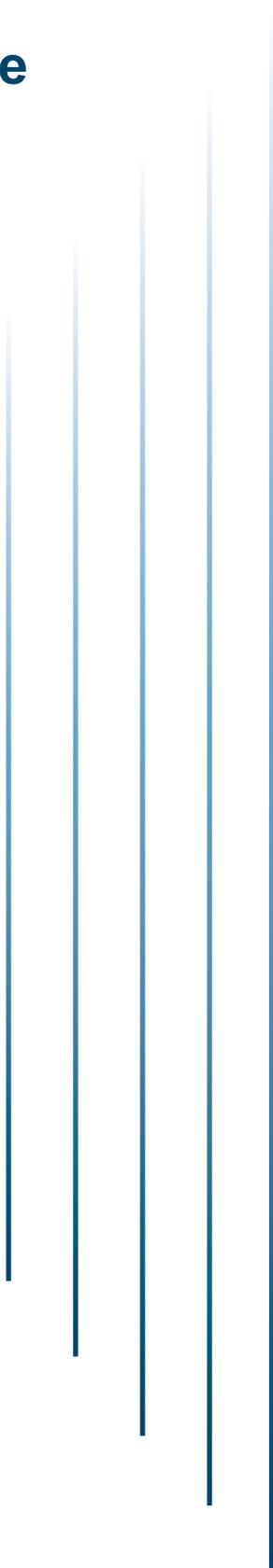


Quarterly Report on Short-Term Water Approvals and Use

July to September 2011



About the BC Oil and Gas Commission

The BC Oil and Gas Commission is an independent, single-window regulatory agency with responsibilities for overseeing oil and gas operations in British Columbia, including exploration, development, pipeline transportation and reclamation.

The Commission's core roles include reviewing and assessing applications for industry activity, consulting with First Nations, ensuring industry complies with provincial legislation and cooperating with partner agencies. The public interest is protected through the objectives of ensuring public safety, protecting the environment, conserving petroleum resources and ensuring equitable participation in production.

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Introduction

The Oil and Gas Activities Act (OGAA) provides authority to the BC Oil and Gas Commission (Commission) to issue short-term water use approvals under Section 8 of the Water Act to manage short-term water use by the oil and gas industry. Approvals under Section 8 of the Water Act authorize the diversion and use of water for a term not exceeding 12 months. This report details the Commission's responsibilities and authorities under Section 8 of the Water Act; it does not include the diversion and use of water approved by other agencies (such as the Ministry of Forests, Lands and Natural Resource Operations, which has responsibility for water licensing) or for purposes other than oil and gas activities.

The oil and gas industry obtains short-term water use approvals for a number of activities, which include:

- Seismic or geophysical exploration.
- Drilling.
- Machine washing.
- Winter ice road freezing.
- Dust control.
- Water floods (to enhance oil recovery).
- Hydraulic fracturing (predominantly of unconventional gas wells, but also conventional gas wells and some oil wells).
- Hydrostatic testing of oil and gas pipelines.
- Other purposes.

This report presents information on short-term water use approvals active during the July to September 2011 period. Included in the report is the cumulative volume of water that was reported as used by the Section 8 approval holders during 2011 (January to September). This is the third report of water use following changes to the Commission's water use reporting requirements that came into effect in March 2011. It will be followed by regular, quarterly reports on short-term water approvals and use. Earlier reports, for the period of January to March 2011, and April to June 2011, are available on the Commission [website](#).

Authority for Short-Term Water Use

Regulatory responsibility for short-term water use approvals is assigned to the Commission through the Oil and Gas Activities Act as a specified enactment for certain sections of the Water Act. This responsibility is a component of the Commission's structure as an efficient, single-window regulatory agency with responsibility for overseeing all aspects of oil and gas operations in British Columbia.

The Commission undertakes its Water Act responsibilities in a number of ways, and includes staffing natural resource specialists trained to review and adjudicate applications for water use associated with oil and gas activity. Commission specialists, including a professional hydrologist, have a high level of knowledge on water resources in northeast B.C., along with detailed knowledge of the oil and gas resource and detailed dynamics that drive the industry.

