Annual Performance Presentation

In Situ Oil Sands Schemes
9673 / 10147 / 10423 / 10787

April 2016

Premium Value | Defined Growth | Independent

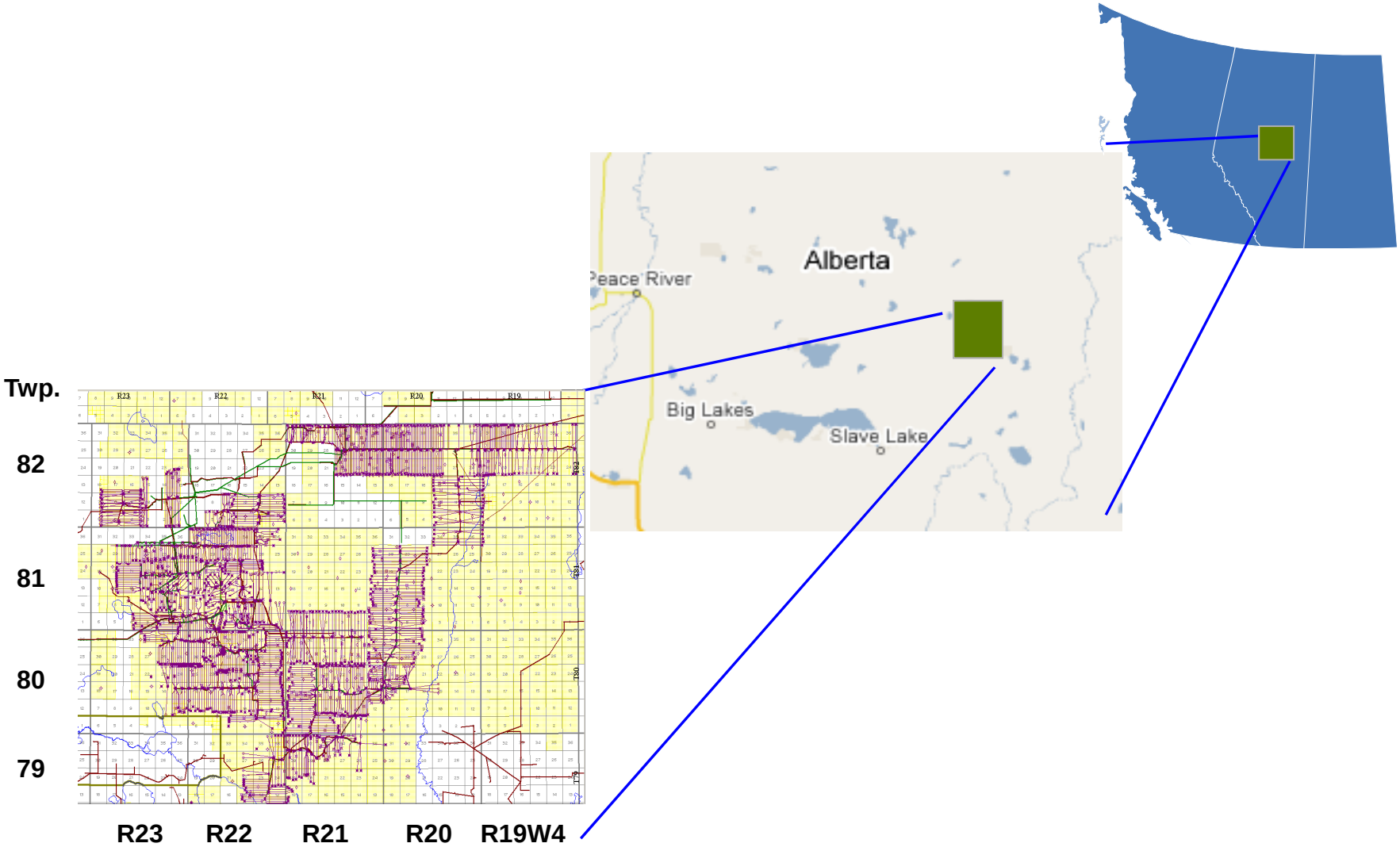
Canadian Natural

Agenda

Canadian Natural

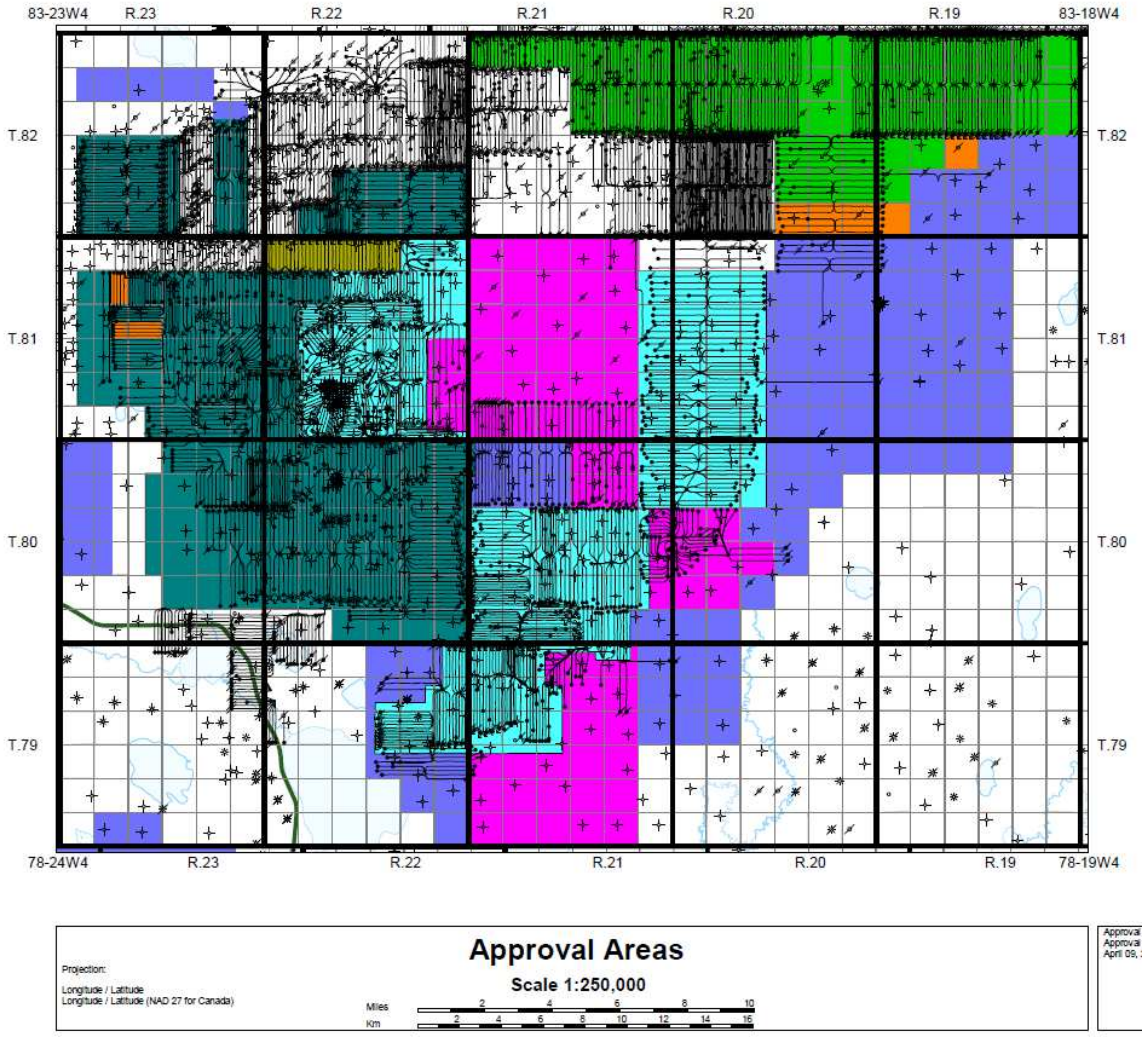
- Current Approvals
- Geological Overview
- Drilling, Completions, and Artificial Lift
- Field Performance and Surveillance
- Cap Rock Integrity & Monitoring
- Future Development Plans
- Facilities
- Measuring & Reporting
- Facility Future Plans
- Water Use, Conservation & Disposal
- AER Compliance
- Conclusions

Brintnell Location



Oil Sands Royalties (OSR 101, OSR 006)

Primary and Enhanced Approval Regions



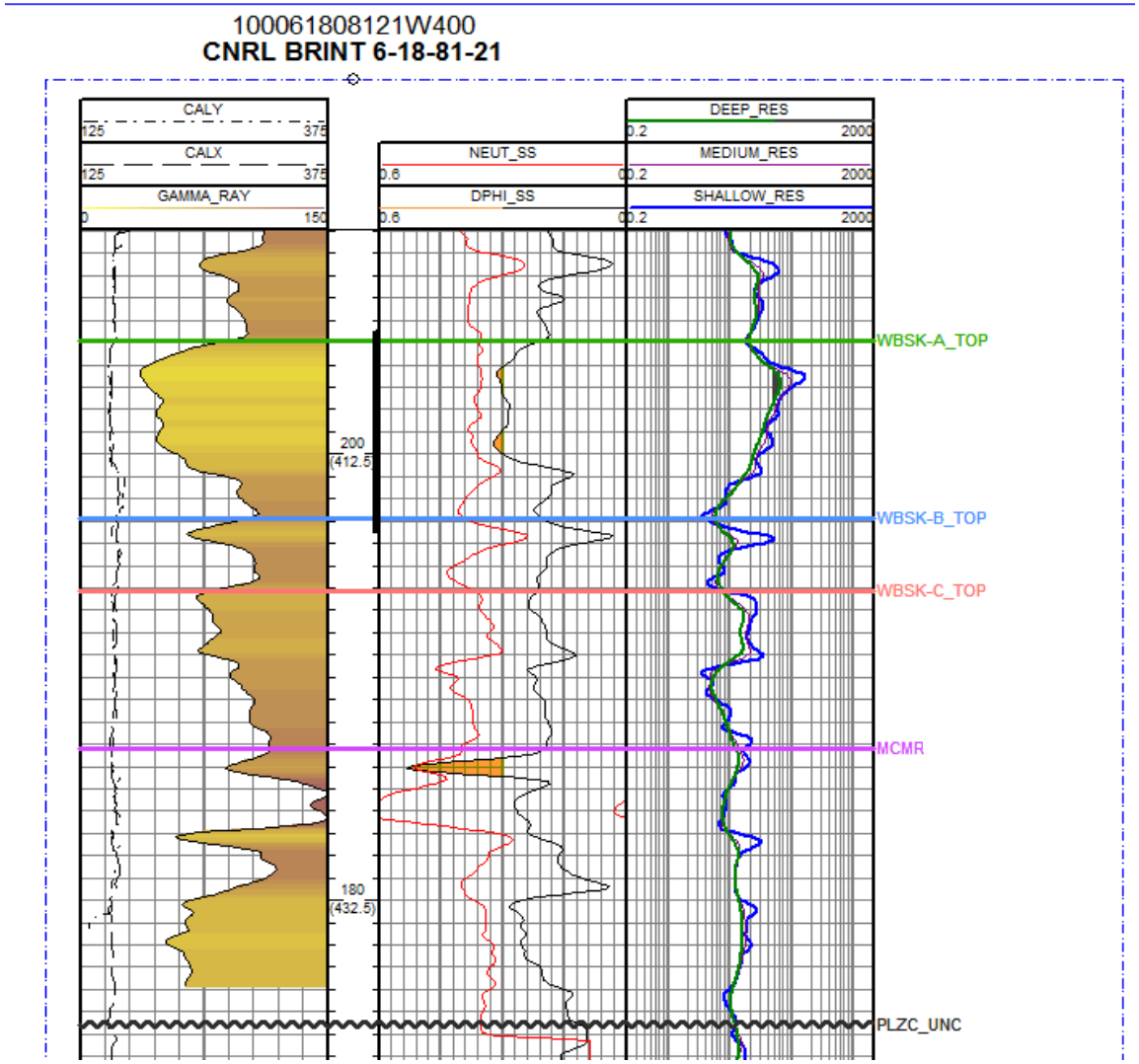
Enhanced Recovery Schemes

- 10147
- 9673
- 10787
- 10423

Primary Recovery Schemes

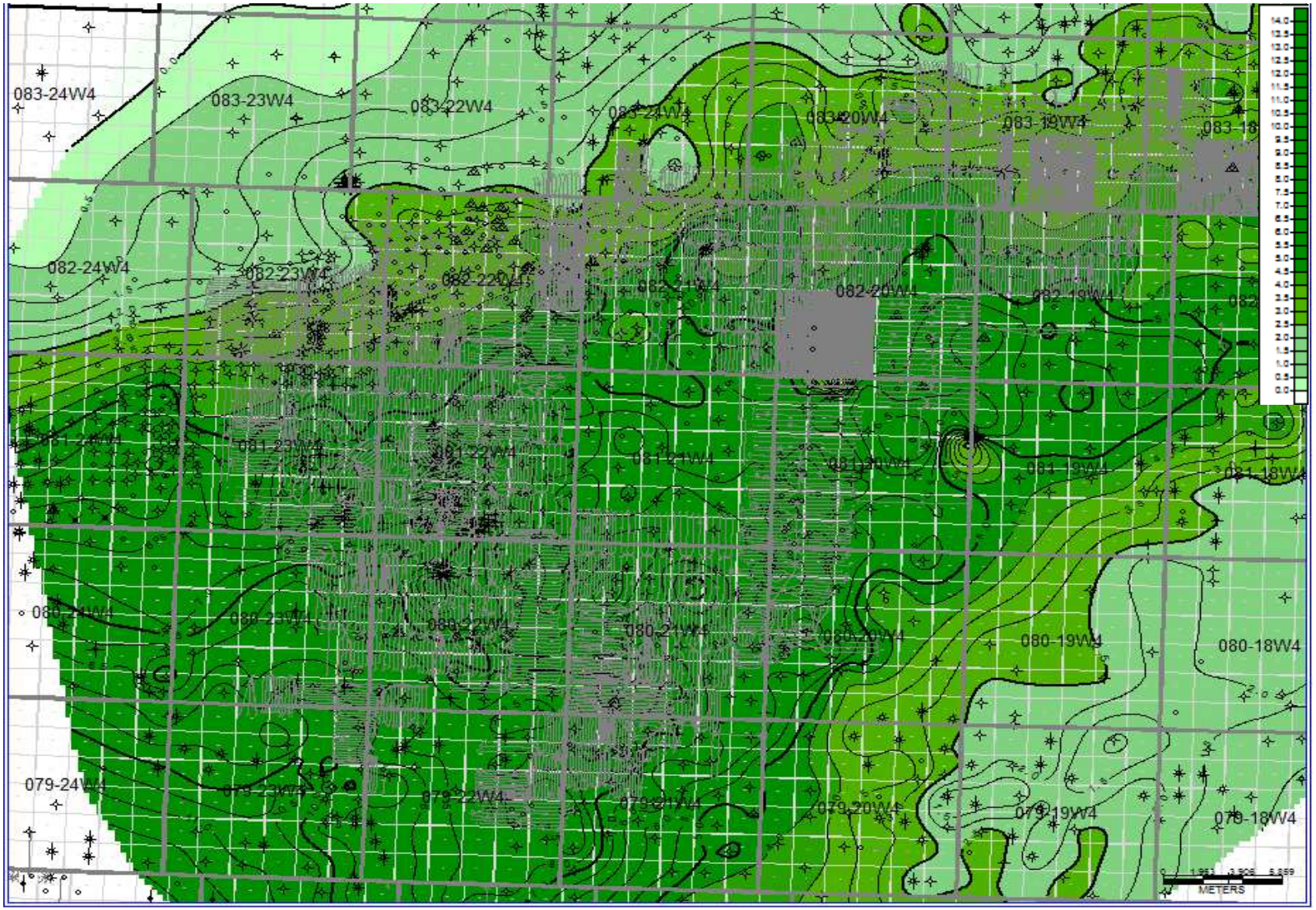
- 6619
- 9466
- 9884

CNRL Brint 6-14-81-21 W4M Type Log



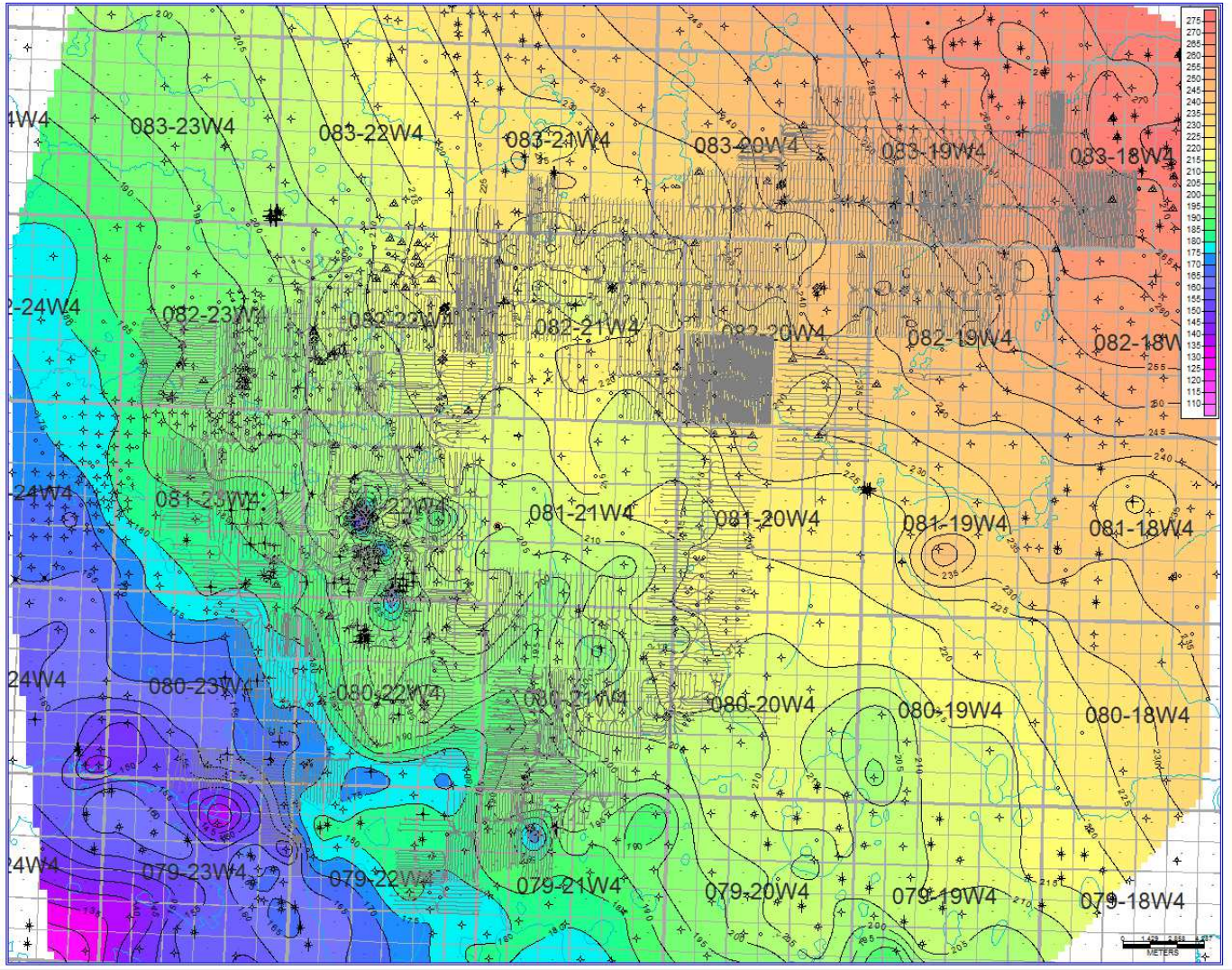
Wabiskaw ‘A’ Net Pay Map

Canadian Natural

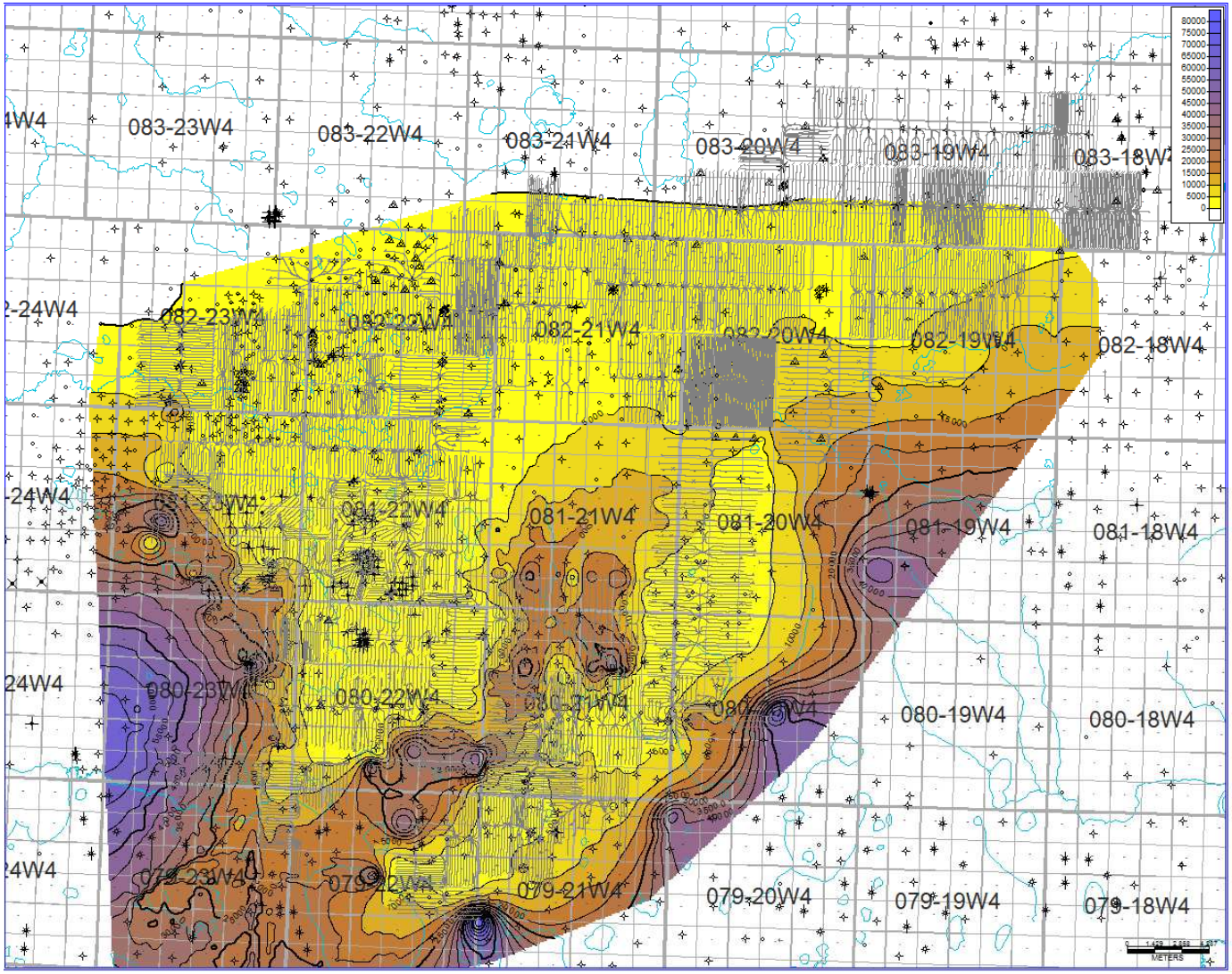


Wabiskaw Structure Map

Canadian Natural



Produced Oil Viscosity Map



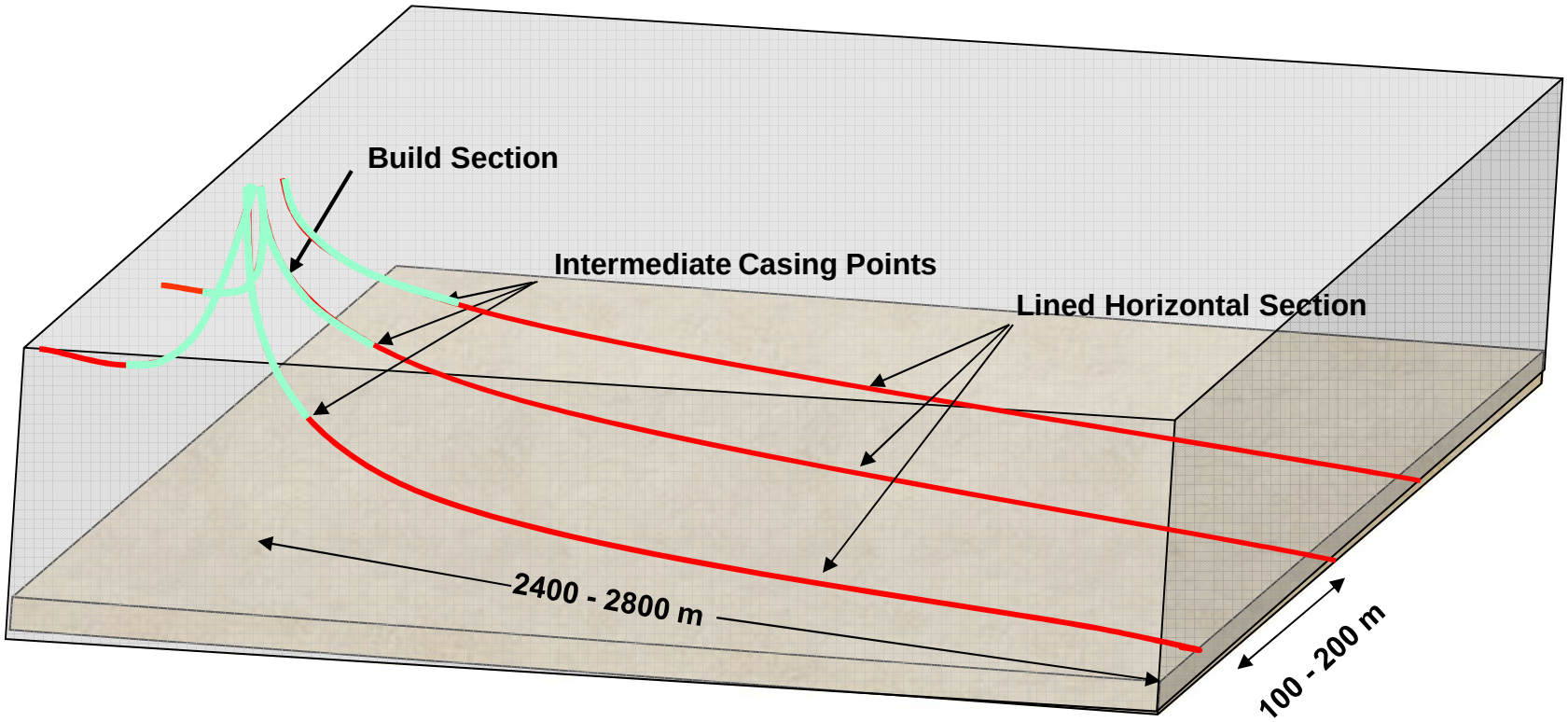
Brintnell Regional Reservoir Properties

Canadian Natural

- **Upper Wabiskaw Sand**
  - Depth of 300-425m TVD
  - Net Pay Range 1 – 9m
  - Porosity 28 – 32%
  - Permeability 300 – 3000md
  - Temperature 13-17 deg. C
  - Water Saturation 30 – 40%
  - Oil Viscosity (dead oil) 800 – 80,000cp @ 15 deg. C
  - Initial Reservoir Pressure 1900 – 2600kpa

