# Quarterly Oil and Gas Water Management Summary



Third Quarter 2016 (July - September)



### **PURPOSE**

This *Quarterly Oil and Gas Water Use Summary* presents short-term water use and water licence data from the Q3 July to September 2016 period.

Previous annual water use reports and quarterly water use summaries are available on the BC Oil and Gas Commission website at <a href="https://www.bcogc.ca">www.bcogc.ca</a>.

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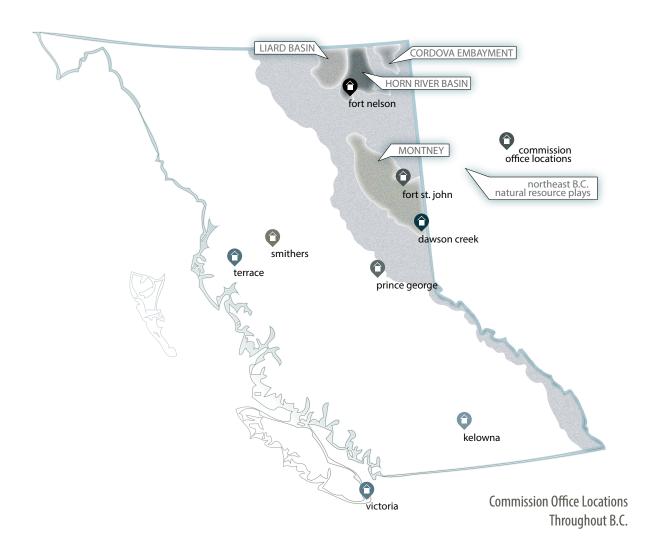
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## BC OIL AND GAS COMMISSION

he <u>BC Oil and Gas Commission</u> (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**

here 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 landowners 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 third quarter of 2016, there were 10 active oil and gas related water licences, representing 37 withdrawal locations, held by 21 companies (Table 1).

The total annual licenced water volume was 17,825,759 m³.

A total of 695,001 m<sup>3</sup> of licenced water was reported as withdrawn in the first three quarters of the year (Table 1).

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

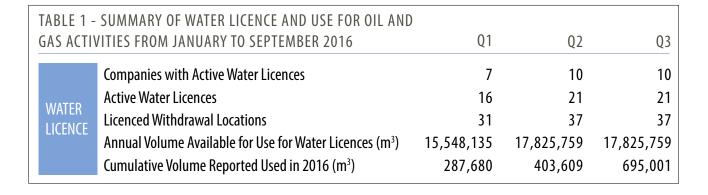


TABLE 2:
OIL AND GAS RELATED WATER LICENCES THAT WITHDREW WATER FROM JULY TO SEPTEMBER 2016

LICENCE#	LICENCEE	SOURCE	OGC WATER MANAGEMENT BASIN	ANNUAL APPROVAL (m³/YR)	Q3 WATER USE (m³/YR)
C112155 C132688	Whitecap Resources Canadian Natural Resources Limited	Peace River Charlie Lake	Lower Peace River Lower Beatton River	1,825,000 394,000	130,172 12,004
C133155 C132372	Canbriam Energy Inc. Canadian Natural Resources Limited	Williston Lake Pine River	Peace Arm Lower Pine River	3,650,000 650,000	104,216 45,000

# SHORT-TERM WATER APPROVAL AND USE

At the end of the third quarter of 2016, there were a total of 227 short-term water use approvals in place, representing 653 withdrawal locations, held by 41 companies (Table 3).

The total water volume associated with short-term approvals that were active on the last day of the quarter was 8,761,992 m<sup>3</sup>.

A total of 701,548 m³ was reported as withdrawn by oil and gas operators during the first three quarters of 2016 (Table 3).

