summary

Fourth Quarter 2018 (October - December)



PURPOSE

This *Quarterly Oil and Gas Water Management Summary* presents short-term water use and water licence data from the Q4 October to December 2018 period.

Previous annual water use reports and quarterly water use summaries are available on the BC Oil and Gas Commission website at www.bcogc.ca.

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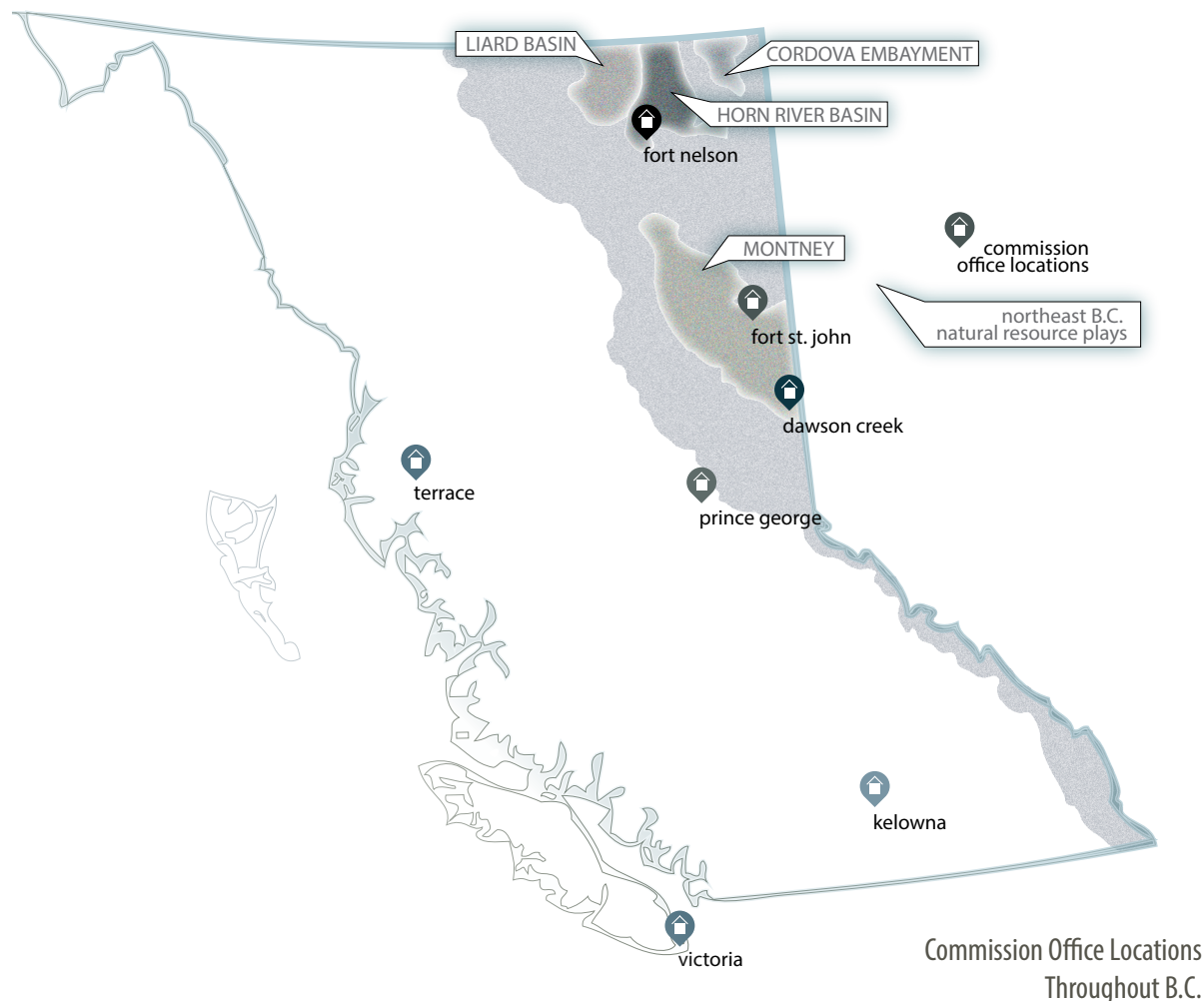
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BC OIL AND GAS COMMISSION

The [BC Oil and Gas Commission](#) (Commission) is the provincial regulatory agency with responsibilities for regulating oil and gas activities in British Columbia, including exploration, development, pipeline transportation and reclamation.

