Annual Performance Review of In Situ Oil Sands Scheme Approval 9404W

Pelican Lake Asset Team
Conventional Oil & Gas
Cenovus Energy

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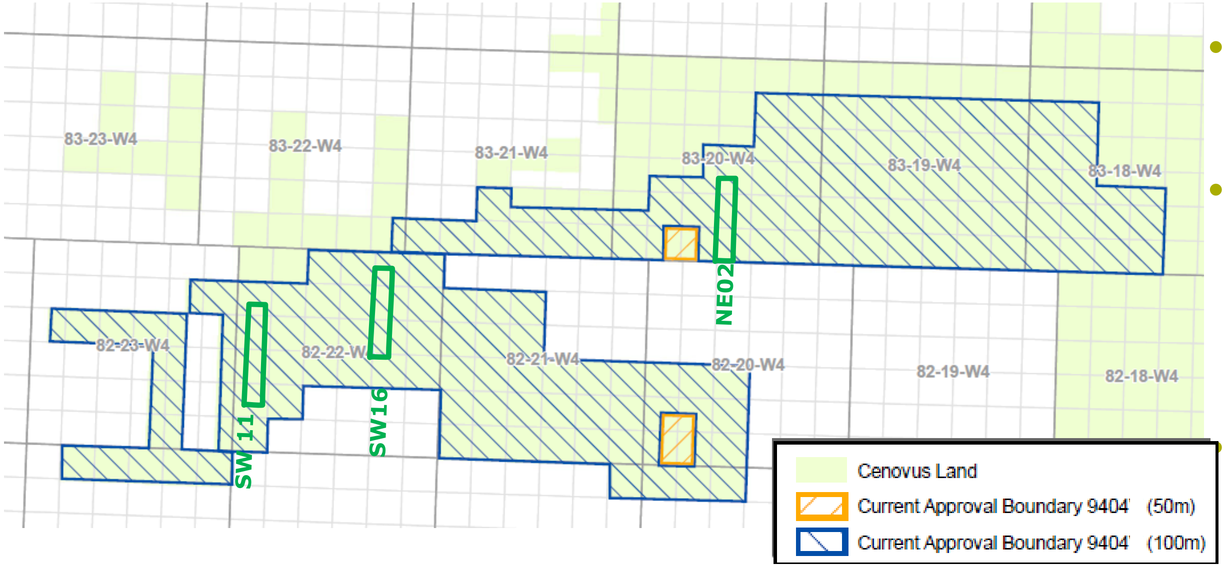
Agenda

- Introductions
- Current Approval
- Geological Overview
- Scheme Performance Update
- Simulation Update
- Hot Water Injection Update
- Cap Rock Integrity & Monitoring Program
- Water Usage Update
- Facilities Update
- 2015/2016 Development Activities
- AER Regulatory Discussion & Key Learnings

Current Approval and Enhanced Oil Recovery (EOR) Scheme Area

Approval 9404W – Current EOR Scheme Area



Interwell spacing distance is from producer to producer

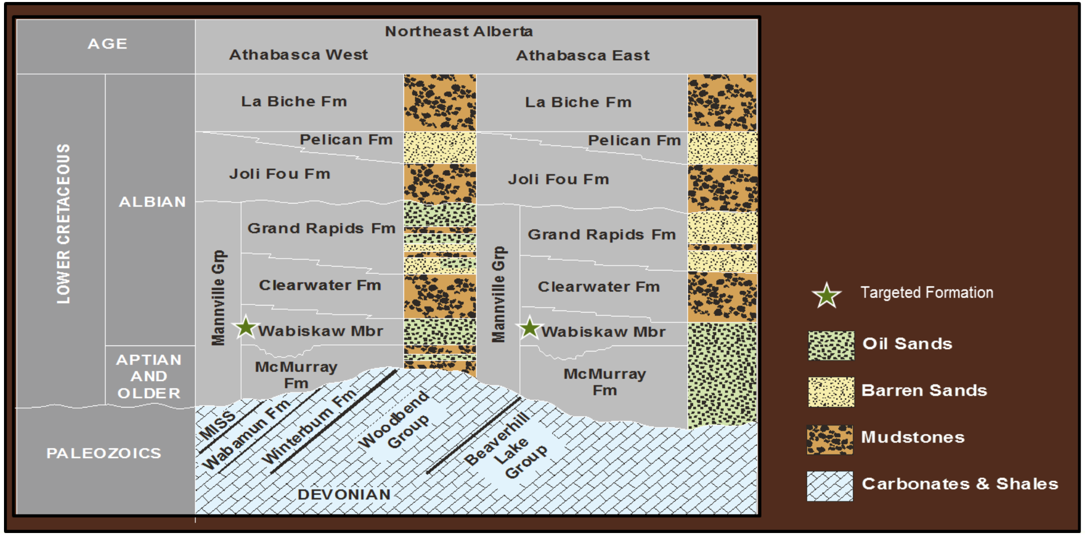
- 9404W was originally approved in April 2014
- No near term requirements to expand beyond existing boundaries and spacing
- Pads shown in green are performance examples shown later in presentation

Geological Overview

Geologic Review

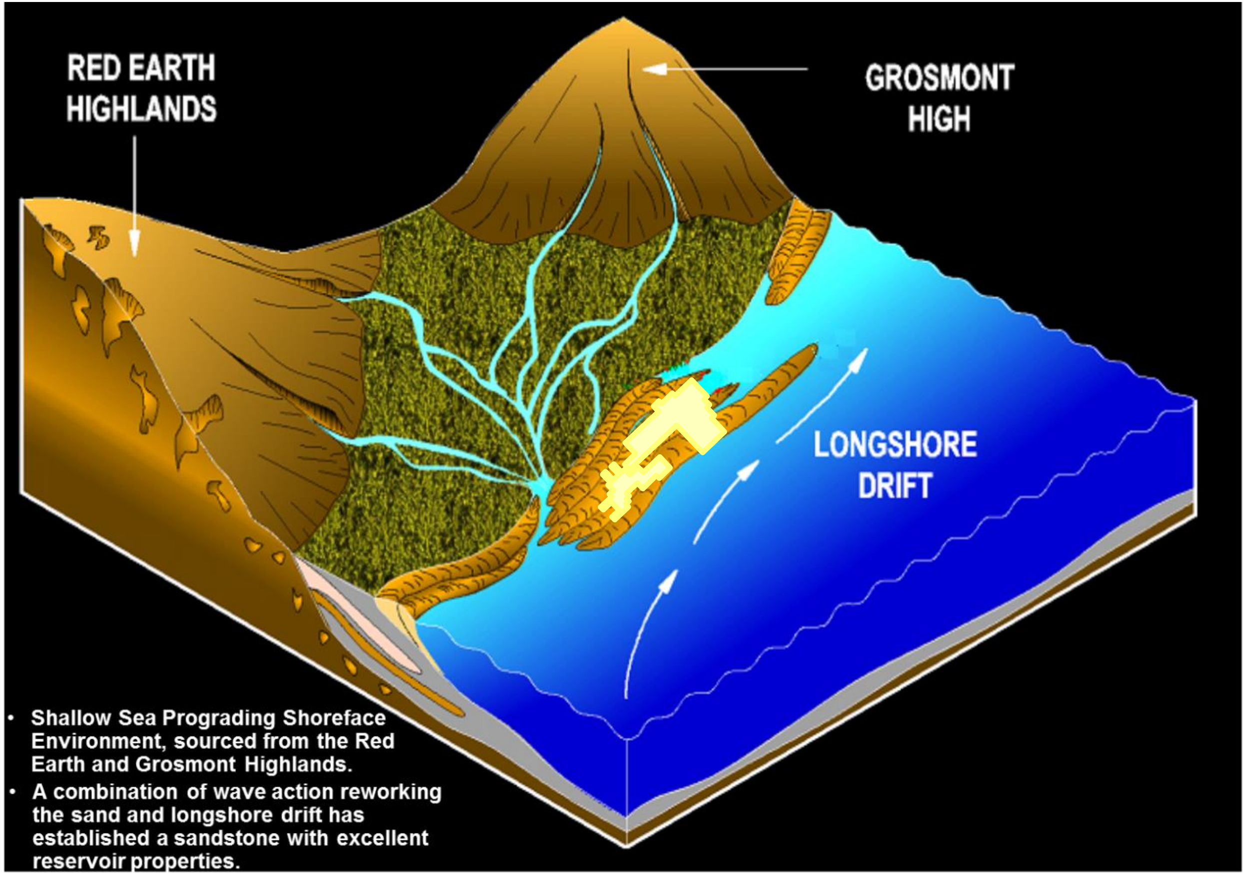
The development interval at Pelican Lake is the Wabiskaw Formation

- Wabiskaw and Clearwater are part of the Mannville Group.
- Wabiskaw composed of oil barring shoreface sands.
- Clearwater acts as cap rock and is composed of mudstones and very competent calcified siltstones.
- Reservoir Properties are very consistent and of a high quality across the field.



