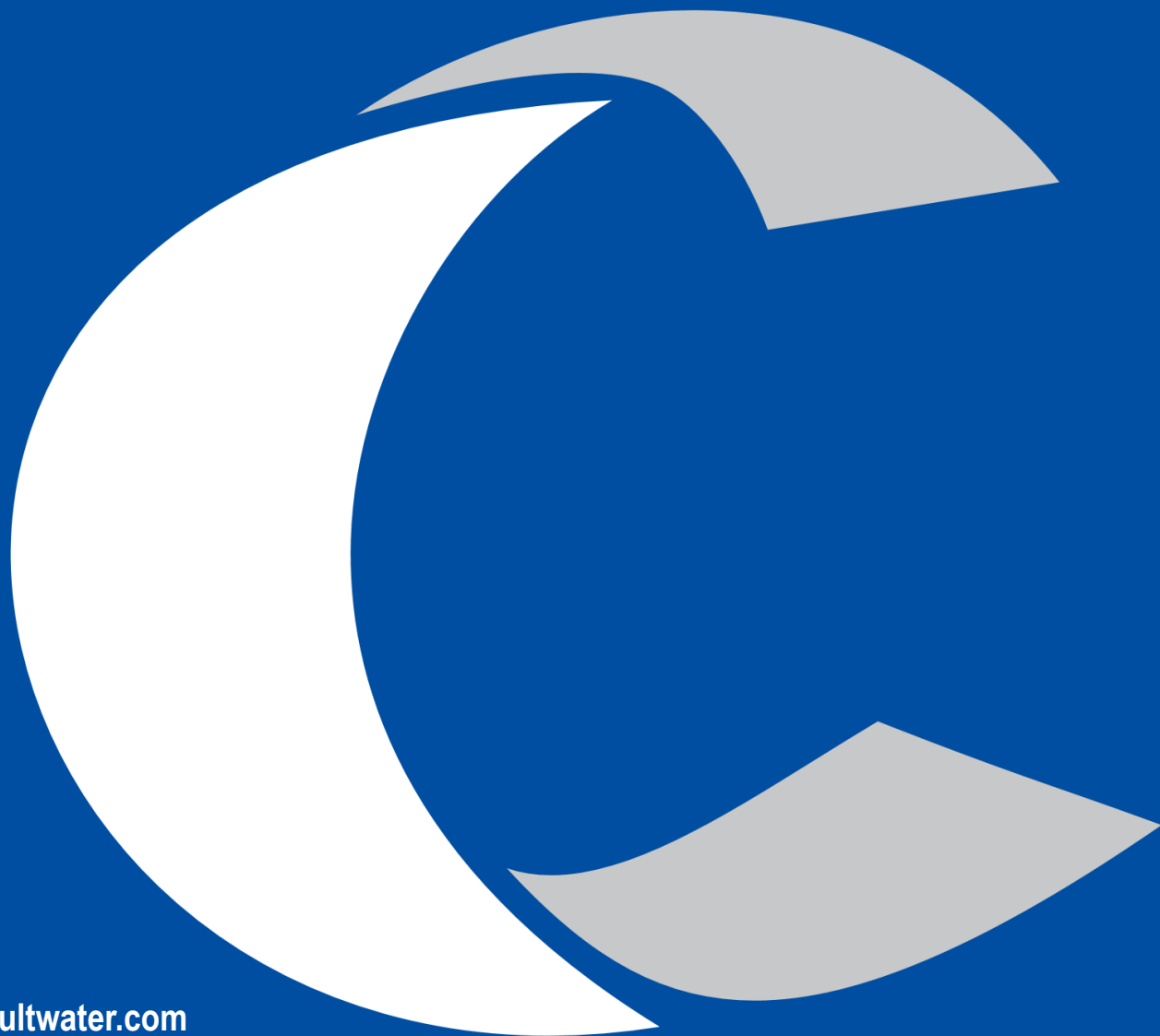


Catapult Water Intelligence

Disposal Across the Montney Duvernay

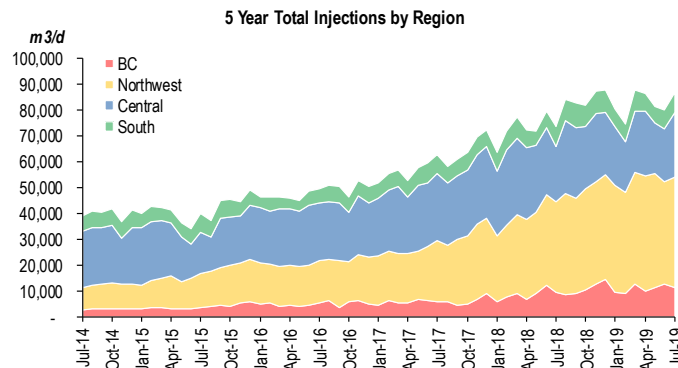




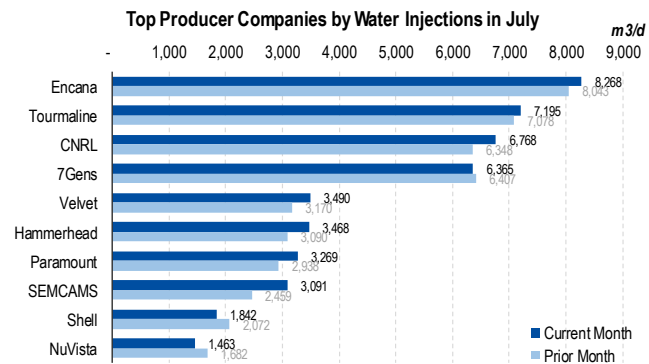
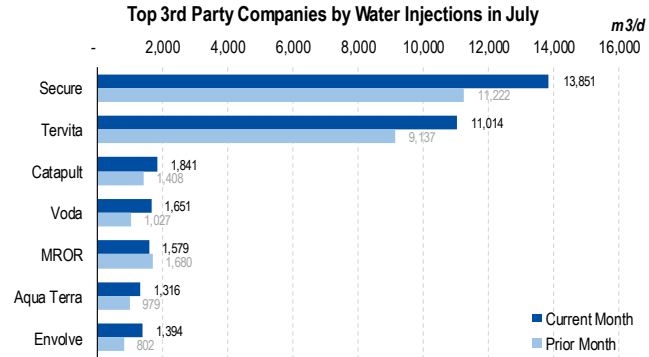
Disposal Across the Montney Duvernay