The Commission's core services include reviewing and assessing applications for industry activity, consulting with First Nations, cooperating with partner agencies, and ensuring industry complies with provincial legislation and all regulatory requirements. The public interest is protected by ensuring public safety, respecting those affected by oil and gas activities, conserving the environment, and ensuring equitable participation in production.

The Commission is responsible for reviewing, assessing, and making decisions on water authorizations from both surface and subsurface water sources. The Commission has the expertise and tools to make informed water allocation decisions, and protecting and maintaining environmental and community water needs are its first priorities.



HOW WATER IS USED

Water is used for various purposes in the oil and gas industry.



The largest use of water for oil and gas activities is for hydraulic fracturing.

However, water is used for other purposes, such as:



Seismic or geophysical exploration



Drilling



Machine washing



Dust control



Water floods (to enhance oil recovery)



Ice road freezing



Hydrostatic testing of pipelines

HOW WATER IS ACCESSED

There are different ways the oil and gas industry may access water in British Columbia. Some methods are managed through provincial legislation, including:

- **Water licences** issued under the Water Sustainability Act (WSA) for surface and groundwater. The Commission has staff designated as Regional Water Managers with authority for issuing and administering long-term water licences.
- **Short-term surface water use or diversion approvals** issued under Section 10 of the WSA. Short-term water use is administered by the Commission.
- **Water source wells** authorized by the Commission under the Oil and Gas Activities Act (OGAA). Water source wells are a specific type of well where the water withdrawn is intended for injection into an underground formation to enhance oil or natural gas recovery.
- **Flowback water** that returns to the surface after being injected for hydraulic fracturing.
- **Produced water** that flows to the surface as a by-product of oil and gas production.

The oil and gas industry can access water by means outside of regulatory oversight:



- **Private agreements** can be made with land owners or others who have a source of surface water supply such as a dugout or a groundwater well. In some cases, private agreements may require a Waterworks water licence under the WSA.

LONG-TERM WATER LICENCES AND USE

At the end of the fourth quarter of 2018, there were 54 active oil and gas related water licences, representing 57 withdrawal locations, held by 14 companies (Table 1).

The total annual licenced water volume was 28,521,636 m³.

A total of 2,346,975 m³ of licenced water was reported as withdrawn for the year (Table 1).

During the fourth quarter 2018, six companies withdrew water by way of water licences, totaling 268,331 m³ (Table 2).

A break-down of water licence allocation and use by OGC Water Management Basin is listed in Table 4.

* Q3 totals updated in Q4 to reflect delayed reporting.

TABLE 1 - SUMMARY OF WATER LICENCE AND USE FOR OIL AND GAS ACTIVITIES FROM JANUARY TO DECEMBER 2018

	Q1	Q2	Q3*	Q4
WATER LICENCE				
Companies with Active Water Licences	12	13	14	14
Active Water Licences	26	35	52	54
Licensed Withdrawal Locations	29	38	55	57
Annual Volume Available for Use for Water Licences (m ³)	19,867,424	24,213,356	27,714,712	28,521,636
Cumulative Volume Reported Used in 2018 (m ³)	741,188	1,344,423	2,078,644	2,346,975

TABLE 2:
OIL AND GAS RELATED WATER LICENCES THAT WITHDREW WATER FROM OCTOBER TO DECEMBER 2018

LICENCE #	LICENCEE	SOURCE	OGC WATER MANAGEMENT BASIN	ANNUAL APPROVAL (m ³ /YR)	Q4 WATER USE (m ³ /YR)
C112155	Whitecap Resources Inc.	Peace River	Lower Peace River	1,825,000	152,603
C126568	Petronas Energy Canada Ltd.	Williston Lake	Peace Arm	3,650,000	34
C132688	Canadian Natural Resources	Charlie Lake	Lower Beaton River	394,000	8,993
C133847	Petronas Energy Canada Ltd.	Unnamed Creek	Cameron River	3,687	1,666
C133955	Encana Corporation	Peace River	Lower Peace River	750,000	42,951
C134110	Petronas Energy Canada Ltd.	Unnamed Stream	Cameron River	79,045	1,258
C500185	Kelt Exploration (LNG) Ltd.	Aquifer	Cache Creek	20,900	21,293
C500226	Veresen Energy Pipeline Inc.	Aquifer	Smoky River	5,500	1,356
C500246	Kelt Exploration (LNG) Ltd.	Aquifer	Cache Creek	160,235	38,177

SHORT-TERM WATER APPROVAL AND USE

At the end of the fourth quarter of 2018, there were a total of 291 short-term water use approvals in place, representing 523 withdrawal locations, held by 43 companies (Table 3).