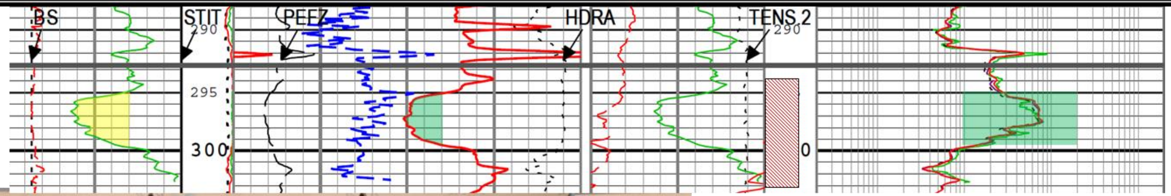
Parameter	Avg or Range	Comments
Depth	300 – 450m	Generally deeper in SW
Avg Thickness	3m	Thins towards North, ranges between 1 – 6m
Avg. Porosity	30%	
Avg. Oil Saturation	70%	
Avg. Permeability	300 – 3000mD	Generally better rock in Western portions of Pelican Lake
Reservoir Temp.	12 – 16 C	
Initial Reservoir Pressure	1800 – 2400kPa	
Oil Viscosity (dead)	1000 – 25000+ cP	Most of core land <= 2500 cP Polymer flood typically < 7000cP
Oil Gravity	11.5 – 16.5 API	

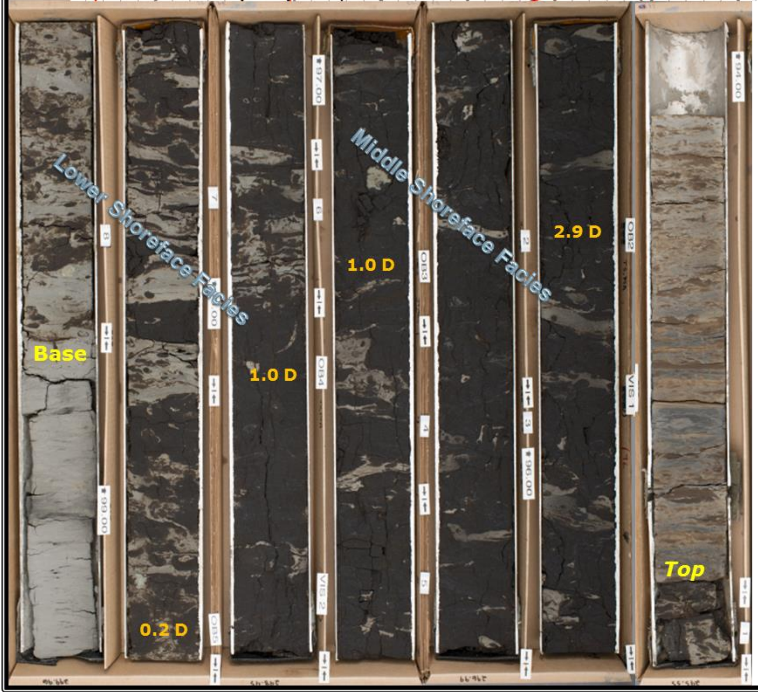
Wabiskaw Depositional Environment: Prograding Shoreface Into A Shallow Sea



- During the early Cretaceous, a relative rise in sea level caused a major southward transgression of the Boreal Sea, which in turn created a marine environment for the deposition of the Wabiskaw Member.
    - Approximately 133 million years ago a shallow sea filled the basin from the north, with the Red Earth & Granor Highlands protruding as barriers.
        - Large extent Tabular sands a result of Shallow sea environment.
    - These barriers are the primary source of sediment supply for the formation of the Wabiskaw.
- The Pelican Lake field is interpreted as a lower to middle shoreface sand which progrades towards the northwest into an offshore environment.

Pelican Lake Type Log & Example Core: 10-03-83-18W4





Core supports the interpretation of the Prograding Shoreface environment.

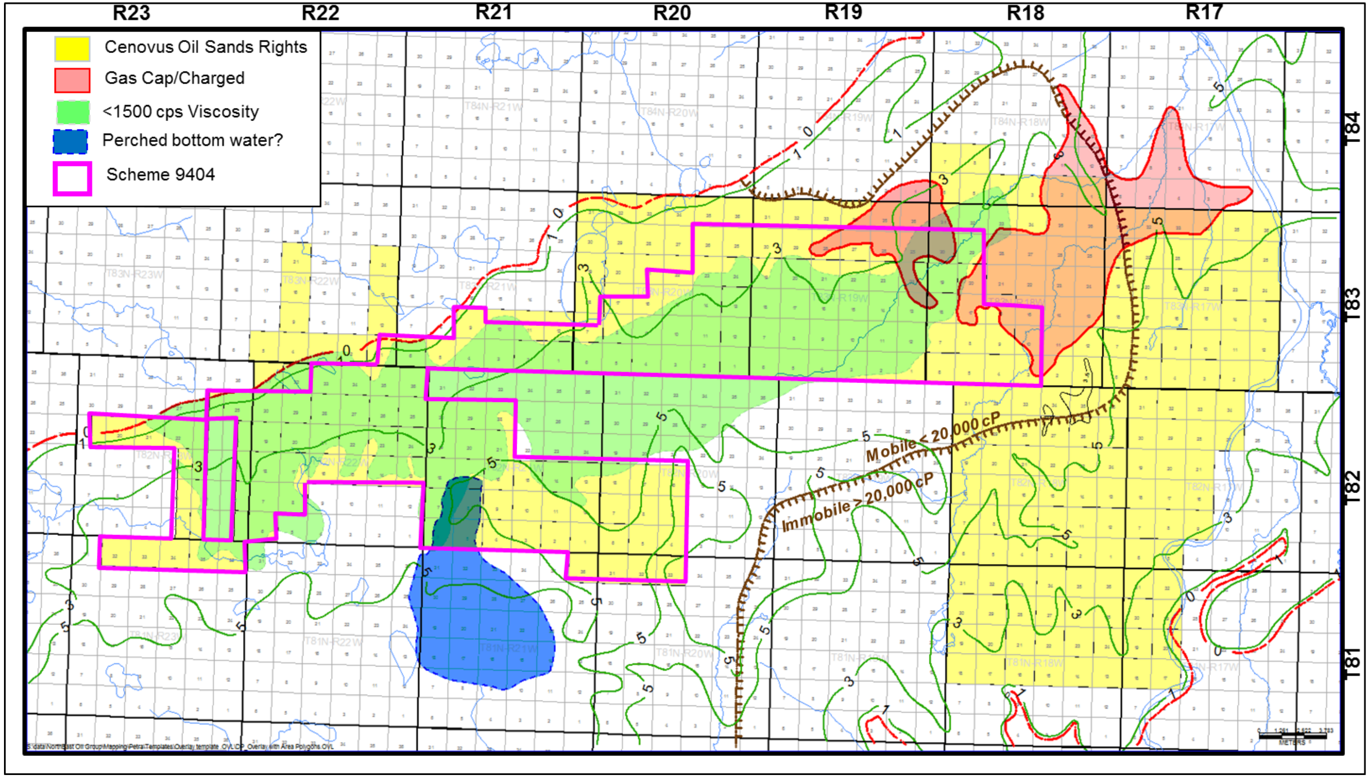
- Cleans up from approximately 25% mud near the base of the Wabiskaw (interpreted as Lower Shoreface), to under 10% mud at the top of the Wabiskaw (Interpreted as Middle Shoreface).
- Coarsens up from Very Fine Upper Sand in the Lower Shoreface to Fine Lower Sand in the Middle Shoreface.

Core Placement	micrometers
Low Core Average	120.33
Middle Core Average	134.87
High Core Average	153.14

- Trace Fossil Assemblages are less marine, and less diverse toward top of the Wabiskaw. This is a further indicator of a prograding shoreface environment.
- Permeability gets better towards top of core as sand coarsens up.

D = Darcy

Wabiskaw Net Pay & Viscosity Fairway



Prograding shoreface environment makes the reservoir very uniform, continuous and predictable

- *Net pay bounded by onlap edge to the north and shoreface edge to the south, thinning uniformly from the center of the pool to the edges.*

Viscosity is low enough for mobile oil over the majority of the Pool. However as we approach the edges of the pool the viscosity gradient is very steep.