Drilling, Completions, and Artificial Lift

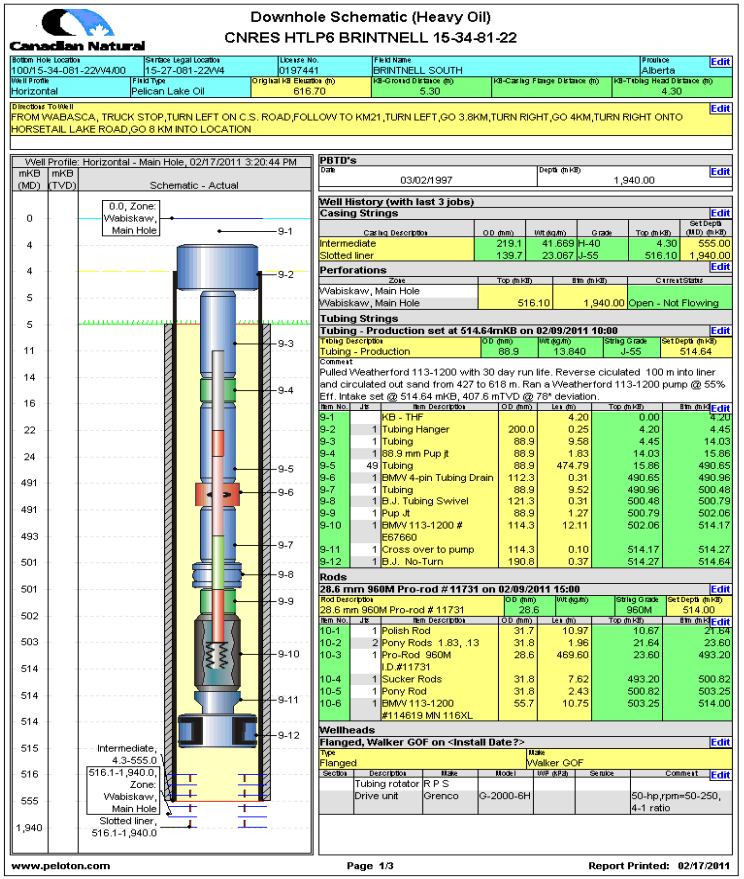
Typical Drilling Configuration



- **CNRL lands the intermediate casing within the Wabiskaw formation.**

Typical Well Configurations

- **Producer**



Downhole Schematic (Heavy Oil)
CNRES HTLP6 BRINTNELL 15-34-81-22

Bottom Hole Location	Surface Legal Location	License No.	Field Name	Province
100/15-34-081-22W4/00	15-27-081-22W4	0197441	BRINTNELL SOUTH	Alberta

Well Profile	Field Type	Original KB Elevation (ft)	KB-Ground Distance (ft)	KB-Casing Flange Distance (ft)	KB-Tubing Head Distance (ft)
Horizontal	Pelican Lake Oil	616.70	5.30		4.30

Directions To Well
FROM WABASCA, TRUCK STOP,TURN LEFT ON C.S. ROAD,FOLLOW TO KM21,TURN LEFT,GO 3.8KM,TURN RIGHT,GO 4KM,TURN RIGHT ONTO HORSETAIL LAKE ROAD,GO 8 KM INTO LOCATION

Well Profile: Horizontal - Main Hole, 02/17/2011 3:20:44 PM
Schematic - Actual

PBTD's

Date	Depth (ftKB)
03/02/1997	1,940.00

Well History (with last 3 jobs)

Casing Strings

Casing Description	OD (mm)	Wt (kg/m)	Grade	Top (ftKB)	Set Depth (MD) (ftKB)
Intermediate	219.1	41.669	H-40	4.30	555.00
Slotted liner	139.7	23.067	J-55	516.10	1,940.00

Perforations

Zone	Top (ftKB)	Btm (ftKB)	Current Status
Wabiskaw, Main Hole			
Wabiskaw, Main Hole	516.10	1,940.00	Open - Not Flowing

Tubing Strings

Tubing - Production set at 514.64mKB on 02/09/2011 10:00

Tubing Description	OD (mm)	Wt (kg/m)	String Grade	Set Depth (ftKB)
Tubing - Production	88.9	13.840	J-55	514.64

Comment
Pulled Weatherford 113-1200 with 30 day run life. Reverse ciculated 100 m into liner and circulated out sand from 427 to 618 m. Ran a Weatherford 113-1200 pump @ 55% Eff. Intake set @ 514.64 mKB, 407.6 mTVD @ 78° deviation.

Item No.	Jts	Item Description	OD (mm)	Len (ft)	Top (ftKB)	Btm (ftKB)
9-1		KB - THF		4.20	0.00	4.20
9-2	1	Tubing Hanger	200.0	0.25	4.20	4.45
9-3	1	Tubing	88.9	9.58	4.45	14.03
9-4	1	88.9 mm Pup jt	88.9	1.83	14.03	15.86
9-5	49	Tubing	88.9	474.79	15.86	490.65
9-6	1	BMV 4-pin Tubing Drain	112.3	0.31	490.65	490.96
9-7	1	Tubing	88.9	9.52	490.96	500.48
9-8	1	B.J. Tubing Swivel	121.3	0.31	500.48	500.79
9-9	1	Pup jt	88.9	1.27	500.79	502.06
9-10	1	BMV 113-1200 # E67660	114.3	12.11	502.06	514.17
9-11	1	Cross over to pump	114.3	0.10	514.17	514.27
9-12	1	B.J. No-Turn	190.8	0.37	514.27	514.64

Rods

28.6 mm 960M Pro-rod # 11731 on 02/09/2011 15:00

Rod Description	OD (mm)	Wt (kg/m)	String Grade	Set Depth (ftKB)
28.6 mm 960M Pro-rod # 11731	28.6		960M	514.00

Item No.	Jts	Item Description	OD (mm)	Len (ft)	Top (ftKB)	Btm (ftKB)
10-1	1	Polish Rod	31.7	10.97	10.67	21.64
10-2	2	Pony Rods 1.83, .13	31.8	1.96	21.64	23.60
10-3	1	Pro-Rod 960M I.D.#11731	28.6	469.60	23.60	493.20
10-4	1	Sucker Rods	31.8	7.62	493.20	500.82
10-5	1	Pony Rod	31.8	2.43	500.82	503.25
10-6	1	BMV 113-1200 #114619 MN 116XL	55.7	10.75	503.25	514.00

Wellheads

Flanged, Walker GOF on <Install Date?>

Type	Make
Flanged	Walker GOF

Section	Description	Make	Model	WP (kPa)	Service	Comment
	Tubing rotator	R P S				
	Drive unit	Grenco	G-2000-6H			50-hp,rpm=50-250, 4-1 ratio

0.0, Zone: Wabiskaw, Main Hole
9-1
9-2
9-3
9-4
9-5
9-6
9-7
9-8
9-9
9-10
9-11
9-12
Intermediate, 4.3-555.0
516.1-1,940.0, Zone: Wabiskaw, Main Hole
Slotted liner, 516.1-1,940.0

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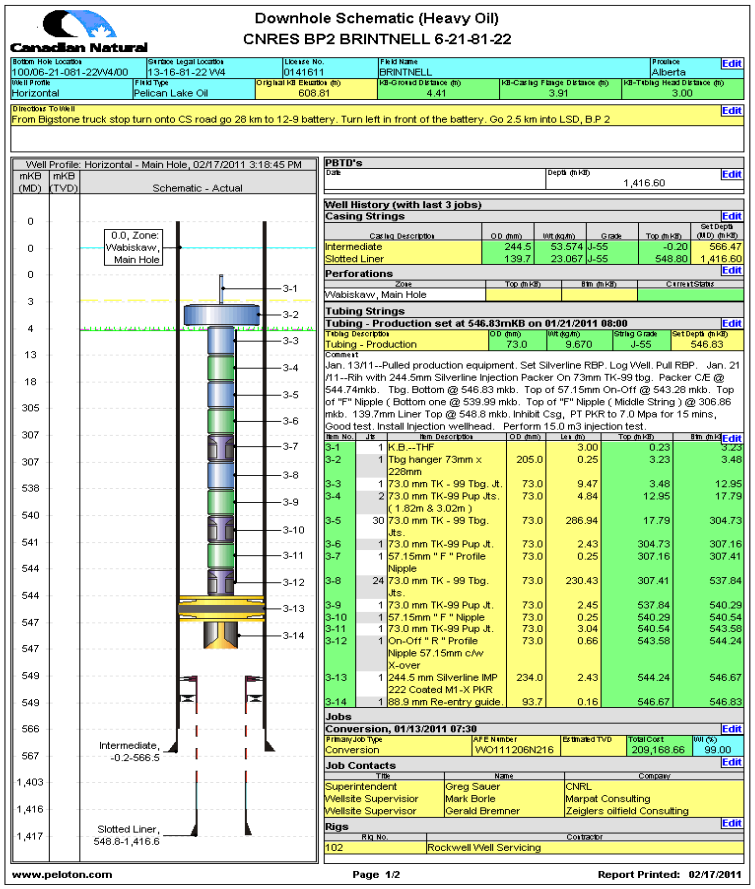
- **Injector**



Downhole Schematic (Heavy Oil)
CNRES BP2 BRINTNELL 6-21-81-22

Bottom Hole Location	Surface Legal Location	License No.	Field Name	Province
100/06-21-081-22W4/00	13-16-81-22 W4	0141611	BRINTNELL	Alberta

Well Profile	Field Type	Original KB Elevation (ft)	KB-Ground Distance (ft)	KB-Casing Flange Distance (ft)	KB-Tubing Head Distance (ft)
Horizontal	Pelican Lake Oil	608.81	4.41	3.91	3.00

Directions To Well
From Bigstone truck stop turn onto CS road go 28 km to 12-9 battery. Turn left in front of the battery. Go 2.5 km into LSD, B.P 2

Well Profile: Horizontal - Main Hole, 02/17/2011 3:18:45 PM
Schematic - Actual

PBTD's

Date	Depth (ftKB)
	1,416.60

Well History (with last 3 jobs)

Casing Strings

Casing Description	OD (mm)	Wt (kg/m)	Grade	Top (ftKB)	Set Depth (MD) (ftKB)
Intermediate	244.5	53.574	J-55	0.20	566.47
Slotted Liner	139.7	23.067	J-55	548.80	1,416.60

Perforations

Zone	Top (ftKB)	Btm (ftKB)	Current Status
Wabiskaw, Main Hole			

Tubing Strings

Tubing - Production set at 546.83mKB on 01/21/2011 08:00

Tubing Description	OD (mm)	Wt (kg/m)	String Grade	Set Depth (ftKB)
Tubing - Production	73.0	9.670	J-55	546.83

Comment
Jan. 13/11--Pulled production equipment. Set Silverline RBP. Log Well. Pull RBP. Jan. 21 /11--Rih with 244.5mm Silverline Injection Packer On 73mm TK-99 tbg. Packer C/E @ 544.74mkb. Tbg. Bottom @ 546.83 mkb. Top of 57.15mm On-Off @ 543.28 mkb. Top of "F" Nipple (Bottom one @ 539.99 mkb. Top of "F" Nipple (Middle String) @ 306.86 mkb. 139.7mm Liner Top @ 548.8 mkb. Inhibit Csg, PT PKR to 7.0 Mpa for 15 mins, Good test. Install Injection wellhead. Perform 15.0 m3 injection test.

Item No.	Jts	Item Description	OD (mm)	Len (ft)	Top (ftKB)	Btm (ftKB)
3-1	1	K.B.--THF		3.00	0.23	3.23
3-2	1	Tbg hanger 73mm x 228mm	205.0	0.25	3.23	3.48
3-3	1	73.0 mm TK - 99 Tbg. Jt.	73.0	9.47	3.48	12.95
3-4	2	73.0 mm TK-99 Pup Jts. (1.82m & 3.02m)	73.0	4.84	12.95	17.79
3-5	30	73.0 mm TK - 99 Tbg. Jts.	73.0	286.94	17.79	304.73
3-6	1	73.0 mm TK-99 Pup Jt.	73.0	2.43	304.73	307.16
3-7	1	57.15mm " F " Profile Nipple	73.0	0.25	307.16	307.41
3-8	24	73.0 mm TK - 99 Tbg. Jts.	73.0	230.43	307.41	537.84
3-9	1	73.0 mm TK-99 Pup Jt.	73.0	2.45	537.84	540.29
3-10	1	57.15mm " F " Nipple	73.0	0.25	540.29	540.54
3-11	1	73.0 mm TK-99 Pup Jt.	73.0	3.04	540.54	543.58
3-12	1	On-Off " R " Profile Nipple 57.15mm c/w X-over	73.0	0.66	543.58	544.24
3-13	1	244.5 mm Silverline IMP 222 Coated M1-X PKR	234.0	2.43	544.24	546.67
3-14	1	88.9 mm Re-entry guide.	93.7	0.16	546.67	546.83

Jobs

Conversion, 01/13/2011 07:30

Primary Job Type	AFE Number	Estimated TVD	Total Cost	WI (%)
Conversion	WO111206N216		209,168.66	99.00

Job Contacts

Title	Name	Company
Superintendent	Greg Sauer	CNRL
Wellsite Supervisor	Mark Borle	Marpat Consulting
Wellsite Supervisor	Gerald Bremner	Zeiglers oilfield Consulting

Rigs

Rig No.	Contractor
102	Rockwell Well Servicing

3-1
3-2
3-3
3-4
3-5
3-6
3-7
3-8
3-9
3-10
3-11
3-12
3-13
3-14
Intermediate, -0.2-566.5
Slotted Liner, 548.8-1,416.6

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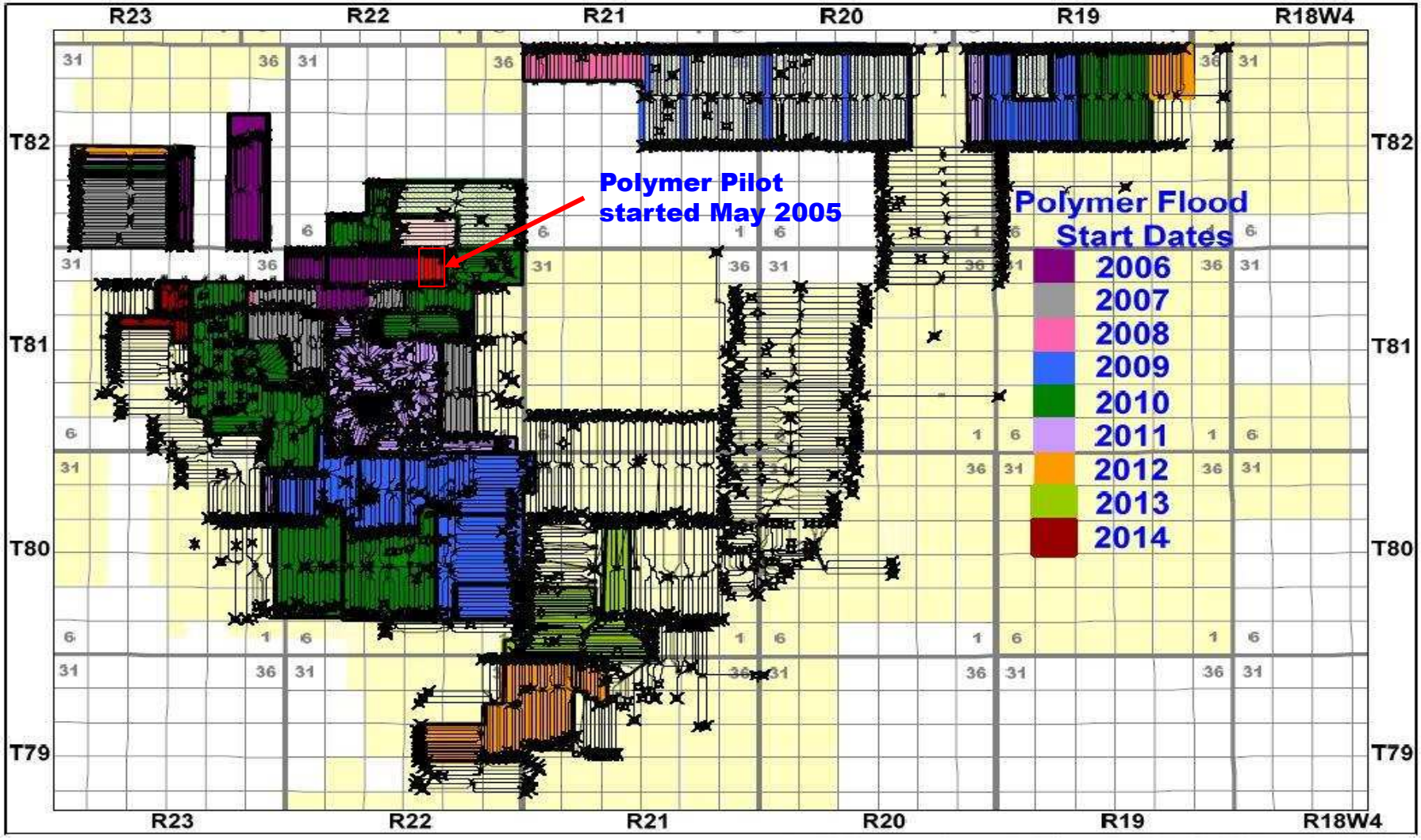
- **Intermediate Casing landed in Wabiskaw sand (producers and injectors).**

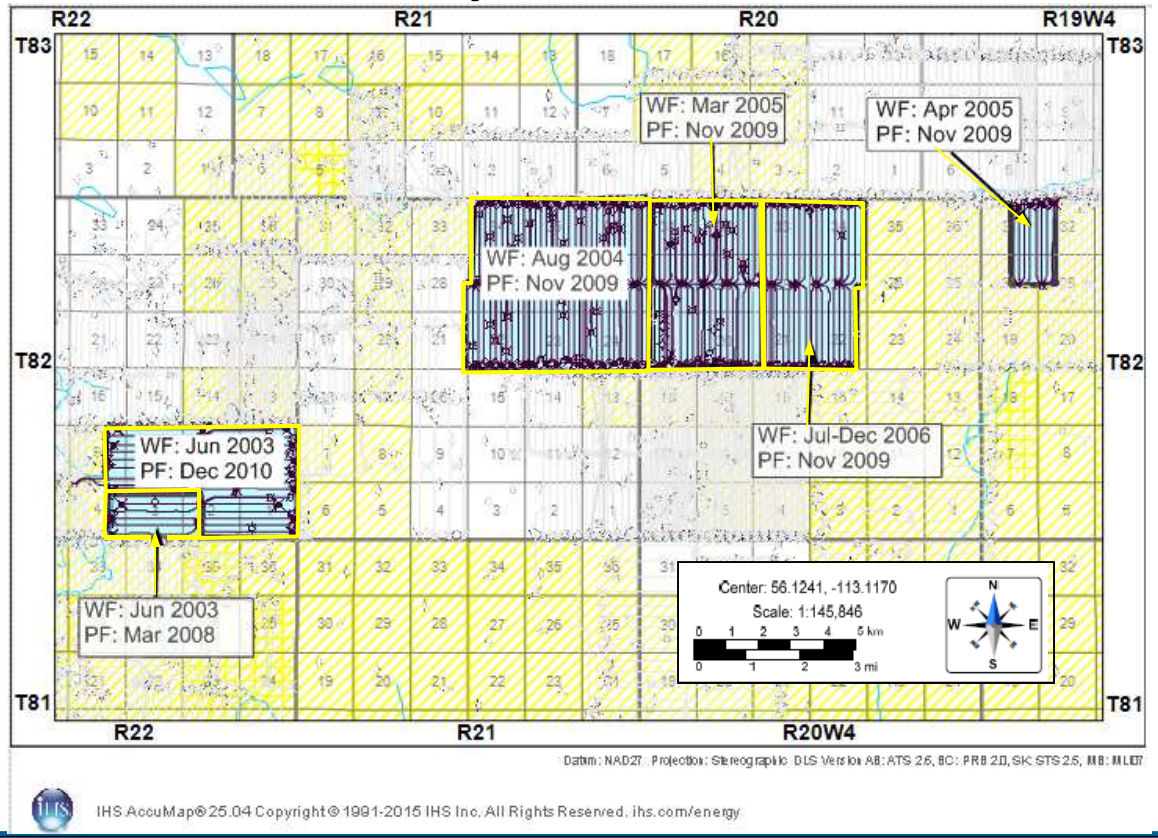
EOR History and Current Approvals

Polymer Flood Development



Polymer Flood After Water Flood

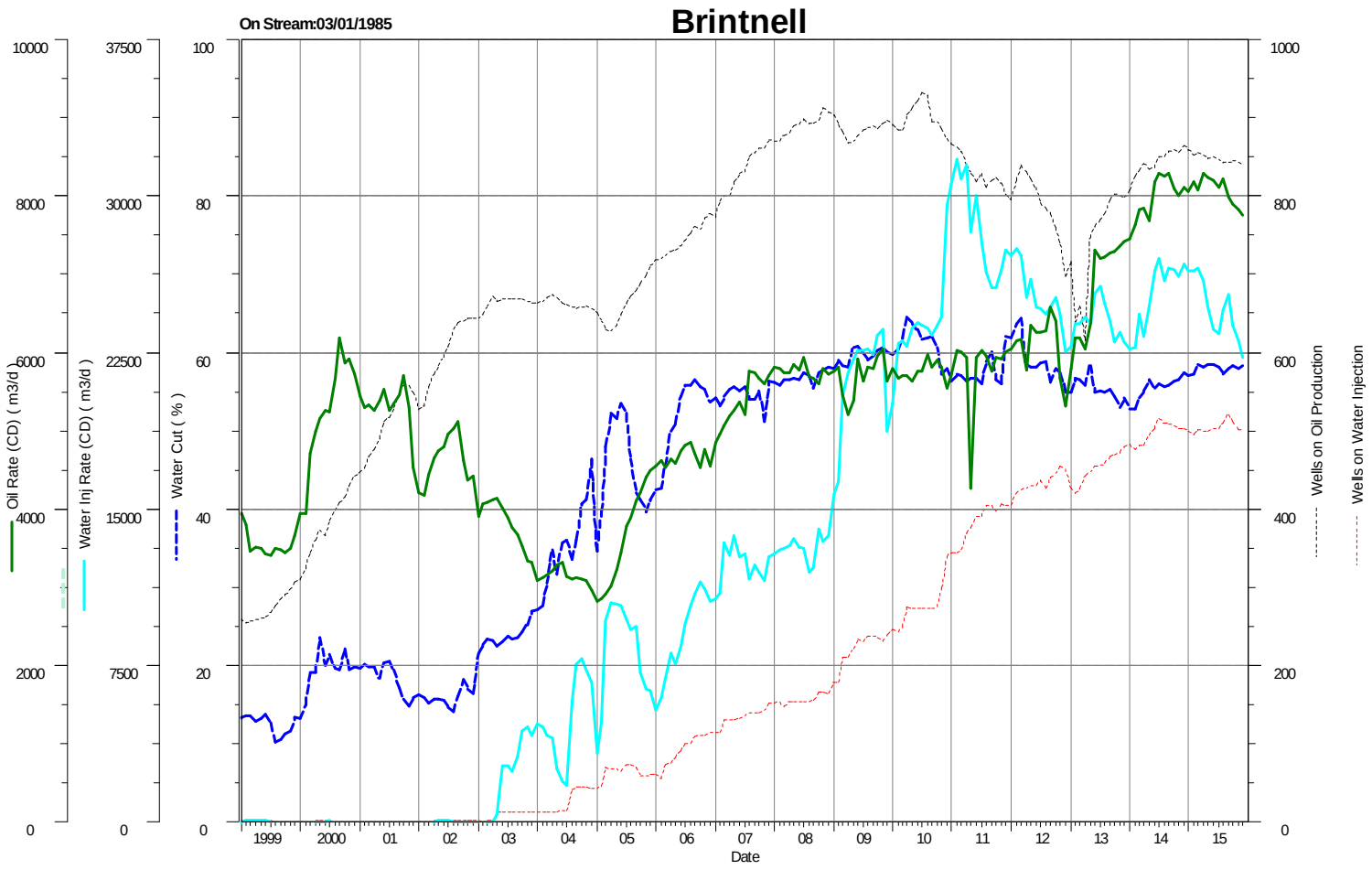
- **The areas highlighted in blue for the map below started on waterflood (WF) prior to being converted to polymer flood (PF). All CNRL Pelican Lake water flood schemes have now been converted to polymer flood. Since 2007, all new enhanced recovery schemes are converted directly to polymer flooding.**