The total water volume associated with short-term approvals that were active on the last day of the quarter was 9,749,261 m³.

A total of 935,085 m³ was reported as withdrawn by oil and gas operators during the 2018 year (Table 3).

A break-down of short-term water approval and use by OGC Water Management Basin is listed in Table 4.

TABLE 3 - SUMMARY OF SHORT-TERM APPROVAL AND USE FOR
OIL AND GAS ACTIVITIES FROM JANUARY TO DECEMBER 2018

	Q1	Q2	Q3	Q4	
SHORT-TERM	Companies with Active Approvals	41	39	41	43
	Active Approvals	185	209	236	291
	Approved Withdrawal locations	643	608	631	523
	Volume Available for Use (m³)	10,605,996	10,790,642	9,709,121	9,749,261
	Cumulative Volume Reported Withdrawn (m³)	99,270	815,498	864,893	935,085



TABLE 4 - SUMMARY OF WATER ALLOCATION
AND USE FOR OIL AND GAS ACTIVITIES IN 2018,
ORGANIZED BY OGC WATER MANAGEMENT BASIN
(Page 1 of 4)

MAJOR and Sub-Basin Name	SHORT-TERM WATER USE APPROVALS - BC OIL AND GAS COMMISSION					OIL AND GAS RELATED WATER LICENCES					MEAN ANNUAL RUNOFF (m³)
	NUMBER OF APPROVED WITHDRAWAL LOCATIONS	TOTAL VOLUME APPROVED (m³) FOR LOCATIONS ACTIVE ON 12/31/2018	TOTAL VOLUME APPROVED as % of MEAN ANNUAL RUNOFF	TOTAL VOLUME WITHDRAWN IN 2018 (m³)	TOTAL VOLUME WITHDRAWN AS % OF MEAN ANNUAL RUNOFF	NUMBER OF LICENCED WITHDRAWAL LOCATIONS	TOTAL VOLUME LICENCED (m³)	TOTAL VOLUME LICENCED as % of MEAN ANNUAL RUNOFF	TOTAL VOLUME WITHDRAWN IN 2018 (m³)	TOTAL VOLUME WITHDRAWN as % of MEAN ANNUAL RUNOFF	
BEATTON RIVER (sub-basin of Peace River)											
Upper Beatton River	10	596,530	0.119%	23,716	0.005%	10	1,144,261	0.229%	114,341	0.023%	499,408,440
Middle Beatton River	24	305,650	0.123%	0	0.000%						249,152,995
Middle Beatton Total (incl. Upper Beatton)	34	902,180	0.121%	23,716	0.003%	10	1,144,261	0.153%	114,341	0.015%	748,561,435
Milligan Creek	14	85,880	0.045%	100	0.000%						191,536,686
Blueberry River	47	894,186	0.305%	11,623	0.004%						293,278,540
Doig River	2	7,200	0.002%	0	0.000%						323,069,523
Lower Beatton River	24	301,187	0.218%	23,576	0.017%	1	394,000	0.285%	31,989	0.023%	138,262,629
BEATTON TOTAL	121	2,190,633	0.129%	59,015	0.003%	11	1,538,261	0.091%	146,330	0.009%	1,694,708,813
HALFWAY RIVER (sub-basin of Peace River)											
Chowade River											327,027,527
Upper Halfway River											795,962,409
Upper Halfway Total (includes Chowade)	0	0	0.000%	0	0.000%	0	0	0.000%	0	0.000%	1,122,989,936
Graham River	2	3,450	0.000%	1,170	0.000%						860,627,172
Cameron River	22	523,546	0.234%	34,388	0.015%	7	246,323	0.110%	4,348	0.002%	223,679,567
Lower Halfway River	13	115,399	0.076%	679	0.000%	7	3,838,688	2.533%	0	000.0%	151,526,991
HALFWAY TOTAL	37	642,395	0.027%	36,237	0.002%	14	4,085,011	0.173%	0	0.000%	2,358,823,666
MOBERLY RIVER (sub-basin of Peace River)											
Moberly River	8	65,829	0.017%	28,460	0.007%						391,714,995
MOBERLY TOTAL	8	65,829	0.000%	28,460	0.007%	0	0	0.000%	0	0.000%	391,714,995
PINE RIVER (sub-basin of Peace River)											
Burnt River											737,930,022
Sukunka River	3	20,000	0.002%	940	0.000%						1,047,282,572
Sukunka River Total (includes Burnt)	3	20,000	0.001%	940	0.000%	0	0	0.000%	0	0.000%	1,785,212,594
Upper Pine River	2	40,500	0.003%	23,063	0.002%						1,466,884,035
Murray River	3	20,850	0.001%	0	0.000%						2,698,285,017
Lower Pine River	35	731,408	0.531%	108,689	0.079%	2	1,300,000	0.945%	196,060	0.142%	137,619,889
PINE TOTAL	43	812,758	0.019%	132,692	0.002%	2	1,300,000	0.021%	196,060	0.003%	6,088,001,535