Injection Report August 2019

Updated with data from July

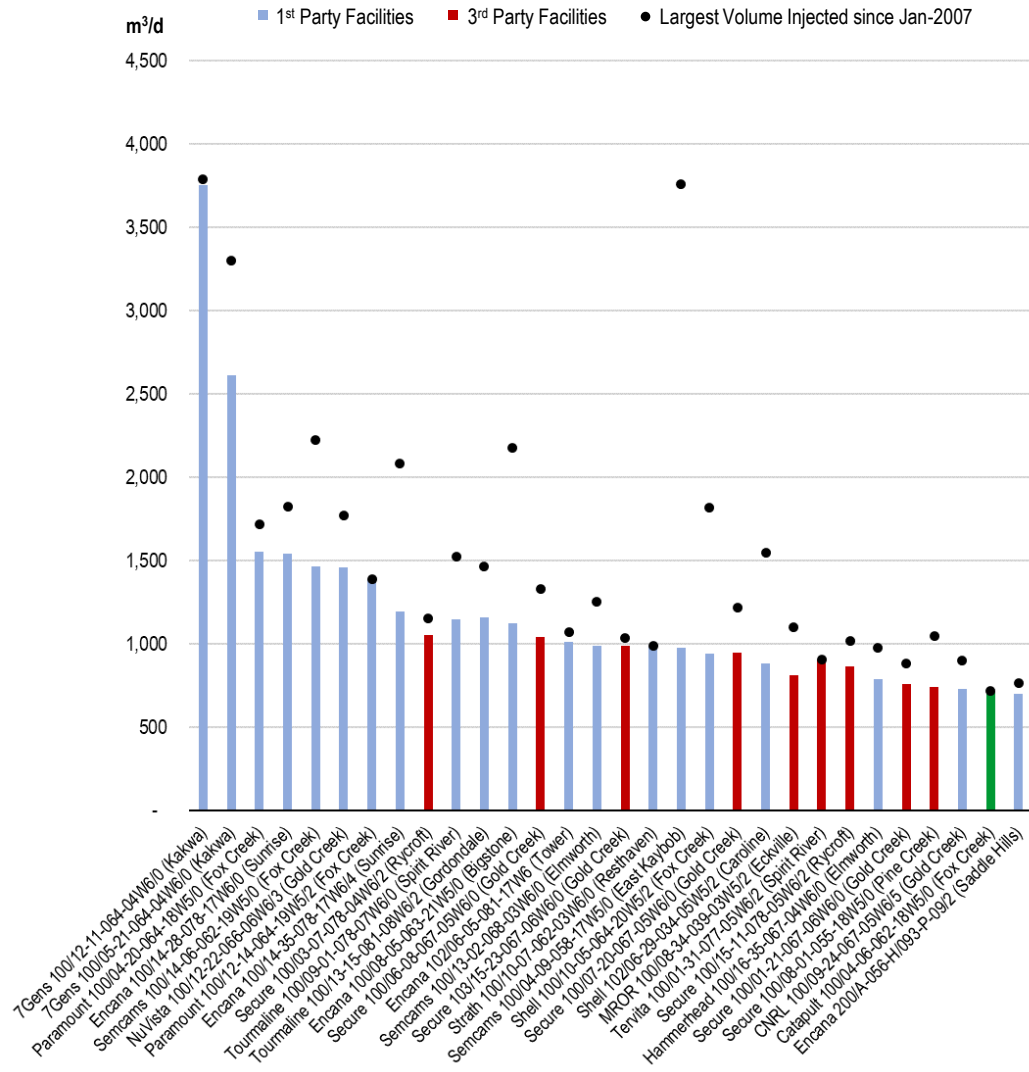


July injections rose 7,002 m³/d (8.7%) from prior month with the largest gains coming from the South Grand Prairie and Fox Creek regions. Kakwa operators were negatively affected by the down time at Pembina Kakwa River gas plant, with gas processed at the facility dropping from 95 mmcf/d down to 22 mmcf/d, and associated water dropping from 26,916 m³/d to 9,435 m³/d, relative to prior month. 7Gens redirected approximately 560 m³/d normally destined for the Pembina plant to its 3-21 battery for trucking out to third parties due to the outage. Secure was the biggest winner of the Pembina outage with Big Mountain recording an increase from prior month of almost the same amount, bringing volume at the facility to 2,602 m³/d, levels not seen since July of last year. With work carried out in June on its 12-18 well complete Envolve was able to return to its usual level of activity of approximately 1,400 m³/d. Fox saw the largest jump out of the four regions due to increased activity at Semcams KA gas plant, Encana 15-31 gas plant, and Secure Kaybob. Drayton and Rimbey combined saw a slight increase from last month and the BC market has slightly softened, although the LNG expectations continue to boost long term projections for the Tower area.

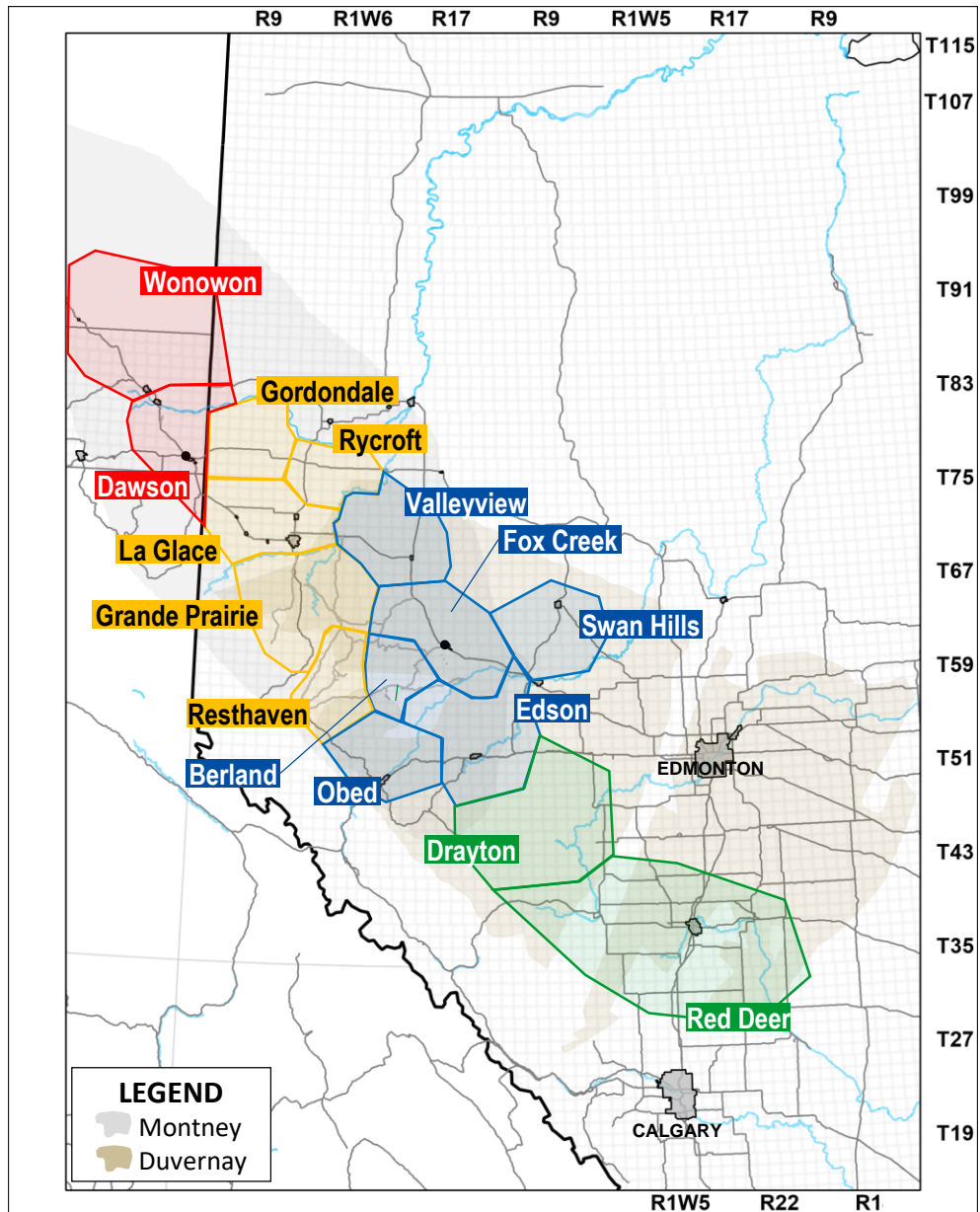


Injections rose across the board relative to prior month and Catapult has regained the #3 spot for 3rd party water injections. Semcams injected the most volume on record for the company in the month of July with 3,091 m³/d driven largely by volume at KA (which increased 434 m³/d, or 26%, from prior month with its 6-6 well coming back online). Hammerhead continues to post all-time highs totalling 3,468 m³/d with increases at both Patterson Creek GP and GGS 9-3. With well work complete Voda Rycroft returns to levels not seen since January with 745 m³/d. Both Voda and Secure have been benefiting at Rycroft from the South Grande Prairie overflow, Secure jumping almost 1000 m³/d. Disposal volume at Paramount 8-9 gas plant near Fox Creek continues its upward trajectory with 1,387 m³/d, a jump from the previous all-time-high last month of 807 m³/d. Further to the south near Edson, Secure Eccles has been shut-in due to issues with the well.

Top 20 Disposal Wells Across the Montney Duvernay for July



Volume for all active wells tracked in this report go back to January 2007. 1st Party wells make up the majority of the top performing disposal wells across the Montney-Duvernay. 7Gens tops the list with both two active Winterburn wells injecting a combined 6,365 m³/d, each well surpassing volume by a single well on record in any of the regions (with the exception of Semcans 4-9 which injected a record of 3,758 m³/d in June 2007). Other fields dominating the list include Encana’s Tower Lake/Sunrise and Tourmaline’s Spirit River/Gordondale. An important note to distinguish: 3rd party operators have been more effective at keeping their monthly volume closer to their peaks, with half of 1st party facilities dropping more than 25% off their peaks reflecting the decline in production and producers moving to new fields and building new disposal facilities required to service it. This is further evidence that 3rd Party operators fully utilize disposal assets due to individual facility economics compared to 1st Parties who tie the disposal assets to field development economics.

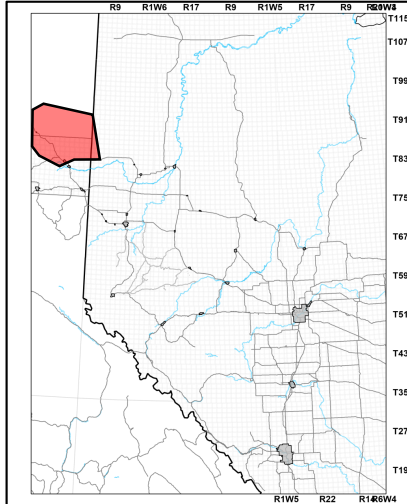
**METHODOLOGY:**

Areas were divided into four main regions: BC (RED), West (GOLD), Central (BLUE), and South (GREEN). Each region was further subdivided into areas taking into account market, facility location, and road access. The disposal wells included in this analysis were primarily selected based on the producing formation being the Montney/Duvernay but do include other sources (Spirit River, Charlie Lake, etc) that have a material effect on market dynamics for water handling. For the most part, wells that are considered part of an Enhanced Oil Recovery scheme are excluded from this analysis, with the exception of those that are disposing fluid produced from a separate formation.