Field Overview

Canadian Natural

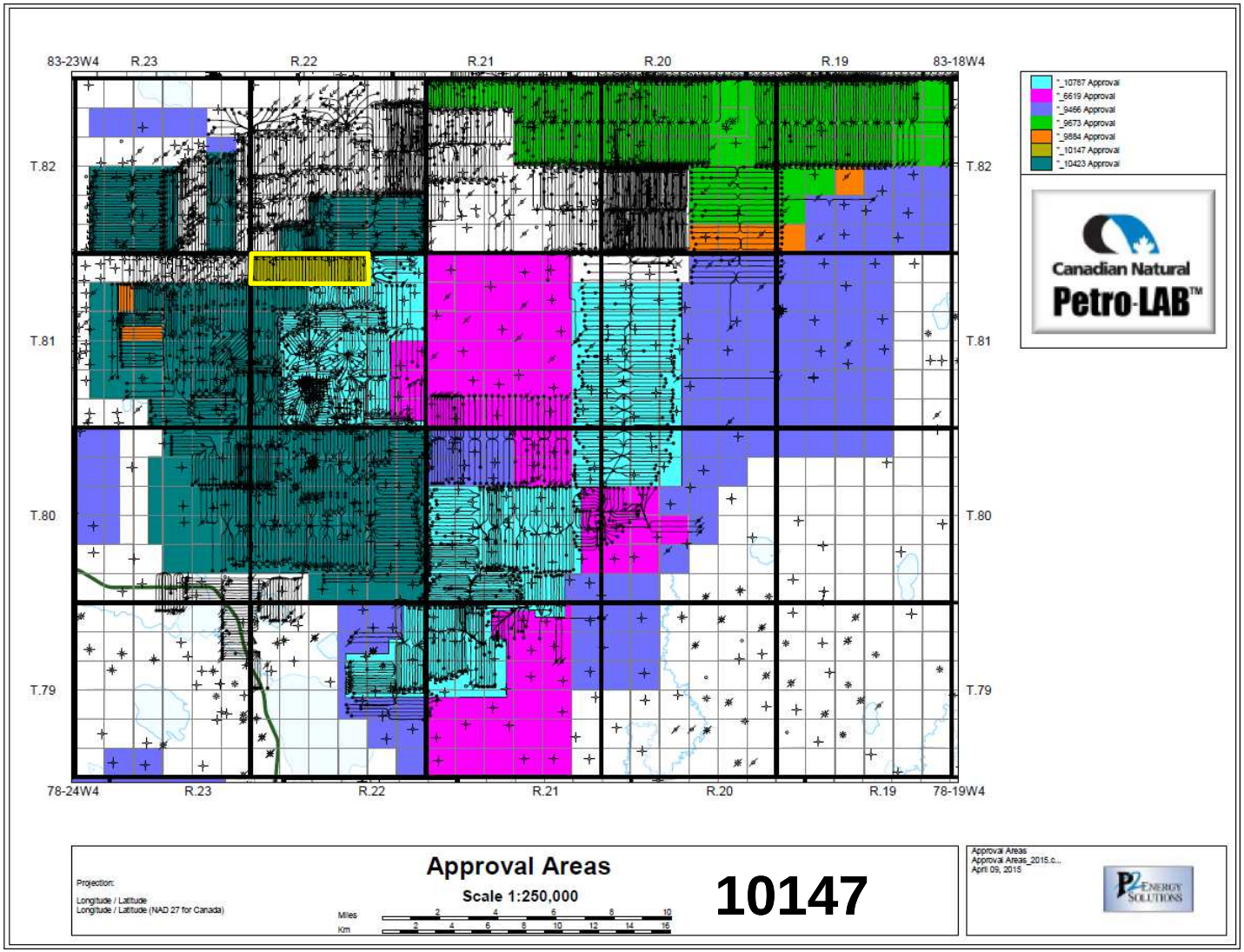
Cum. oil: 37,099 E3m3



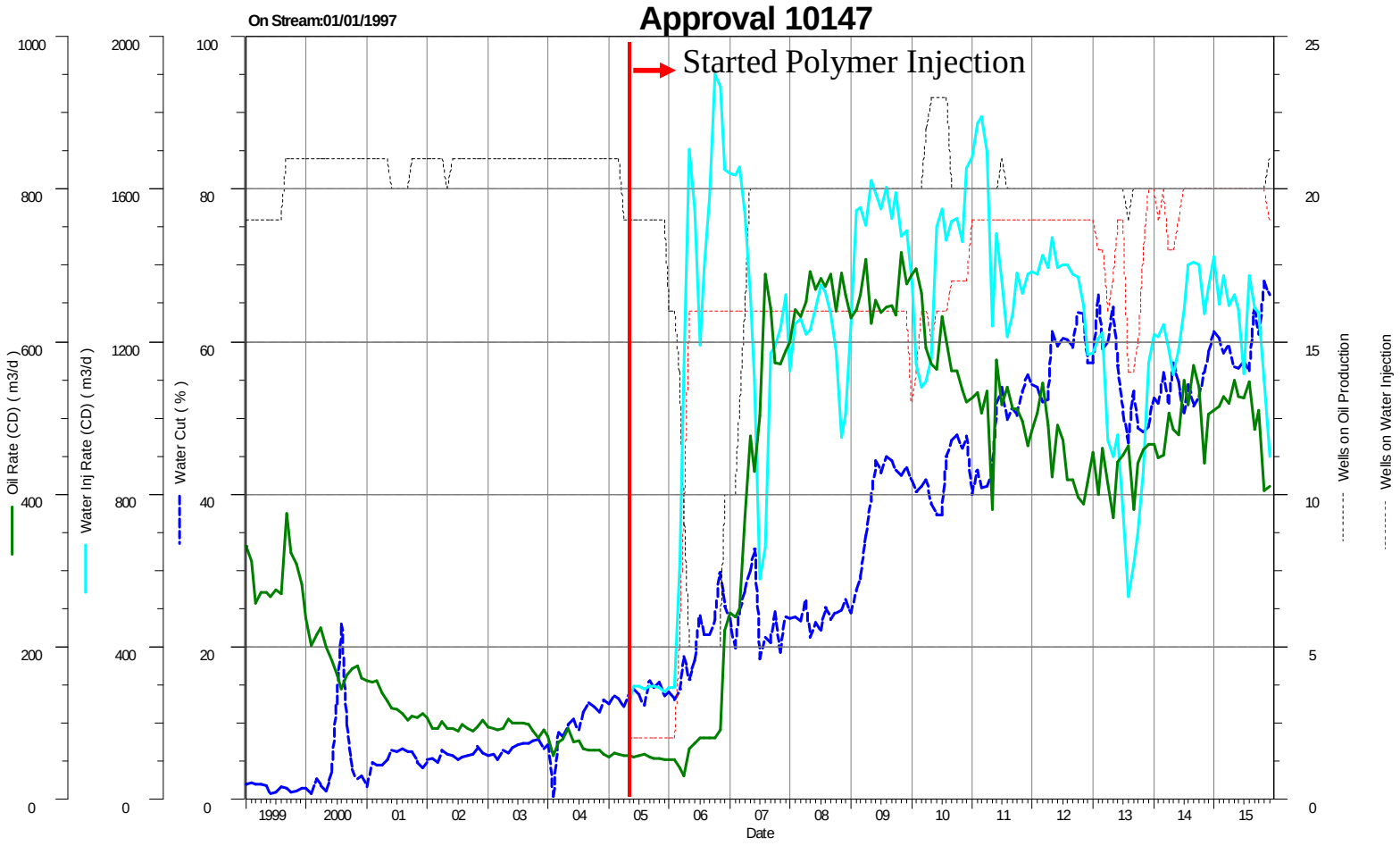
Approximately 63% of the approved EOR scheme areas are currently developed and under flood as of the end of 2015

Field Performance and Surveillance

Approval 10147



Approval 10147 Production Update



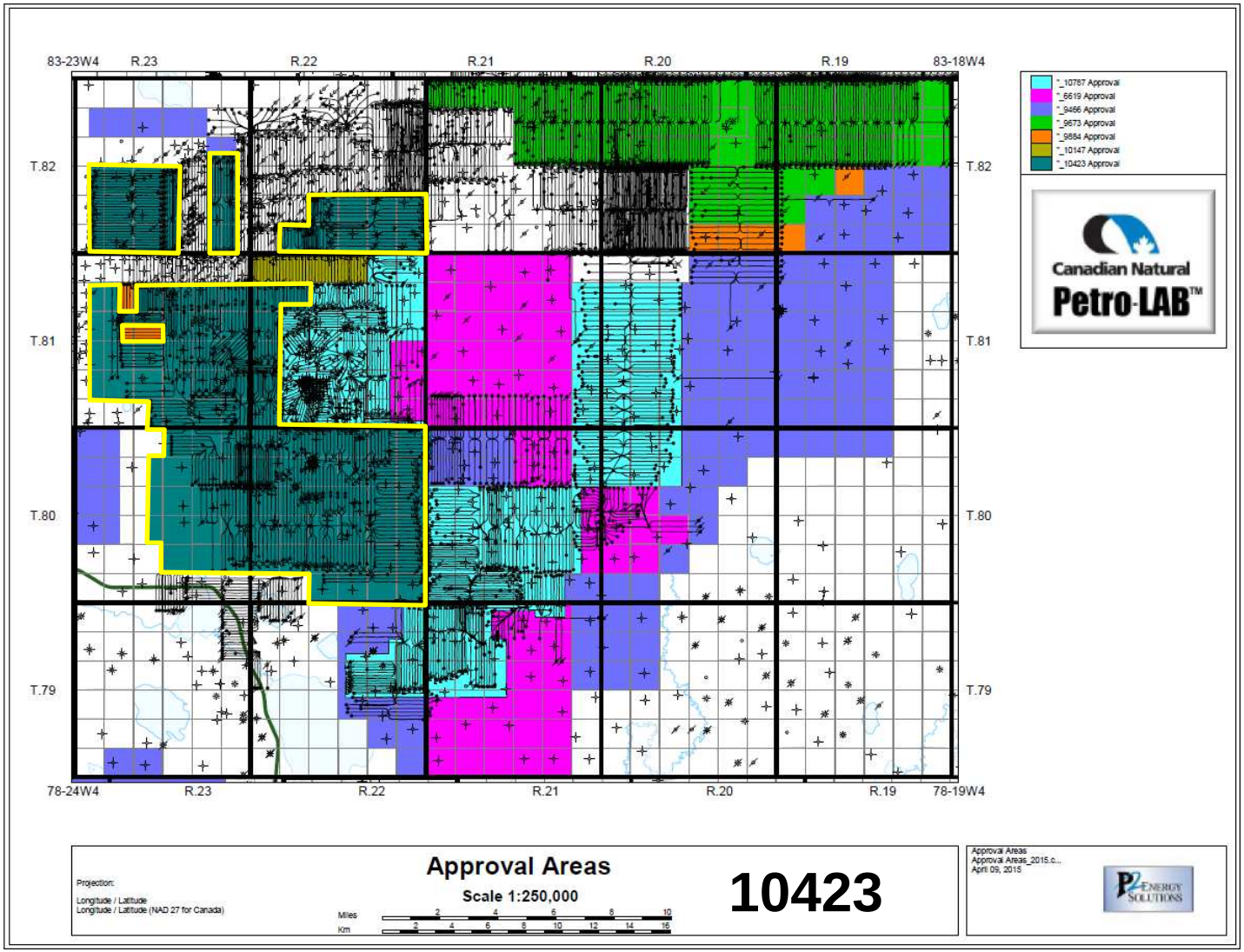
Cum oil: 2,336 E3m3 Cum water: 1,563 E3m3 Cum injection: 4,781 E3m3

Approval 10147 Discussion

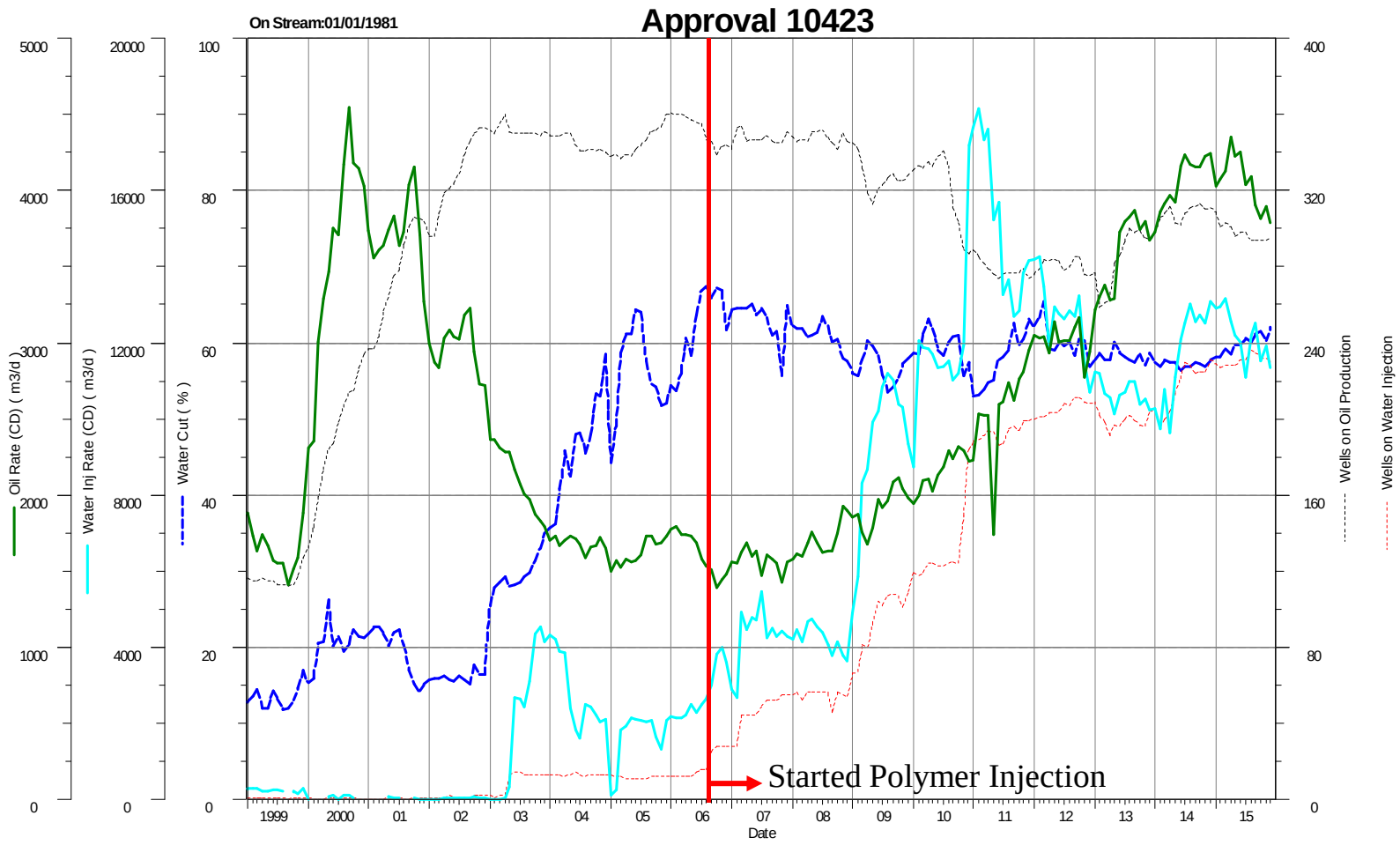
Canadian Natural

- Contains the most mature polymer flood patterns including the original pilot area which began flooding in 2005.
- First Polymer Response in April 2006 from the HTL6 Pilot area.
- Peak production occurred from mid 2007 to early 2010 at 650 m3/d oil.
- Injection returned to normal in 2014-2015 following a significant reduction in 2013 for offset drilling.
- Water cut averaged just above 60% during 2015.
- Producer cleanouts executed since 2013 have helped recent production. Cleanouts are mechanical and executed using standard reverse circulation methods.
- Oil viscosity ranges from 1,300 cp to 2,800 cP.

Approval 10423



Approval 10423 Production Update



Cum oil: 17,873 E3m3 Cum water: 16,832 E3m3 Cum injection: 37,120 E3m3

Approval 10423 Discussion

Canadian Natural

- Polymerflood started in 2006 covering roughly 5% of the approval area split between 3 small groups. The flood was expanded every year up to 2010. In 2012, small area from PRSA 9884 was added to the approval.
- Currently 73% of the approval area is under flood.
- Small portion of approval area under waterflood starting in 2003. This area was converted to polymer in 2008 and 2010.
- First polymer response in July 2007 but due to the size and staged flood expansion, did not see a ramp up in oil volumes until early 2009.
- Portions of the approval area are affected by higher in-situ water saturation and/or oil viscosity. Response in these regions has been more delayed and erratic when compared to other portions of the pool.
- Oil viscosity ranges from 1,100 cp to 50,000 cp.

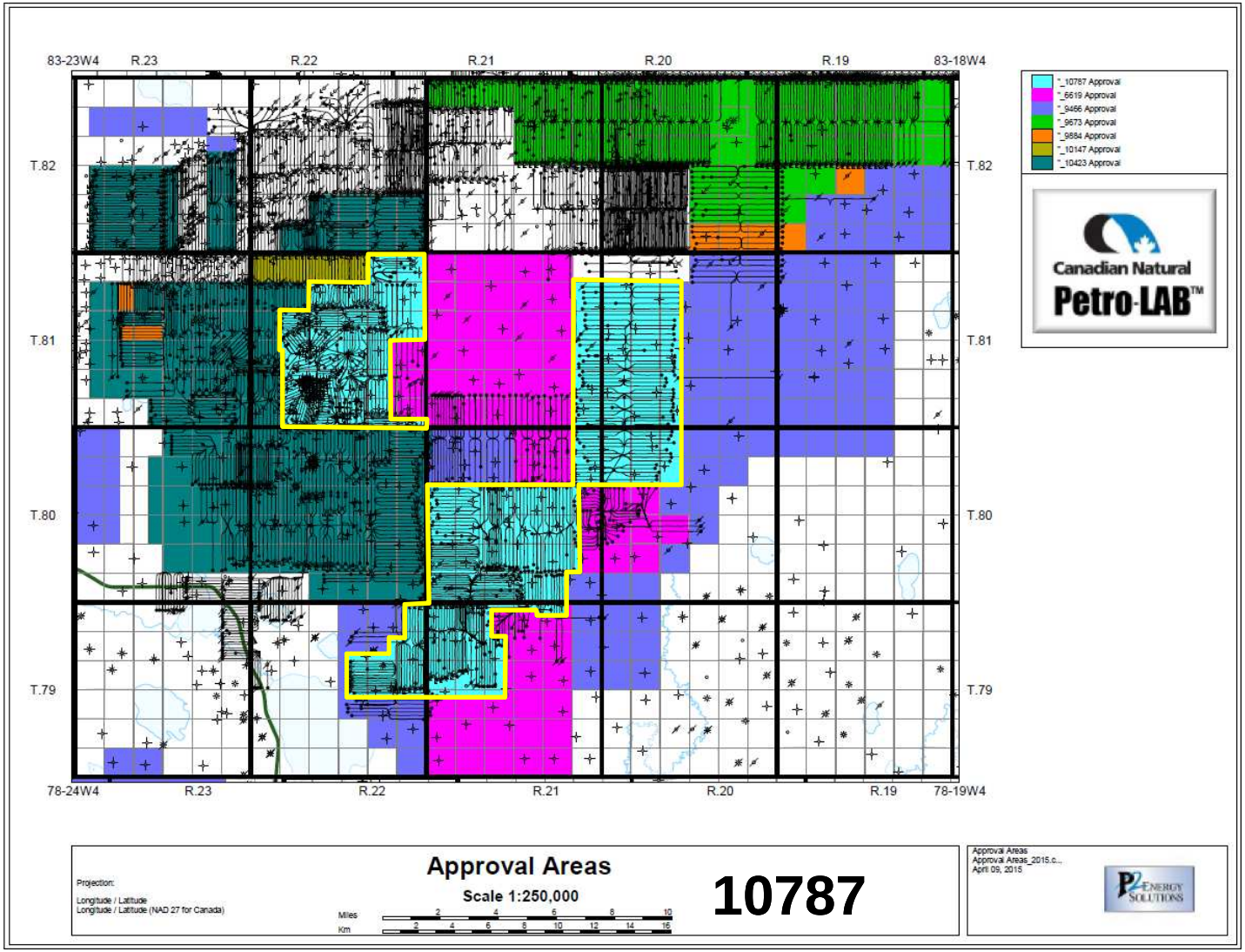
Approval 10423 Discussion

Canadian Natural

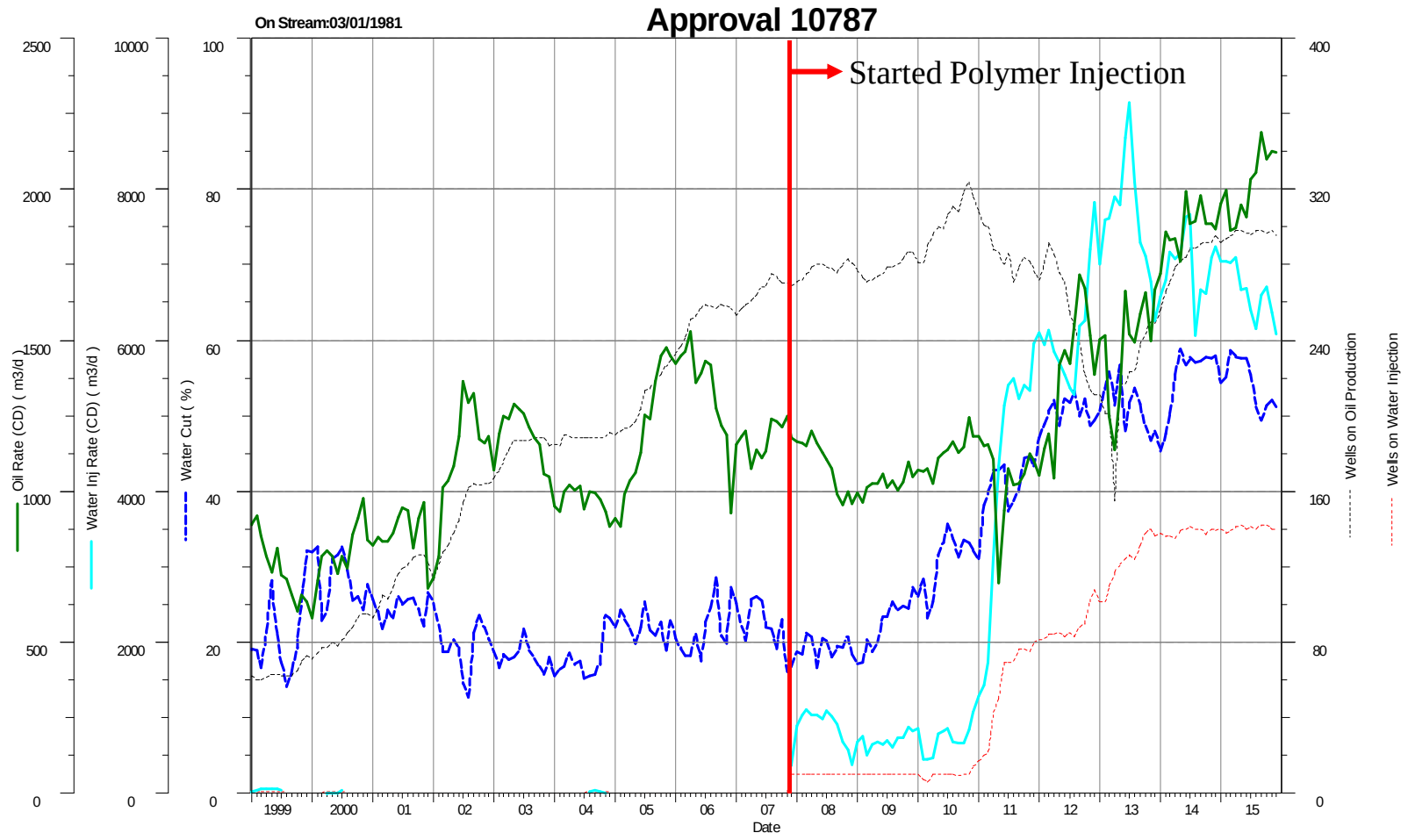
2015 Activity

- 6 producers drilled in 2014 were converted to injection in WB32 area.
- Oil production continued to ramp up in WB14 area in the early part of the year following the conversion of 12 producers to injectors in 2014.
- Some areas experiencing increased water cut, average water cut was about 60% during 2015.