The Commission manages water approvals and use with specific focus on environmental values. Resources and methods include:

- The Commission developed a watershed base map for northeast British Columbia (derived from the Ministry of Environment's Freshwater Atlas base map).

- Water use approvals are done on a watershed basis with an understanding of cumulative effects management to ensure withdrawals do not exceed environmental limits, and that environmental flows are maintained.
- The Commission publicly reports on all water approvals and use:
 - [Quarterly reports](#)
 - [Table of active approvals](#)
- The Commission recognizes the need to manage for special or unique situations, and to take action as necessary; an example was the suspension of industry water use during the 2010 summer drought in the Peace River area.
- The Commission is developing a hydrology modelling and decision support tool, in partnership with the Ministry of Forests, Lands and Natural Resource Operations (FLNRO) and Geoscience BC to provide an enhanced ability to manage water withdrawals within a cumulative effects framework.
- Commission staff work cooperatively with water stewardship staff from FLNRO to ensure decisions are fully informed.

Fees for Commission Water Approvals

As a component of the single-window, streamlined, regulatory agency approach, in 2004 the Crown waived various application and rental fees associated with the specified enactments for which the Commission has authority.

Instead of numerous and separate fees administered through various acts and regulations, fees are consolidated into application fees paid by industry to the Commission for well

authorizations, geophysical exploration, and other activities.

These fees are established through and defined in the [Fee, Levy and Security Regulation](#).

A portion of the application fees that are allocated to the Commission provide for natural resource specialists to review and adjudicate the applications for oil and gas activity, including applications made under the Water Act.

Processes and Requirements

Oil and gas operators apply to the Commission for approval to use or divert water for an oil or gas activity. Natural resource officers in the Commission's Permitting and Authorizations division receive, review and adjudicate the applications. Prior to March 2011, applications typically were for a specified volume per day, but not for a total volume for the duration of the approval. Also, water that was diverted and used from natural surface water sources, such as from rivers and lakes, required an approval, but water that was obtained from dugouts or borrow pits did not require an approval. With regard to reporting, companies holding a Section 8 approval were required to maintain records of water withdrawals, but there was no formal water use reporting requirement in place.



Liard River

In March 2011, the Commission made a number of changes in its requirements related to short-term water use approvals:

- Water sourced from a dugout or a borrow pit (referred to as either a Water Source Dugout or a Water Storage Site) now requires an approval for short-term use under Section 8 of the Water Act.
- Schedule A approvals were eliminated and replaced with a Basin Section 8 approval. (Schedule A approvals provided the approval holder the right to access small quantities of water per day from any of a number of rivers and lakes in northeast B.C., listed in a table referred to as the Schedule A list; a Basin Section 8 provided authority to access a maximum of 45 cubic metres (m³) per day and 5,000 m³/year from a river or lake in a specified river basin. Basin Section 8s are limited to only a few uses, such as geophysical exploration, where it is not possible to have a standard approval with distinct points of withdrawal specified).
- Holders of short-term water use approvals are now required to report to the Commission the actual water volumes withdrawn from the various surface sources. Companies are required to report on a quarterly basis the water volumes withdrawn each month for each approved point of withdrawal.
- Applications are now required to contain a total volume per year that is requested, in addition to the requested volume per day.

The data contained in this report reflects the July to September 2011 period, representing the third reporting requirement from industry. In addition, cumulative water use for January to September 2011 is presented.

RESULTS

Total Approval and Reported Use

During the July to September period of 2011, there were a total of 185 short-term water use approvals in place, with 838 specified points of diversion, held by 49 companies (Table 1). The total water volume associated with these approvals was 55.3 million m³. This water volume is approved for use for a 12-month period for the approvals that were active during July to September 2011.

The total volume of active approvals during July to September 2011 is 20 per cent less than the second quarter of 2011 (69.2 million m³), and 29 per cent less than the first quarter of 2011 (78.4 million m³). This reduction results largely from the Commission now requiring companies to apply for a total volume of water, rather than just a volume per day. The Commission anticipates that the total water volume approved statistic will continue to drop until all pre-2011 approvals have expired.

Of the total volume approved for withdrawal, a total of 2.53 million m³ was reported by the approval holders as being withdrawn. This is a cumulative total for 2011, representing withdrawals during the nine-month period of January to September.