SHORT-TERM WATER USE APPROVALS - BC OIL AND GAS COMMISSION						OIL AND GAS RELATED WATER LICENCES					
MAJOR and Sub-Basin Name	NUMBER OF APPROVED WITHDRAWAL LOCATIONS	TOTAL VOLUME APPROVED (m³) FOR LOCATIONS ACTIVE ON 12/31/2018	TOTAL VOLUME APPROVED as % of MEAN ANNUAL RUNOFF	TOTAL VOLUME WITHDRAWN IN 2018 (m³)	TOTAL VOLUME WITHDRAWN AS % OF MEAN ANNUAL RUNOFF	NUMBER OF LICENCED WITHDRAWAL LOCATIONS	TOTAL VOLUME LICENCED (m³)	TOTAL VOLUME LICENCED as % of MEAN ANNUAL RUNOFF	TOTAL VOLUME WITHDRAWN IN 2018 (m³)	TOTAL VOLUME WITHDRAWN as % of MEAN ANNUAL RUNOFF	MEAN ANNUAL RUNOFF (m³)
KISKATINAW RIVER (sub-basin of Peace River)											
West Kiskatinaw River											117,515,115
East Kiskatinaw River											105,452,962
Middle Kiskatinaw River	6	1,230,996	2.185%	247,581	0.439%						56,347,972
Middle Kiskatinaw Total (incl. West & East)	6	1,230,996	0.441%	247,581	0.089%	0	0	0.000%	0	0.000%	279,316,049
Lower Kiskatinaw River	13	739,007	0.824%	45,719	0.051%	5	2,223,069	2.479%	453,670	0.506%	89,659,847
KISKATINAW TOTAL	19	1,970,003	0.534%	293,300	0.079%	5	2,223,069	0.602%	453,670	0.123%	368,975,896
PEACE RIVER											
Peace Arm						3	9,125,000	0.000%	53,439	0.000%	N/A
Upper Peace River	3	877,532	0.002%	0	0.000%						36,423,413,429
Lynx Creek	2	39,996	0.131%	0	0.000%						30,436,635
Farrell Creek	9	83,944	0.092%	0	0.000%						91,018,843
Cache Creek	1	12,000	0.016%	0	0.000%	3	366,157	0.491%	118,509	0.159%	74,603,546
Pouce Coupe River	8	337,022	0.132%	189,901	0.074%	4	1,382,754	0.541%	31,956	0.012%	255,686,202
Lower Peace River	16	434,662	0.380%	149,856	0.131%	5	2,388,348	2.086%	1,339,418	1.170%	114,470,012
PEACE TOTAL (incl. Kisk/Pine/Moberly/Half/Beatton)	267	7,466,774	0.016%	889,461	0.002%	47	22,408,600	0.047%	2,343,730	0.005%	47,891,853,572
SMOKY RIVER											
Smoky River	3	9,000	0.000%	0	0.000%	2	8,000	0.000%	1,356	0.000%	2,669,506,123
SMOKY TOTAL	3	9,000	0.000%	0	0.000%	2	8,000	0.000%	1,356	0.000%	2,669,506,123
MUSKWA RIVER (sub-basin of Fort Nelson River)											
Upper Muskwa River											1,725,201,511
Middle Muskwa River											1,973,711,816
Middle Muskwa Total (incl. Upper Muskwa)	0	0	0.000%	0	0.000%	0	0	0.000%	0	0.000%	3,698,913,327
Lower Muskwa River	2	1,500	0.000%	0	0.000%						646,841,560
MUSKWA TOTAL	0	1,500	0.000%	0	0.000%	0	0	0.000%	0	0.000%	4,345,754,887
PROPHET RIVER (sub-basin of Fort Nelson River)											
Upper Prophet River	1	1,500	0.000%	300	0.000%	1	36,593	0.002%	0	0.000%	1,470,271,289
Middle Prophet River	1	150	0.000%	50	0.000%						621,428,680
Middle Prophet Total (incl. Upper Prophet)	2	1,650	0.000%	350	0.000%	1	36,593	0.002%	0	0.000%	2,091,699,969
Lower Prophet River	1	7,000	0.003%	150	0.000%						272,262,427
PROPHET TOTAL	3	8,650	0.000%	500	0.000%	1	36,593	0.002%	0	0.000%	2,363,962,396