DEFINITIONS:

'1st Party' volume refers to injections by facilities owned and operated by the producers themselves, whereas '3rd Party' refers to volume from facilities owned and operated by independent disposal/waste companies. 'Facilities' listed in the following charts are either batteries or waste plants that may be tied to more than one disposal well.

WONOWON



Top 5 Wonowon Facilities by Monthly Volume

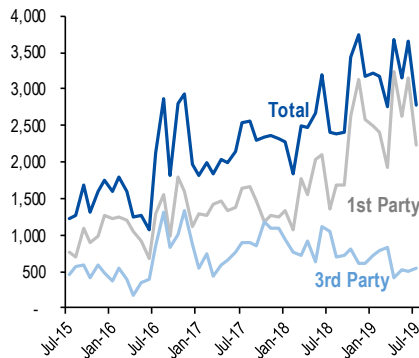
Name	Company	Volume (m3)
Whitecap Boundary Lake (8-2) Disp	Whitecap	21,764
Tervita Mile 103	Tervita	14,479
Kelt LNG C-093-I/094-A-12	Kelt	12,474
Progress A-032-K/094-G-02	Progress	12,285
CNRL Birch C-018-I/094-A-13 Disp	CNRL	12,040

Top 5 Wonowon Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
202/D-096-K/094-A-12/0	Upper Debolt	Tervita	14,479
200/C-093-I/094-A-12/4	Debolt	Kelt	12,474
200/C-032-K/094-G-02	Debolt	Progress	12,285
100/02-29-084-13W6/2	Cadomin	Whitecap	11,330
200/A-085-H/094-A-13/0	Bluesky	CNRL	11,241

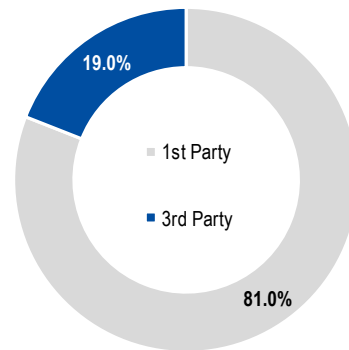
1st Party/3rd Party Injections over last Four Years

Monthly Injections in m3/d



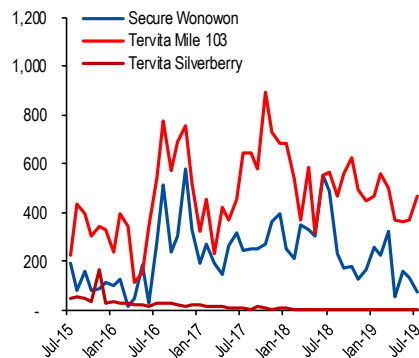
First Party vs Third Party

Rolling Three Month Average



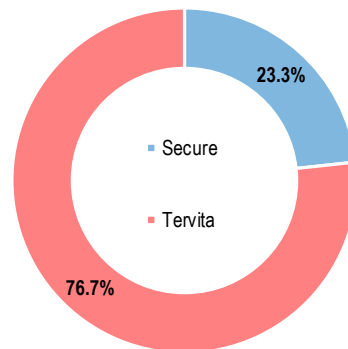
3rd Party Facility Injections over last Four Years

Monthly injections in m3/d

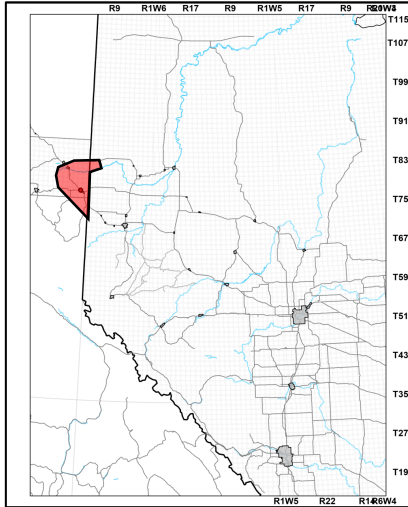


Market Share by Company

Rolling Three Month Average



DAWSON



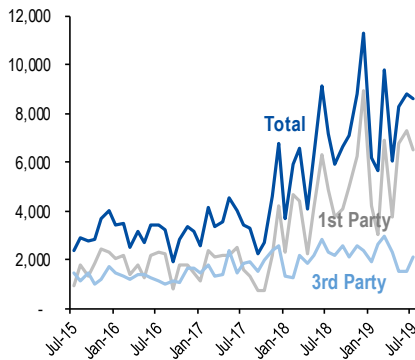
Top 5 Dawson Facilities by Monthly Volume

Name	Company	Volume (m3)
ECA Sunrise (01-27) Disp	Encana	47,849
ECA Sunrise (14-35) Disp	Encana	37,008
ECA Tower (16-06) Disp	Encana	31,325
ECA Heritage C-046-H/093-P-09 Disp	Encana	21,788
ECA Tower (05-11) Disp	Encana	19,256

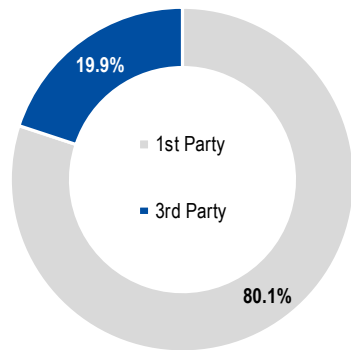
Top 5 Dawson Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
100/14-28-078-17W6/0	Cadotte	Encana	47,849
100/14-35-078-17W6/4	Paddy/Cadotte	Encana	37,008
102/06-05-081-17W6	Cadomin	Encana	31,325
200/A-056-H/093-P-09/2	Baldonnell	Encana	21,788
100/08-11-081-18W6	Cadomin	Encana	19,256

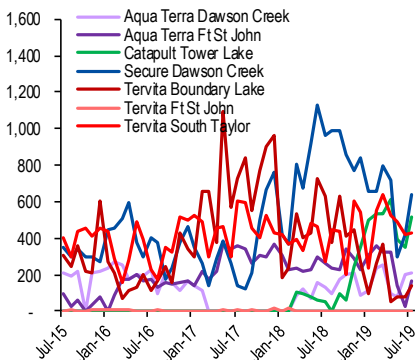
1st Party/3rd Party Injections over last Four Years Monthly Injections in m3/d



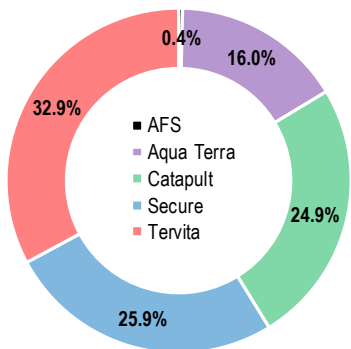
First Party vs Third Party Rolling Three Month Average



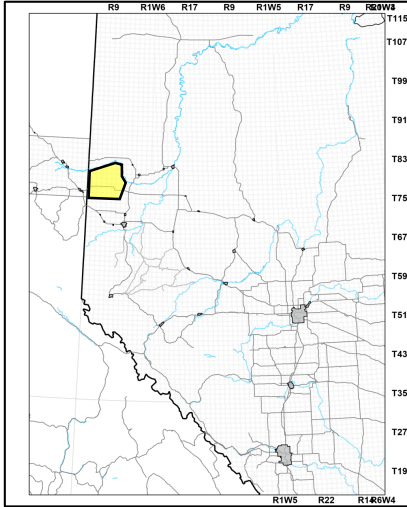
3rd Party Facility Injections over last Four Years Monthly injections in m3/d



Market Share by Company Rolling Three Month Average



GORDONDALE



Top 5 Gordondale Facilities by Monthly Volume

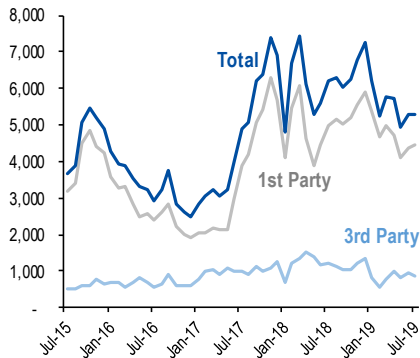
Name	Company	Volume (m3)
Tourmaline 15-13 Disp	Tourmaline	44,647
Tourmaline 12-6 Disp	Tourmaline	40,406
Birchcliff 3-22 Disp	Birchcliff	18,941
Birchcliff 5-27 Disp	Birchcliff	12,038
Kelt 6-19 Disp	Kelt	8,699

Top 5 Gordondale Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
100/13-15-081-08W6/2	Belloy	Tourmaline	36,045
102-12-13-082-09W6/0	Belloy	Tourmaline	24,884
102/07-13-082-09W6/4	Belloy	Tourmaline	19,763
100/11-22-078-12W6/3	Paddy-Cadotte	Birchcliff	12,340
103/07-06-079-11W6/0	Paddy-Cadotte	Birchcliff	12,038