Approval 10787



Approval 10787 Production Update



Cum oil: 8,678 E3m3 Cum water: 4,809 E3m3 Cum injection: 12,517 E3m3

Approval 10787 Discussion

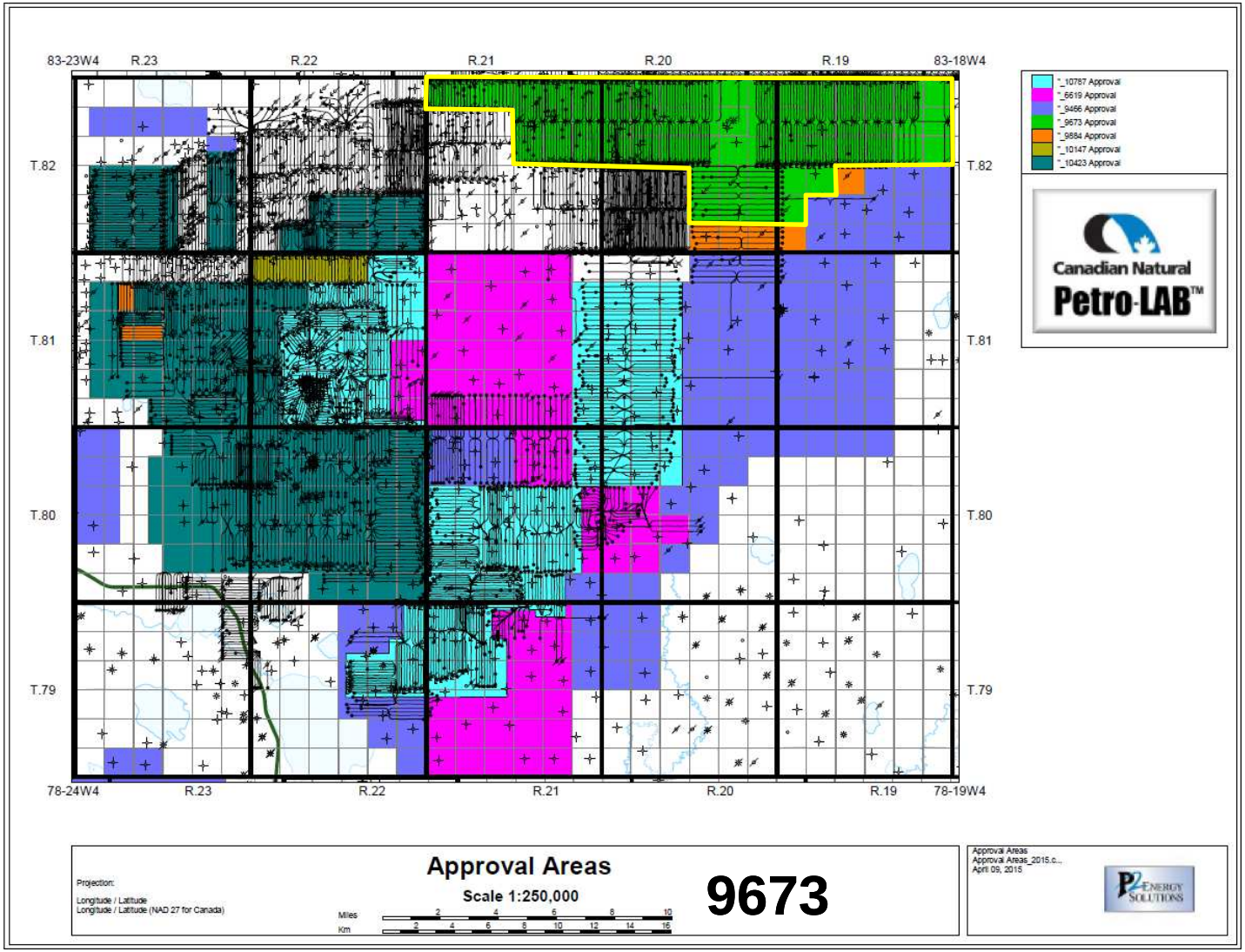
Canadian Natural

- Polymer flood started in Dec 2007 covering roughly 4% of the approval area split into 2 small groups. There were no expansions until 2010, since then there has been an expansion completed in every year including 2013. Currently 45% of the approval area is under flood.
- First polymer response in Nov 2008 but due to the size and staged flood expansion, did not see a ramp up in oil volumes until mid 2012.
- Oil production increased in the late part of 2013 and early 2014, mostly due to new well activations.
- Polymer injection was commenced in the Peerless and Sandy Lake portions of the area in 2013, with some wells responding in 2015.
- The BP 23-24 area has demonstrated reduced formation water production after 8 years of flooding.
- Altogether, this has resulted in reducing WCT from 58% to 50% during 2015.
- Oil viscosity ranges from 1,100 cp to 14,400 cp.

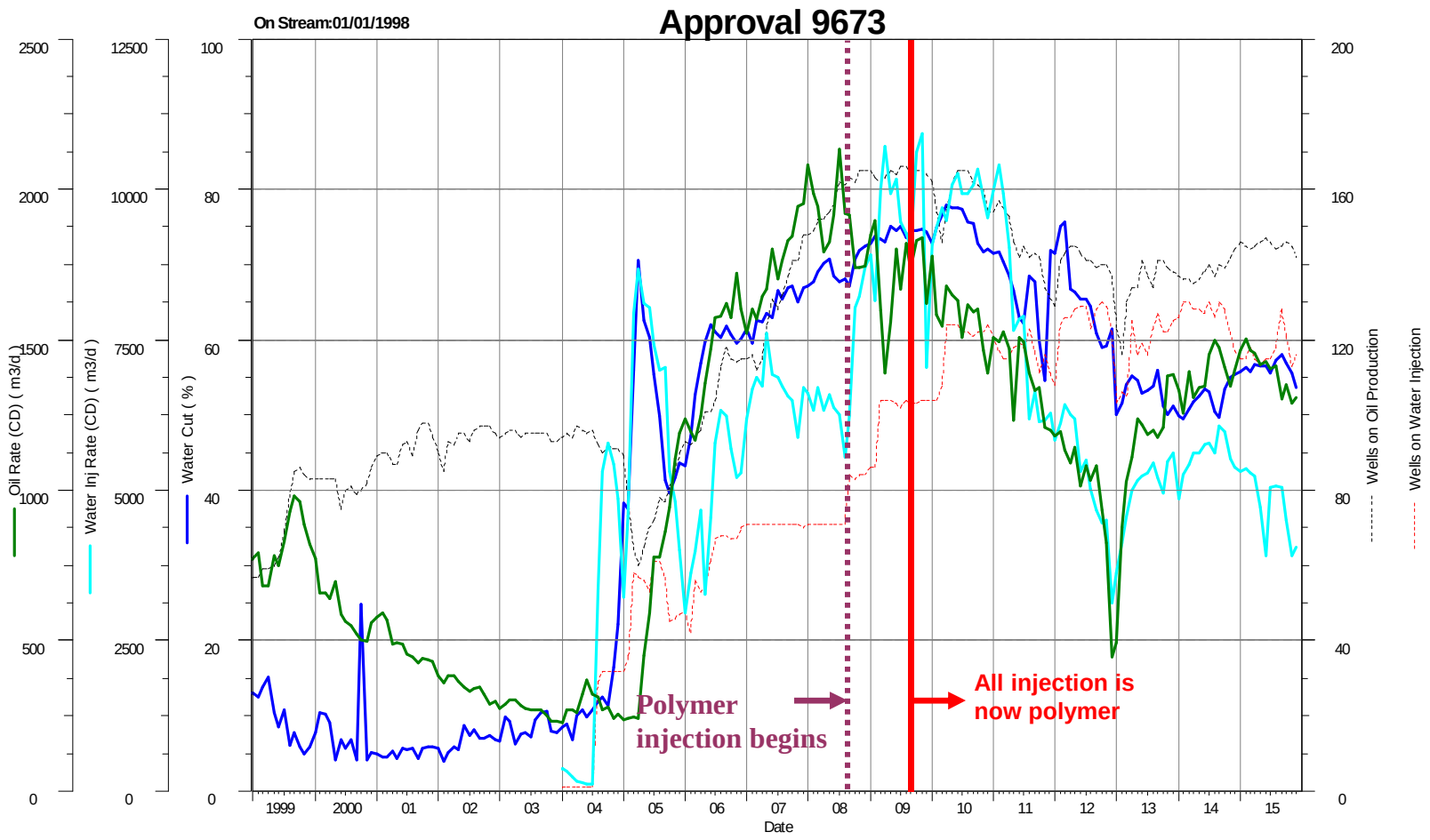
Approval 10787 – 04/01-24-079-22W4 Monitoring

- In May 2012, the 03/16-36-079-22W4 well intersected the 00/01-24-079-22W4 wellbore while drilling
- Numerous attempts were made to repair the 00/01-24 well but ultimately the wellbore could not be returned to service. A non-routine abandonment was conducted on 00/01-24 in March 2013. The 04/01-24-079-22W4 observation well was drilled in September 2013 to monitor the polymer flood near the 00/01-24 offset following consultations with the AER (Approval 10787K).
- 04/01-24-079-22W4 Monitoring Program:
  - Reservoir pressure and produced water was monitored quarterly for Q4 2013 and the first three quarters of 2014. A reservoir pressure taken third quarter of 2015 confirmed these results.
  - The reservoir pressure declined in each observation indicating normal primary decline and no communication from outside the Wabiskaw
  - Due to low produced water volumes, could not obtain a sufficient volume of water to analyze
  - CNRL will continue to monitor the produced watercut and take yearly pressure measurements on this well

Approval 9673



Approval 9673 Production Update



Cum oil: 7,097 E3m3 Cum water: 11,456 E3m3 Cum Injection: 28,544 E3m3

Approval 9673 Discussion

Canadian Natural

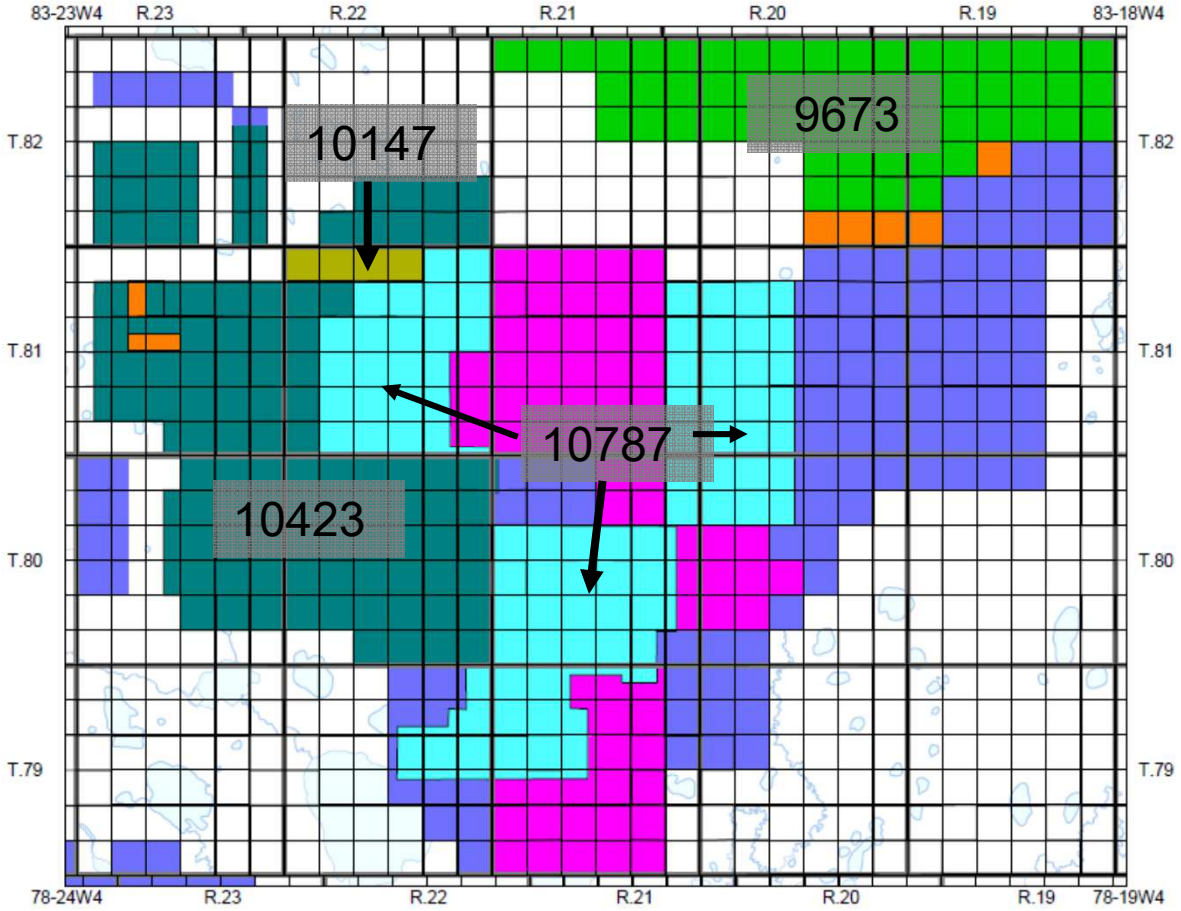
- Originally approved for waterflood in 2004; waterflood was expanded in 2005/2006 to cover roughly 40% of the current approval area.
- Waterflood peak production occurred from late 2007 to early 2009 at 1850 m3/d oil.
- Polymerflood began in Sept 2008 covering 6% of approval area. Existing waterflood patterns remained unchanged at this time.
- In 2009 all waterflood areas were converted to polymer and a small expansion area from primary was added; additional small expansions from primary were conducted in each year from 2010 to 2012. Currently 70% of the approval area is under flood.
- First polymer response occurred in Sept 2009 but due to declining production from the waterflood areas, have only recently started to see a ramp up in oil volumes from the polymer flood.

Approval 9673 Discussion

Canadian Natural

- The conversion from water to polymer has had a dramatic effect on the conformance of the flood. Within two years of conversion for most areas, watercuts declined.
- In 2015 watercut averaged about 55%.
- Oil viscosity ranges from 600 cp to 13,000 cp.

Estimated Ultimate Recovery Factors for Flooded Areas (excludes primary areas)



Approval 9673
Total area OBIP 97.4 E^6m^3
OBIP under flood: 78.4 E^6m^3
RF to date: 8%
Estimated ultimate recovery factors:
16-20%

Approval 10787
Total area OBIP 205.2 E^6m^3
OBIP under flood: 81.4 E^6m^3
RF to date: 7%
Estimated ultimate recovery factors:
21-28%

Approval 10147
Total area OBIP 8.98 E^6m^3
OBIP under flood: 8.98 E^6m^3
RF to date: 26%
Estimated ultimate recovery factors:
32-38%

Approval 10423
Total area OBIP 229.0 E^6m^3
OBIP under flood: 163.8 E^6m^3
RF to date: 10%
Estimated ultimate recovery factors:
24-30%

*RF to-date represents the RF from the polymer flooding areas only. Estimated RF range represents RF from areas recognized for EOR reserves by reserve auditor.

Good Performance – HTL1 (Approval 10147)

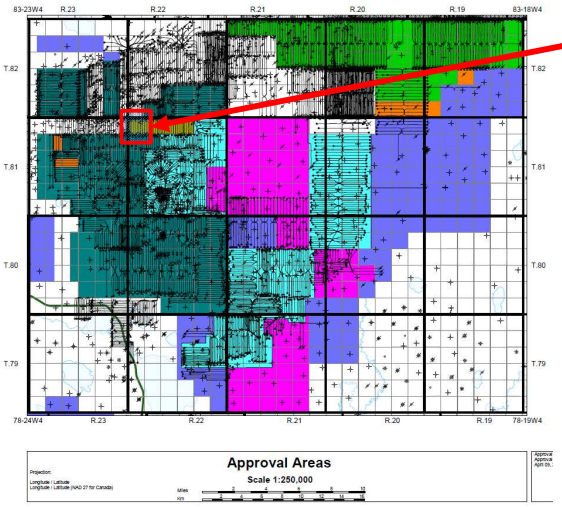
- **HTL1 Pad**
  - **Well list and allocation factors:**

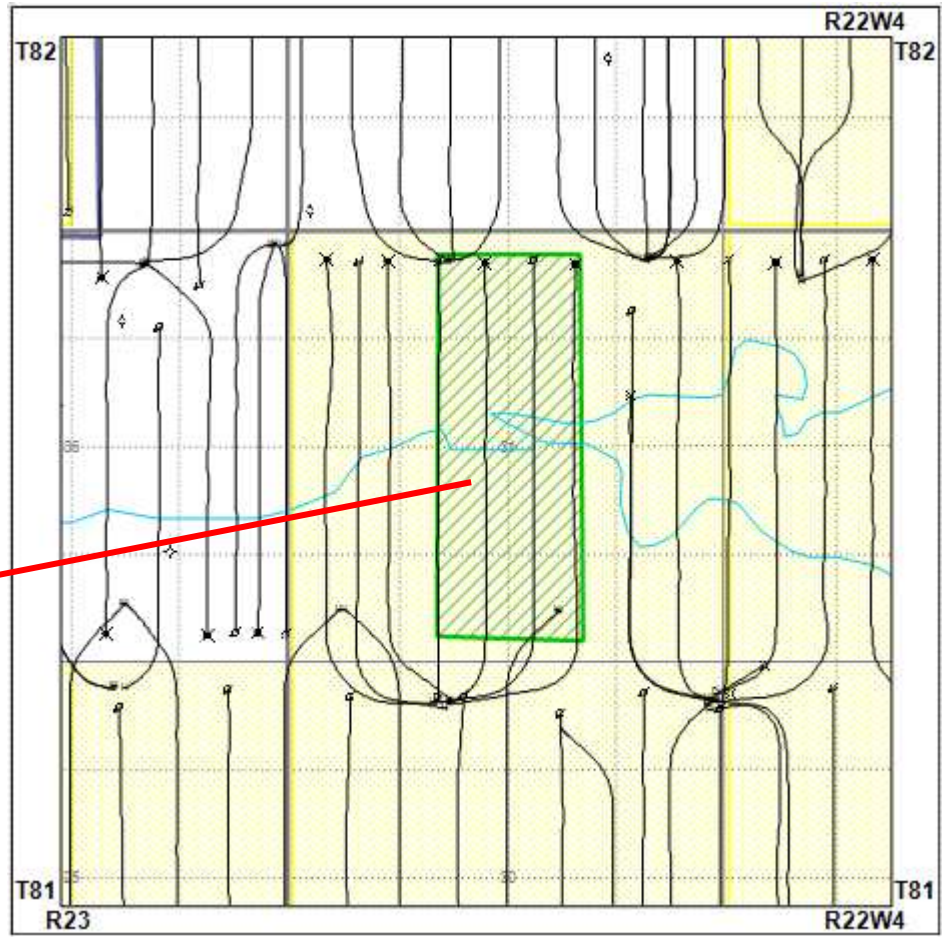
Injectors

- 100/14-31-081-22W4/0 (50%)
- 100/15-31-081-22W4/0 (100%)

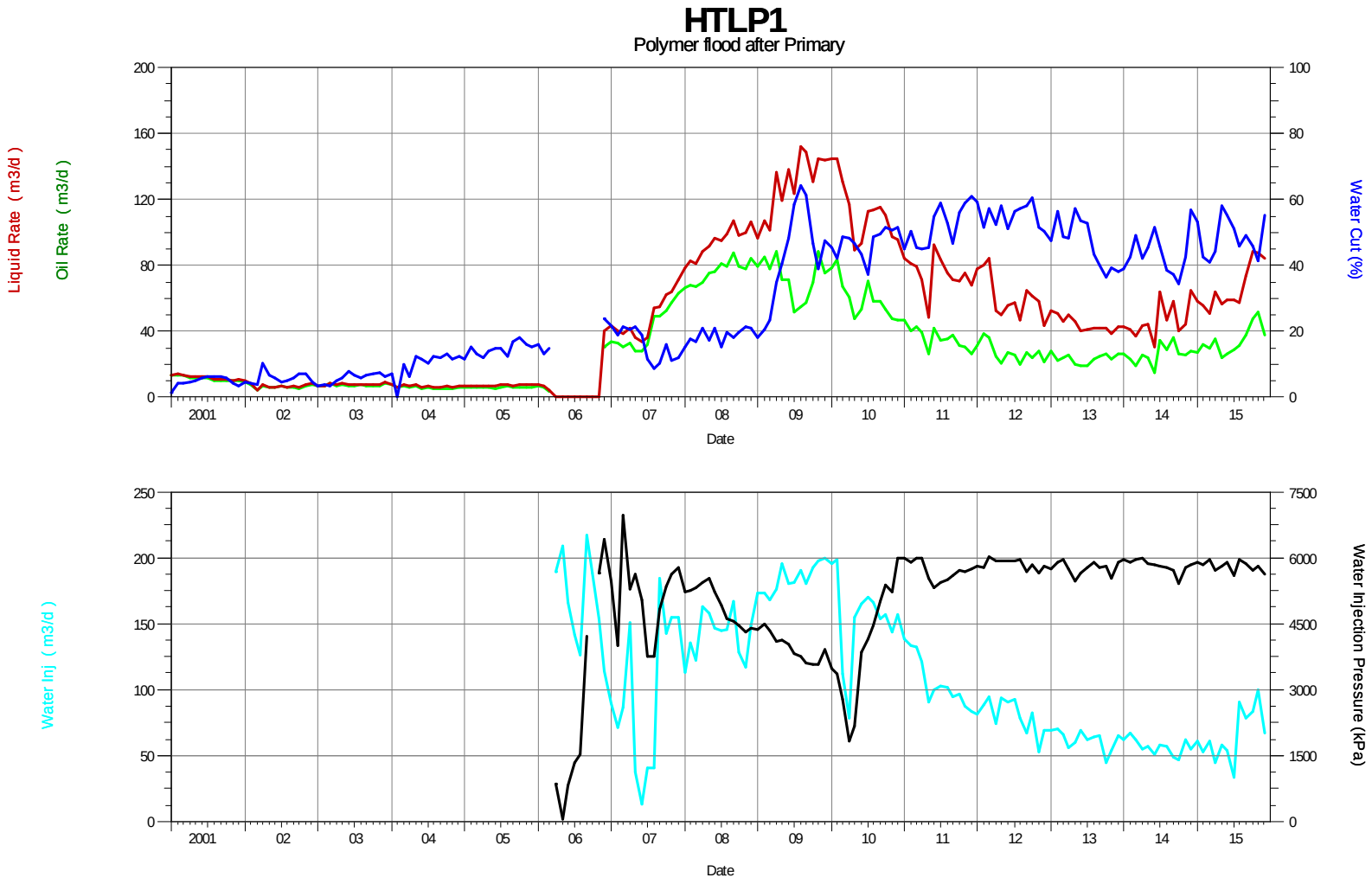
Producers

- 102/15-31-081-22W4/0 (50%)
- 102/14-31-081-22W4/0 (100%)





Good Performance – HTL1 (Approval 10147)



Average Performance – NHTP10 (Approval 10423)

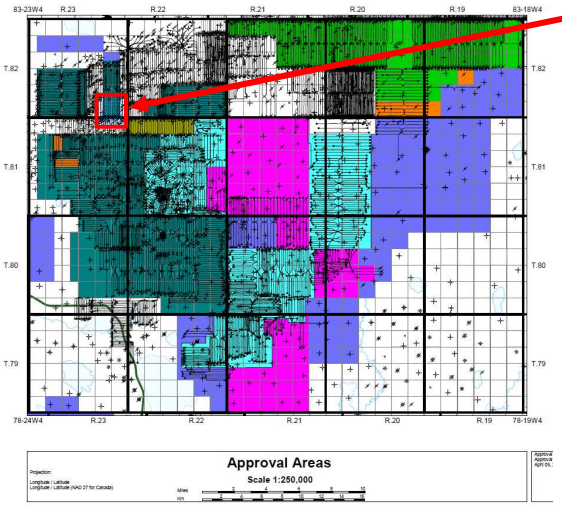
- **NHT Pad 10 subgroup**
  - **Well List and allocation factors:**

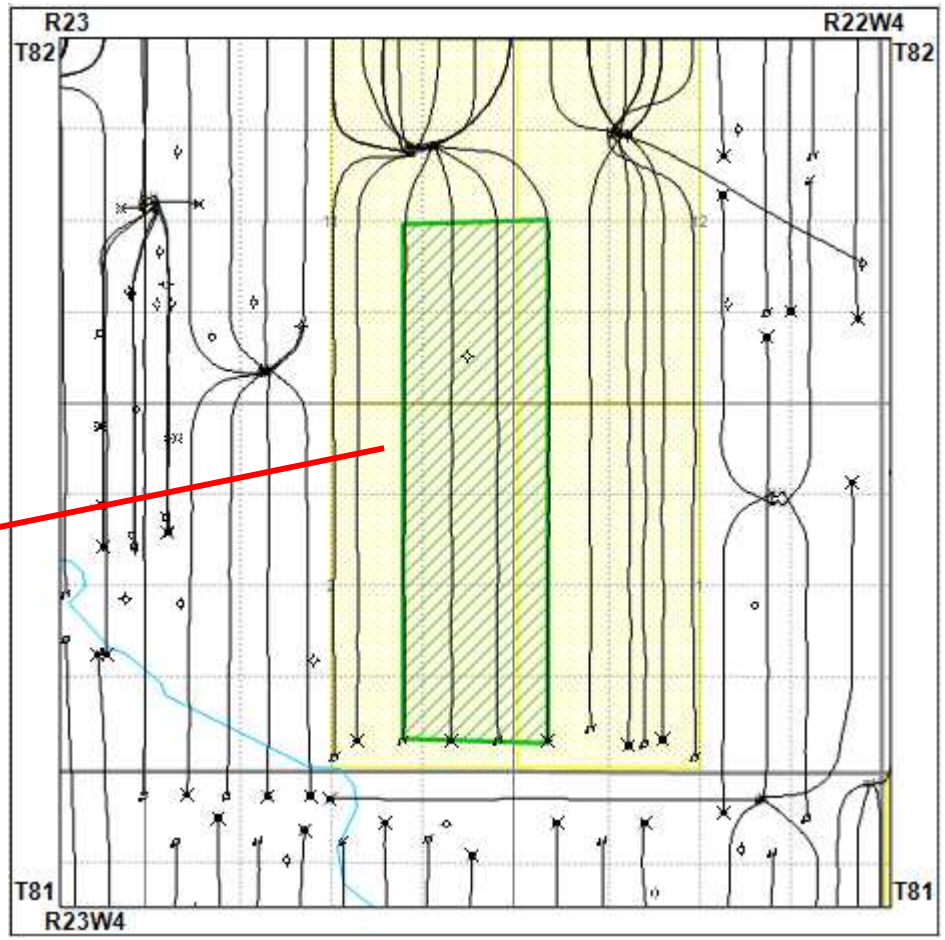
Injectors

- 100/02-02-082-23W4/0 (50%)
- 100/01-02-082-23W4/0 (100%)