- *Full development inventory lies in the mobile oil area*

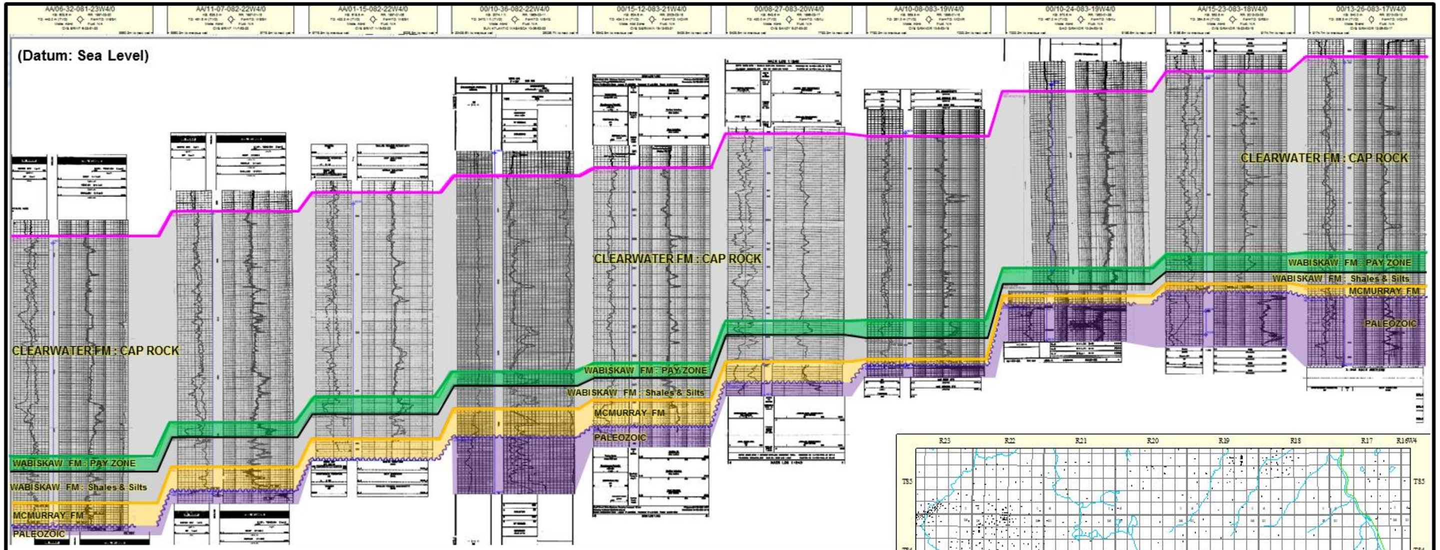
Structure is driven by Paleozoic unconformity and rises dramatically to the NE.

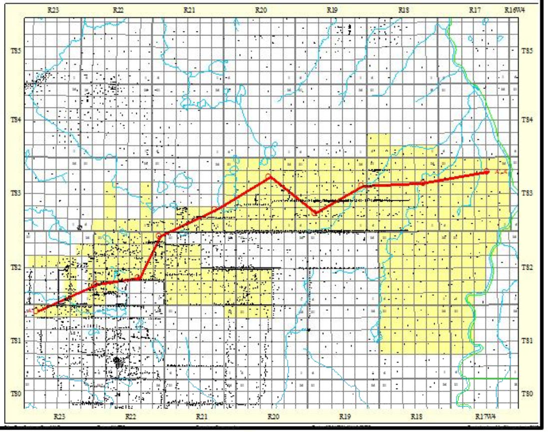
- *A number of Gas caps exist on associated highs, mostly in the NE part of the reservoir and are avoided when planning our future development wells.*

Reservoir properties of the step out areas in both the Mobile and Hot Water development plans compare very favorably to the rest of the field.

Small zone of potentially perched water in the South Central part of the field.

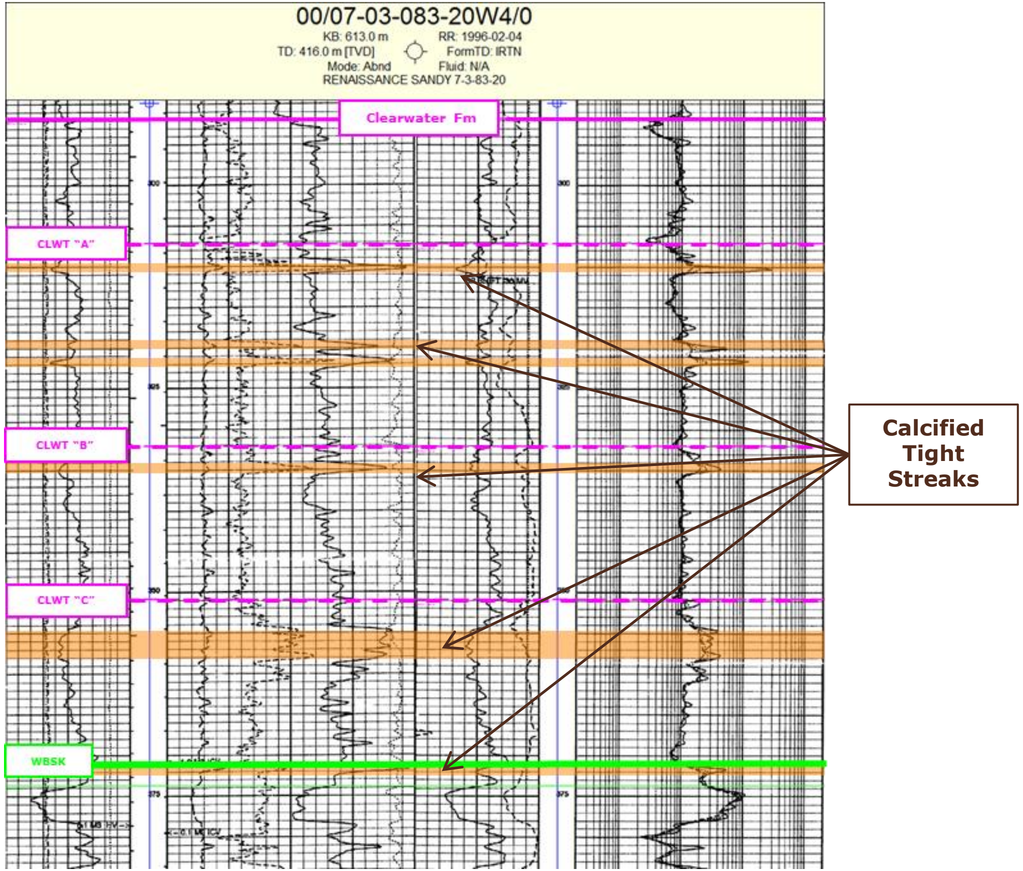
Geological Cross Section – Field Wide Strike Section





- Wabiskaw Pay zone is uniform throughout the pool, along strike (SW to NE).
- Clearwater Cap rock is approximately 80 m thick across the whole pool. It is a very competent formation comprised of shale and calcified siltstone, which makes it a very robust cap rock.
- Structure rises as you move north due to the rising of the Paleozoic Unconformity.
- We start to lose accommodation space for the Wabiskaw toward the NE as we approach the Paleozoic high.

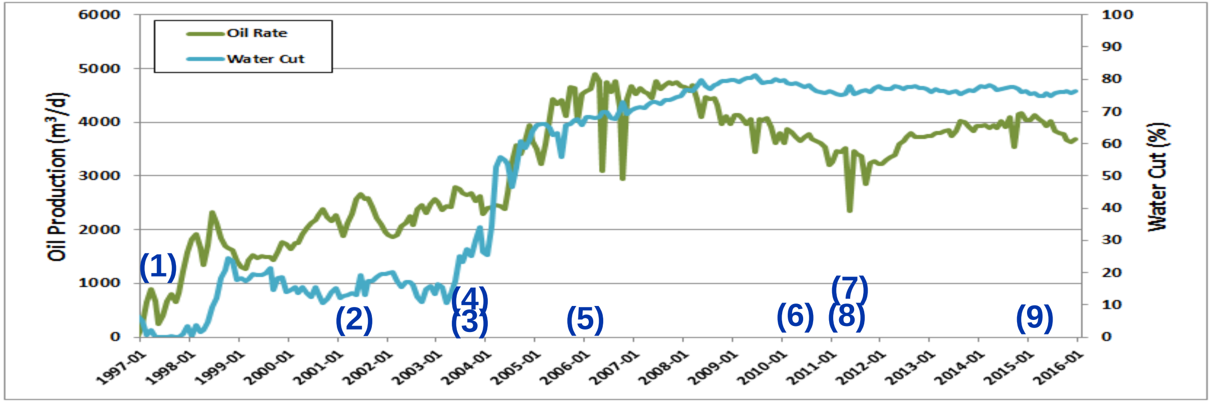
Regional Caprock Geology: Clearwater and Wabiskaw Formation