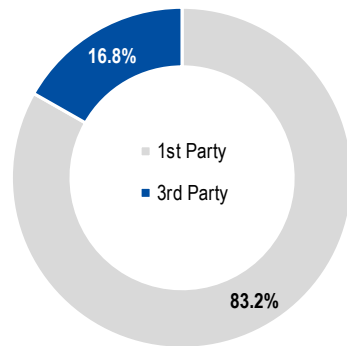
1st Party/3rd Party Injections over last Four Years

Monthly Injections in m3/d



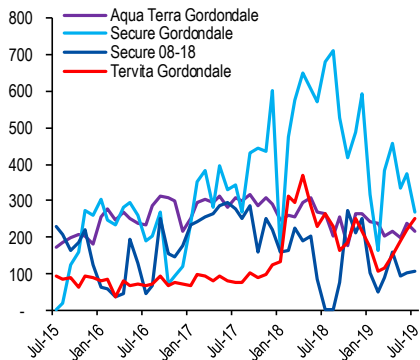
First Party vs Third Party

Rolling Three Month Average



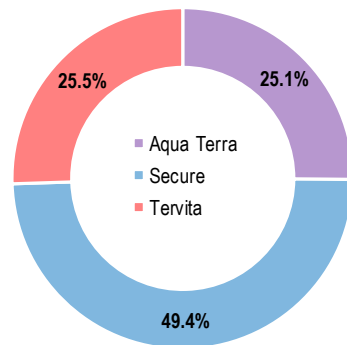
3rd Party Facility Injections over last Four Years

Monthly injections in m3/d

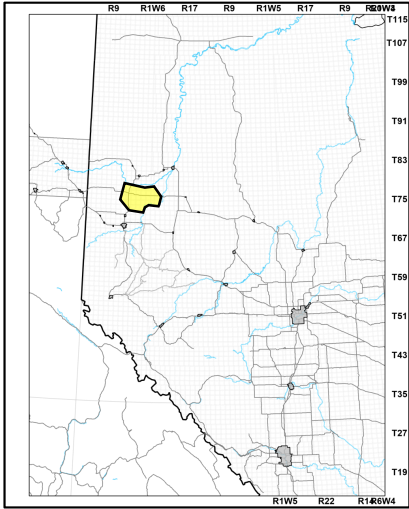


Market Share by Company

Rolling Three Month Average



RYCROFT



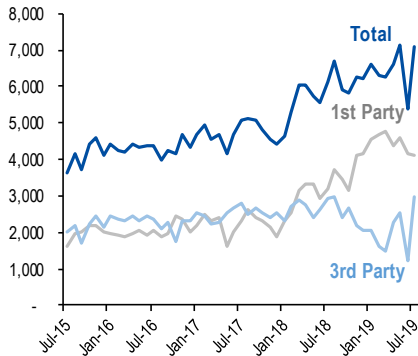
Top 4 Rycroft Facilities by Monthly Volume

Name	Company	Volume (m3)
Tourmaline Spirit River Inj	Tourmaline	127,684
Secure Rycroft	Secure	59,549
Voda Rycroft	Voda	37,646
Tervita Spirit River	Tervita	36,442

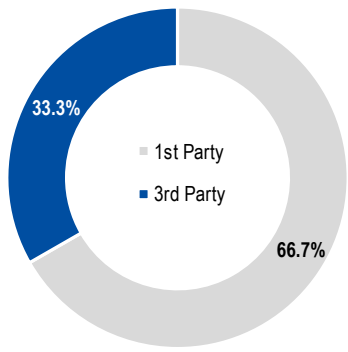
Top 5 Rycroft Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
100/09-01-078-07W6/0	Belloy	Tourmaline	35,664
100/03-07-078-04W6/2	Gething	Secure	32,735
100/01-31-077-05W6/2	Cadomin	Tervita	28,158
100/15-11-078-05W6/2	Gething	Secure	26,814
102/06-04-077-07W6/2	Belloy	Tourmaline	17,274

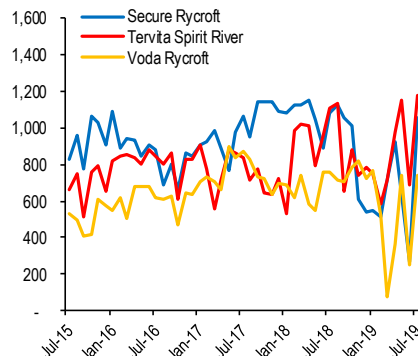
1st Party/3rd Party Injections over last Four Years
Monthly Injections in m3/d



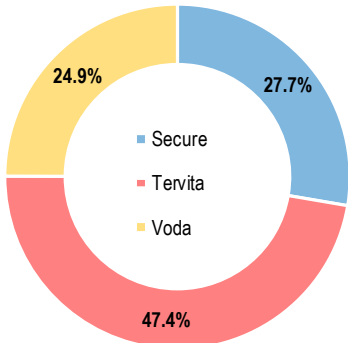
First Party vs Third Party
Rolling Three Month Average



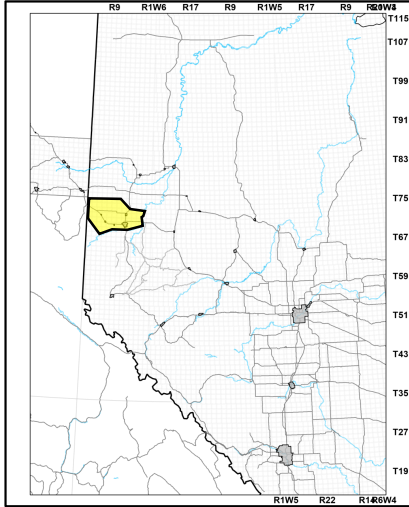
3rd Party Facility Injections over last Four Years
Monthly injections in m3/d



Market Share by Company
Rolling Three Month Average



LA GLACE



Top 5 La Glace Facilities by Monthly Volume

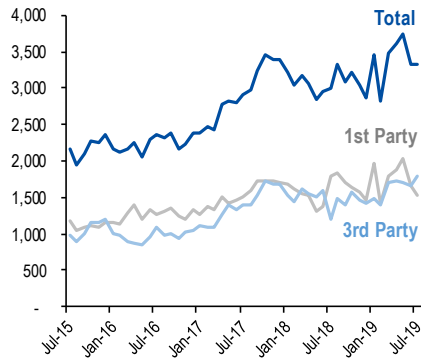
Name	Company	Volume (m3)
Tervita La Glace	Tervita	40,802
CNRL 14-34 Disp	CNRL	12,185
Encana Saddle Hills GP	Encana	10,720
Advantage Glacier GP	Advantage	10,608
Secure Emerson	Secure	7,200

Top 5 La Glace Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
100/13-36-072-09W6/0	Paddy	Tervita	16,301
100/08-09-072-08W6/0	Paddy	Tervita	12,938
100/13-36-072-09W6/0	Paddy	Tervita	11,563
100/06-17-075-07W6/2	Montney	Encana	10,720
100/04-34-075-12W6/0	Baldonnel	Advantage	10,608

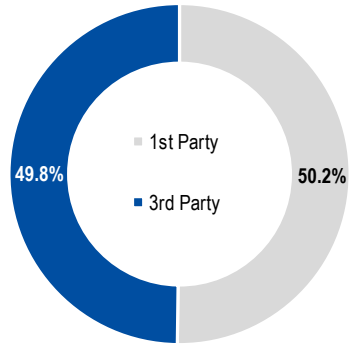
1st Party/3rd Party Injections over last Four Years

Monthly Injections in m3/d



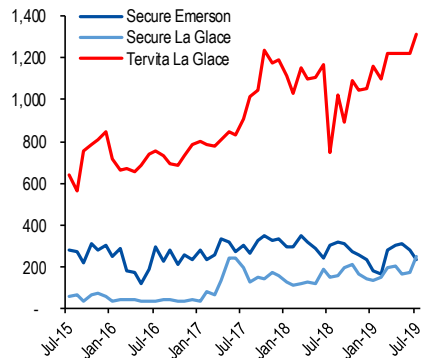
First Party vs Third Party

Rolling Three Month Average



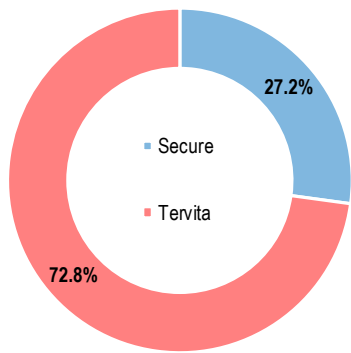
3rd Party Facility Injections over last Four Years