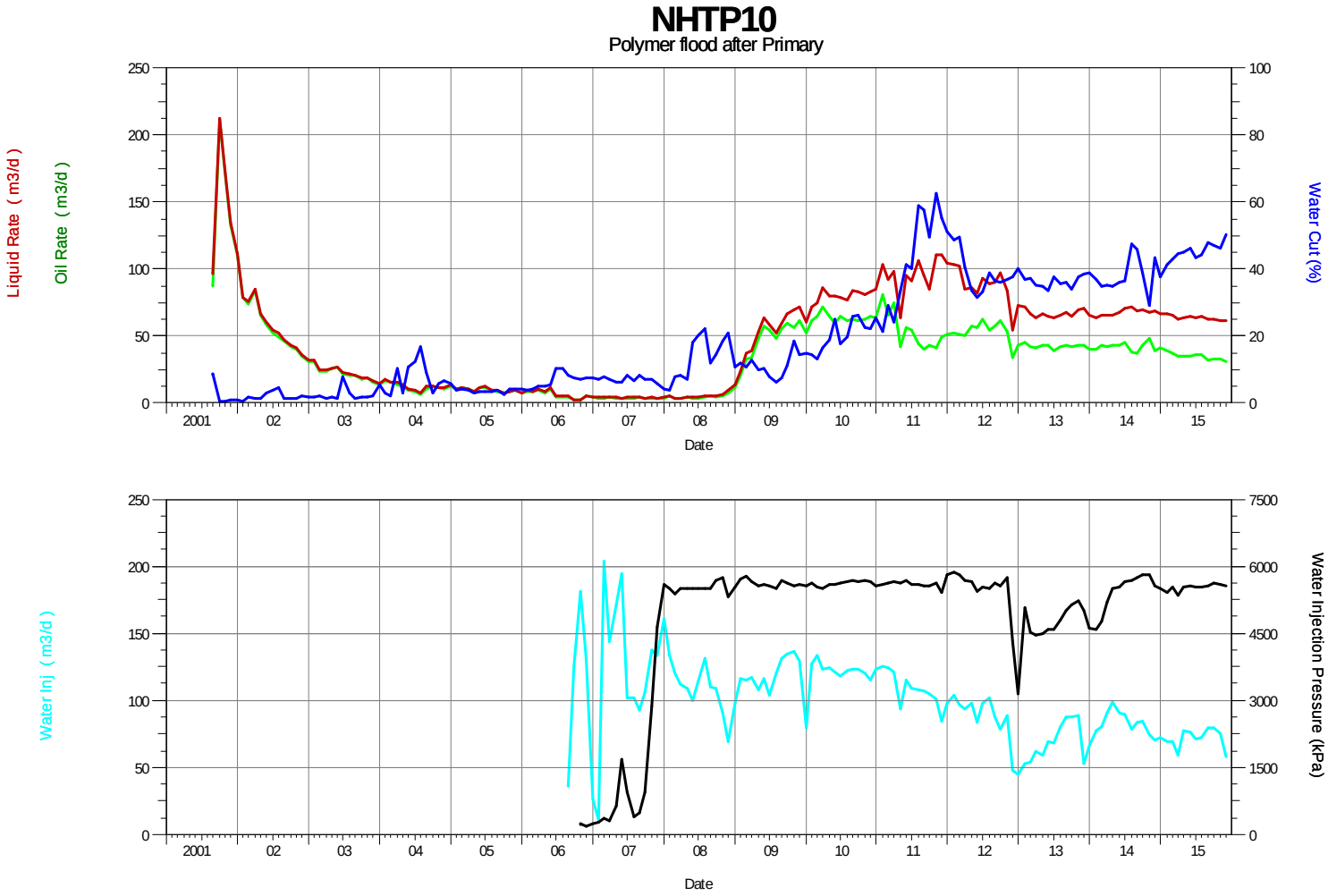
Producers:

- 102/01-02-082-23W4/0 (100%)
- 102/04-01-082-23W4/0 (50%)





Average Performance – NHTP10 (Approval 10423)



Below Average Performance – SB 26 (Approval 10423)

Canadian Natural

- **SB 26 103/10-24 Pattern**
  - **Well List and allocation factors:**

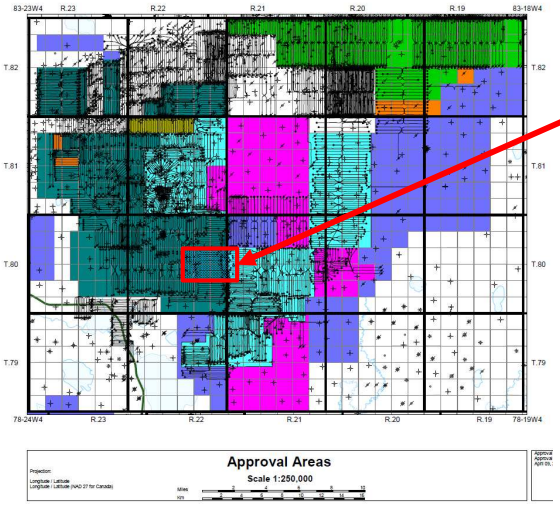
    Injector

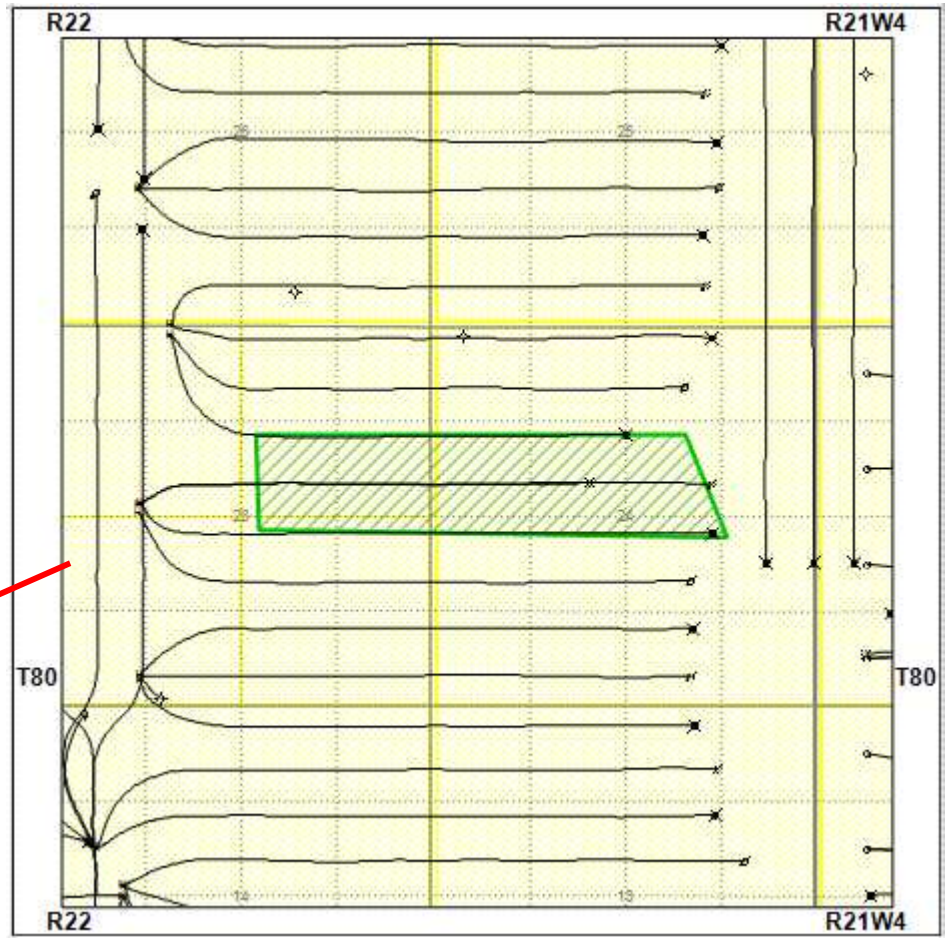
    ➢**103/10-24-080-22W4/2 (100%)**

    Producers

    ➢**102/11-24-080-22W4/0 (50%)**

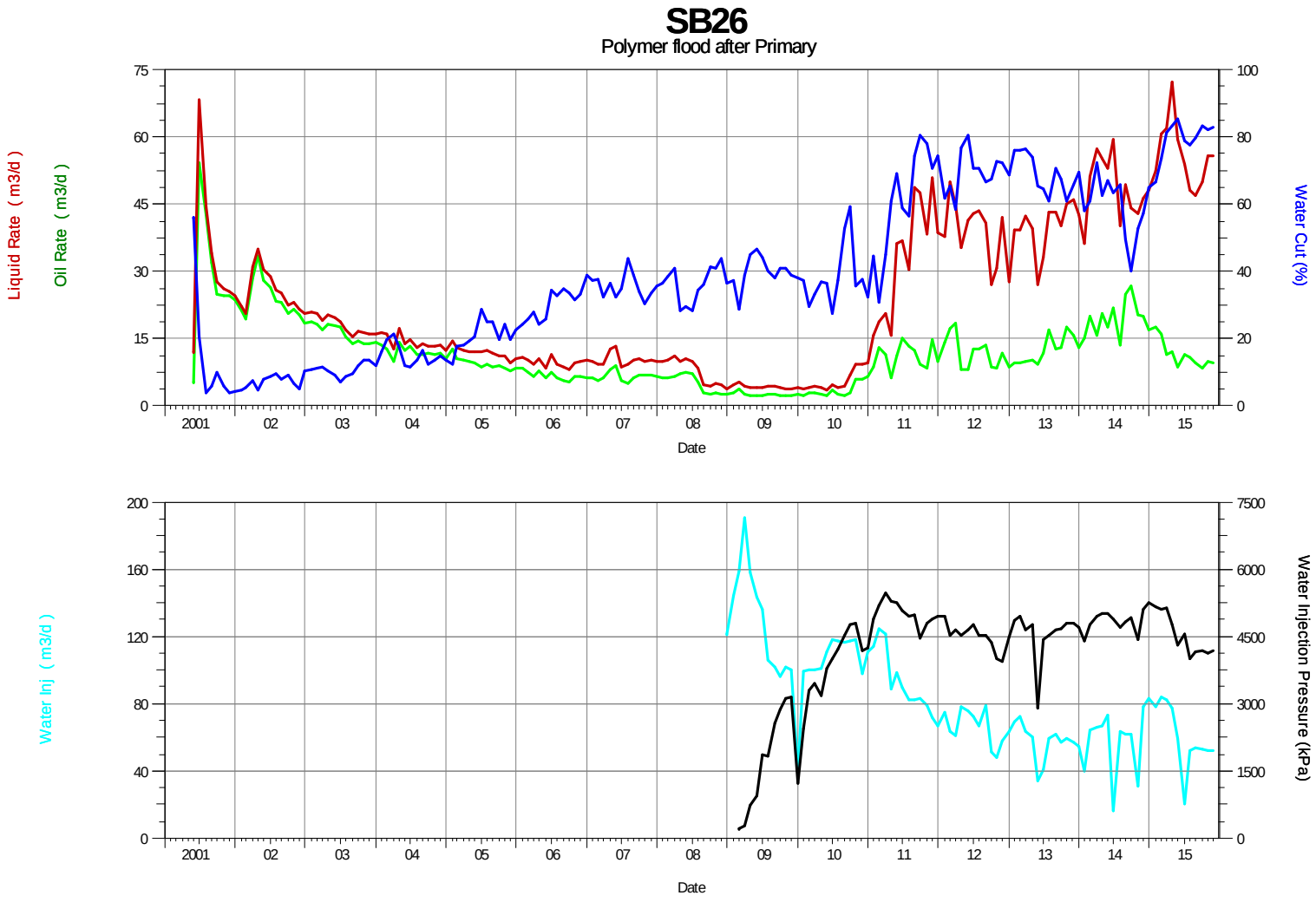
    ➢**104/07-24-080-22W4/0 (50%)**



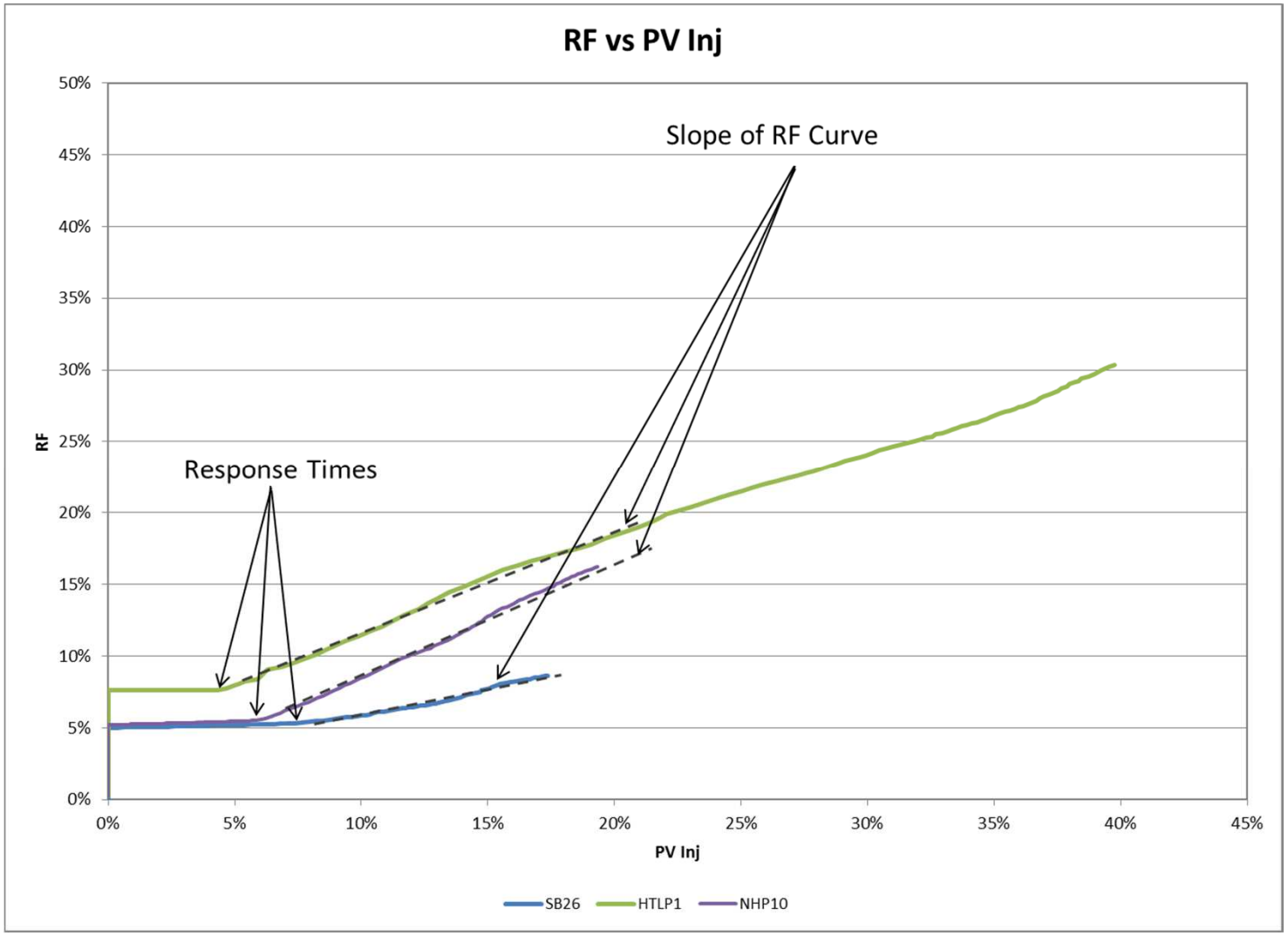


Below Average Performance – SB 26 (Approval 10423)

Canadian Natural



Summary of Good/Average/Poor Areas



Plot showing Recovery Factor (RF) versus Pore Volume (PF) Injected. Indicates effectiveness and performance of the flood.

Cap Rock Integrity

Cap Rock Integrity

Canadian Natural

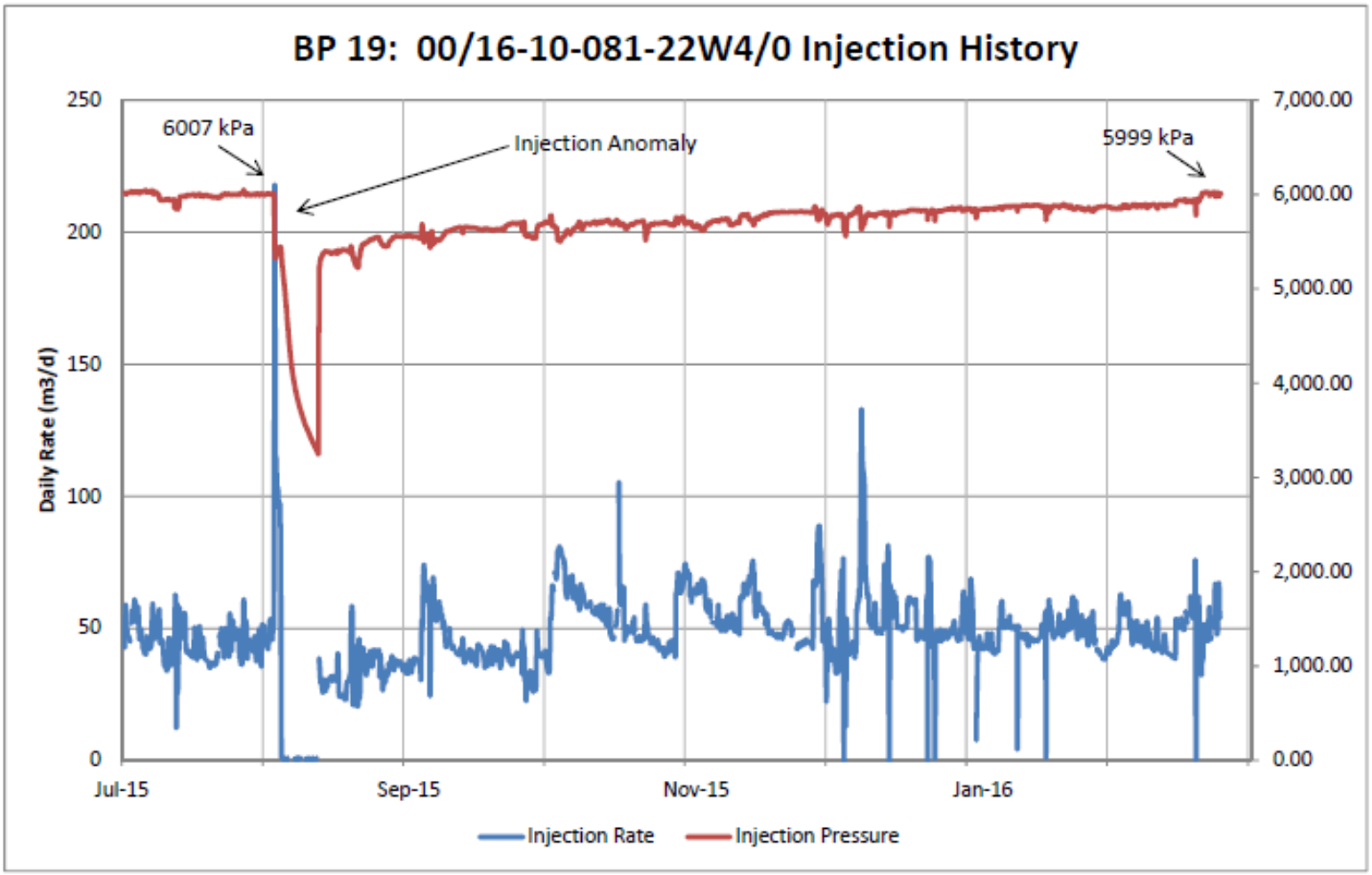
- **2015 Anomalies (5 in total):**

Date of Event	Location	Cause of Alarm	Operations Review of Injection Well	Initial Injection Pressure	Anomalous Pressure	Initial Injection Rate	Anomalous Rate	Cause of Anomaly
(MM/DD/YYYY)	(Pad Name and UWI)			(kPag)	(kPag)	(m3/d)	(m3/d)	
May 18, 2015	NBP 8 03/04-23-082-21W4/0	Drop in injection pressure/injection rate increase	Everything working operationally.	5300	4000	48	75	Flood accessing new higher permablility reservoir
August 2, 2015	BP 19 00/16-10-081-22W4/0	Drop in injection pressure/injection rate increase	Everything working operationally.	5999	5434	50	223	Flood accessing new higher permablility reservoir
August 21, 2015	NBP 8 03/04-23-082-21W4/0	Drop in injection pressure/injection rate increase	Everything working operationally.	5500	4211	55	108	Flood accessing new higer permablility reservoir
August 30, 2015	BP 18 00/01-15-081-22W4/0	Drop in injection pressure/injection rate increase	Everything working operationally.	5962	4980	34	165	Breakthrough to offsetting production wells
October 12, 2015	NBP 8 03/04-23-082-21W4/0	Drop in injection pressure/injection rate increase	Everything working operationally.	5479	4065	63	104	Flood accessing new higher permablility reservoir

- **7 anomalies in 2014, 4 anomalies in 2013, 9 anomalies in 2012; 18 anomalies in 2011**

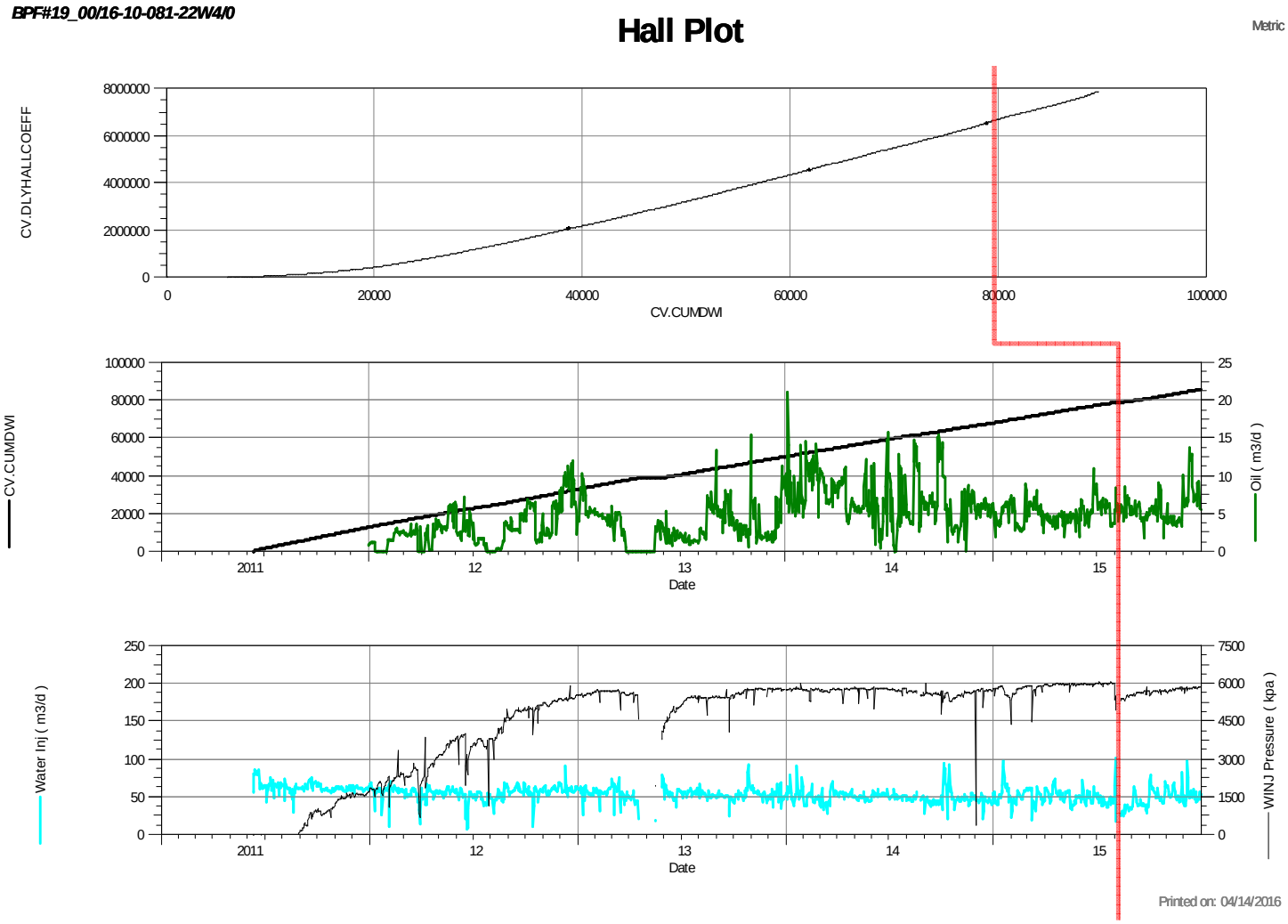
All five 2015 anomalies were fully investigated and reported. All injectors are back on-stream under normal operating conditions and have regained pressure following the event.