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

	- SUMMARY OF SHORT-TERM APPROVAL AND USE FOR GAS ACTIVITIES FROM JANUARY TO SEPTEMBER 2016	Q1	Q2	Q3
	Companies with Active Approvals	39	46	41
	Active Approvals	162	202	227
SHORT-	Approved Withdrawal locations	753	749	653
TERM	Volume Available for Use (m³)	9,347,183	10,903,248	8,761,992
	Cumulative Volume Reported Withdrawn (m³)	269,564	484,338	701,548



## WATER SUSTAINABILITY ACT

he Water Sustainability Act (WSA) came into effect on February 29, 2016, resulting in changes to surface water and groundwater allocation processes by the Commission. With the implementation of the WSA, the following regulations were created or revised and brought into force:

- Water Sustainability Regulation (replaces Water Regulation)
- Groundwater Protection Regulation (revised)
- Dam Safety Regulation (revised)
- Fees, Rentals and Charge Tariff Regulation (new)

The WSA modernizes the language of the Water Act and introduces a number of significant policy changes. Examples of key items that affect oil and gas activities include, but are not limited to:

- Water in a stream, and the percolation and flow of groundwater, are vested to the Crown.
- The regulatory scheme for the diversion and use of stream water is maintained and applied to both stream water and aquifer water.
- The rights of prior appropriation are retained First In Time, First In Right (FITFIR).
- The consideration of the environmental flow needs of a stream in licensing decisions is mandated for all water allocation decisions related

- to streams, and to aquifers "reasonably likely" of being hydraulically connected to a stream.
- Explicit notification, objection and appeal rights for short-term water use approvals and changes in and about a stream are specified (appeals are to the Environmental Appeal Board).
- Deep groundwater is exempted from the requirement for a water licence.
- New powers are created to be applied when streams are at risk of falling or have fallen below their critical environmental flow thresholds, to modify the existing precedence of water use for the purpose of protecting the aquatic ecosystem of streams and aquifers

- and essential domestic uses (i.e., FITFIR can be overridden).
- Authority is provided to statutory decision makers to require environmental mitigation or offsetting when the diversion and use of water, or changes in and about a stream, are likely to have a significant adverse impact on the water quality, water quantity or aquatic ecosystem of a stream or aquifer.

As there are significant changes resulting from the implementation of the WSA, operators are strongly encouraged to review the document <u>Water Sustainability Act Applications Support for Operators</u>. This supplemental outlines material changes to application manuals,



processes and fees, short-term water use approvals, water licensing, and the aforementioned regulations.

The WSA and its regulations may be viewed online:

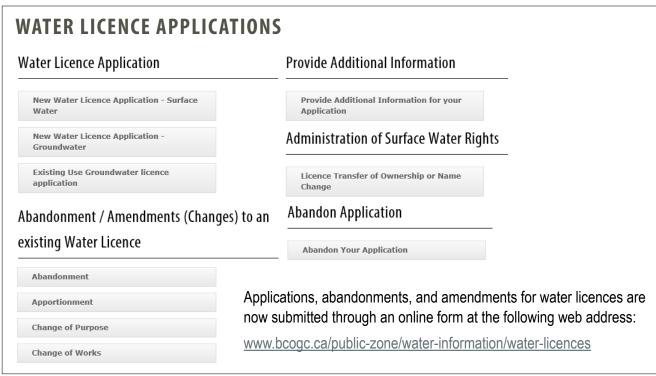
Water Sustainability Act

Water Sustainability Regulation

Water Sustainability Fees, Rentals and Charges Tariff Regulation

**Groundwater Protection Regulation** 

**Dam Safety Regulation** 





### SHORT-TERM WATER USE APPROVALS - BC OIL AND GAS COMMISSION

### OIL AND GAS RELATED WATER LICENCES

ORGANIZED BY OGC WATER MANAGEMENT BASIN (Page 1 of 4)  MAJOR and Sub-Basin Name	NUMBER OF APPROVED WITHDRAWAL LOCATIONS	TOTAL VOLUME APPROVED (m³) FOR LOCATIONS ACTIVE ON 9/30/2016	TOTAL VOLUME APPROVED as % of MEAN ANNUAL RUNOFF	TOTAL VOLUME WITHDRAWN IN 2016 (m³)	TOTAL VOLUME WITHDRAWN AS % OF MEAN ANNUAL RUNOFF	NUMBER OF LICENCED WITHDRAWA LOCATIONS	VOLUME	TOTAL VOLUME LICENCED as % of MEAN ANNUAL RUNOFF	TOTAL VOLUME WITHDRAWN IN 2016 (m³)	TOTAL VOLUME WITHDRAWN as % of MEAN ANNUAL RUNOFF	MEAN ANNUAL RUNOFF (m³)
BEATTON RIVER (sub-basin of Peace River)											
Upper Beatton River	25	1,162,349	0.233%	139,806	0.028%	2	780,000	0.156%			499,408,440
Middle Beatton River	26	195,437	0.078%	0		0					249,152,995
Middle Beatton Total (incl. Upper Beatton)	51	1,357,786	0.181%	139,806	0.019%	2	780,000	0.104%			748,561,435
Milligan Creek	9	179,690	0.094%	0	0.000%	0					191,536,686
Blueberry River	36	604,797	0.206%	603	0.000%	0		0.000%			293,278,540
Doig River	1	3,000	0.001%	0	0.000%	0		0.000%			323,069,523
Lower Beatton River	0	0	0.000%	0		1	394,000	0.285%	28,717	0.021%	138,262,629
BEATTON TOTAL	97	2,145,273	0.127%	140,409	0.008%	3	1,174,000	0.069%	28,717	0.002%	1,694,708,813
HALFWAY RIVER (sub-basin of Peace River)											
Chowade River	0	0		0		0					327,027,527
Upper Halfway River	5	182,550	0.023%	590		0					795,962,409
Upper Halfway Total (includes Chowade)	5	182,550	0.016%	590	0.000%	0	0	0.000%			1,122,989,936
Graham River	3	306,300	0.036%	30,287	0.004%	0					860,627,172
Cameron River	28	1,041,211	0.465%	34,771	0.016%	0					223,679,567
Lower Halfway River	13	624,795	0.412%	6,960	0.005%	0					151,526,991
HALFWAY TOTAL	49	2,154,856	0.091%	72,608	0.003%	0	0	0.000%			2,358,823,666
MOBERLY RIVER (sub-basin of Peace River)											
Moberly River	1	23,102	0.006%	0		0					391,714,995
MOBERLY TOTAL	1	23,102	0.000%	0	0.000%	0	0	0.000%			391,714,995
PINE RIVER (sub-basin of Peace River)											
Burnt River	0	0	0.000%	0	0.000%	0					737,930,022
Sukunka River	3	30,000	0.003%	0		0					1,047,282,572
Sukunka River Total (includes Burnt)	3	30,000	0.002%	0	0.000%	0	0	0.000%			1,785,212,594
Upper Pine River	3	13,933	0.001%	1,840	0.000%	0					1,466,884,035
Murray River	4	30,096	0.001%	465	0.000%	8	390,000	0.014%	0	0.000%	2,698,285,017
Lower Pine River	29	684,526	0.497%	86,071	0.063%	1	650,000	0.472%	45,000	0.033%	137,619,889
PINE TOTAL	39	758,555	0.019%	88,376	0.001%	9	1,040,000	0.017%	45,000	0.001%	6,088,001,535