Not all approval holders reported water use as required. For this reporting period, eight approvals (4.3 per cent of total) held by six companies were not reported. As per standard procedure, these have been referred to the Commission's Compliance and Enforcement Branch for investigation and follow-up.

Commission Water Management Basins, Mean Annual Discharge

In 2011 the Commission developed map coverage of river basins in northeast B.C., referred to as the OGC Water Management Basins (Appendix A). This coverage was created from the Ministry of Environment's Freshwater Atlas mapping. Table 2 (Appendix B) summarizes the short-term water use within the OGC Water Management Basins. The 185 short-term water use approvals and the associated 887 points of withdrawal are listed within the specific river basin in which they occur.

For each basin, the mean annual discharge (cubic metres per second, m³/s) and mean annual runoff (m³/year) are listed. These values are calculated using two approaches:

1. Where there is a Water Survey of Canada stream flow gauge in the basin, the mean annual discharge is calculated from the historic gauge record, and is converted into a discharge per square kilometer of drainage basin (m³/s/km²). This value is then used to produce estimates of mean annual discharge for ungauged sub-basins by multiplying it by the drainage basin area of ungauged sub-basins. Table 3 (Appendix C) contains a listing of the Water Survey of Canada stream flow gauges used in this report.
2. There is a general lack of Water Survey of Canada stream flow data for the Horn, Liard and Cordova basins in northeast B.C. from which discharge estimates can be made. However, the Commission completed a preliminary hydrological modelling study in the Horn and Liard basins in March 2011 that has been used to provide preliminary estimates of mean annual discharge and runoff for some basins.

The Commission recognizes the importance of having enhanced stream flow estimates for river basins in which oil and gas activities occur, and has started a project, in partnership with FLNRO and Geoscience BC, to complete overview hydrologic modelling for all of northeast British Columbia and produce a GIS-based hydrology decision-support tool. This project is expected to be completed in early 2012, and will provide improved estimates of monthly, seasonal and annual runoff. This information will then assist the Commission with regard to Section 8 short-term water use approvals.

The hydrology information is used to provide context for the short-term water approvals and use. In Table 2, the total volume approved and used in each river basin is presented as a percentage of mean annual runoff.

Approvals and Use in Relation to Basin Runoff

In most river basins in northeast B.C., the total approved short-term water use is a small fraction of the mean annual runoff.

Table 1 – Summary of Short-Term Water Use Approvals active during 2011

	Q1 Total Jan-Mar 2011	Q2 Total Apr-Jun 2011	Q3 Total Jul-Sep 2011	Q4 Total Oct-Dec 2011
Number of Approvals	161	181	185	-
Number of Points of Withdrawal	599	553	838	-
Number of Companies	45	46	49	-
Total Volume Approved (m3) ¹	78,350,264	69,243,134	55,268,101	-
Total Volume Reported Used (m3) ²	88,956	1,393,879	2,525,830	-

Notes:

1. The number of approvals, number of points of withdrawal, number of companies and total volume approved are for a 12-month period beginning with each quarter.
2. The total volume reported is for calendar year 2011.
3. For Q1, 38 approvals (24 per cent of total) representing 19,818,000 m³ of approved volume (25 per cent of total) were not reported.
4. For Q2, eight approvals (3.5 per cent of total) representing 1,170,000 m³ of approved volume (1.6 per cent of total) were not reported.
5. The water report for Apr-Jun 2011 showed the total number of Section 8 approvals as 229. This was an error. The total number of approvals active in the Apr-Jun period were 181.



Horn River Basin

The basins with the 10 largest total approved volumes as a percentage of mean annual runoff are:

- Tsea River – 1.9 per cent
- Upper Petitot River – 1.7 per cent
- Sahdoanah River – 1.1 per cent
- Lynx Creek – 1.2 per cent
- Kiwigana River – 0.83 per cent
- Shekilie River – 0.67 per cent
- East Kiskatinaw River – 0.62 per cent
- Kyklo River – 0.33 per cent
- Capot-Blanc River – 0.32 per cent
- Lower Petitot River – 0.27 per cent

For all the remaining basins, the approved short-term water use corresponds to less than 0.27 per cent of mean annual runoff. Actual water use (as reported by the approval holders) in individual basins is a small fraction of the approved water use, and was less than 0.1 per cent of mean annual runoff in individual river basins, except for the Tsea River, where actual use was 0.26 per cent of mean annual runoff (note: the Tsea River is part of the Petitot River watershed, and is located in the Horn River Basin gas play area), and the East Kiskatinaw River, where actual use was 0.13 per cent of mean annual runoff.