Cap Rock Integrity – BP19 100/16-10



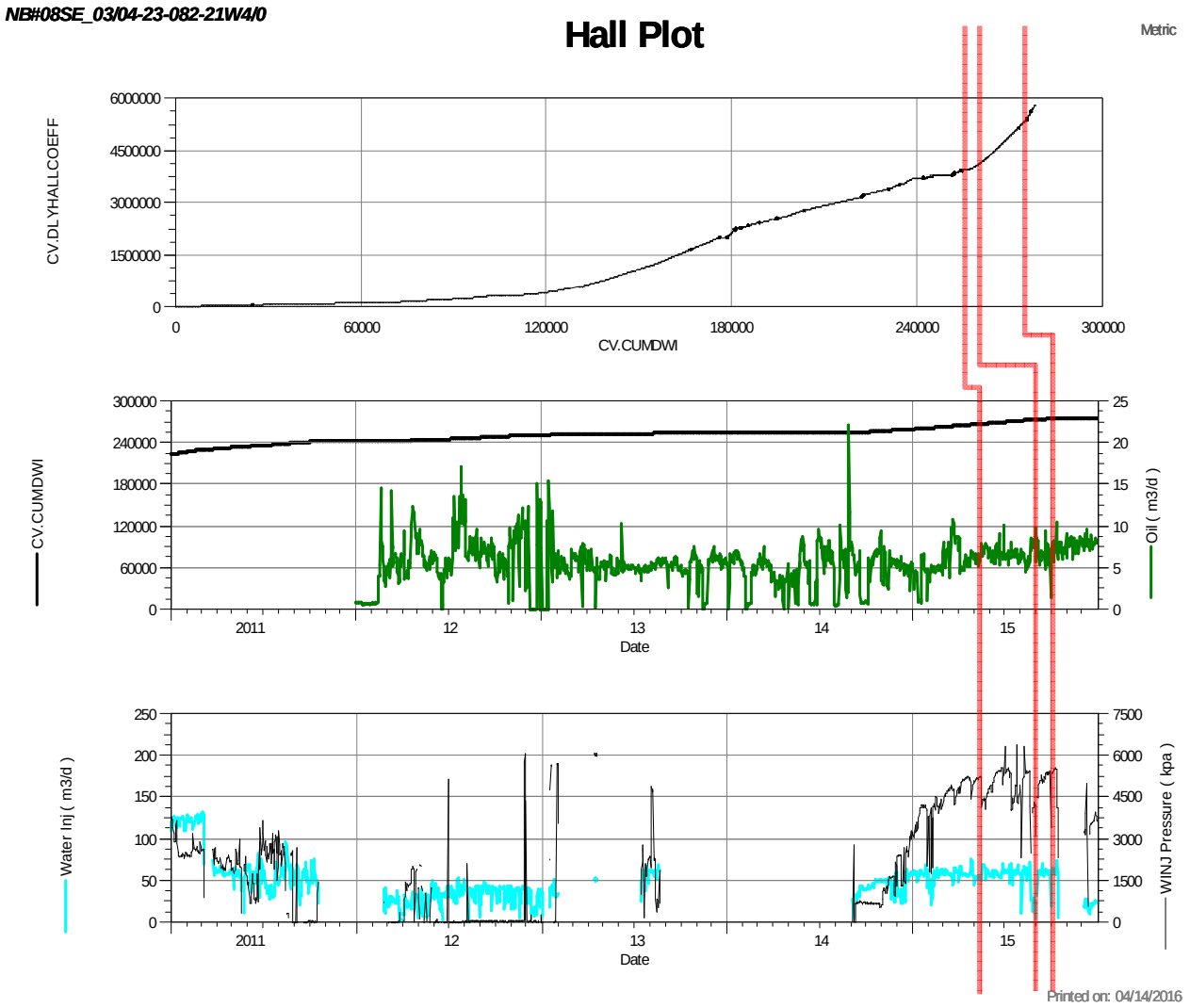
100/16-10-081-22W4/0: Well was shut in for 1 week as a precaution. Rates and pressures returned to normal upon restarting injection.

Cap Rock Integrity – BP19 – 100/16-10



Hall plots are reviewed regularly to investigate potential cap rock breaches. A sudden change in the Hall Plot slope may indicate a potential issue.

Hall Plot for NBP 8 03/04-23



103/04-23-082-21W4/0: 3 of the 5 events were at this well. The first event initiated a Hall plot slope change. At the same time, pattern fluid production increased and WCT decreased.

Future Development Plans

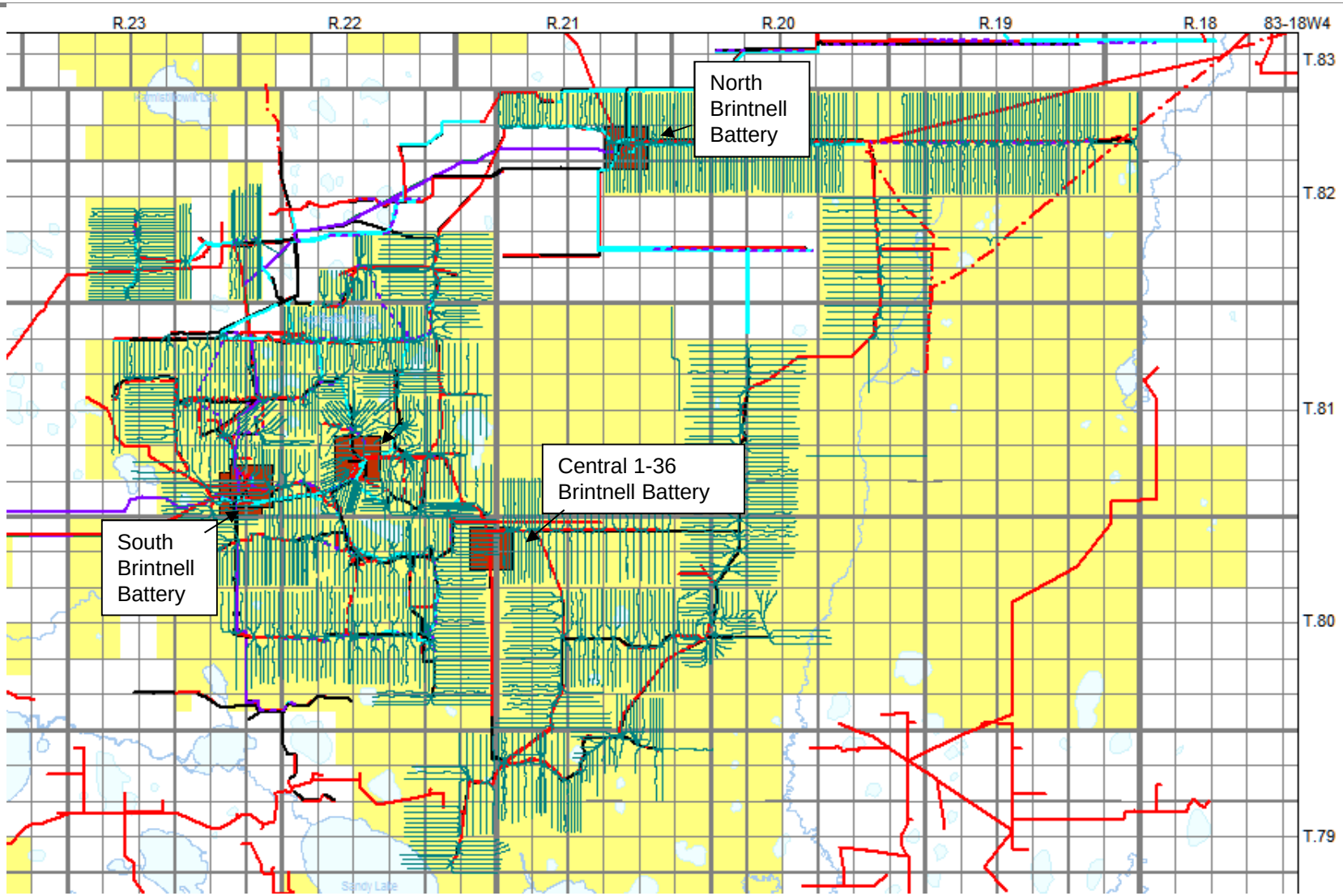
Future Development Plans

Canadian Natural

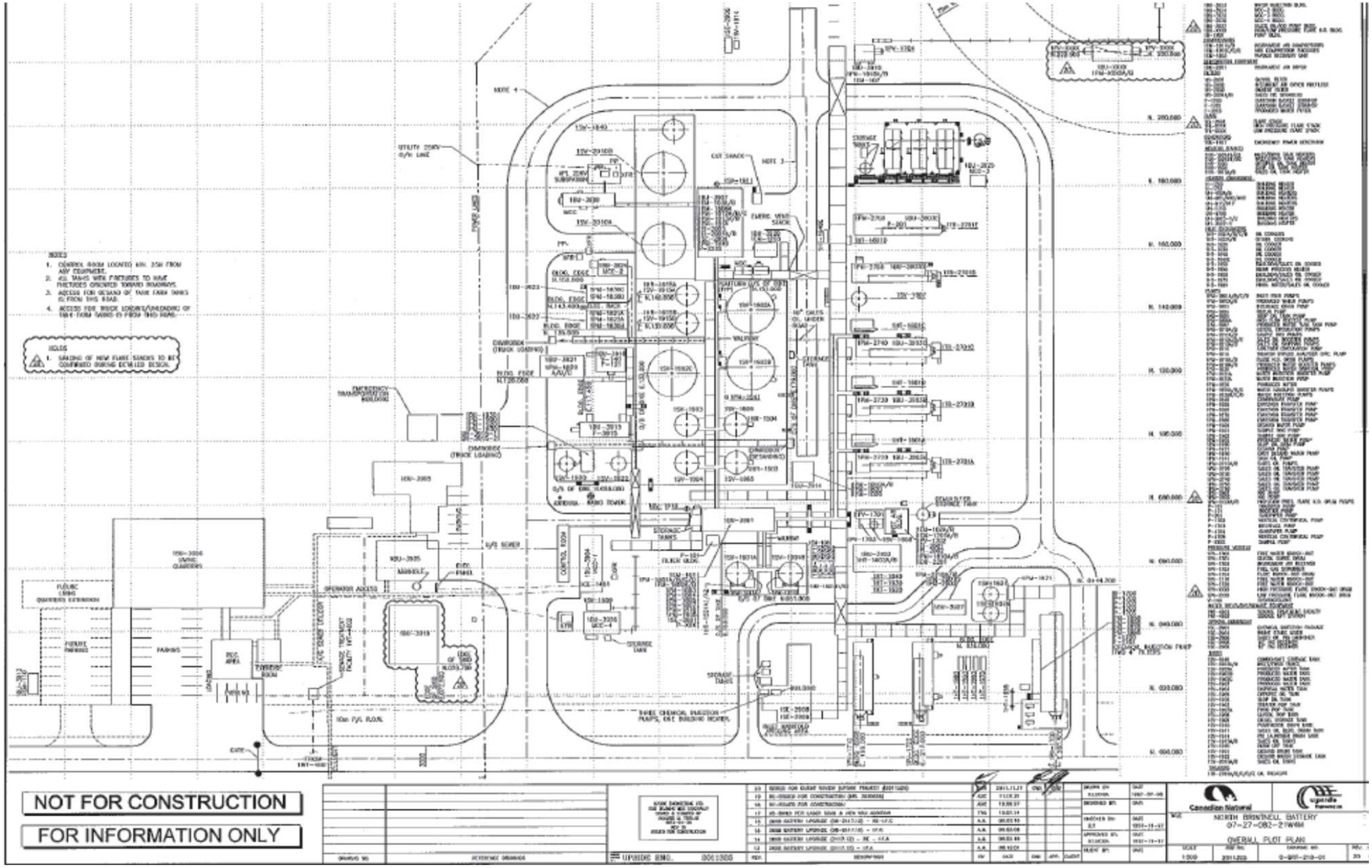
- Canadian Natural plans to continue with the expansion of the polymer flood at Brintnell over the next several years. Expansion will push the flood to the southeastern and western edges of the pool.
- The focus of this year's capital program will be optimization of the existing well patterns. No drilling is planned for 2016.
- CNRL received approval in 2012 to implement a surfactant pilot in the field. CNRL is not pursuing surfactant flooding at the present time.

Facilities

Brintnell Batteries

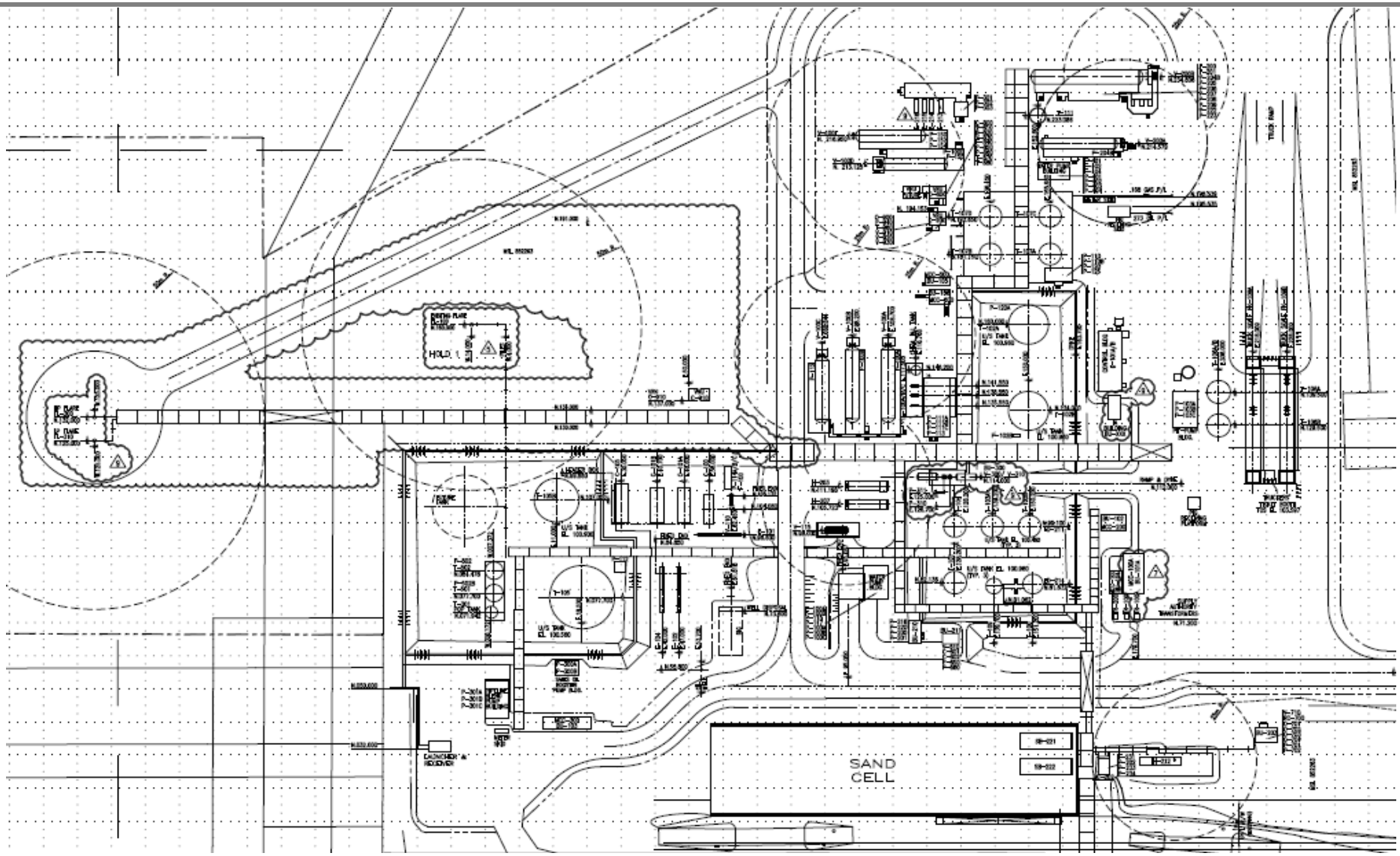


Facility: NB 07-27-82-21W4 Battery Plot Plan



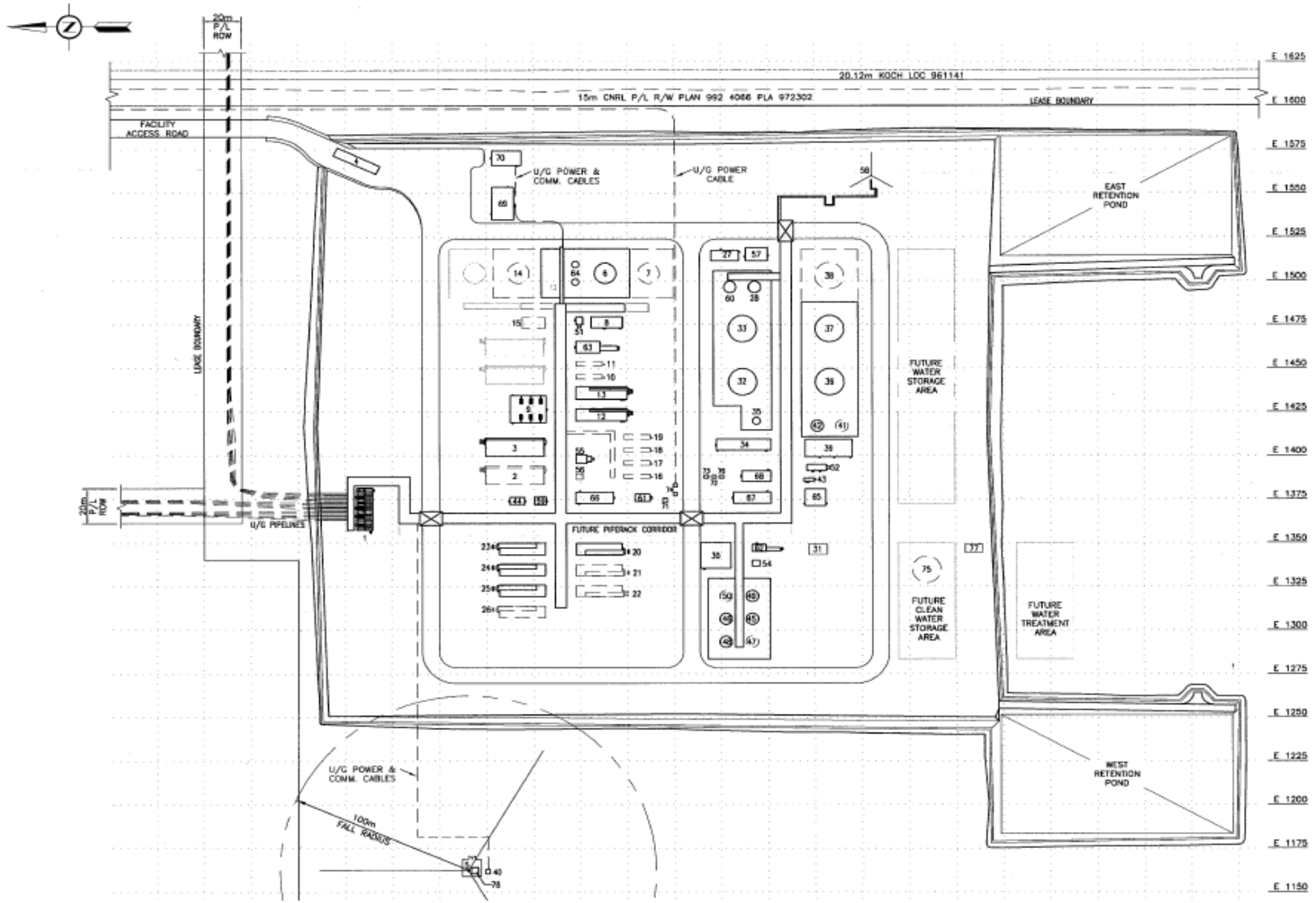
Refer to Appendix A

Facility: SB 09-02-81-23W4 Battery Plot Plan



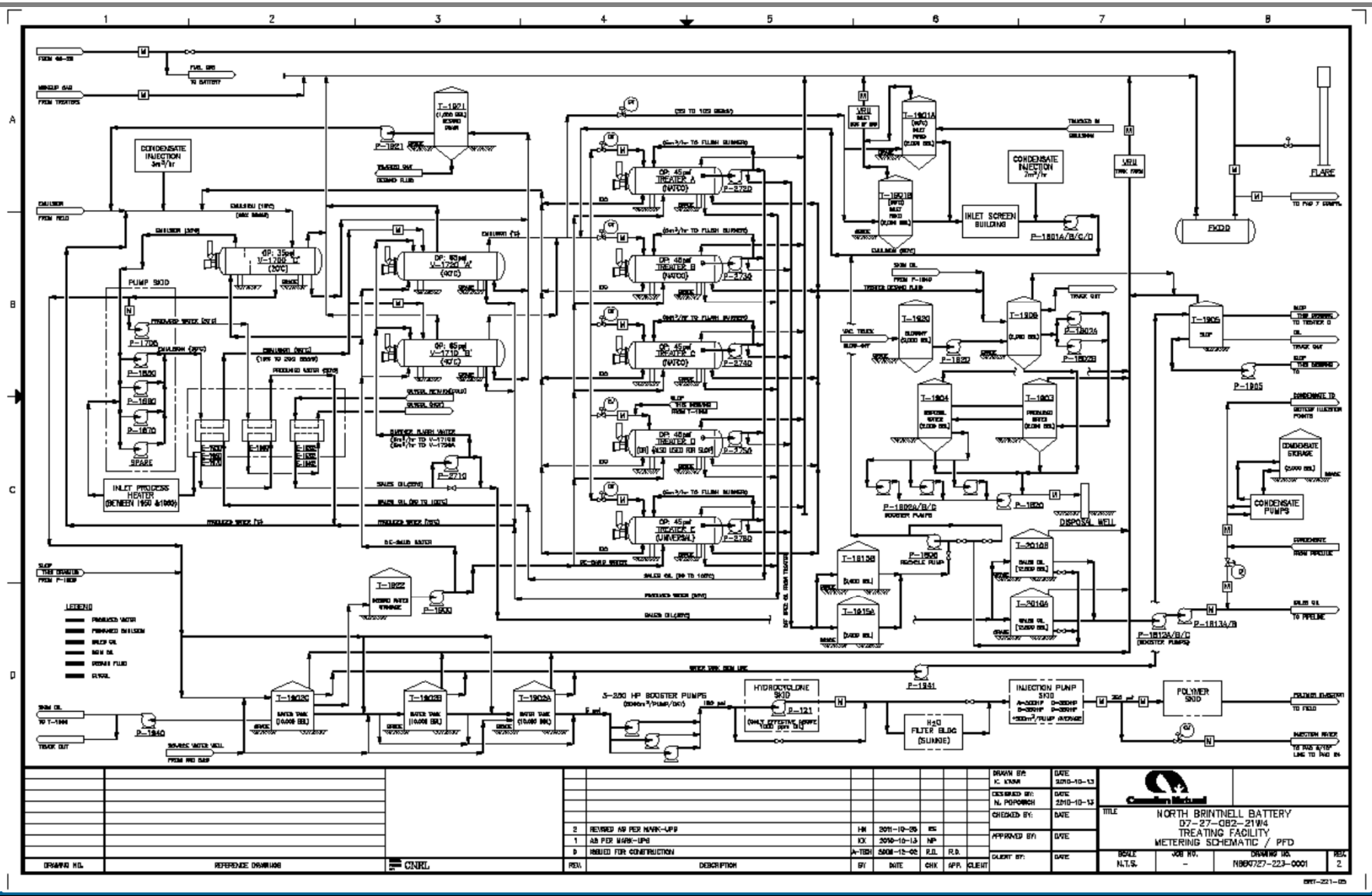
Refer to Appendix A

Facility: CB 01-36-80-22W4 Battery Plot Plan



Refer to Appendix A

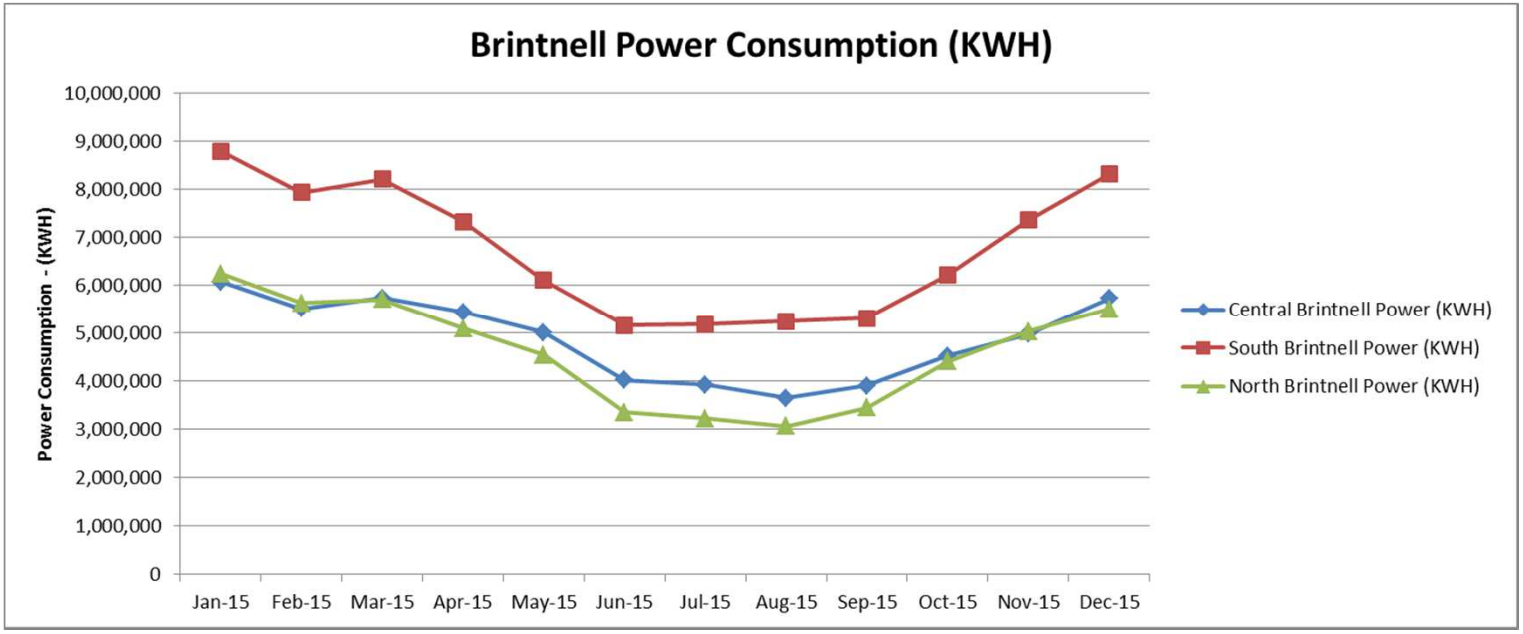
Facility: Typical Brintnell Battery PFD



Refer to Appendix B

Brintnell Power Consumption

Power Consumption - KWH													
	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	TOTAL
Central Brintnell	6,076,710	5,507,612	5,733,240	5,438,419	5,015,062	4,023,750	3,927,186	3,648,464	3,909,748	4,523,816	4,976,577	5,727,228	**58,507,813**
South Brintnell	8,795,731	7,933,840	8,207,432	7,328,913	6,106,494	5,165,585	5,186,158	5,246,982	5,311,794	6,214,601	7,366,027	8,314,751	**81,178,306**
North Brintnell	6,244,432	5,631,054	5,707,856	5,101,786	4,540,890	3,355,819	3,228,355	3,062,986	3,444,674	4,404,159	5,033,560	5,505,633	**55,261,203**
	21,116,873	**19,072,506**	**19,648,528**	**17,869,118**	**15,662,445**	**12,545,155**	**12,341,699**	**11,958,432**	**12,666,216**	**15,142,575**	**17,376,163**	**19,547,613**	**194,947,323**