Monthly injections in m3/d

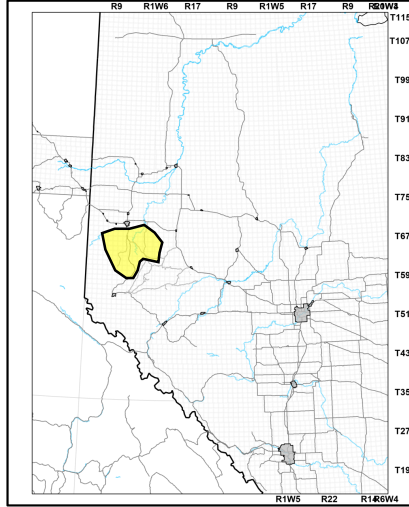


Market Share by Company

Rolling Three Month Average



GOLD CREEK



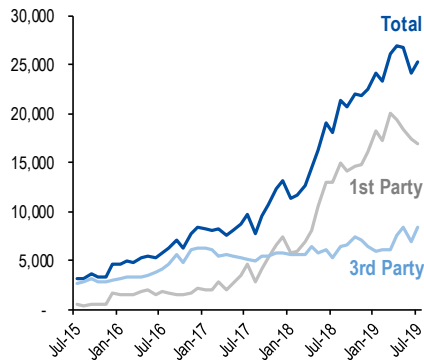
Top 5 Gold Creek Facilities by Monthly Volume

Name	Company	Volume (m3)
7Gens 9-10 Disp (Karr)	7Gens	116,366
Hammerhead GGS (9-3)	Hammerhead	82,436
7Gens 16-17 Disp (Karr)	7Gens	80,935
Secure Big Mountain Creek	Secure	80,673
Envolve Gold Creek	Envolve	59,497

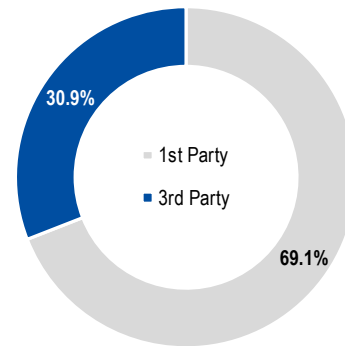
Top 5 Gold Creek Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
100/12-11-064-04W6/0	Winterburn	7Gens	116,366
100/05-21-064-04W6/0	Winterburn	7Gens	80,935
100/12-22-066-06W6/3	Leduc	NuVista	45,346
100/06-08-067-05W6/0	Leduc	Secure	32,345
100/13-02-068-03W6/0	Belloy	Velvet	30,709

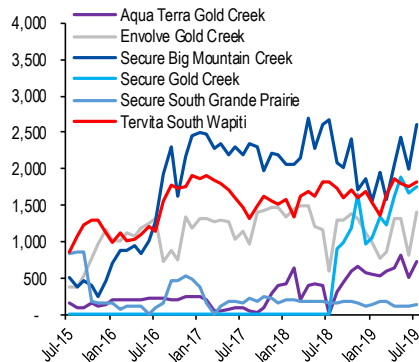
1st Party/3rd Party Injections over last Four Years Monthly Injections in m3/d



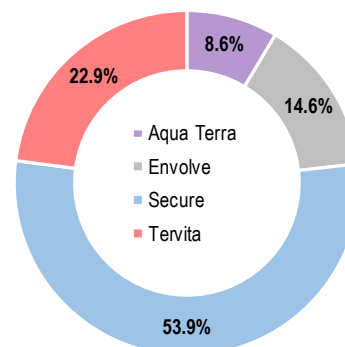
First Party vs Third Party Rolling Three Month Average



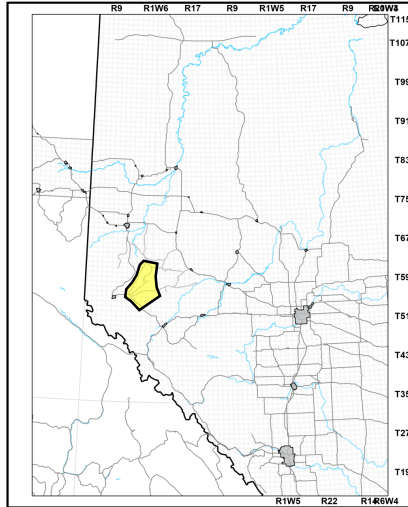
3rd Party Facility Injections over last Four Years Monthly injections in m3/d



Market Share by Company Rolling Three Month Average



RESTHAVEN



Top 4 Resthaven Facilities by Monthly Volume

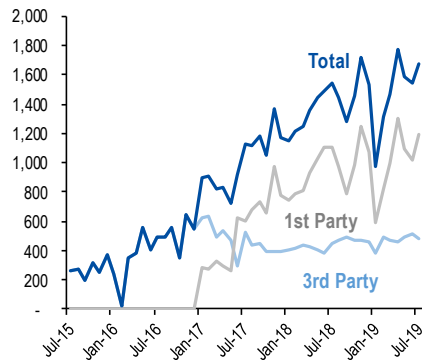
Name	Company	Volume (m3)
Strath Jayar 06-08-062-03W6	Strath	30,632
Voda Grande Cache	Voda	14,830
XTO Resthaven 2-10-060-01W6	XTO	3,789
Cequence 100/02-21-061-26W5/2	Cequence	1,556
Cequence 100/04-23-061-27W5/0	Cequence	1,008

Top 4 Resthaven Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
100/10-07-062-03W6/0	Leduc	Strath	30,632
100/11-26-057-06W6/2	Doig/Montney	Voda	13,925
100/11-03-060-01W6/0	Belloy	XTO	3,789
100/02-21-061-26W5/2	Cadotte	Cequence	1,556
100/04-23-061-27W5/2	Paddy Cadotte	Cequence	1,008

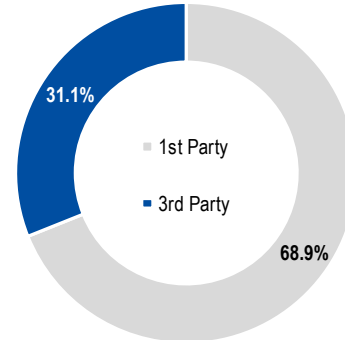
1st Party/3rd Party Injections over last Four Years

Monthly Injections in m3/d



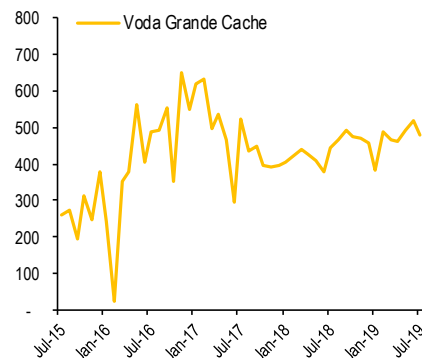
First Party vs Third Party

Rolling Three Month Average



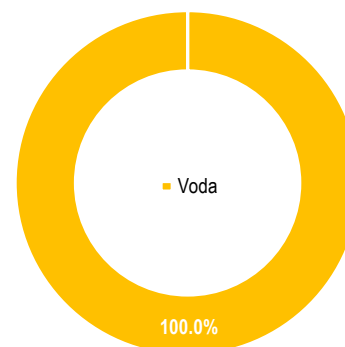
3rd Party Facility Injections over last Four Years

Monthly injections in m3/d

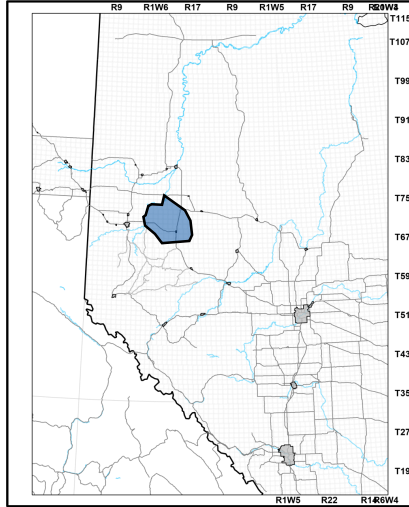


Market Share by Company

Rolling Three Month Average



VALLEYVIEW



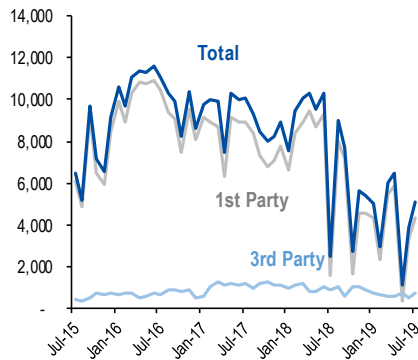
Top 5 Valleyview Facilities by Monthly Volume

Name	Company	Volume (m3)
CNRL Sturgeon 9-26 Disp	CNRL	43,024
CNRL Sturgeon 12-5 Disp	CNRL	31,953
CNRL Sturgeon 11-2 Disp	CNRL	31,021
CNRL Sturgeon 7-31 Disp	CNRL	27,533
Tervita Valleyview	Tervita	18,537