MAJOR and Sub-Basin Name	SHORT-TERM WATER USE APPROVALS - BC OIL AND GAS COMMISSION					OIL AND GAS RELATED WATER LICENCES					
	NUMBER OF APPROVED WITHDRAWAL LOCATIONS	TOTAL VOLUME APPROVED (m³) FOR LOCATIONS ACTIVE ON 12/31/2018	TOTAL VOLUME APPROVED as % of MEAN ANNUAL RUNOFF	TOTAL VOLUME WITHDRAWN IN 2018 (m³)	TOTAL VOLUME WITHDRAWN AS % OF MEAN ANNUAL RUNOFF	NUMBER OF LICENCED WITHDRAWAL LOCATIONS	TOTAL VOLUME LICENCED (m³)	TOTAL VOLUME LICENCED as % of MEAN ANNUAL RUNOFF	TOTAL VOLUME WITHDRAWN IN 2018 (m³)	TOTAL VOLUME WITHDRAWN as % of MEAN ANNUAL RUNOFF	MEAN ANNUAL RUNOFF (m³)
SIKANNI CHIEF RIVER (sub-basin of Fort Nelson River)											
Upper Sikanni Chief River						2	6,039,241	0.748%	0	0.000%	807,771,692
Middle Sikanni Chief River	29	510,598	0.054%	6,692	0.000%	4	29,202	0.003%	1,889	0.000%	949,755,794
Middle Sikanni Chief Total (incl. Upper Sikanni)	29	510,598	0.029%	6,692	0.001%	6	6,068,443	0.345%	1,889	0.000%	1,757,527,486
Lower Sikanni Chief	7	42,200	0.005%	1,371	0.000%						875,678,142
SIKANNI CHIEF TOTAL	36	552,798	0.021%	8,063	0.000%	6	6,068,443	0.230%	1,889	0.000%	2,633,205,628
FORT NELSON RIVER											
Kahntah River											400,582,903
Fontas River	2	24,500	0.004%	5,579	0.001%						591,531,903
Fontas Total (includes Kahntah)	2	24,500	0.002%	5,579	0.001%	0	0	0.000%	0	0.000%	992,114,806
Klua Creek	2	8,400	0.002%	0	0.000%						402,135,448
Upper Fort Nelson River	8	23,400	0.008%	301	0.000%						276,181,026
Upper Fort Nelson Total (incl. Sikanni Chief Total, Kahntah, Fontas, Klua)	48	609,098	0.014%	13,943	0.000%	6	6,068,443	0.141%	1,889	0.000%	4,303,636,908
Snake River	4	16,800	0.005%	853	0.000%						310,763,522
Sahtaneh River	13	64,500	0.014%	2,201	0.000%						474,904,729
Middle Fort Nelson River	6	15,000	0.003%	746	0.000%						515,348,901
Middle Ft Nelson Total (incl. Upper Ft. Nelson total, Muskwa Total, Prophet Total, Snake, Sahtaneh)	74	715,548	0.006%	18,243	0.000%	7	6,105,036	0.050%	1,889	0.000%	12,314,371,343
Kiwigana River	10	39,200	0.009%	1,276	0.000%						441,657,543
Lower Fort Nelson River											312,768,938
FORT NELSON TOTAL	84	754,748	0.006%	19,519	0.000%	7	6,105,036	0.047%	1,889	0.000%	13,068,797,824
LIARD RIVER											
Muncho River											551,551,360
Upper Liard River											33,125,817,465
Upper Liard Total (incl. Muncho)	0	0	0.000%	0	0.000%	0	0	0.000%	0	0.000%	33,677,368,825
Grayling River											630,833,914
Upper Toad River											1,521,055,576
Racing River											1,488,336,681
Lower Toad River											419,472,722
Beaver River											10,862,659,426
Middle Liard River											463,652,312