Facility Modifications

Canadian Natural

- **Reasons for Modifications:**
  - **Oil Treating:**
    - Heat integration: Installing indirect heating projects to reduce OPEX. Currently investigating other opportunities.
    - Optimizing battery process
  - **Integrity:**
    - Implementing plan to rebuild existing flood areas; future flood areas to be rebuilt as the flood is expanded
    - Construction ongoing. Working towards 2017 compliance.
    - All high risk sour pipelines have been lined as of Feb, 2014
  - **Improve Water Quality:**
    - De-oiling and Filtration

Battery Performance

Canadian Natural

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
North Brintnell 7-27										
Oil Produced (m3)	705,917	809,627	959,335	988,448	957,855	835,263	1,075,836	1,027,258	937,154	900,340
Produced Water (m3)	1,374,731	1,775,300	2,096,258	2,292,879	2,386,085	1,484,277	1,795,440	1,567,398	1,772,860	1,618,804
Recycle Rates (m3)	1,220,482	1,779,160	2,057,161	2,238,740	2,330,418	1,453,371	1,786,316	1,559,325	1,772,860	1,618,804
Produce Recycle	88.8%	100.2%	98.1%	97.6%	97.7%	97.9%	**99.5%**	**99.5%**	**100.0%**	**100.0%**
Average Daily Recycle (m3/d)	3,344	4,874	5,621	6,134	6,385	3,982	4,881	4,272	4,857	4,435
Average Disposal Rates (m3/d)	423	-11	107	148	153	85	25	22	0	0
Central Brintnell 12-09										
Oil Produced (m3)	568,076	603,657	569,149	533,178	528,267	492,495	546,580	237,914		
Produced Water (m3)	167,755	193,349	267,607	378,988	323,086	402,772	402,822	143,284		
Recycle Rates (m3)	0	26,826	159,288	346,418	301,720	357,025	329,781	104,583		
Produce Recycle	0.0%	13.9%	59.5%	91.4%	93.4%	88.6%	81.9%	**73.0%**		
Average Daily Recycle (m3/d)	0	73	435	949	827	978	901	775		
Average Disposal Rates (m3/d)	460	456	296	89	59	125	200	106		
Central Brintnell 01-36										
Oil Produced (m3)								584,297	780,513	951,411
Produced Water (m3)								638,159	1,946,244	2,347,871
Recycle Rates (m3)								565,099	1,615,263	1,908,506
Produce Recycle								**88.6%**	**83.0%**	**81.3%**
Average Daily Recycle (m3/d)								2,457	4,425	5,229
Average Disposal Rates (m3/d)								318	907	1,204
South Brintnell 9-02										
Oil Produced (m3)	441,942	575,306	620,631	602,897	645,053	782,847	1,080,977	1,055,952	1,220,367	1,100,589
Produced Water (m3)	341,034	413,480	501,318	544,390	776,095	1,014,789	1,505,539	1,494,985	1,205,459	1,278,060
Recycle Rates (m3)	0	22,465	173,011	204,727	173,120	823,109	1,412,965	1,384,546	1,091,455	1,172,557
Produce Recycle	0.0%	5.4%	34.5%	37.6%	22.3%	81.1%	93.9%	**92.6%**	**90.5%**	**91.7%**
Average Daily Recycle (m3/d)	0	62	473	561	474	2,255	3,861	3,793	2,990	3,212
Average Disposal Rates (m3/d)	934	1,071	897	931	1,652	525	253	303	312	289
Total Volumes										
Oil Produced (m3)	1,715,934	1,988,589	2,149,115	2,124,523	2,131,175	2,110,605	2,703,393	2,905,421	2,938,034	2,952,339
Produced Water (m3)	1,883,520	2,382,129	2,865,183	3,216,258	3,485,267	2,901,838	3,703,800	3,843,826	4,924,563	5,244,736
Recycle Rates (m3)	1,220,482	1,828,451	2,389,460	2,789,885	2,805,257	2,633,505	3,529,061	3,613,553	4,479,577	4,699,867
Fresh Water (m3)	512,766	1,026,684	1,493,264	1,433,242	1,553,045	1,479,780	1,876,840	2,041,938	2,028,731	1,937,567
Brackish Water (m3) - Grosmont	1,438,110	1,661,989	764,664	2,963,684	3,999,848	6,274,361	4,780,011	3,800,437	3,666,120	3,133,047
Disposal Volume (m3)	663,038	553,678	475,723	426,373	680,010	268,333	174,739	222,200	464,554	544,868
Total Produce Recycle (%)	64.8%	76.8%	83.4%	86.7%	80.5%	90.8%	95.3%	**94.0%**	**91.0%**	**89.6%**
Average Daily Recycle (m3/d)	3,344	5,009	6,529	7,644	7,686	7,215	9,642	9,900	12,273	12,876
Average Daily Disposal (m3/d)	1,817	1,517	1,300	1,168	1,863	735	477	748	1,219	1,493

Battery converted to trucked in facility May 15, 2013

Battery Commissioned May 2013 - first oil May 15, 2013

Measuring and Reporting

Measurement and Reporting

Canadian Natural

- **Methods of Measurement:**
  - Oil and Water: flow meters and test tanks (Primary only)
  - Solution Gas: orifice meters/GOR Testing
- **Typical Well Testing:**
  - Frequency and duration: well testing as per Directive 17.
  - Meter installations have replaced test tanks (high volume and flood producers).
    - Part of all new pad expansions and rebuilds.
- **2015 Field Proration Factors:**
  - Meets directive 17 requirements (Oil: 0.859, Water: 1.13)

Measurement and Reporting – Continued

Canadian Natural

- **Optimization:**
  - Remove test tanks and install flow meters on pads/wells
    - Increase testing frequency and duration
    - Perform testing inline
    - Eliminates gas venting from tanks
    - Reduces fuel gas consumption
    - Reduces potential for spill
  - Standardize testing equipment across field
    - Reduce downtime and maintenance
    - Increase reliability in calibration
    - Improve & revise BS&W testing procedures for better accuracy

Brintnell Gas Volumes - Update

Canadian Natural

GAS VOLUMES (E3M3)	2015-01	2015-02	2015-03	2015-04	2015-05	2015-06	2015-07	2015-08	2015-09	2015-10	2015-11	2015-12	Grand Total
DISP	6,718	4,929	5,554	5,051	4,922	4,717	4,696	4,689	3,972	4,586	4,575	4,359	58,766
FLARE	102	133	94	81	93	86	121	108	140	77	98	128	1,260
FUEL	4,652	3,917	4,070	3,515	3,529	3,485	3,327	3,089	3,205	3,293	3,543	3,992	43,617
PROD	6,882	5,141	5,970	5,426	5,280	5,139	5,201	5,145	4,373	4,954	4,926	4,942	63,380
PURREC	254	208	203	163	111	77	96	100	90	67	90	75	1,534
REC	4,652	3,917	3,867	3,352	3,418	3,408	3,232	2,989	3,115	3,225	3,453	3,717	42,344
VENT	317	287	322	295	265	337	385	348	262	291	253	254	3,614

- Produced gas is captured, processed and used throughout the field as consumable fuel gas.
- Venting only occurs at the well leases when D-60 requirements have been approved by the AER.
- Year over year reductions in vented and flared gas volumes

Future Facility Plans

Facility Future Plans

- **Major Activities:**
  - Pad Rebuilds
  - Future Polymer Expansions
  - Water Management Plan

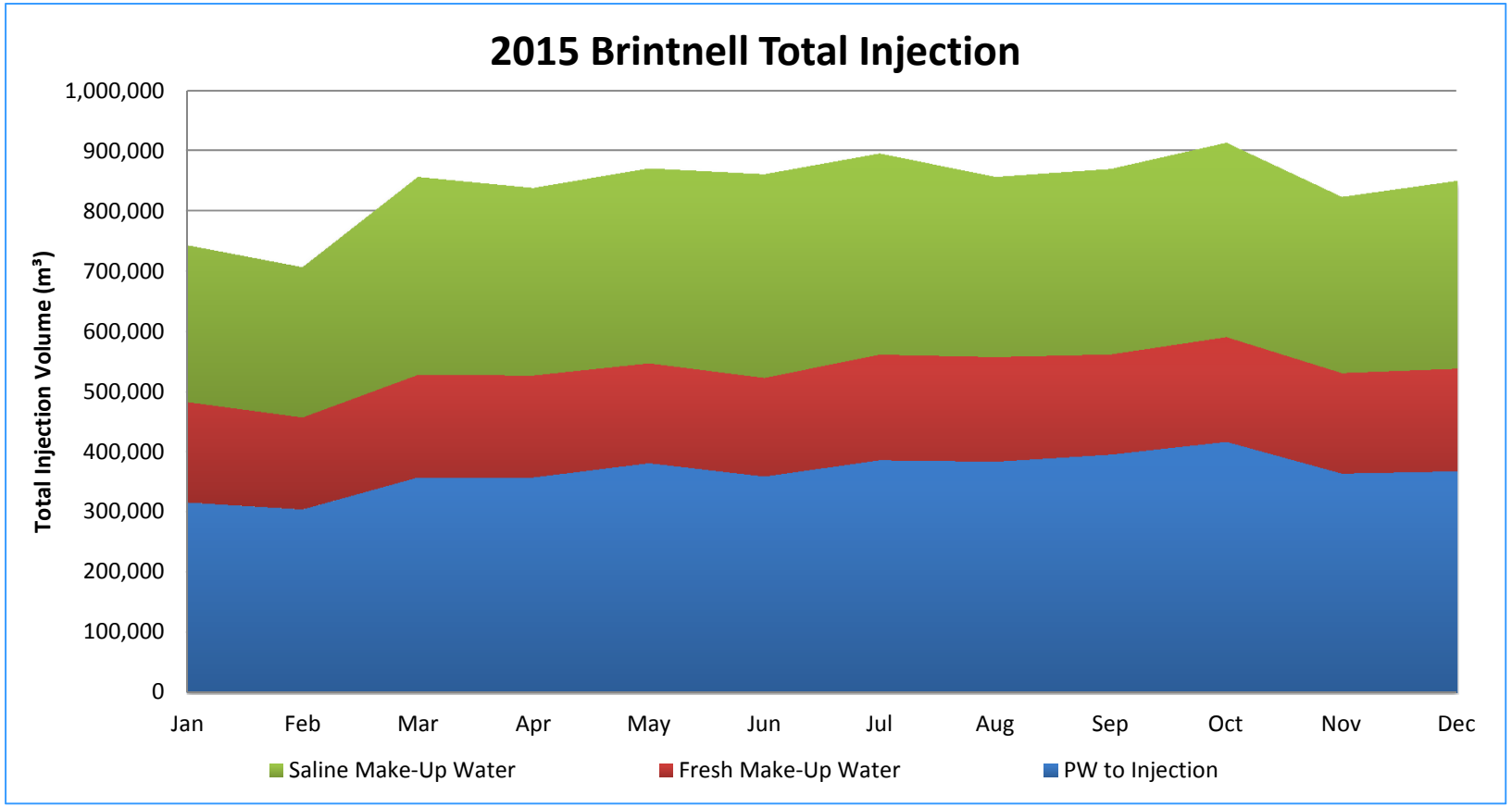
Water Use

Non-Saline Water Use

Canadian Natural

- Canadian Natural currently has license 00249595-00-00 with Alberta Energy Regulator for the annual diversion of up to 2,151,310 m3 of non-saline water for injection with an expiry date of 2019-01-25.
  - CNRL received a renewal of this license in early 2014.
- Canadian Natural has not increased the amount of licensed non-saline water since 2006, yet has significantly increased the amount of area under flood as seen in the polymer flood section of this presentation.
- Working to optimize the use of fresh water for polymer hydration to maximize its benefit
- Significant investment has been made in infrastructure and increased operating cost in order to continue to expand the polymer flood without the use of additional non-saline water to our current license.
- In Compliance with Alberta Environment and Water regarding monthly reporting, observation well monitoring, and all other terms of the License.

Brintnell Total Injection



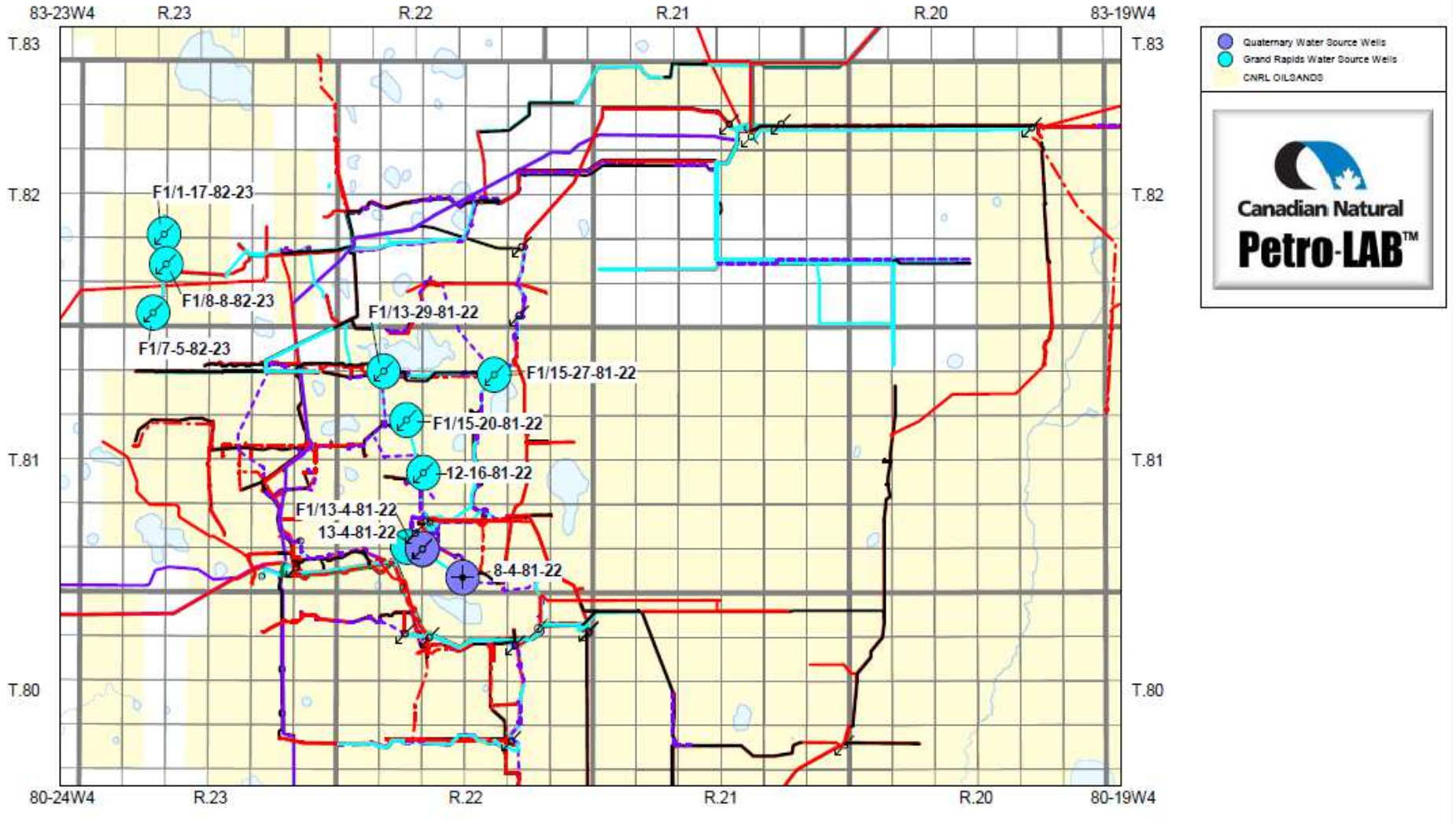
2015 Injection Water Summary

Canadian Natural

2015 Polymer Injection Volumes (m^3)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Produced Water to Injection	390,190	361,511	394,294	384,333	390,510	354,874	394,027	387,440	398,895	416,387	363,110	382,033
Fresh Make-Up Water	175,502	154,073	177,850	167,178	170,969	164,929	160,841	152,568	147,385	144,058	156,046	166,169
Saline Make-Up Water	307,716	271,327	298,900	291,836	289,709	237,233	248,732	278,302	266,916	242,341	212,603	187,433
Total	873,408	786,911	871,044	843,347	851,188	757,036	803,600	818,309	813,195	802,786	731,758	735,635

Total Injection Volumes (m^3)	2007		2008		2009		2010		2011		2012		2013		2014		2015	
Produced Water to Injection	2,382,129	47%	2,865,183	56%	3,216,258	42%	3,485,267	39%	2,901,838	27%	3,388,006	34%	3,522,671	38%	4,390,618	44%	4,617,604	48%
Fresh Make-Up Water	1,026,684	20%	1,493,264	29%	1,433,242	19%	1,553,045	17%	1,479,780	14%	1,876,840	19%	2,041,938	22%	2,028,731	20%	1,937,567	20%
Saline Make-Up Water	1,661,989	33%	764,664	15%	2,963,684	39%	3,999,848	44%	6,274,361	59%	4,780,011	48%	3,800,437	41%	3,666,120	36%	3,133,047	32%
Total	5,070,802		5,123,111		7,613,184		9,038,160		10,655,979		10,044,856		9,365,047		10,085,470		9,688,218	

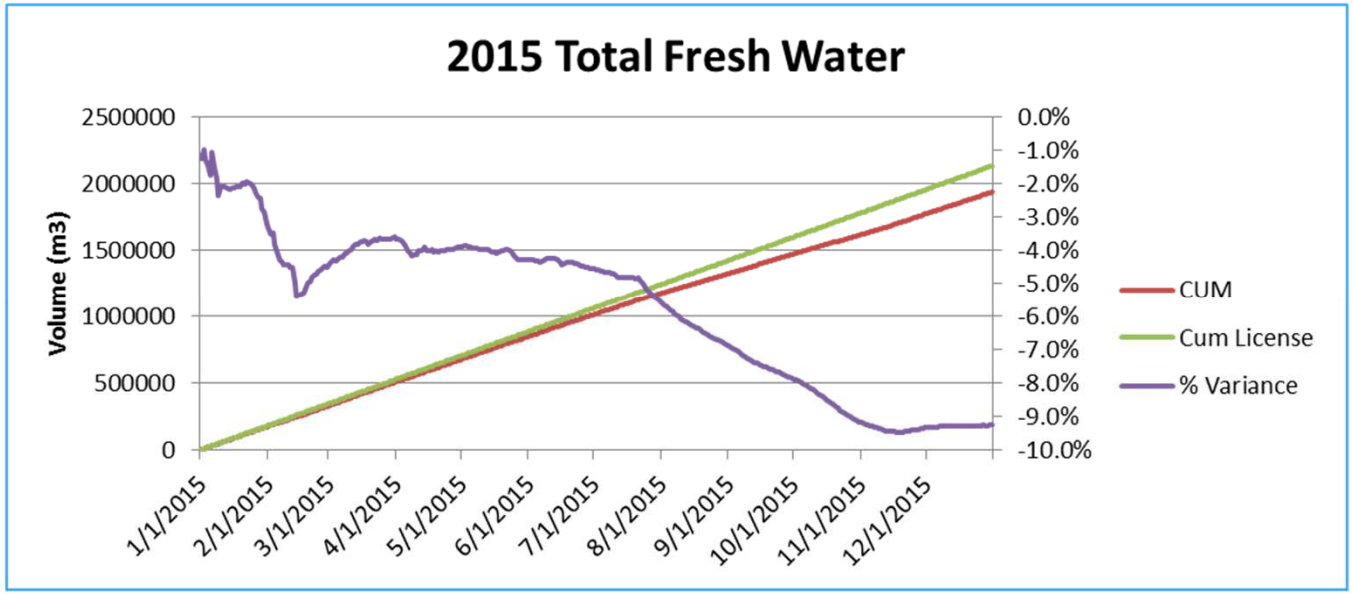
Non-Saline Well Locations



Non-Saline Water Make up Wells

Well Name	UWI	Production Interval	Maximum Rate of Diversion (m3/day)	Maximum Annual Diversion Volume (m3)	2015 Average Diversion Volumes (m3/day)
WSW BP25 - QUAT	100/08-04-081-22W4/00	53.3 - 65.2	818	247,470	447
WSW BP11 - QUAT	1F2/13-04-081-22W4/00	34.3 - 38.8	1,200	153,300	420
WSW BP2 - GR	1AA/12-16-081-22W4/02	270.6 - 317.6	1,200	1,750,540	874
WSW BP11 - GR	1F1/13-04-081-22W4/00	258.5 - 315.9	812		784
WSW HTP2 - GR	1F1/13-29-081-22W4/00	265.8 - 326.8	2,250		1,396
WSW HTP6 - GR	1F1/15-27-081-22W4/00	264.8 - 317.8	468		326
WSW NHTP16 - GR	1F1/01-17-082-23W4/00	253.0 - 310.0	933		521
WSW WBP30 - GR	100/15-20-081-22W4/00	260-315	750		196
WSW NHP 13 - GR	100/07-05-082-23W4/00	232-302	325		238
WSW HHP 15 - GR	100/08-08-082-23W4/00	243-305	225		107