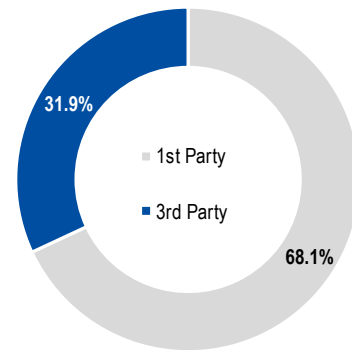
Top 5 Valleyview Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
100/04-05-069-21W5/0	Leduc	CNRL	21,036
100/01-02-069-22W5/2	Leduc	CNRL	18,279
100/05-32-068-21W5/0	Leduc	CNRL	14,534
100/07-10-069-22W5/0	Leduc	CNRL	13,566
100/14-30-068-21W5/0	Leduc	CNRL	12,999

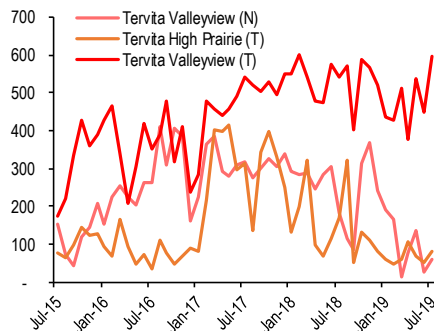
1st Party/3rd Party Injections over last Four Years Monthly Injections in m3/d



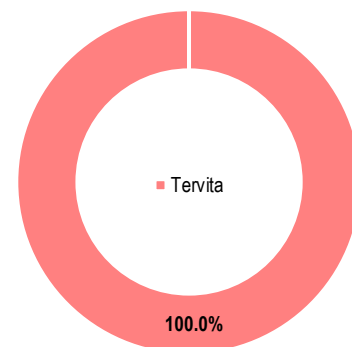
First Party vs Third Party Rolling Three Month Average



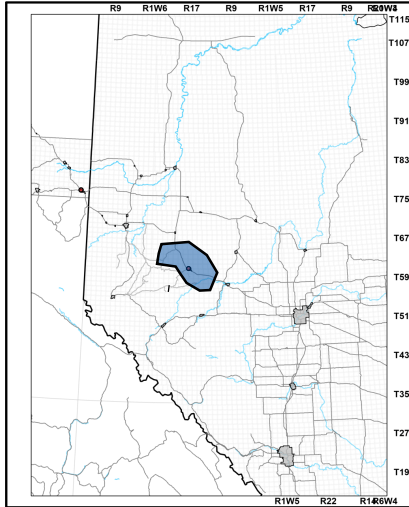
3rd Party Facility Injections over last Four Years Monthly injections in m3/d



Market Share by Company Rolling Three Month Average



FOX CREEK



Top 5 Fox Creek Facilities by Monthly Volume

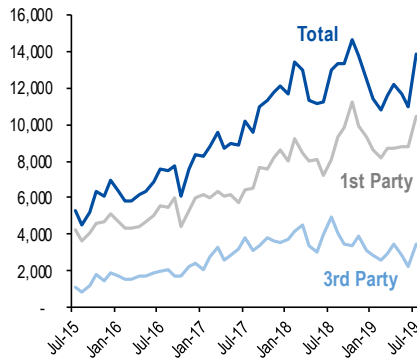
Name	Company	Volume (m3)
SEMCAMS KA	Semcams	64,918
Paramount 16-7 Injection	Paramount	48,162
Paramount 8-9 Gas Plant	Paramount	43,002
SEMCAMS K3	Semcams	30,325
Shell 5-33 Dehy	Shell	29,270

Top 5 Fox Creek Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
100/04-20-064-18W5/0	Debolt	Paramount	48,162
100/14-06-062-19W5/0	Swan Hills	Semcams	45,440
100/12-14-064-19W5/2	Swan Hills	Paramount	43,002
100/04-09-058-17W5/0	Leduc	Semcams	30,325
100/10-05-064-20W5/2	Debolt	Shell	29,270

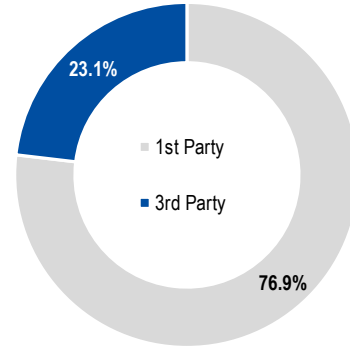
1st Party/3rd Party Injections over last Four Years

Monthly Injections in m3/d



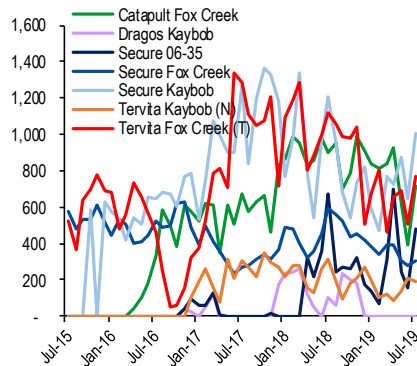
First Party vs Third Party

Rolling Three Month Average



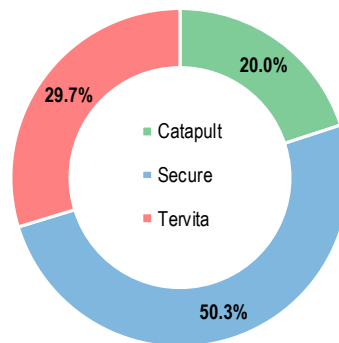
3rd Party Facility Injections over last Four Years

Monthly injections in m3/d

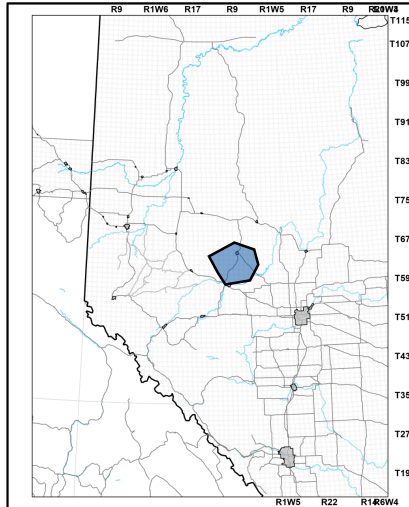


Market Share by Company

Rolling Three Month Average



SWAN HILLS



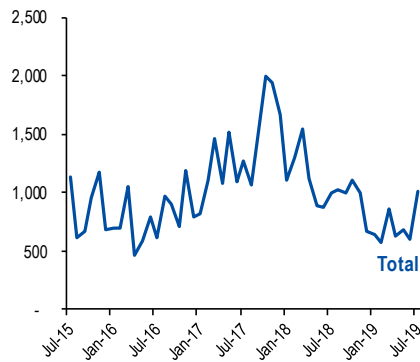
Top 5 Swan Hills Facilities by Monthly Volume

Name	Company	Volume (m3)
Tervita Greencourt (N)	Tervita	14,754
Tervita Swan Hills	Tervita	5,193
Tervita Judy Creek	Tervita	5,027
Secure Judy Creek	Secure	3,004
Voda Mayerthorpe	Voda	3,219

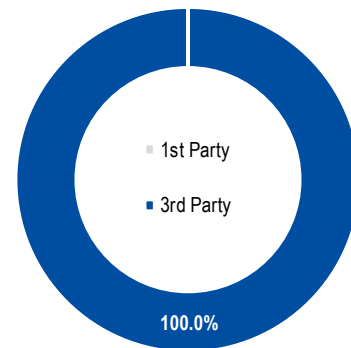
Top 5 Swan Hills Wells

LSD	Formation	Company	Volume (m3)
102/06-31-058-09W5/0	Pekisko	Tervita	14,754
102/06-30-063-10W5/0	Swan Hills	Tervita	5,193
100/02-06-063-11W5/2	Nisku	Tervita	4,012
100/16-31-056-08W5/0	Pekisko	Voda	3,219
100/06-29-063-09W5/2	Wabamun	Secure	2,072

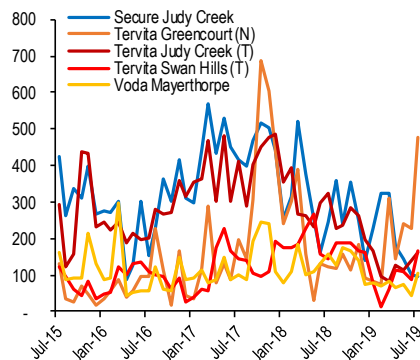
1st Party/3rd Party Injections over last Four Years
Monthly Injections in m3/d



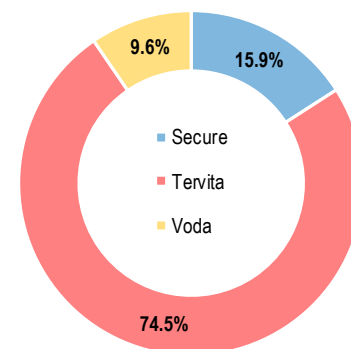
First Party vs Third Party
Rolling Three Month Average