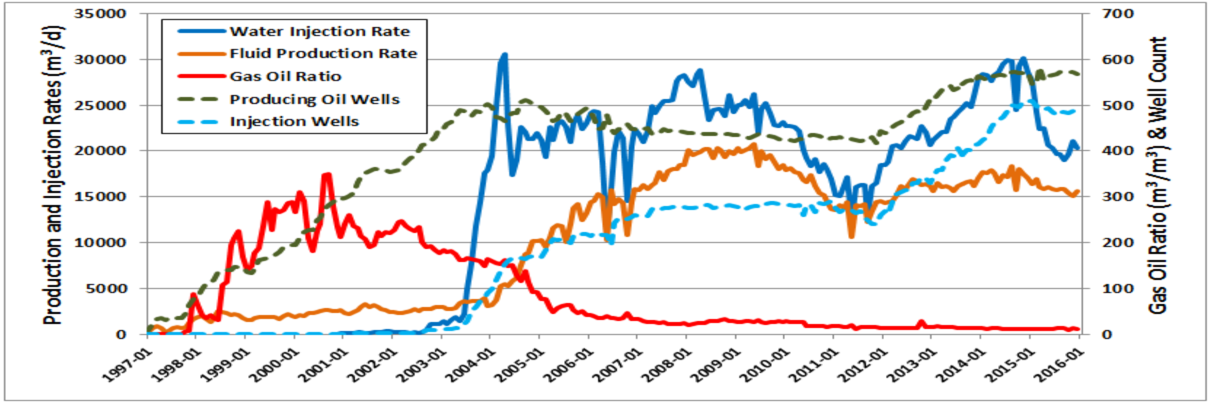


- Top Clearwater to top Wabiskaw porosity includes Clearwater Formation, Wabiskaw tight streak and Wabiskaw shale.
- 75 to 95 m thick over the oil development area, very gentle dip to the SW.
- Clearwater Formation can be correlated across entire region.
- Clearwater subdivided into 4 units: 3 cycles (Clearwater C, B, and A) and a shale unit at the top. The siltstone at the top of the 3 packages has been cemented into a tight streak or a package of calcareous streaks.
- The Clearwater units and associated packages of tight streaks can be correlated regionally.
- The Wabiskaw tight streak is present in every well across the area and can be correlated regionally as well.
- Clearwater formation deposition is unaffected by karsting or
carbonate dissolution. Therefore Clearwater deposition occurs
after these events.

Scheme Performance Update

Scheme 9404W – Production Update (Cum Oil @ Dec 2015 = 21,814 E^3m^3)





Milestones

(1) Primary production (400m inter-well spacing)

(2) Waterflood pilot (400m inter-well; injector infilled)

(3) Commercial Waterflood

(4) Polymer Pilot

(5) Commercial Polymer

(6) Injection rates lowered to arrest watercut increases. Injection shut-in on pads for infill drilling program

(7) Infill Drilling to 100m and 133m inter-well spacing

(8) Hot Water Pilot (Pad E29)

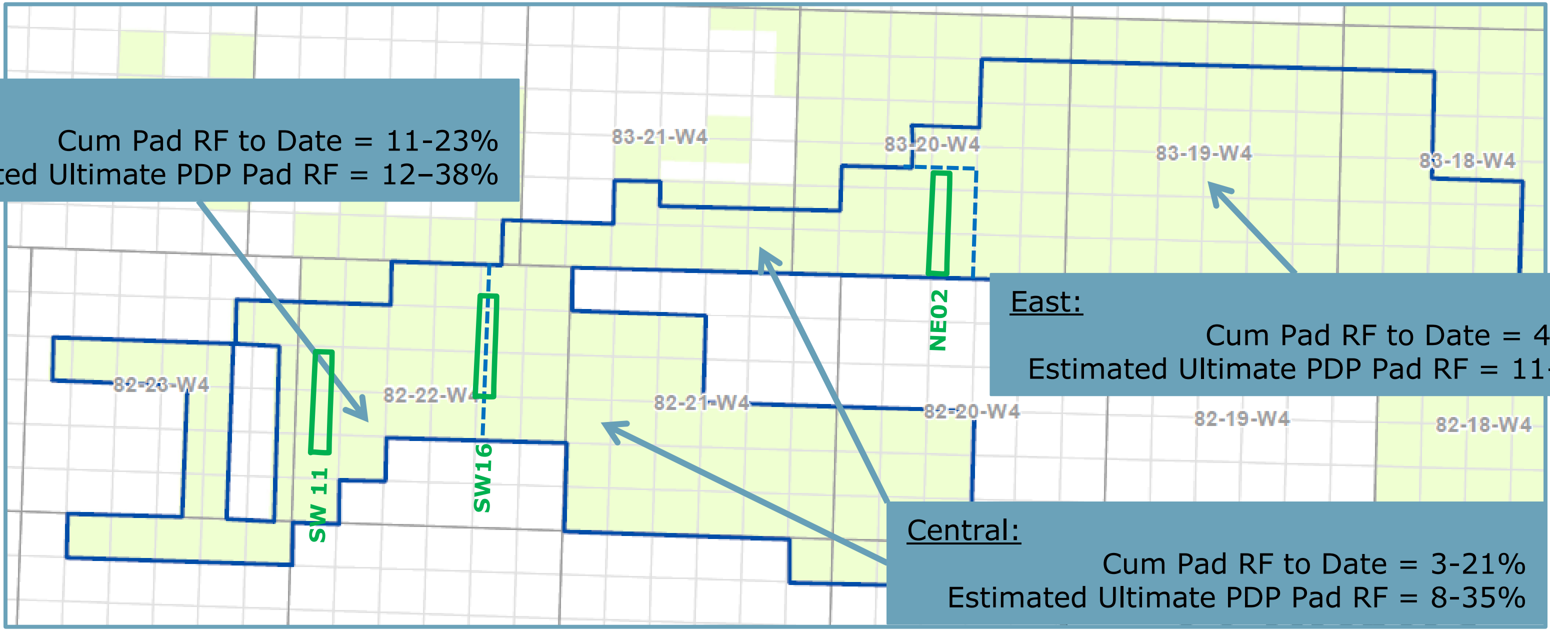
(9) Field-wide Optimization of Injection Rates and Polymer Consumption

2015 Highlights

Injection rate/polymer consumption optimization

- Enhanced flood management focus in 2015
- Injection rates lowered in areas where estimated impact on production was considered low
- Polymer consumption optimized as supported by technical work
- Several polymer flooded pads reverted to water after reaching the optimal polymer slug
  - Decision backed by detailed reservoir & simulation modeling work
  - Facilities decommissioned in a way that allows safe restart if required

Current and Expected Ultimate Recovery Factors



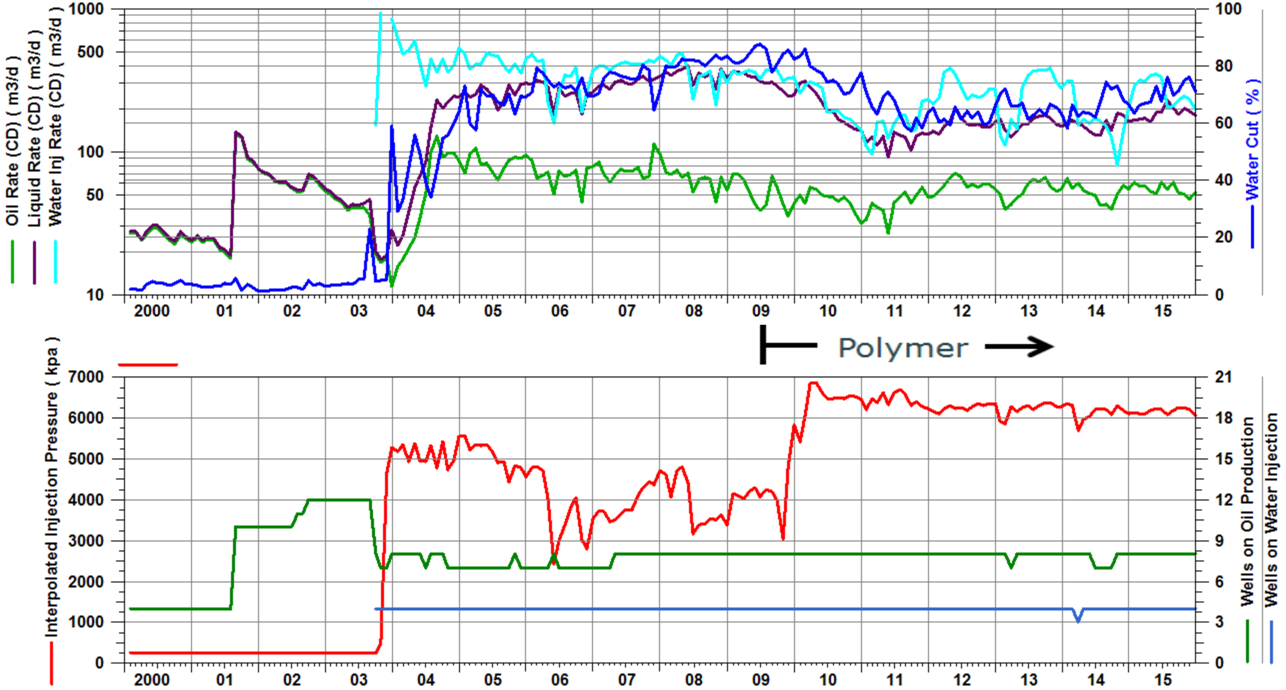
West:
Cum Pad RF to Date = 11-23%
Estimated Ultimate PDP Pad RF = 12–38%