1,620,965



Water Chemistry

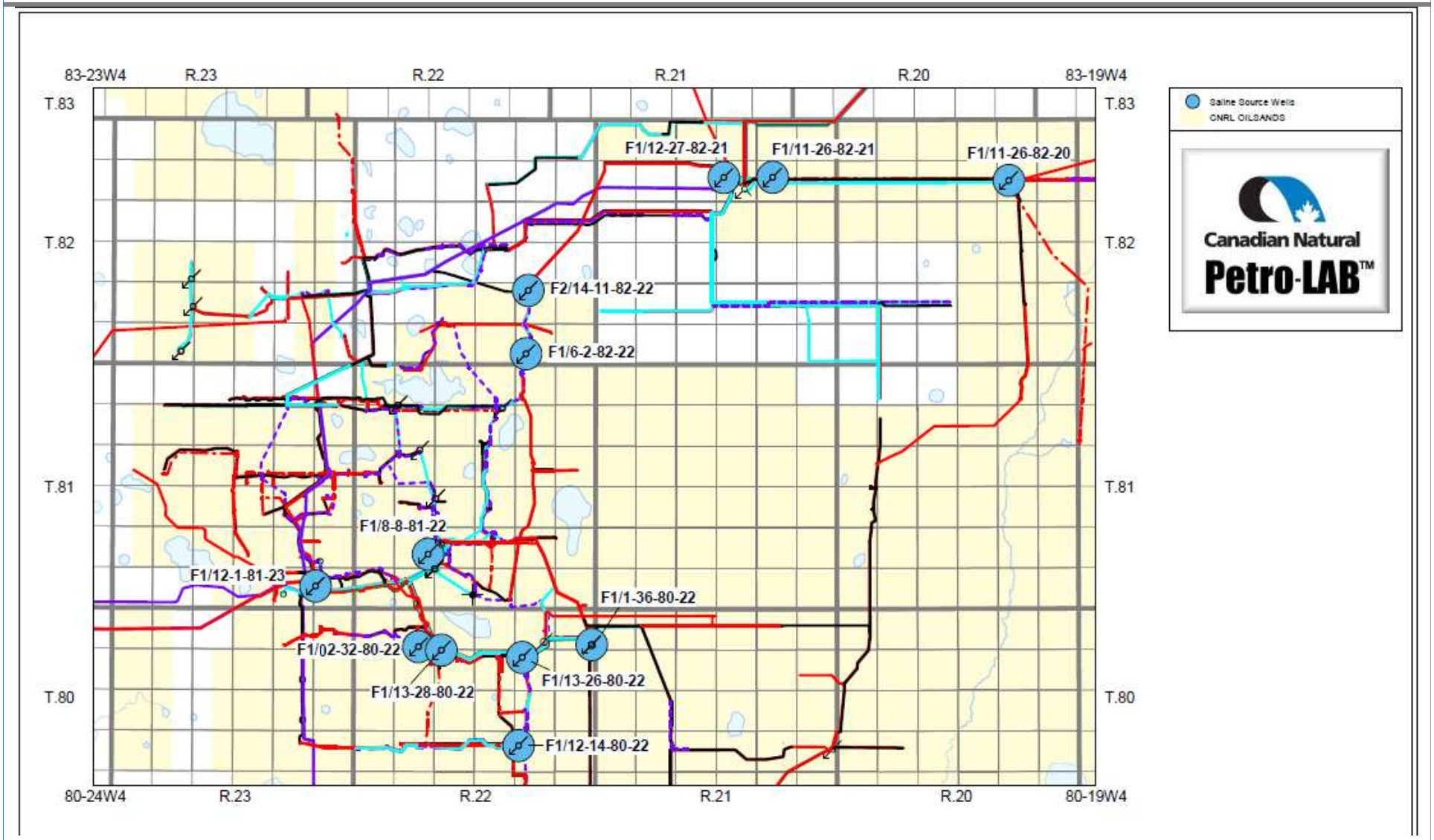
Canadian Natural

- **Non-Saline Water Source Wells**

Monitoring Well	Sample Date	Lab pH	Lab EC µS/cm	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	T-Alkalinity mg/L	HCO_3 mg/L	CO_3 mg/L	SO_4 mg/L	NO_2-N mg/L	NO_3-N mg/L	NO_2-N+NO_3-N mg/L	Hardness mg/L	TDS mg/L
WSW HTP 2 - GR	25-Jul-15	*8.95*	2600	2.05	1.41	*608*	3.64	82.6	1270	1340	104	<0.60	<0.020	<0.040	<0.045	10.9	*1460*
WSW HTP 6 - GR	25-Jul-15	*8.95*	2580	1.95	1.34	*602*	3.58	91.3	1250	1320	98.7	<0.60	<0.020	<0.040	<0.045	10.4	*1450*
WSW NHTP 13 - GR	26-Jul-15	*8.65*	2570	2.35	1.56	*603*	4.17	94.8	1260	1400	66.6	<0.60	<0.020	<0.040	<0.045	12.3	*1470*
WSW NHTP 15 - GR	26-Jul-15	*8.96*	2560	1.88	1.52	*610*	3.71	99.8	1230	1300	102	<0.60	<0.020	<0.040	<0.045	11	*1460*
WSW NHTP 16 - GR	26-Jul-15	*8.93*	2670	1.99	1.71	*637*	3.99	93.2	1350	1430	108	<1.5	<0.050	<0.10	<0.11	12	*1550*
WSW BP 2 - GR	25-Jul-15	*8.94*	2470	1.84	1.23	*609*	3.57	89	1210	1270	96.2	<0.60	<0.020	<0.040	<0.045	9.7	*1430*
WSW BP 11 - GR	25-Jul-15	*8.95*	2390	1.74	1.17	*595*	3.53	76	1210	1280	101	<0.60	<0.020	<0.040	<0.045	9.2	*1410*
WSW BP 11 - Quat	25-Jul-15	*8.54*	740	88	24.1	*53.8*	4.9	0.73	329	369	16.2	73.8	<0.010	0.062	0.062	319	*443*
WSW BP 25 - Quat	19-Jan-16	*7.59*	1600	129	39.4	*207*	6.32	1.52	487	594	<5.0	462	<0.010	<0.020	<0.050	484	*1140*
WB30 - GR	25-Jul-15	*9.01*	2610	2.22	1.37	*631*	3.74	98.3	1330	1380	116	<0.60	<0.020	<0.040	<0.045	11.2	*1540*

- **Saline Water Source Wells – Grosmont**
  - **Typical TDS range – 22,000-35,000 mg/L**

Saline Water Source Map



2015 Saline Water Source Well Diversion Volumes (m^3)

Canadian Natural

	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	TOTALS
1F1/01-36-080-22W4/00	99,770	92,695	99,908	94,693	89,170	81,814	76,562	70,972	70,626	69,962	51,497	52,844	**950,513**
1F1/02-32-080-22W4/00	61,678	46,702	54,733	61,923	64,750	49,930	65,685	56,327	57,540	50,085	48,387	44,639	**662,379**
1F1/08-08-081-22W4/00	22,742	25,600	6,237	20,369	38,953	23,337	23,884	44,409	26,431	13,401	6,429	4,004	**255,796**
1F1/11-26-082-21W4/00	44,798	39,551	30,754	31,971	24,223	0	36,351	30,233	42,887	35,813	23,663	30,322	**370,566**
1F1/12-01-081-23W400	20,497	9,486	39,779	37,288	12,321	14,749	4,409	11,126	6,008	10,630	17,266	0	**183,558**
1F1/13-26-080-22W4/00	45,196	0	2,529	13,993	53,711	16,069	37,942	60,360	35,126	33,118	0	21,439	**319,482**
1F1/13-28-080-22W4/00	13,035	57,293	64,960	31,599	6,581	51,335	3,899	4,875	28,298	29,333	65,361	34,185	**390,754**
1F1/12-14-080-22W4/00	-	-	-	-	-	-	-	-	-	-	-	-	-
1F1/11-26-082-20W4/00	-	-	-	-	-	-	-	-	-	-	-	-	-
1F1/12-27-082-21W4/00	-	-	-	-	-	-	-	-	-	-	-	-	-
1F1/06-02-082-22W4/00	-	-	-	-	-	-	-	-	-	-	-	-	-
1F2/14-11-082-22W4/00	-	-	-	-	-	-	-	-	-	-	-	-	-
	307,716	**271,327**	**298,900**	**291,836**	**289,709**	**237,233**	**248,732**	**278,302**	**266,916**	**242,341**	**212,603**	**187,433**	**3,133,047**

- Inactive wells above have been suspended and could be reactivated for future use.

Water Usage and Disposal

Canadian Natural

Total Water Volumes	2007	2008	2009	2010	2011	2012	2013	2014	2015
Produced Water (m3)	2,382,129	2,865,183	3,216,258	3,485,267	2,901,838	3,703,800	3,522,671	4,390,618	4,617,604
Fresh Water (m3)	1,026,684	1,493,264	1,433,242	1,553,045	1,479,780	1,876,840	2,041,938	2,028,731	1,937,567
Brackish Water (m3) - Grosmont	1,661,989	764,664	2,963,684	3,999,848	6,274,361	4,780,011	3,800,437	3,666,120	3,133,047
Disposal Volume (m3)	553,678	475,723	426,373	680,010	268,333	174,739	222,200	464,554	544,868
Total Produce Recycle (%)	76.80%	83.40%	86.70%	80.50%	90.80%	95.30%	94.00%	91.0%	**89.6%**
Average Daily Recycle (m3/d)	5,009	6,529	7,644	7,686	7,215	9,642	9,900	12,273	12,876

- **Continued to focus on maintaining high water recycling ratios.**
  - **2015 recycle at 89.6%.**
- **CNRL continues to be in compliance with AENV water diversion license.**
- **CNRL Disposal injection in compliance with Directive 51 Guidelines and Approvals.**

Pelican Lake Water Information

Canadian Natural

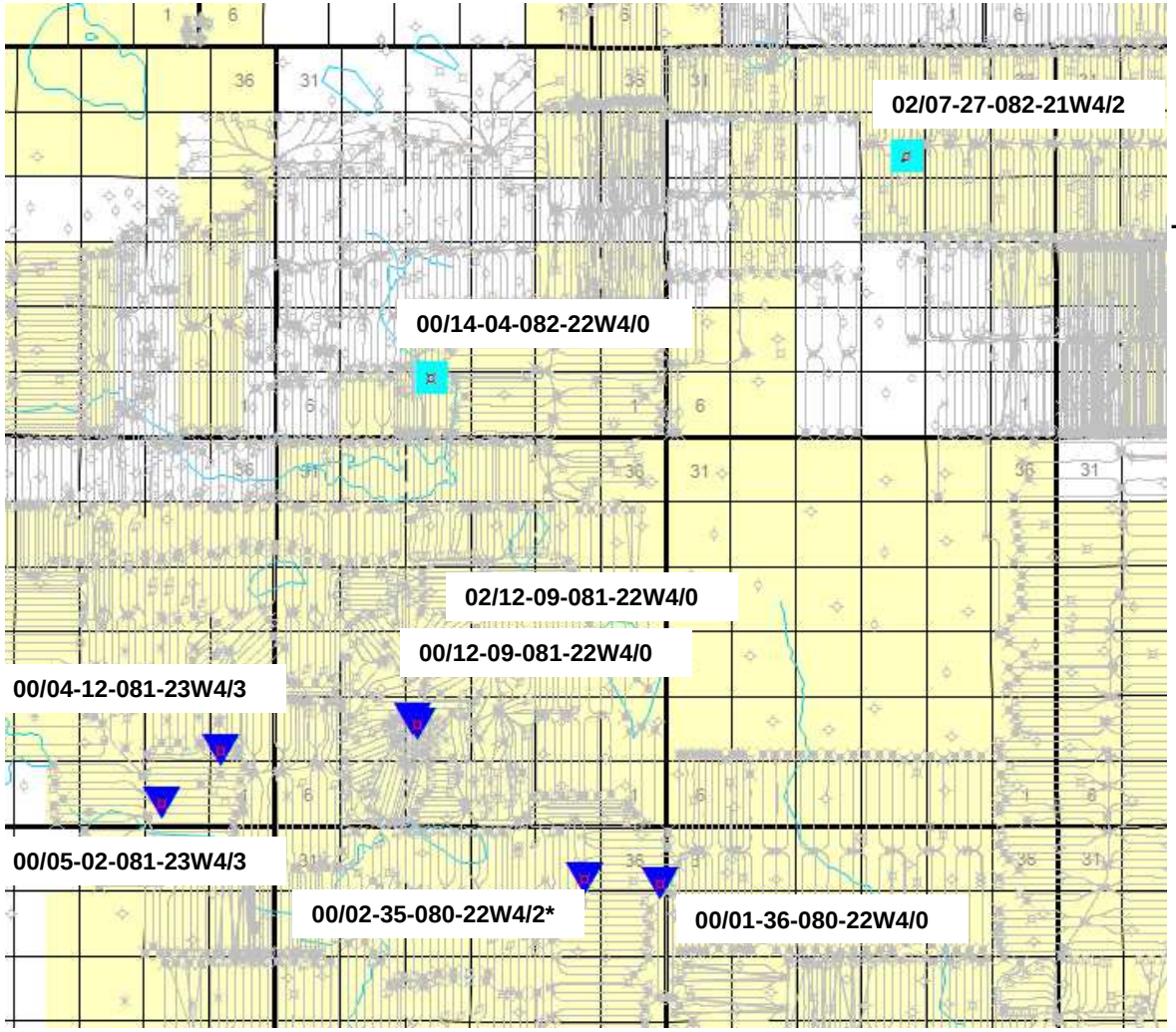
Pelican Lake Water Information												
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015		
Fresh Water (m3/day) - Quaternary and Grand Rapids	1405	2813	4091	3927	4255	4054	5142	5594	5558	5308		
Brackish Water (m3/day) - Grosmont	3940	4553	2095	8120	10958	17190	13096	10412	10044	8584		
Total Source Water (m3/day)	5345	7366	6186	12046	15213	21244	18238	16007	15602	13892		
Total Source Water per barrel of oil	1.1	1.4	1.1	2.1	2.6	3.7	3.0	2.3	2.0	1.7		
Brackish Water per barrel of oil	0.8	0.8	0.4	1.4	1.9	3.0	2.1	1.5	1.3	1.1		
Fresh Water per barrel of oil	0.3	0.5	0.7	0.7	0.7	0.7	0.8	0.8	0.7	0.7		
Produced Water Recycle (m3/day)	3344	5009	6546	7644	7686	7215	9669	9900	12273	12876		
Recycle Rates	64.8%	76.8%	83.4%	86.7%	80.5%	90.8%	95.3%	94.0%	91.0%	89.6%		
Oil Produced (bbl/day)	29570	34269	37035	36612	36726	36372	38656	42934	50194	50877		
Pelican Lake Water Information 2015 Monthly												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fresh Water (m3/day) - Quaternary and Grand Rapids	5,754	5,052	5,831	5,481	5,606	5,408	5,273	5,002	4,832	4,723	5,116	5,448
Brackish Water (m3/day) - Grosmont	10,089	8,896	9,800	9,568	9,499	7,778	8,155	9,125	8,751	7,946	6,971	6,145
Total Makeup Water (m3/day)	15,843	13,948	15,631	15,050	15,104	13,186	13,429	14,127	13,584	12,669	12,087	11,594
Total Makeup Water per barrel of oil	1.9	1.8	1.9	1.8	1.8	1.6	1.6	1.7	1.7	1.6	1.6	1.5
Brackish Water per barrel of oil	1.2	1.2	1.2	1.2	1.1	1.0	1.0	1.1	1.1	1.0	0.9	0.8
Fresh Water per barrel of oil	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.7
Produced Water Recylce (m3/day)	13026	12059	13307	12815	13001	11937	13289	12931	13303	13977	12145	12811
Recycle Rates	92.74%	93.13%	91.67%	87.33%	86.03%	86.04%	89.19%	88.96%	90.86%	91.62%	89.76%	88.41%
Oil Produced (bbl/day)	51,314	47,485	51,751	51,668	52,504	50,567	52,358	52,662	49,623	50,731	48,562	49,634

Pelican Water Management Plan

Canadian Natural

- Striving to improve field performance by increasing throughput through injectivity improvements
- Optimize polymer loading with the use of existing fresh water volumes
- Additional water treatment processes previously piloted but not implemented – economics and operating limitations posed challenges
- 2015 – Small water treatment pilot to investigate new technologies to improve produced water quality
- Additional Grosmont Source/Disposal options are being investigated as we plan the long-term Water Sourcing options.

Water and Oilfield Disposal Map



8898D

00/12-09-081-22W4/0 Nisku
02/12-09-081-22W4/0 Grosmont
00/05-02-081-23W4/3 Nisku
00/04-12-081-23W4/3 Nisku
00/01-36-080-22W4/0 Nisku
00/02-35-080-22W4/2* Nisku
*(*amendment underway)*

8309C

00/14-04-082-22W4/0 Nisku**
*(**to be amended)*
02/07-27-082-21W4/2 Grosmont

Abandoned Disposal wells

00/05-02-081-23W4/2 Grosmont
02/09-02-081-23W4/0 Nisku
00/13-01-081-23W4/2 Nisku

Approval 8309C

Approval 8898D

CNRL Brintnell Disposal Wells

Canadian Natural

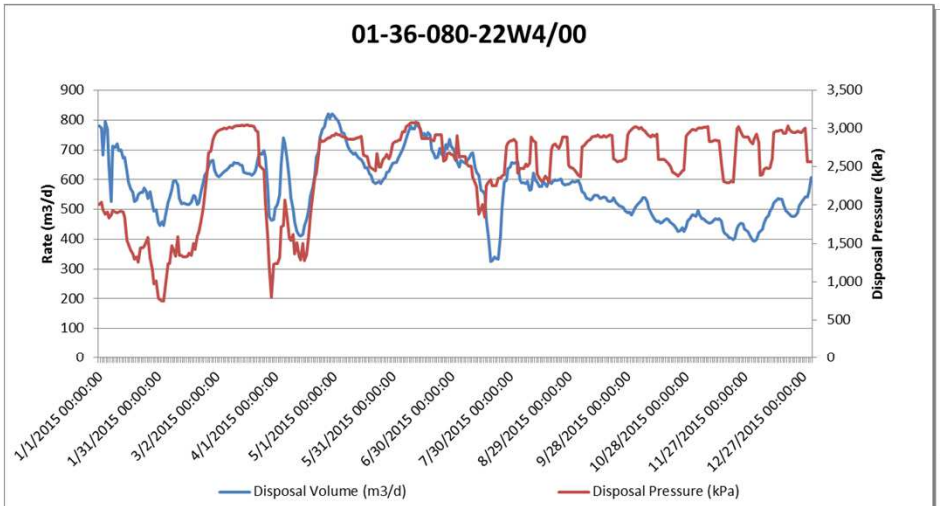
TABLE 1
APPROVAL NO. 8898D

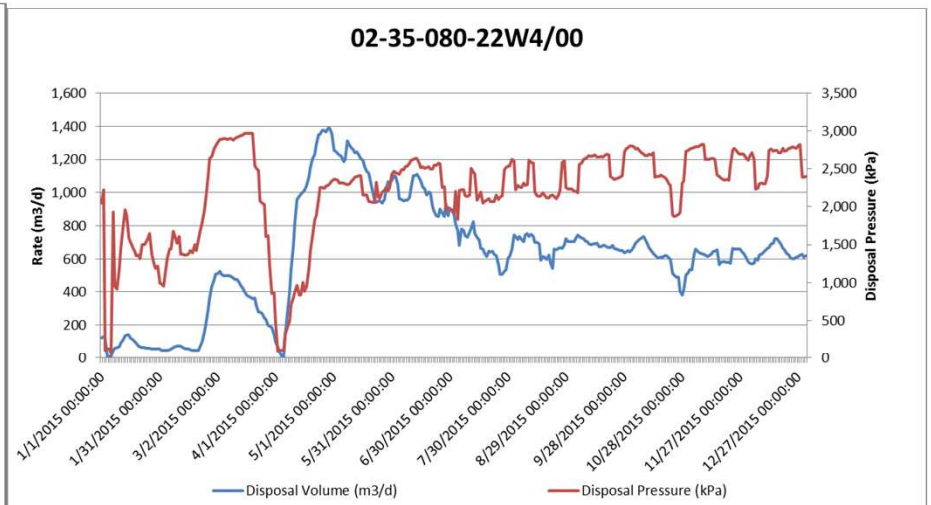
1	2	3	4	5	6
Unique Well Identifiers (*Directive 051* satisfied)	Unique Well Identifiers (*Directive 051* not satisfied)	Disposal Zone	Top of Injection Interval (Measured depth - metres KB)	Depth of Production Packer (Measured depth - metres KB)	Maximum Wellhead Injection Pressure (kilopascals gauge)
00/12-09-081-22W4/0		Nisku	487.5	478.9	6000
02/12-09-081-22W4/0		Grosmont	536.0	526.7	4325
† 00/05-02-081-23W4/3		Nisku	513.0	508.2	3300
00/04-12-081-23W4/3		Nisku	508.0	506.0	3450
† 00/02-35-080-22W4/2 *		Nisku	487.0[1]	480.0	3200
00/01-36-080-22W4/0		Nisku	458.1[1]	454.0	3200

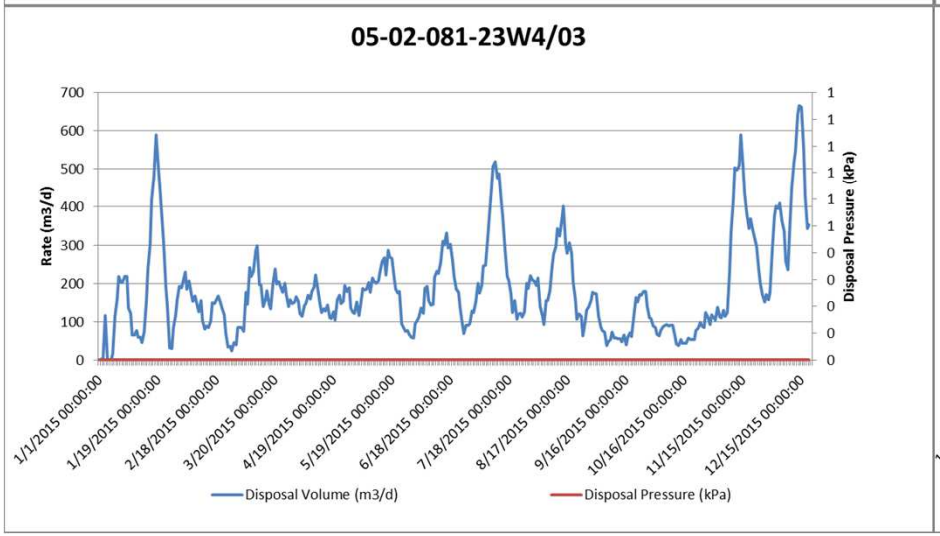
***00/02-35-080-22W4/2**

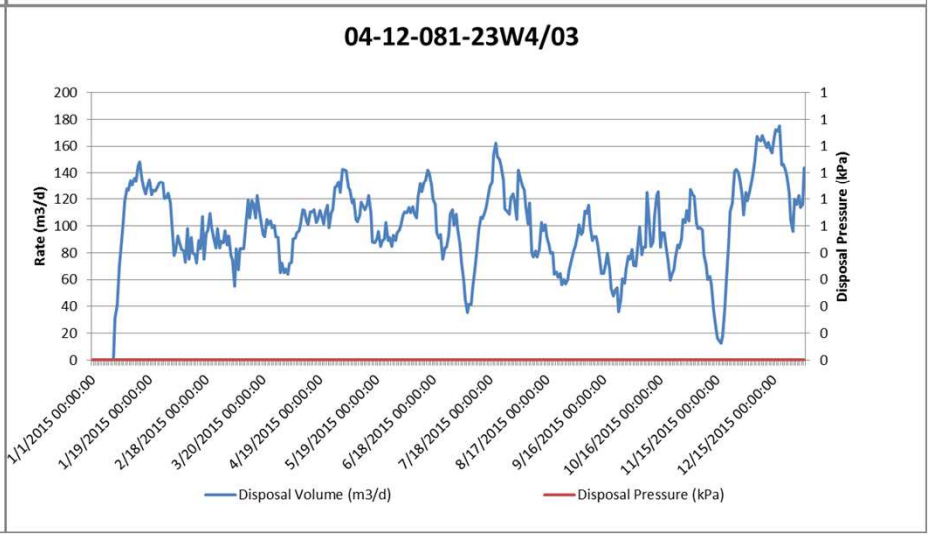
- **re-perfed and acidized within the Nisku, March 28-April 4, 2015, to optimize disposal capacity**
- **D65 application has been approved and processed by the AER**

Disposal Well Data









AER Compliance

Hydrogen Sulphide

Canadian Natural

- Souring of production to occur over time, Engineering and Construction, has and will continue to ensure compliance across the entire Field to handle sour production (<1% H2S).
- H2S produced at padsites and batteries is expected to be in low concentration and volume.
- CNRL collects solution gas at batteries and wellsites in a common solution gas gathering system.
- Gas to be sweetened in field and at major facility sites (emulsion batteries, compressor station).

AER Compliance

Canadian Natural

- **CNRL continues to work with AER regarding injection well integrity:**
  - **Formation/hydraulic isolation**
  - **Cement bond**
  - **Casing corrosion**
- **Process of upgrading existing wellsite facilities to meet current regulations and codes for the expected service (higher WCT, higher TDS, less than 1% H2S). Timeline to be completed over next 2-3 years throughout field (existing facilities met regulations at time of original construction).**
  - **Priority on areas where we have seen corrosion through inspections, and areas with high water cut**

AER Compliance

Canadian Natural

- Canadian Natural Resources is not aware of any outstanding compliance issues regarding the current approvals.
- CNRL currently in compliance with other regulatory bodies (AER, AENV).
- Reclamation programs: Well and Pipeline abandonments as required by Directives 65 and 13.
- Inactive wells: currently compliant.
  - Long Term Inactives.
  - Review future flood areas to properly downhole suspend/abandon wells within a reasonable time of start of injection (some wells to be completed for flood monitoring).

Outstanding Applications

- **No outstanding applications**

Conclusion

Canadian Natural

- Canadian Natural continues to be committed to maximizing the value of the resource for the both itself and the Province of Alberta through it's Royalty Interest
  - 2015 – Record production year from Pelican Lake
- Results from the polymer flood continue to be encouraging
  - Continuing to evaluate the impacts of oil viscosity and water production on the ultimate performance and recovery under polymer flooding
- CNRL continues to optimize the operation of the flood and expand to new, more challenging areas
- CNRL is working on an injection plan to maximize field throughput and thus ultimate recovery of the field. Several options are being investigated over the next several years.
- Compliance with all AER regulations, including cap rock integrity monitoring, and communication with the AER remains a top priority for CNRL.

THE FUTURE CLEARLY DEFINED

Premium Value I Defined Growth I Independent

Canadian Natural