MAJOR and Sub-Basin Name	SHORT-TERM WATER USE APPROVALS - BC OIL AND GAS COMMISSION					OIL AND GAS RELATED WATER LICENCES					
	NUMBER OF APPROVED WITHDRAWAL LOCATIONS	TOTAL VOLUME APPROVED (m³) FOR LOCATIONS ACTIVE ON 12/31/2018	TOTAL VOLUME APPROVED as % of MEAN ANNUAL RUNOFF	TOTAL VOLUME WITHDRAWN IN 2018 (m³)	TOTAL VOLUME WITHDRAWN AS % OF MEAN ANNUAL RUNOFF	NUMBER OF LICENCED WITHDRAWAL LOCATIONS	TOTAL VOLUME LICENCED (m³)	TOTAL VOLUME LICENCED as % of MEAN ANNUAL RUNOFF	TOTAL VOLUME WITHDRAWN IN 2018 (m³)	TOTAL VOLUME WITHDRAWN as % of MEAN ANNUAL RUNOFF	MEAN ANNUAL RUNOFF (m³)
LIARD RIVER con't											
Middle Liard Total (incl. Upper Liard Total, Grayling, Upper Toad, Racing, Lower Toad, Beaver)	0	0	0.000%	0	0.000%	0	0	0.000%	0	0.000%	49,063,379,456
Capot-Blanc Creek											183,879,851
Dunedin River											820,464,167
Lower Liard River											1,236,634,664
LIARD TOTAL (incl. Fort Nelson)	84	754,748	0.001%	19,519	0.000%	7	6,105,036	0.009%	1,889	0.000%	64,373,155,962
PETITOT RIVER											
Sahdoanah River	8	28,000	0.011%	3,875	0.002%						252,625,362
Upper Petitot River	20	84,000	0.006%	1,400	0.000%						1,476,579,488
Tsea River	31	196,134	0.045%	3,022	0.001%						434,062,484
Middle Petitot River	20	160,400	0.023%	530	0.000%						698,562,753
Middle Petitot Total (incl. Sahdoanah, Upper Petitot, Tsea)	79	468,534	0.016%	8,827	0.000%	0	0	0.000%	0	0.000%	2,861,830,087
Lower Petitot River	19	46,600	0.005%	0	0.000%						904,314,069
PETITOT TOTAL	98	515,134	0.014%	8,827	0.000%	0	0	0.000%	0	0.000%	3,766,144,156
HAY RIVER											
Upper Kotcho River	3	28,400	0.009%	165	0.000%						311,519,217
Kyklo River	4	20,600	0.014%	2,639	0.002%						145,897,691
Shekilie River	22	146,200	0.032%	184	0.000%						450,747,494
Lower Kotcho River	1	3,000	0.001%	1,023	0.000%						311,519,217
Lower Kotcho Total (includes Upper Kotcho, Kyklo, Shekilie)	30	198,200	0.016%	4,011	0.000%	0	0	0.000%	0	0.000%	1,219,683,619
Hay River	26	180,000	0.033%	8,437	0.002%						538,672,352
HAY TOTAL	56	378,200	0.022%	12,448	0.001%	0	0	0.000%	0	0.000%	1,758,355,971
CHINCHAGA RIVER											
Chinchaga River	2	1,000	0.001%	3,489	0.003%						109,492,680
CHINCHAGA TOTAL	2	1,000	0.001%	3,489	0.003%	0	0	0.000%	0	0.000%	109,492,680
OTHER (outside Northeast B.C.)	11	642,405	0.000%	1,341	0.000%	0	0	0.000%	0	0.000%	N/A
GRAND TOTAL	521	9,749,261	0.008%	935,085	0.001%	56	28,521,636	0.024%	2,346,975	0.002%	120,568,508,464



Previous annual water reports and quarterly updates
are available on the Commission's website at:
<http://www.bcogc.ca/public-zone/water-information>

For specific questions or enquiries
regarding this data, please contact:
OGC.Communications@bcogc.ca