### SHORT-TERM WATER USE APPROVALS - BC OIL AND GAS COMMISSION

OIL AND GAS RELATED WATER LICENCES

SUMMARY OF WATER ALLOCATION AND USE FOR OIL AND	SHORT-TERM WATER USE APPROVALS - BC OIL AND GAS COMMISSION					OIL AND GAS RELATED WATER LICENCES							
GAS ACTIVITIES IN 2016, ORGANIZED BY OGC WATER MANAGEMENT BASIN (Page 2 of 4)  MAJOR and	NUMBER OF APPROVED WITHDRAWAL	TOTAL VOLUME APPROVED (m³) FOR LOCATIONS ACTIVE ON	TOTAL VOLUME APPROVED as % of MEAN	TOTAL VOLUME WITHDRAWN	TOTAL VOLUME WITHDRAWN AS % OF MEAN ANNUAL	NUMBER OF LICENCED WITHDRAWA	VOLUME	TOTAL VOLUME LICENCED as % of MEAN ANNUAL	TOTAL VOLUME WITHDRAWN	TOTAL VOLUM WITHDRAWN as % of MEAI ANNUAL	I MEAN		
Sub-Basin Name	LOCATIONS	9/30/2016	ANNUAL RUNOFF	IN 2016 (m <sup>3</sup> )	RUNOFF	LOCATIONS	(m³)	RUNOFF	IN 2016 (m <sup>3</sup> )	RUNOFF	(m³)		
KISKATINAW RIVER (sub-basin of Peace River)													
West Kiskatinaw River	0	0	0.000%	0	0.000%	0					117,515,115		
East Kiskatinaw River	1	2,300	0.002%	0	0.000%	0					105,452,962		
Middle Kiskatinaw River	4	33,536	0.060%	53,107	0.094%	0					56,347,972		
Middle Kiskatinaw Total (incl. West & East)	5	35,836	0.013%	53,107	0.019%	0					279,316,049		
Lower Kiskatinaw River	13	220,363	0.246%	4,582	0.005%	1	20,969	0.023%	0	0.000%	89,659,847		
KISKATINAW TOTAL	18	256,199	0.069%	57,689	0.016%	1	20,969	0.006%	0	0.000%	368,975,896		
PEACE RIVER													
Peace Arm	0	0		0		2	7,300,000		253,241		N/A		
Upper Peace River	0	0	0.000%	0		0	0	0.000%			36,423,413,429		
Lynx Creek	0	0	0.000%	0		0					30,436,635		
Farrell Creek	4	40,706	0.045%	0	0.000%	0					91,018,843		
Cache Creek	0	0	0.000%	0	0.000%	1	185,022	0.248%			74,603,546		
Pouce Coupe River	5	147,302	0.058%	54,950	0.021%	2	132,754	0.052%			255,686,202		
Lower Peace River	8	33,349	0.029%	6,649	0.006%	3	2,298,348	2.008%	356,052	0.311%	114,470,012		
PEACE TOTAL (incl. Kisk/Pine/Moberly/Half/Beatton)	221	5,559,342	0.012%	420,681	0.001%	21 1	12,151,093	0.025%	683,010	0.001%	47,891,853,572		
SMOKY RIVER													
Smoky River	10	56,700	0.002%	0	0.000%	1	2,500	0.000%			2,669,506,123		
SMOKY TOTAL	10	56,700	0.002%	0	0.000%	1	2,500	0.000%			2,669,506,123		
MUSKWA RIVER (sub-basin of Fort Nelson River)													
Upper Muskwa River	0	0	0.000%	0		0					1,725,201,511		
Middle Muskwa River	0	0	0.000%	0		0					1,973,711,816		
Middle Muskwa Total (incl. Upper Muskwa)	0	0	0.000%	0	0.000%	0	0	0.000%			3,698,913,327		
Lower Muskwa River	0	0	0.000%	0		0					646,841,560		
MUSKWA TOTAL	0	0	0.000%	0	0.000%	0	0	0.000%			4,345,754,887		
PROPHET RIVER (sub-basin of Fort Nelson River)													
Upper Prophet River	5	67,190	0.005%	0	0.000%	0					1,470,271,289		
Middle Prophet River	5	19,500	0.003%	0		0					621,428,680		
Middle Prophet Total (incl. Upper Prophet)	10	86,690	0.004%	0	0.000%	0	0	0.000%			2,091,699,969		
Lower Prophet River	5	31,900	0.012%	0		0					272,262,427		
PROPHET TOTAL	15	118,590	0.005%	0	0.000%	0	0	0.000%			2,363,962,396		