East:
Cum Pad RF to Date = 4-26%
Estimated Ultimate PDP Pad RF = 11–33%

Central:
Cum Pad RF to Date = 3-21%
Estimated Ultimate PDP Pad RF = 8-35%

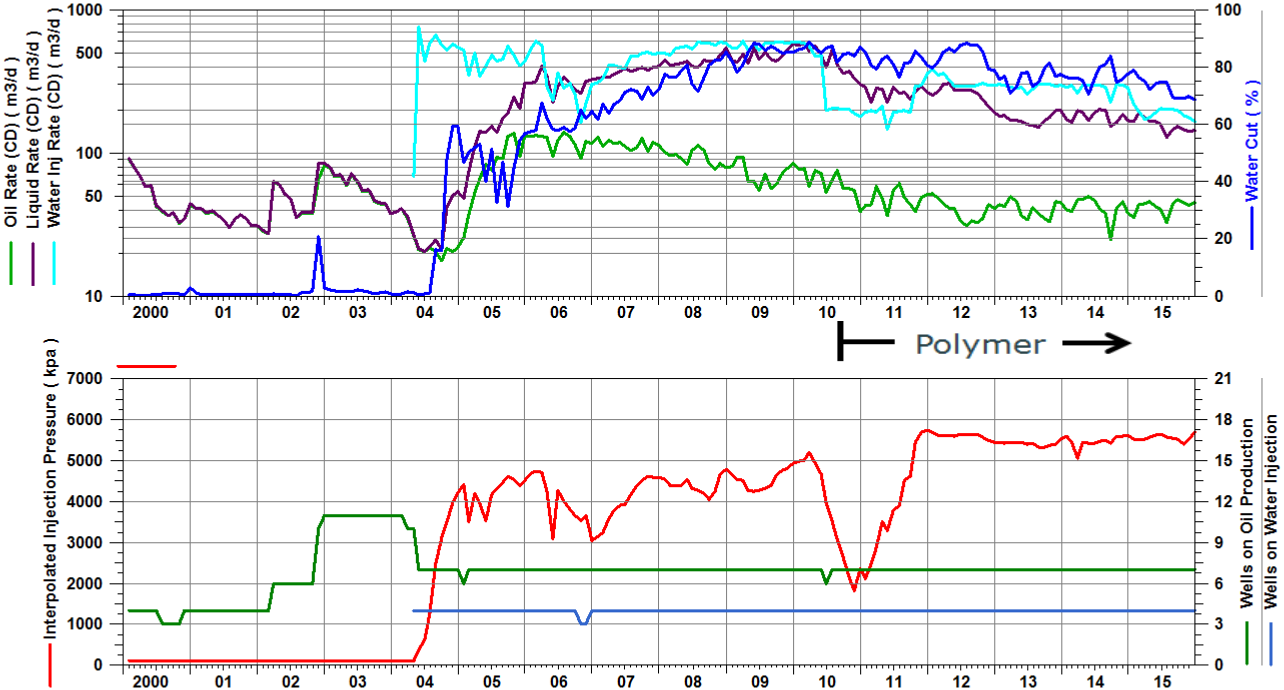
- Recovery Factors (RF) are dependent on reservoir quality, heterogeneity, pad maturity, well density/spacing, and if gas caps are present
- Cumulative pad recovery factors include primary recovery

SW16 – Good performance



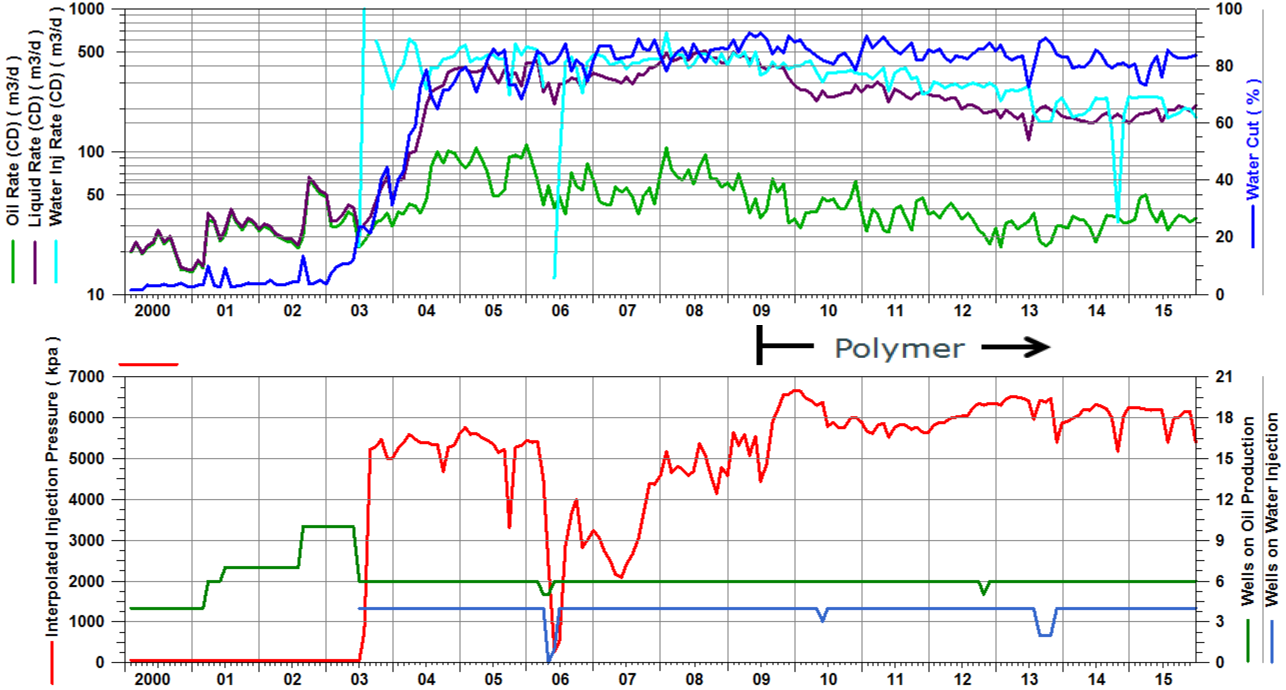
- Polymer started in 2009
- Water cut started to drop immediately
- Oil rate increased as a result and remains flat

NE02 – Average performance



- Polymer started in late 2010
- Decline rate arrested due to declining water cut
- Oil rate stable for the last five years