SUMMARY

The Commission has authority under OGAA for short-term water use approvals through Section 8 of the Water Act. Changes in the Commission's water use approval processes were introduced in March 2011, which included the new requirement for the quarterly reporting of actual water withdrawals from all approved points of withdrawal.

This report presents a summary of short-term water approvals for the July to September 2011 period, and a summary of reported usage for the January to September period. During this period, there were a total of 185 short-term water use approvals in place, with 838 specified points of diversion, held by 49 companies. The total water volume associated with these approvals was 55.3 million m³, a reduction of 20 per cent from the previous quarter. A total of 2.53 million m³ (4.6 per cent of approved volume) was reported by the approval holders as actually being withdrawn during the January to September period.

Not all approval holders reported water use as required. Data was not reported for eight approvals (4.3 per cent of total) held by six companies. These files have been referred to the Commission's Compliance and Enforcement Branch for investigation and follow-up.

Table 2 of this report presents the short-term water use and

approval information in relation to mean annual runoff from the river basins in which the approvals are located. In most cases, the total approved use was less than 0.25 per cent of mean annual runoff. Three basins in the Horn River Basin have approved water use of one to two per cent (Upper Petitot River, Tsea River and Sahdoanah River), while Lynx Creek, in the Peace River basin, has approved water use of 1.2 per cent of mean annual runoff. All others were less than one per cent of annual runoff. In all cases, the actual reported use was a very small fraction of the total approved use. The Tsea River (in the Horn River Basin) was the highest and had a reported use representing 0.26 per cent of mean annual runoff.

Total approved use is high relative to actual use for a number of reasons, a major reason being an artifact of the Commission's approval process wherein a total volume approved was not necessarily required. This practice was changed in March 2011, and the Commission now requires companies to apply for a total volume for the duration of the approval. Total volumes approved for short-term water approvals are declining, and are anticipated to continue declining until mid-2012 as a result of this new practice.

The next quarterly water use report will be for October to December 2011.

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APPENDIX B

Table 2 – Current Section 8 (short-term water use) approved by the Commission.

Approved volumes for July-September 2011; actual withdrawals for January-September 2011 and annual discharge

Major Basin Name	Sub-Basin Name	Number of Section 8 Approvals	Number of Points of Diversion	Total Volume Approved (m ³)	Total Volume Approved as % of Mean Annual Runoff	Total Volume Withdrawn (m ³)	Total Volume Withdrawn as % of Mean Annual Runoff	Mean Annual Discharge (m ³ /s)	Mean Annual Runoff (m ³)
Beatton	Upper Beatton River	11	18	327,770	0.085%	11,580	0.003%	12.2	386,248,504
	Middle Beatton River	3	8	594,780	0.101%	3,968	0.001%	18.7	590,127,120
	Milligan Creek	7	48	540,060	0.185%	0		9.3	292,529,786
	Blueberry River	5	14	280,719	0.083%	7,314	0.002%	10.7	336,659,474
	Doig	1	3	24,595	0.010%	0		7.7	243,054,492
	Lower Beatton River	1	1	182,000	0.015%	0		38.6	1,218,123,360
	Beatton Total		28	92	1,949,924	0.114%	22,862	0.001%	54.1
Fort Nelson	Fontas River	2	18	742,388	0.101%	0		23.3	734,802,107
	Kahntah River	1	2	18,000	0.003%	0		17.3	544,750,613
	Kiwigana River	12	82	3,240,266	0.830%	51,269	0.013%	12.4	390,226,333
	Klua River	1	5	248,248	0.063%	0		12.4	391,372,372
	Upper Prophet River							24.9	786,946,888
	Middle Prophet River			364,000	0.028%	0		41.7	1,315,951,920
	Lower Prophet River							51.2	1,615,749,120
	Snake River	2	11	627,540	0.193%	0		10.3	324,902,101
	Upper Fort Nelson River	3	22	1,154,308	0.022%	3,809	0.000%	165	5,207,004,000
	Middle Fort Nelson River	19	36	2,451,683	0.026%	499,459	0.005%	300	9,467,280,000
Lower Fort Nelson River	3	16	364,331	0.003%	3,100	0.000%	340	10,729,584,000	
Fort Nelson Total		43	192	9,210,764	0.083%	557,637	0.005%	350	11,068,673,506
Halfway	Upper Halfway River	4	8	1,282,750	0.114%	43,734	0.004%	35.6	1,123,450,560
	Chowade							10.3	325,043,280
	Graham River	1	1	3,500	0.001%	0		18.3	576,557,352
	Cameron River	4	6	229,300	0.045%	42,270	0.008%	16.2	511,548,540
	Lower Halfway River	6	8	708,704	0.035%	3,635	0.000%	64.2	2,025,051,192
Halfway Total		15	23	2,224,254	0.096%	89,639	0.004%	73.5	2,319,119,474
Hay	Hay River	2	16	373,884	0.144%	0		8.2	260,100,000
Hay Total		2	16	373,884		0			2,319,119,474