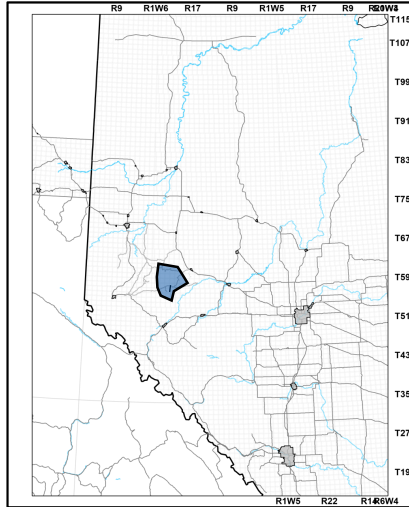
3rd Party Facility Injections over last Four Years
Monthly injections in m3/d



Market Share by Company
Rolling Three Month Average



BERLAND



Top 5 Berland Facilities by Monthly Volume

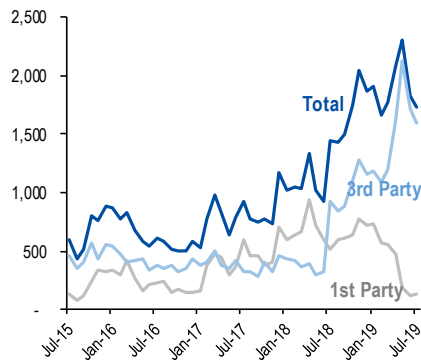
Name	Company	Volume (m3)
Secure Tony Creek	Secure	19,532
Catapult Berland	Catapult	18,734
Secure Wild River	Secure	11,239
CNRL Wild River (4-3 Plant)	CNRL	2,342
Delphi 16-34	Delphi	1,299

Top 5 Berland Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
100/06-21-062-22W5/0	Blueridge	Secure	19,532
100/01-19-059-23W5/0	Leduc	Catapult	18,734
100/06-09-057-22W5/0	Nisku	Secure	11,239
100/12-29-056-22W5/0	Montney	CNRL	2,342
100/16-34-059-21W5/0	Leduc	Delphi	1,299

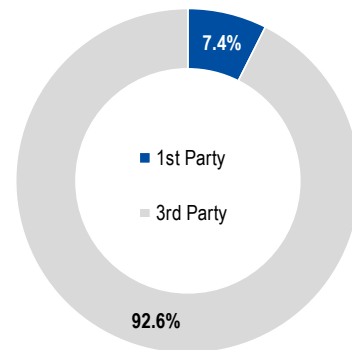
1st Party/3rd Party Injections over last Four Years

Monthly Injections in m3/d



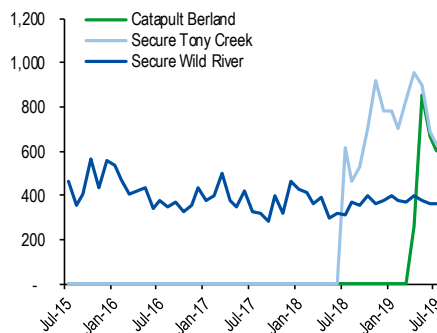
First Party vs Third Party

Rolling Three Month Average



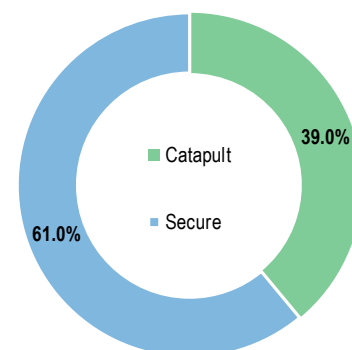
3rd Party Facility Injections over last Four Years

Monthly injections in m3/d

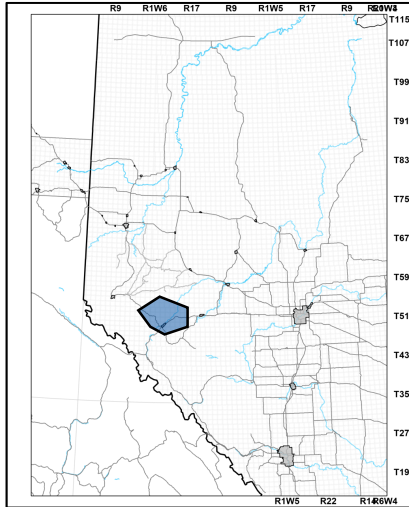


Market Share by Company

Rolling Three Month Average



OBED



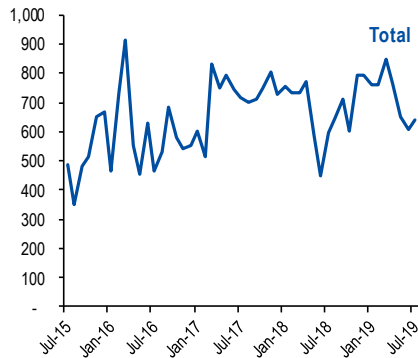
Top 2 Obed Facilities by Monthly Volume

Name	Company	Volume (m3)
Secure Obed (Lambert)	Secure	10,419
Secure Obed (Dalehurst)	Secure	9,388

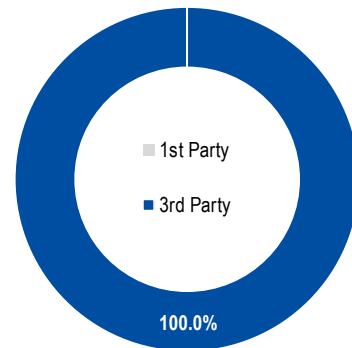
Top 4 Obed Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
100/09-30-052-22W5/2	Leduc	Secure	9,450
100/04-26-052-23W5/3	Leduc	Secure	8,529
100/09-30-052-22W5/2	Leduc	Secure	969
100/04-26-052-23W5/3	Leduc	Secure	859

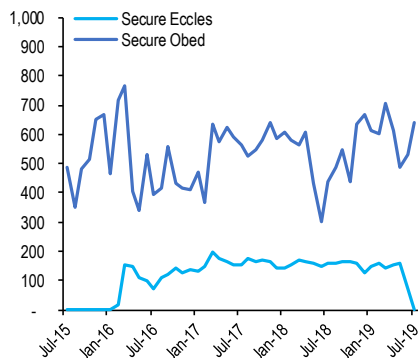
1st Party/3rd Party Injections over last Four Years
Monthly Injections in m3/d



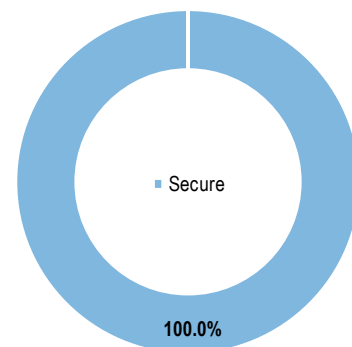
First Party vs Third Party
Rolling Three Month Average



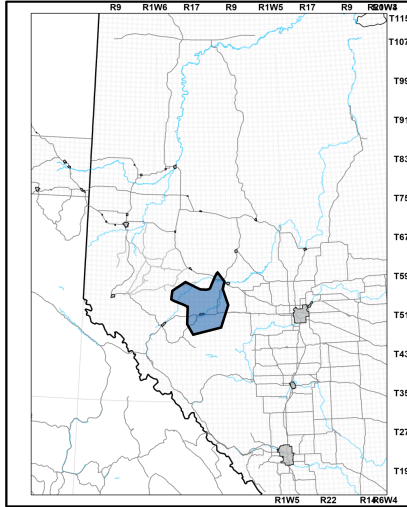
3rd Party Facility Injections over last Four Years
Monthly injections in m3/d



Market Share by Company
Rolling Three Month Average



EDSON



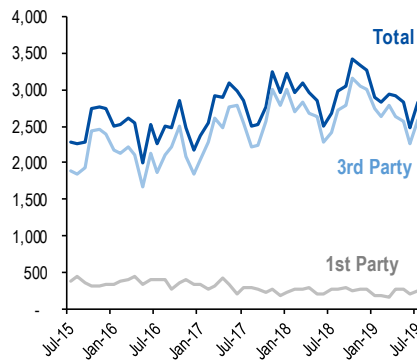
Top 5 Edson Facilities by Monthly Volume

Name	Company	Volume (m3)
Secure Pine Creek	Secure	22,965
Tervita West Edson	Tervita	17,278
Secure Nosehill	Secure	16,921
Tervita Moose Creek	Tervita	14,813
Tervita Niton Junction (N)	Tervita	8,143