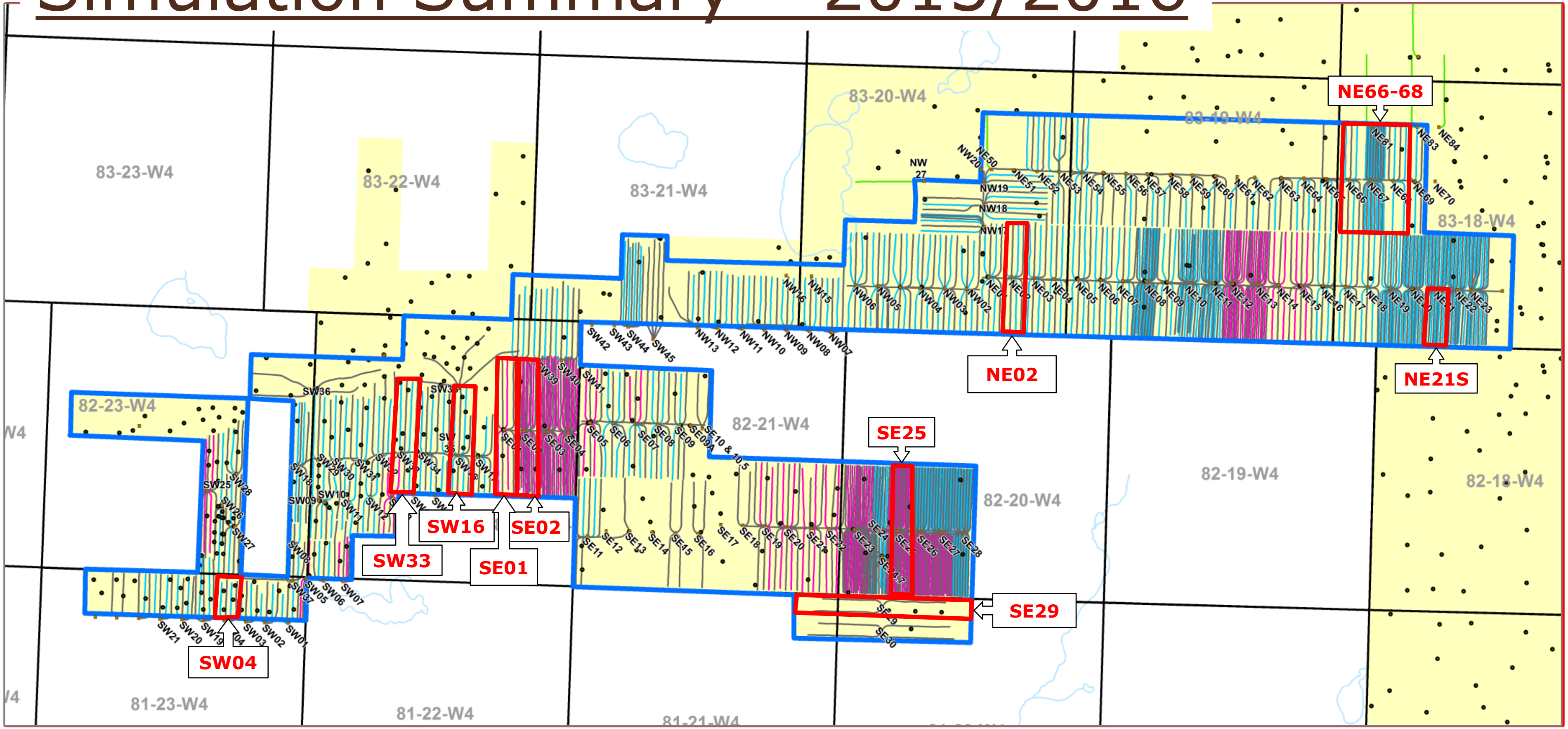
SW11 – Below average performance



- Polymer started in 2009
- Minor decline in water cut offset by declining liquid
- No observable upside to polymer

Simulation Update

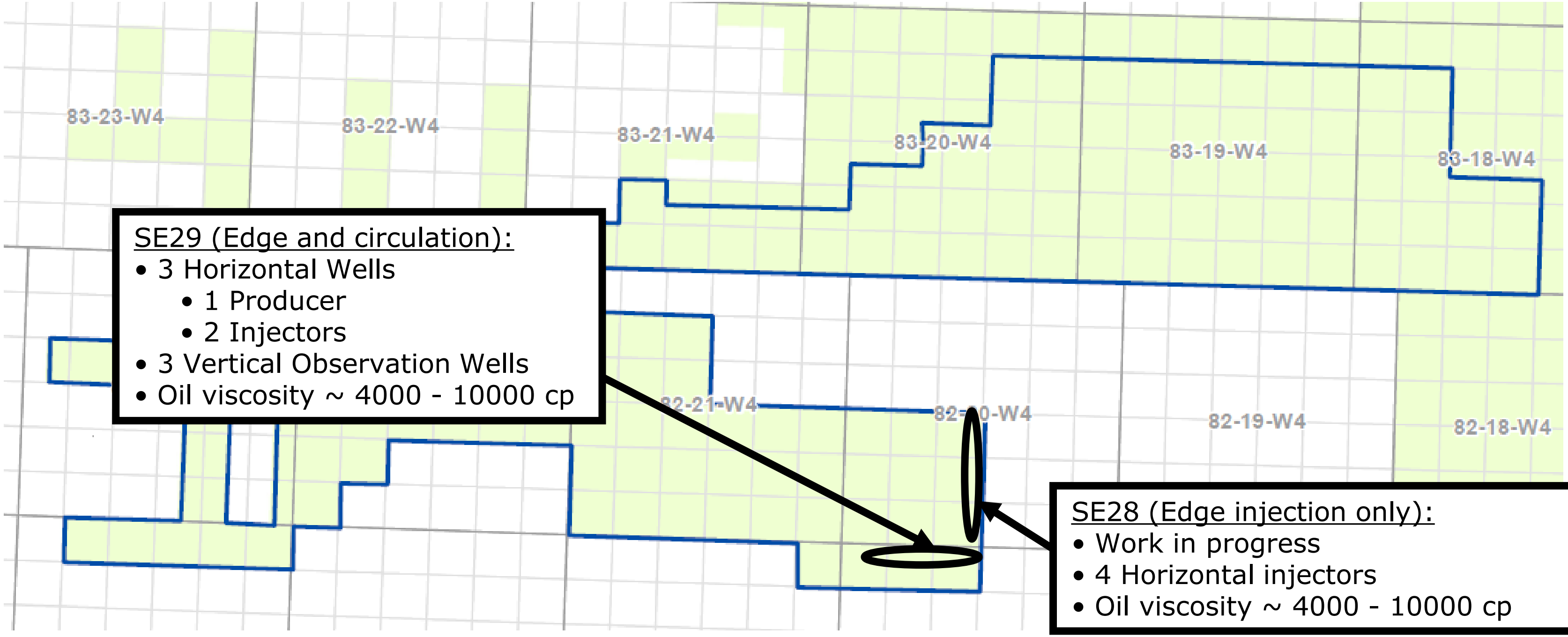
Simulation Summary – 2015/2016



Hot Water Injection Update

Pelican Lake Hot Water Injection Pilots

Pilot areas are only hot water (no polymer)



SE29 (Edge and circulation):
- 3 Horizontal Wells
  - 1 Producer
  - 2 Injectors
- 3 Vertical Observation Wells
- Oil viscosity ~ 4000 - 10000 cp

SE28 (Edge injection only):
- Work in progress
- 4 Horizontal injectors
- Oil viscosity ~ 4000 - 10000 cp

- Both pilots target higher oil viscosity areas within Pelican Lake
- Expansion opportunities being evaluated offsetting current SE29 pilot

Pelican Lake Hot Water Injection Status

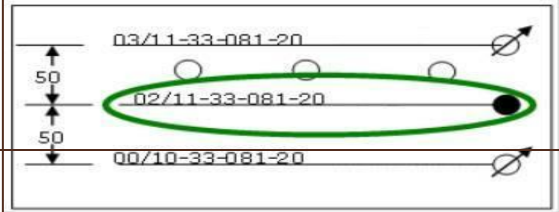
SE29 Pilot Status Update (Edge and Circulation)

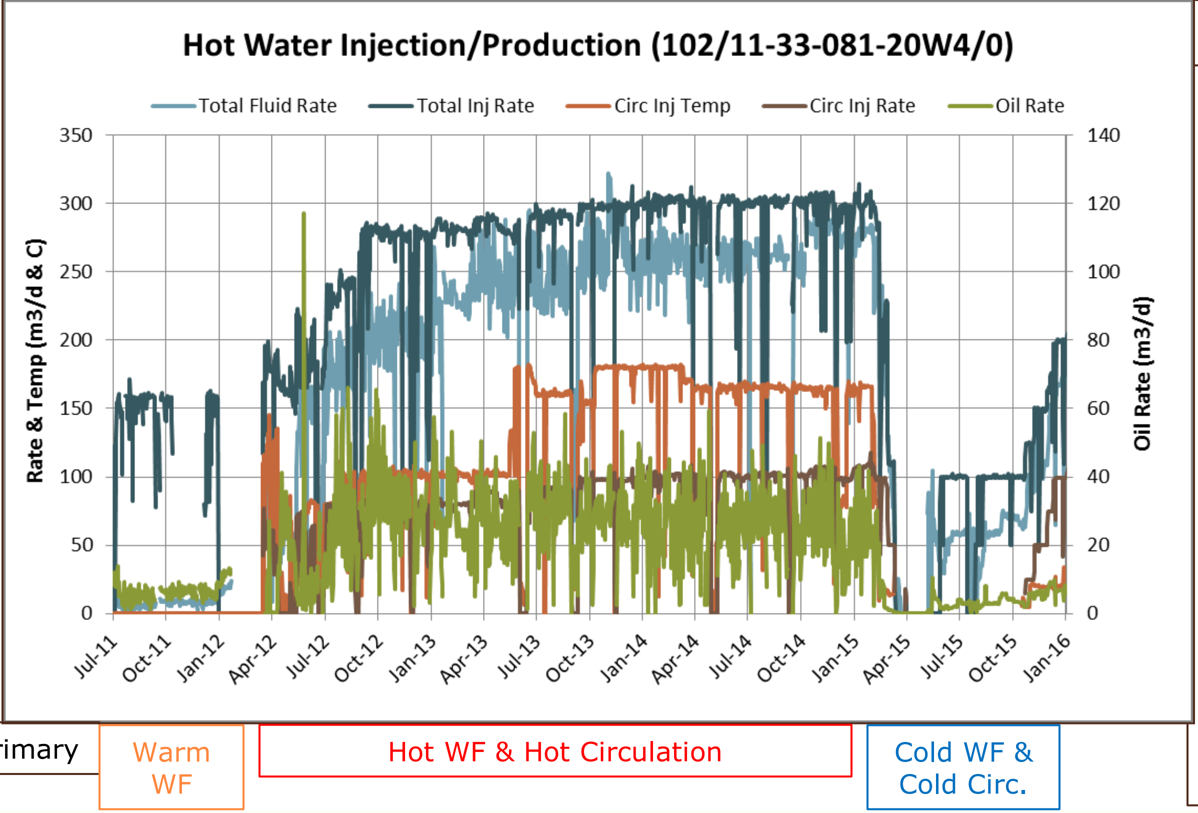
- Phase 1 Complete
  - Primary production: November 28, 2010 - May 31, 2011
- Phase 2 Complete
  - Hot waterflood: June 1, 2011 – March 13, 2012
- Phase 3 Ongoing
  - Hot water circulation (Patent Pending): March 14, 2012 – through January 2015
  - Boiler facilities shut-in February 2015, pilot underwent cold waterflood and cold water circulation during remainder of 2015
  - Warm water injection in 2016 (high efficiency line heaters)