Kiskatinaw	East Kiskatinaw River	6	53	590,703	0.616%	124,459	0.130%	3.0	95,935,104
	West Kiskatinaw River	2	8	98,368	0.109%	16,506	0.018%	2.9	90,570,312
	Middle Kiskatinaw	2	14	67,769	0.027%	18,100	0.007%	8.1	255,616,560
	Lower Kiskatinaw River	3	5	143,850	0.046%	12,812	0.004%	10.0	315,576,000
Kiskatinaw Total		13	80	900,690	0.275%	171,877	0.052%	10.4	327,904,045
Kotchko	Kyklo River	4	21	627,620	0.331%	1,554	0.001%	6	189,345,600
	Lower Kotcho River	3	22	943,452	0.270%	0		11.07	349,342,632
	Shekilie River	3	19	2,657,200	0.668%	532	0.000%	12.6	397,625,760
	Upper Kotcho River	2	2	112,628	0.020%	0		17.5	552,258,000
Kotchko Total		12	64	4,340,900	0.291%	2,086	0.000%	47.2	1,489,518,720
Liard	Capot-Blanc River	4	23	1,038,184	0.323%	3,260	0.001%	10.2	321,887,285
	Dunedin River							49.6	1,565,181,051
	Lower Toad River							71.2	2,246,511,740
	Grayling River							18.5	583,947,351
	Beaver River							16.6	525,243,649
	Upper Liard River							95.5	3,013,750,800
	Middle Liard River							114	3,597,566,400
	Lower Liard River	5	13	335,100	0.008%	3,950	0.000%	136	4,291,833,600
Liard Total		9	36	1,373,284	0.003%	7,210	0.000%	1420	44,811,792,000
Moberly	Moberly River	3	3	600,400	0.166%	4,080			361,134,655
Moberly Total		3	3	600,400	0.166%	4,080	0.001%	11.4	361,134,655
Muskwa	Upper Muskwa River							44.5	1,404,313,200
	Middle Muskwa River							89	2,808,626,400
	Lower Muskwa River					2,370	0.000%	124	3,913,142,400
Muskwa Total		0	0	0	0.000%	2,370	0.000%	213	6,713,724,706
Peace	Cache Creek	1	1	1,000	0.000%	0		7.3	230,370,480
	Farrell Creek							5.09	160,628,184
	Lower Peace River	4	6	2,007,400	0.005%	78,684	0.000%	1280	40,393,728,000
	Lynx Creek	3	3	954,000	1.190%	0		2.54	80,156,304
	Peace Arm							1280	40,393,728,000
	Upper Peace River	3	3	910,600	0.002%	80,623	0.000%	1430	45,127,368,000
Peace Total		11	13	3,873,000		159,307			