SUMMARY OF WATER ALLOCATION AND USE FOR OIL AND	SHOR	T-TERM WATER U	SE APPROVALS - B	C OIL AND GAS	COMMISSION	OIL AND GAS RELATED WATER LICENCES						
	NUMBER OF APPROVED WITHDRAWAL	TOTAL VOLUME APPROVED (m³) FOR LOCATIONS ACTIVE ON	TOTAL VOLUME APPROVED as % of MEAN	TOTAL VOLUME WITHDRAWN	TOTAL VOLUME WITHDRAWN AS % OF MEAN ANNUAL	NUMBER O LICENCED WITHDRAWA	VOLUME	TOTAL VOLUME LICENCED as % of MEAN ANNUAL	TOTAL VOLUME WITHDRAWN	TOTAL VOLUME WITHDRAWN as % of MEAN ANNUAL	MEAN	
Sub-Basin Name	LOCATIONS	9/30/2016	ANNUAL RUNOFF	IN 2016 (m <sup>3</sup> )	RUNOFF	LOCATIONS		RUNOFF	IN 2016 (m <sup>3</sup> )	RUNOFF	(m³)	
SIKANNI CHIEF RIVER (sub-basin of Fort Nelson River)												
Upper Sikanni Chief River	1	75,000	0.009%	0	0.000%	1	2,993,000	0.371%	11,991	0.001%	807,771,692	
Middle Sikanni Chief River	35	335,380	0.035%	85,767	0.009%						949,755,794	
Middle Sikanni Chief Total (incl. Upper Sikanni)	36	410,380	0.023%	85,767	0.005%	1	2,993,000	0.170%	11,991	0.001%	1,757,527,486	
Lower Sikanni Chief	8	16,173	0.002%	0							875,678,142	
SIKANNI CHIEF TOTAL	44	426,553	0.016%	85,767	0.003%	1	2,993,000	0.114%	11,991	0.000%	2,633,205,628	
FORT NELSON RIVER												
Kahntah River	14	43,700	0.011%	1,210	0.000%	0					400,582,903	
Fontas River	2	450	0.000%	0		0					591,531,903	
Fontas Total (includes Kahntah)	16	44,150	0.004%	1,210	0.000%	0	0	0.000%	0	0.000%	992,114,806	
Klua Creek	0	0	0.000%	0	0.000%	0					402,135,448	
Upper Fort Nelson River	2	24,200	0.009%	0		0					276,181,026	
Upper Fort Nelson Total (incl. Sikanni Chief Total	l, 62	494,903	0.011%	86,977	0.002%	1	2,993,000	0.070%	11,991	0.000%	4,303,636,908	
Kahntah, Fontas, Klua)												
Snake River	5	21,000	0.007%	0	0.000%	0					310,763,522	
Sahtaneh River	14	112,100	0.024%	17,084	0.004%	2	60,000	0.013%	0	0.000%	474,904,729	
Middle Fort Nelson River	7	37,825	0.007%	4,534	0.001%	0			0		515,348,901	
Middle Ft Nelson Total (incl. Upper Ft. Nelson total,	103	784,418	0.006%	108,595	0.001%	3	3,053,000	0.025%	11,991	0.000%	12,314,371,343	
Muskwa Total, Prophet Total, Snake, Sahtaneh)												
Kiwigana River	12	44,000	0.010%	0	0.000%	5	42,500	0.010%			441,657,543	
Lower Fort Nelson River	13	89,292	0.029%	100		0					312,768,938	
FORT NELSON TOTAL	128	917,710	0.007%	108,695	0.001%	8	3,095,500	0.024%	11,991	0.000%	13,068,797,824	
LIARD RIVER											,	
Muncho River	0	0		0		0					551,551,360	
Upper Liard River	0	0		0		0					33,125,817,465	
Upper Liard Total (incl. Muncho)	0	0	0.000%	0	0.000%	0	0	0.000%			33,677,368,825	
Grayling River	0	0		0		0					630,833,914	
Upper Toad River	0	0		0		0					1,521,055,576	
Racing River	0	0		0		0					1,488,336,681	
Lower Toad River	0	0		0		0					419,472,722	
Beaver River	0	0		0		0					10,862,659,426	
Middle Liard River	0	0		U		0					463,652,312	