SE28 Pilot Status Update (Edge Only)

- Four injectors at SE28 initially targeted a surface injection temperature of 80°C using energy efficient line heaters (max temp 90°C)
  - Actual injection temperatures remained much lower than target in 2015 due to technical issues with line heaters, design optimization has been completed and will be implemented in early 2016

SE29 Producer Performance





- Circulation Temperature entered 2015 at ~160°C prior to being ramped down in February 2015
- Injection Rate is representative of total injection from circulation & offsetting injectors
- Oil rates returned to approximately 5m^3/d in 2015 after resuming cold waterflood operation, limited impact from cold circulation in Q4-2015
- Work underway to install lineheater and return to warm circulation in 2016

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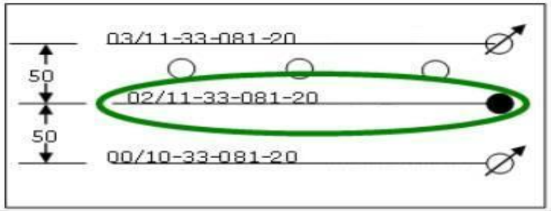
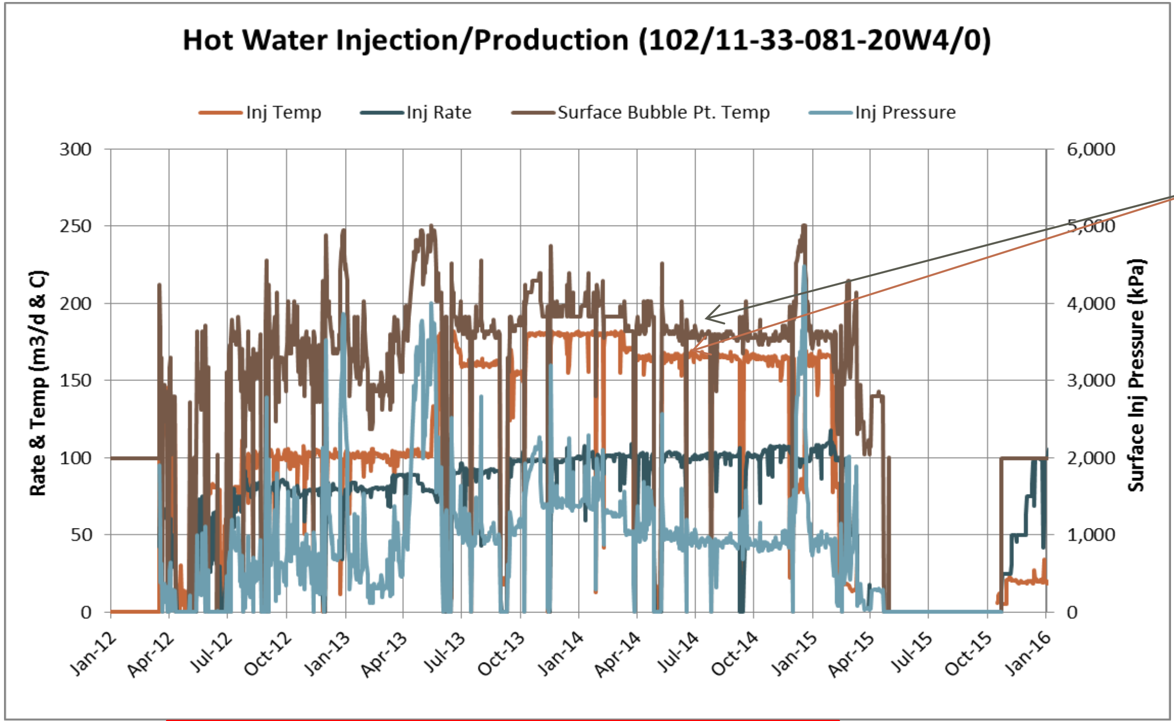
SE29 Hot Water Circulation Update

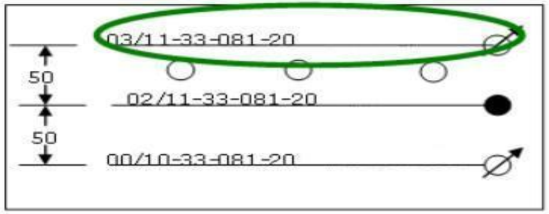


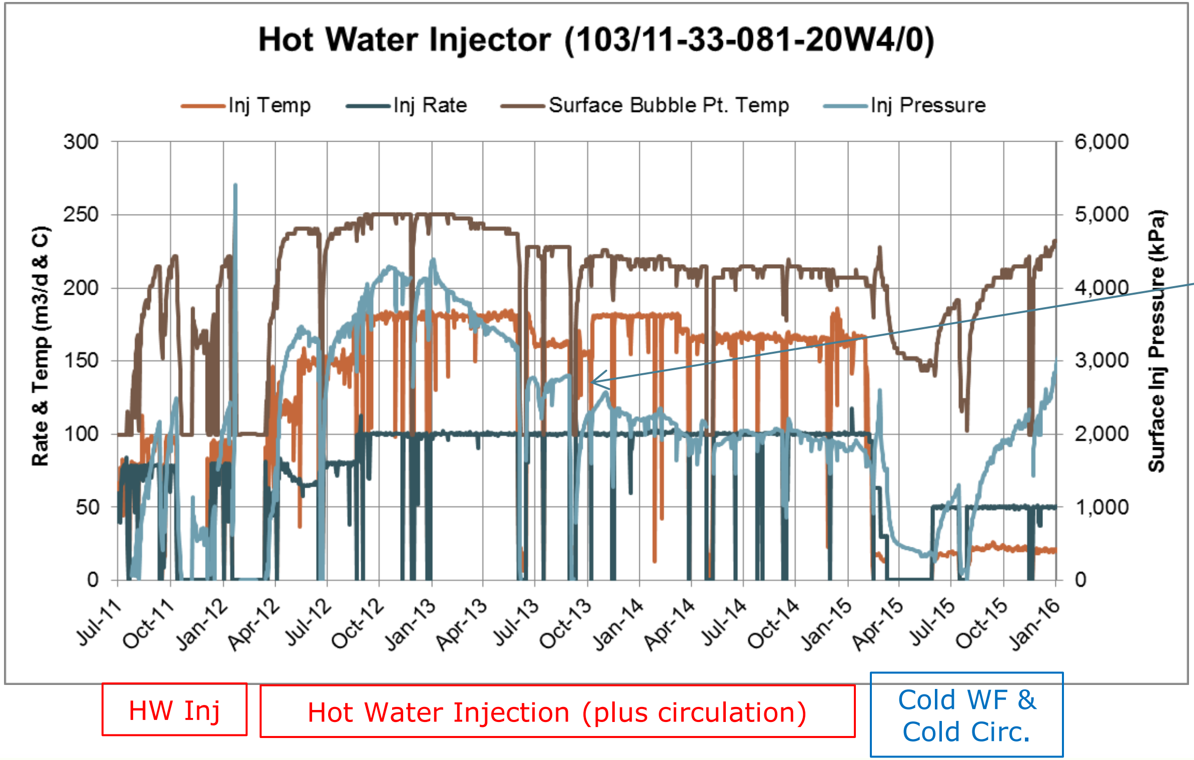


Hot WF & Hot Circulation

- Continue to operate under the constraint that the water injection temperature never exceeds bubble point temperature (as indicated by graph)
  - **All injected fluids have remained as a liquid (no steam injection)**
- SCADA set-points in place ensuring operation not in steam envelope
- Planning to operate “warm” in 2016 after installing lineheater