Petitot	Lower Petitot River	22	35	6,703,900	0.271%	42,843	0.002%	78.3	2,470,960,080
	Middle Petitot River	9	28	941,200	0.048%	11,581	0.001%	62.7	1,978,661,520
	Sahdoanah River	5	27	2,630,628	1.113%	0	0.000%	7.5	236,366,424
	Sahtaneh River	9	36	1,372,908	0.341%	1,280	0.000%	12.8	402,990,552
	Tsea River	9	39	6,521,930	1.928%	871,220	0.258%	10.7	338,297,472
	Upper Petitot River	15	63	8,485,000	1.660%	453,941	0.089%	16.2	511,233,120
Petitot Total		69	228	26,655,566	0.397%	1,380,865	0.021%	78.3	6,713,724,706
Pine River	Burnt							15.9	501,765,840
	Sukunka							45.4	1,432,715,040
	Upper Pine							38.9	1,227,590,640
	Murray River	4	22	1,711,500	0.065%	53,835	0.002%	83.4	2,631,903,840
	Lower Pine River	2	32	99,150	0.002%	27,617	0.000%	189	5,964,386,400
Pine Total		6	54	1,810,650	0.030%	81,452	0.001%	189	5,980,515,840
Prophet	Upper Prophet River							42	1,325,419,200
	Middle Prophet	1	2	364,000	0.016%	2,451	0.000%	70.1	2,212,187,760
	Lower Prophet					4,343	0.000%	86.2	2,720,265,120
Prophet Total		1	2	364,000	0.013%	6,794	0.000%	86.2	2,720,265,120
	Upper Sikanni Chief River	3	4	559,000	0.068%	12,682	0.002%	26.1	823,653,360
	Middle Sikanni Chief River	5	8	126,625	0.005%	2,376	0.000%	76.7	2,420,467,920
	Lower Sikanni Chief River					0		132	4,165,603,200
Sikanni Chief Total		8	12	685,625	0.016%	15,058	0.000%	132	4,165,603,200
Smoky	Smoky River	6	23	904,300	0.037%	24,593	0.001%	77.8	2,455,181,280
Smoky Total		6	23	904,300		24,593	0.001%	77.8	2,455,181,280
Other		1	1	860					
Grand Total		226	838	55,268,101		2,525,830			

Note: Refer to report for information on how Mean Annual Discharge and Mean Annual Runoff were calculated

APPENDIX C

Table 3 – Water Survey of Canada Hydrometric Stations utilized in the “mean annual discharge” calculations.

Gauge No.	Gauge Name	Basin Area (km ²)	Mean Annual Discharge (m ³ /s)	Mean Annual Runoff (mm)
07FA003	Halfway River above Graham River	3,780	35.6	421
07FA005	Graham River above Colt Creek	2,200	24.4	496
07FA006	Halfway River near Farrell Creek	9,330	73.5	352
07FB001	Pine River at East Pine	12,100	190	702
07FB002	Murray River near the Mouth	5,550	83.4	672
07FB003	Sukunka River near the Mouth	2,590	54.8	946
07FB004	Dickebusch Creek near the Mouth	82	0.592	323
07FB008	Moberly River near Fort St. John	1,520	11.4	336
07FC001	Beatton River near Fort St. John	15,600	54.1	155
07FC003	Blueberry River below Aitken Creek	1,770	5.35	135
07FD001	Kiskatinaw River near Farmington	3,640	10.4	128
10BE004	Toad River above Nonda Creek	2,570	43.4	755
10BE011	Grayling River near the Mouth	1,780	16.5	414
10BE101	Toad River near the Mouth	6,900	103	667
10CA001	Fontas River near the Mouth	7,400	31.3	189
10CB001	Sikanni Chief River near Fort Nelson	2,160	25.9	535
10CC001	Fort Nelson River at Fort Nelson	43,500	351	361
10CC002	Fort Nelson River above Muskwa River	22,800	138	271
10CD001	Muskwa River near Fort Nelson	20,300	212	467
10CD003	Raspberry Creek near the Mouth	273	1.19	195
10CD004	Bougie Creek at km 368	332	2.67	360
10CD005	Adsett Creek at km 386	109	0.861	353
10CD006	Prophet River above Cheves Creek	7,320	74.6	456