SUMMARY OF WATER ALLOCATION AND USE FOR OIL AND GAS ACTIVITIES IN 2016, ORGANIZED BY OGC WATER

### SHORT-TERM WATER USE APPROVALS - BC OIL AND GAS COMMISSION

OIL AND GAS RELATED WATER LICENCES

GAS ACTIVITIES IN 2016, ORGANIZED BY OGC WATER	SHORT TERM WATER OSE AT HOVELS DE OIL ARD GAS COMMISSION								its itheities tittleit eigettyks				
MANAGEMENT BASIN (Page 4 of 4)  MAJOR and	NUMBER OF APPROVED WITHDRAWAL	TOTAL VOLUME APPROVED (m³) FOR LOCATIONS ACTIVE ON	TOTAL VOLUME APPROVED as % of MEAN	TOTAL VOLUME WITHDRAWN	TOTAL VOLUME WITHDRAWN AS % OF MEAN ANNUAL	NUMBER LICENCE WITHDRAV	D VOLUME	TOTAL VOLUME LICENCED as % of MEAN ANNUAL	TOTAL VOLUME WITHDRAWN	TOTAL VOLUME WITHDRAWN as % of MEAN ANNUAL	MEAN ANNUAL RUNOFF		
Sub-Basin Name	LOCATIONS	9/30/2016	ANNUAL RUNOFF	IN 2016 (m <sup>3</sup> )	RUNOFF	LOCATION		RUNOFF	IN 2016 (m <sup>3</sup> )	RUNOFF	(m³)		
LIARD RIVER con't													
Middle Liard Total (incl. Upper Liard Total, Grayling,	0	0	0.000%	0	0.000%	0	0	0.000%			49,063,379,456		
Upper Toad, Racing, Lower Toad, Beaver)													
Capot-Blanc Creek	16	342,230	0.186%	35,032	0.019%	0					183,879,851		
Dunedin River	21	114,825	0.014%	0	0.000%	0					820,464,167		
Lower Liard River	13	365,610	0.030%	84,239	0.007%	0					1,236,634,664		
LIARD TOTAL (incl. Fort Nelson)	178	1,740,375	0.003%	227,966	0.000%	8	3,095,500	0.005%	11,991	0.000%	64,373,155,962		
PETITOT RIVER													
Sahdoanah River	18	20,150	0.008%	5,321	0.002%	0					252,625,362		
Upper Petitot River	54	91,438	0.006%	435	0.000%	0					1,476,579,488		
Tsea River	23	51,700	0.012%	3,740	0.001%	3	2,520,000	0.581%	0	0.000%	434,062,484		
Middle Petitot River	13	47,475	0.007%	330	0.000%	2	26,666	0.004%			698,562,753		
Middle Petitot Total (incl. Sahdoanah,	108	210,763	0.007%	9,826	0.000%	5	2,546,666	0.089%	0	0.000%	2,861,830,087		
Upper Petitot, Tsea)													
Lower Petitot River	30	96,800	0.011%	1,260		2	30,000	0.003%			904,314,069		
PETITOT TOTAL	138	307,563	0.008%	11,086	0.000%	7	2,576,666	0.068%	0	0.000%	3,766,144,156		
HAY RIVER													
Upper Kotcho River	1	4,000	0.001%	0	0.000%	0					311,519,217		
Kyklo River	5	29,200	0.020%	8,640	0.006%	0					145,897,691		
Shekilie River	27	186,610	0.041%	66	0.000%	0					450,747,494		
Lower Kotcho River	1	4,500	0.001%	2,666	0.001%	0					311,519,217		
Lower Kotcho Total (includes Upper Kotcho,	34	224,310	0.018%	11,372	0.001%	0	0	0.000%			1,219,683,619		
Kyklo, Shekilie)													
Hay River	25	188,200	0.035%	11,580	0.002%	0					538,672,352		
HAY TOTAL	59	412,510	0.023%	22,952	0.001%	0	0	0.000%			1,758,355,971		
CHINCHAGA RIVER													
Chinchaga River	17	61,000	0.056%	0	0.000%	0					109,492,680		
CHINCHAGA TOTAL	17	61,000	0.056%	0	0.000%	0	0	0.000%			109,492,680		
OTHER (outside Northeast B.C.)	30	624,502		18,863		0	0				N/A		
GRAND TOTAL	653	8,761,992	0.007%	701,548	0.001%	37	17,825,759	0.015%	695,001	0.001%	120,568,508,464		



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

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