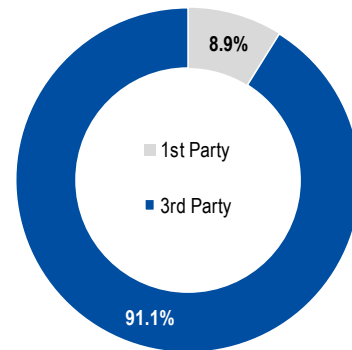
Top 5 Edson Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
100/08-01-055-18W5/0	Leduc	Secure	22,965
100/09-31-055-20W5/2	Leduc	Secure	16,921
100/15-16-053-19W5/0	Elkton	Tervita	13,547
100/06-13-052-16W5/2	Swan Hills	Tervita	9,498
100/11-19-054-17W5/0	Leduc	Repsol	7,285

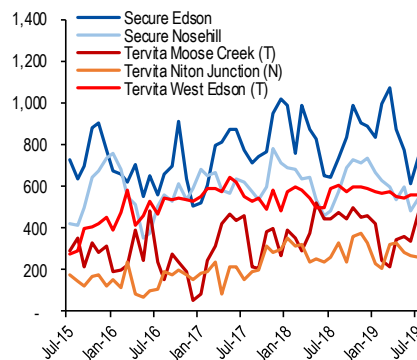
1st Party/3rd Party Injections over last Four Years Monthly Injections in m3/d



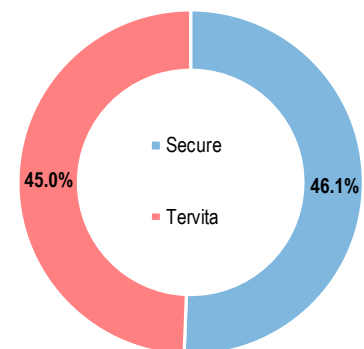
First Party vs Third Party Rolling Three Month Average



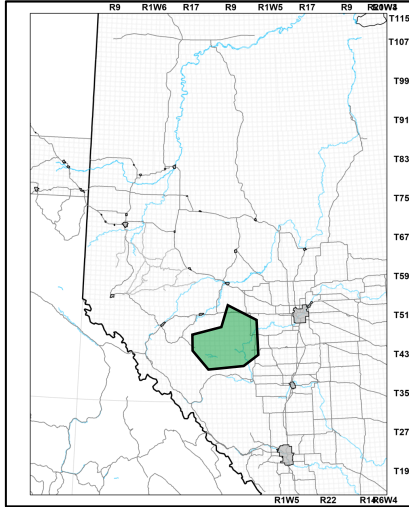
3rd Party Facility Injections over last Four Years Monthly injections in m3/d



Market Share by Company Rolling Three Month Average



DRAYTON



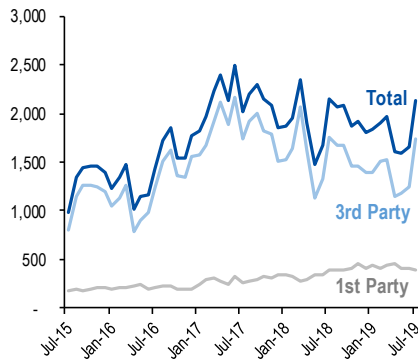
Top 5 Drayton Facilities by Monthly Volume

Name	Company	Volume (m3)
Secure Brazeau	Secure	28,965
Secure Drayton	Secure	14,502
Voda Cynthia	Voda	10,039
Tervita Drayton (N)	Tervita	7,446
Tervita Brazeau	Tervita	7,384

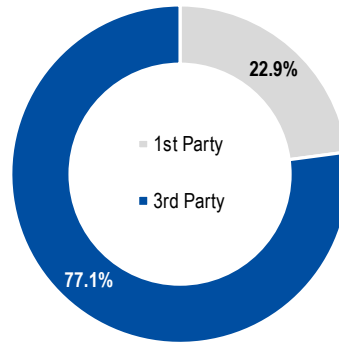
Top 5 Drayton Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
100/09-26-047-11W5/2	Nisku	Secure	16,966
104/12-32-048-06W5/0	Nordegg	Secure	11,363
104/06-02-049-10W5/0	Nisku	Voda	10,039
1W0/13-08-047-10W5/4	Nisku	Secure	8,330
100/10-13-047-11W5/2	Nisku	Tervita	6,219

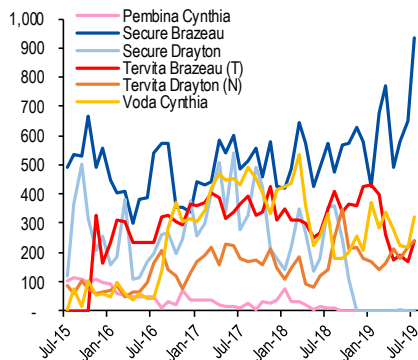
1st Party/3rd Party Injections over last Four Years Monthly Injections in m3/d



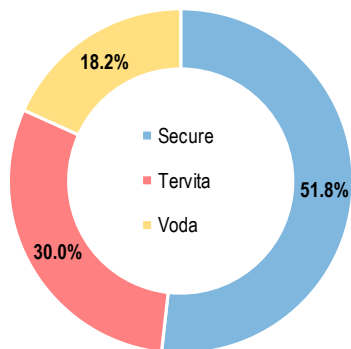
First Party vs Third Party Rolling Three Month Average



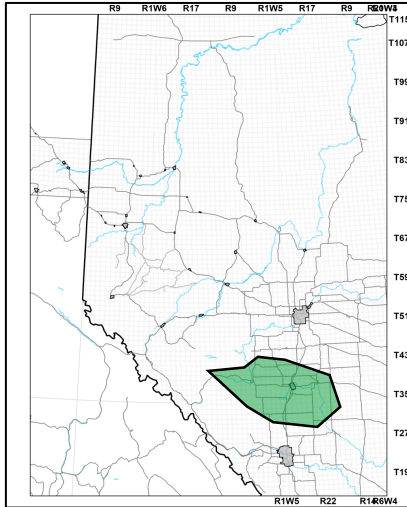
3rd Party Facility Injections over last Four Years Monthly injections in m3/d



Market Share by Company Rolling Three Month Average



RED DEER



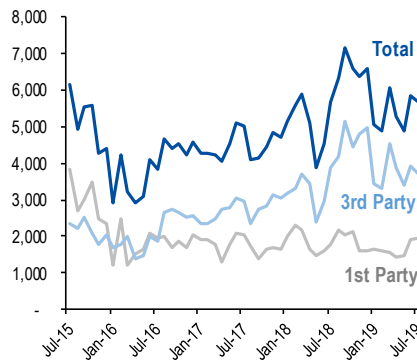
Top 5 Red Deer Facilities by Monthly Volume

Name	Company	Volume (m3)
MROR Eckville	MROR	48,948
Secure Rocky Mountain House	Secure	31,016
Shell Caroline GP (3-30)	Shell	27,765
Tervita Buck Creek	Tervita	16,337
Tervita Eckville (N)	Tervita	15,493

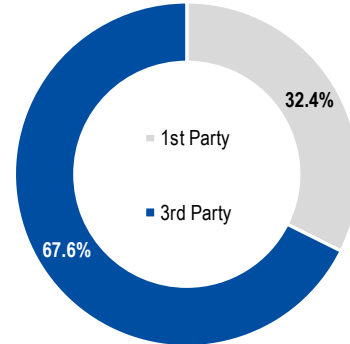
Top 5 Red Deer Wells by Monthly Volume

LSD	Formation	Company	Volume (m3)
102/06-29-034-05W5/2	Leduc	Shell	27,364
100/08-34-039-03W5/2	Leduc	MROR	25,192
102/06-36-046-07W5/2	Nisku	Tervita	16,337
102/10-07-040-08W5/2	Nisku	Secure	16,158
103/04-04-040-08W5/0	Nisku	Secure	14,768

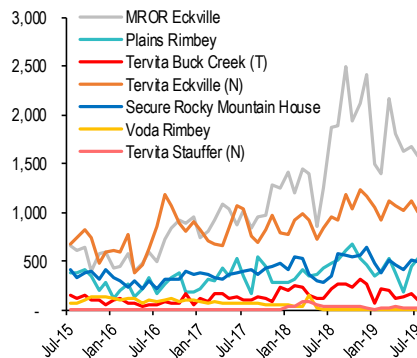
1st Party/3rd Party Injections over last Four Years Monthly Injections in m3/d



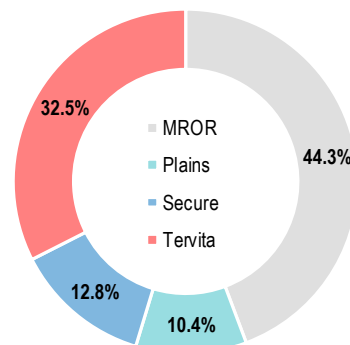
First Party vs Third Party Rolling Three Month Average



3rd Party Facility Injections over last Four Years Monthly injections in m3/d



Market Share by Company Rolling Three Month Average



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