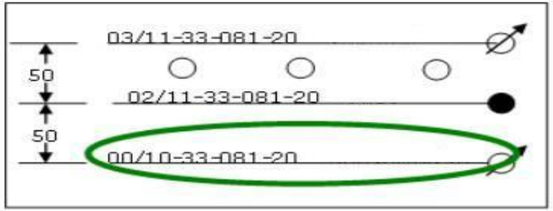
SE29 "Hot" Injector Performance

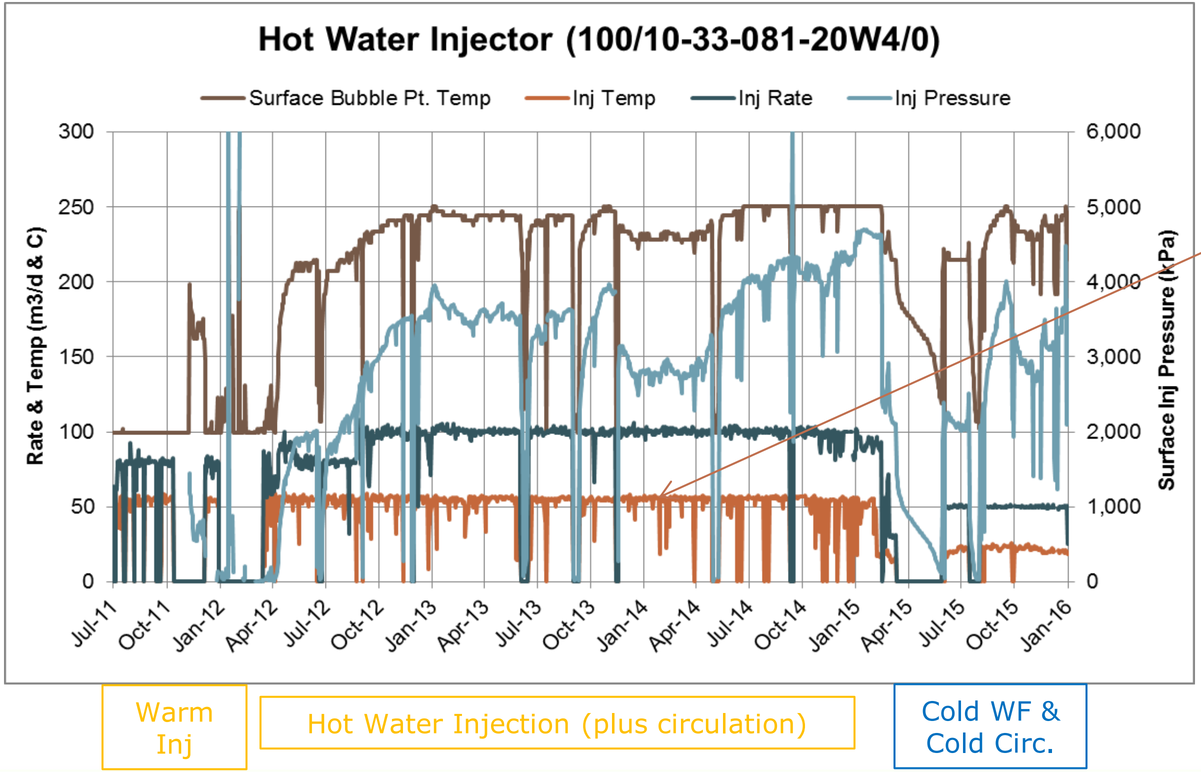




- Water injection temperature never exceeds bubble point temperature
- As expected, injection pressure decreases over time as heat stimulates the reservoir
- Observation wells are also continuing to see an increase in temperature, even after reverting to cold injection in 2015 (25m away from injector)
- Currently planning to remain on cold injection going forward

SE29 "Warm" Injector Performance





- Existing primary well on pad converted to injector – casing spec not suitable for high temperature injection (~55 C max)
- Switched to cold injection (at reduced rates) in 2015 similar to 103/11-33 injector, planning to remain cold going forward

Cap Rock Monitoring Program

Cap Rock Monitoring Summary

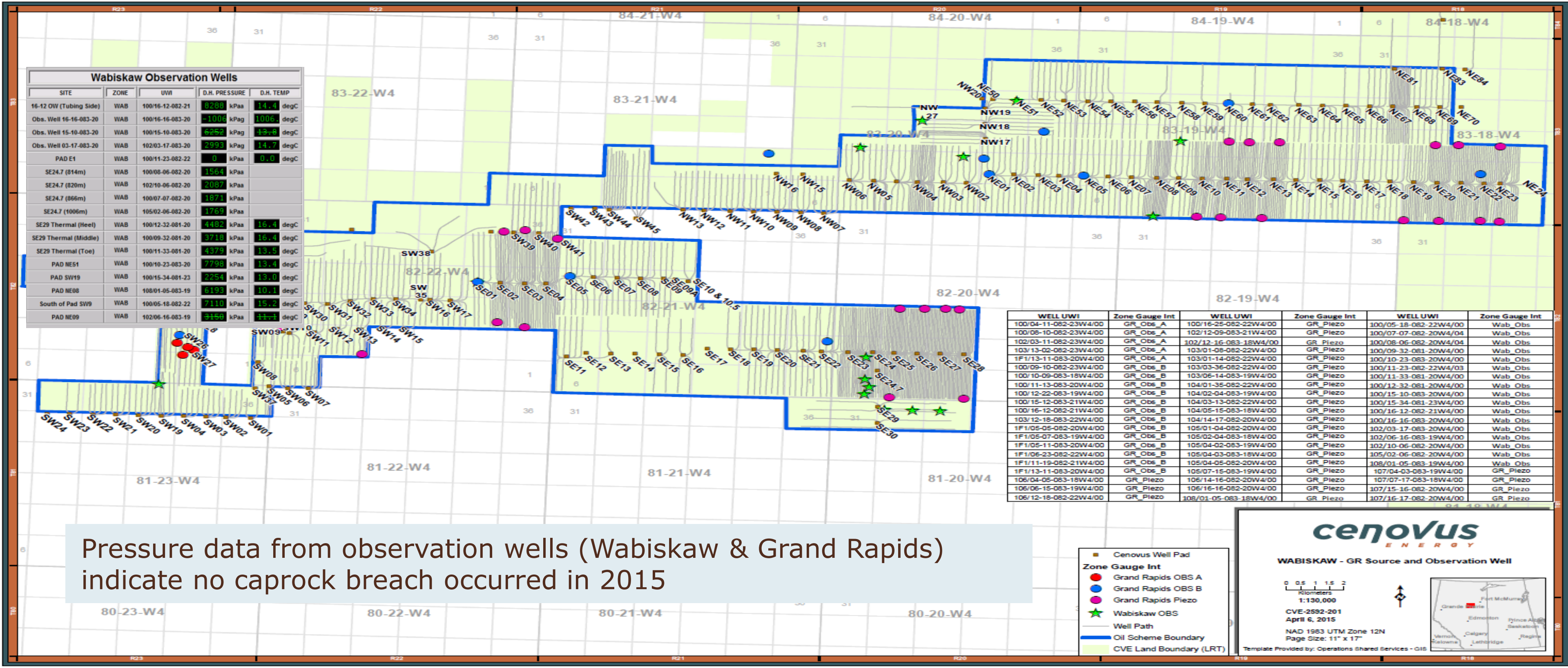
No indication of caprock breach based on ongoing flood surveillance

- Previous third party studies indicate the Clearwater shale caprock is safe against the failure mechanisms studied at injection pressures up to 14 Mpa (bottomhole)
  - Allowable maximum wellhead injection pressure 7MPa
- Real time monitoring of Wabiskaw injection pressures and regular review of pattern Voidage Replacement Ratio (VRR)
  - Injection pressures and VRR's support containment within the Wabiskaw. Currently overall VRR=1.1 (instantaneous) with average wellhead injection pressure 4.5 MPa
  - Using an automated field wide alarm system in SCADA-ProcessNet to monitor and notify engineers of any changes in injectivity
  - Long term monitoring: Hall plots
- Real time monitoring of the bottom hole pressures and rates in Grand Rapids water source wells and bottom hole pressures in Grand Rapids observation wells. No increase in pressures in the Grand Rapids observation wells to suggest any communication with Wabiskaw formation

Annual water analysis on all Grand Rapids water source wells

- No increases in total dissolved solids (TDS) observed that can be attributed to a loss of caprock integrity.

Observation Well Summary



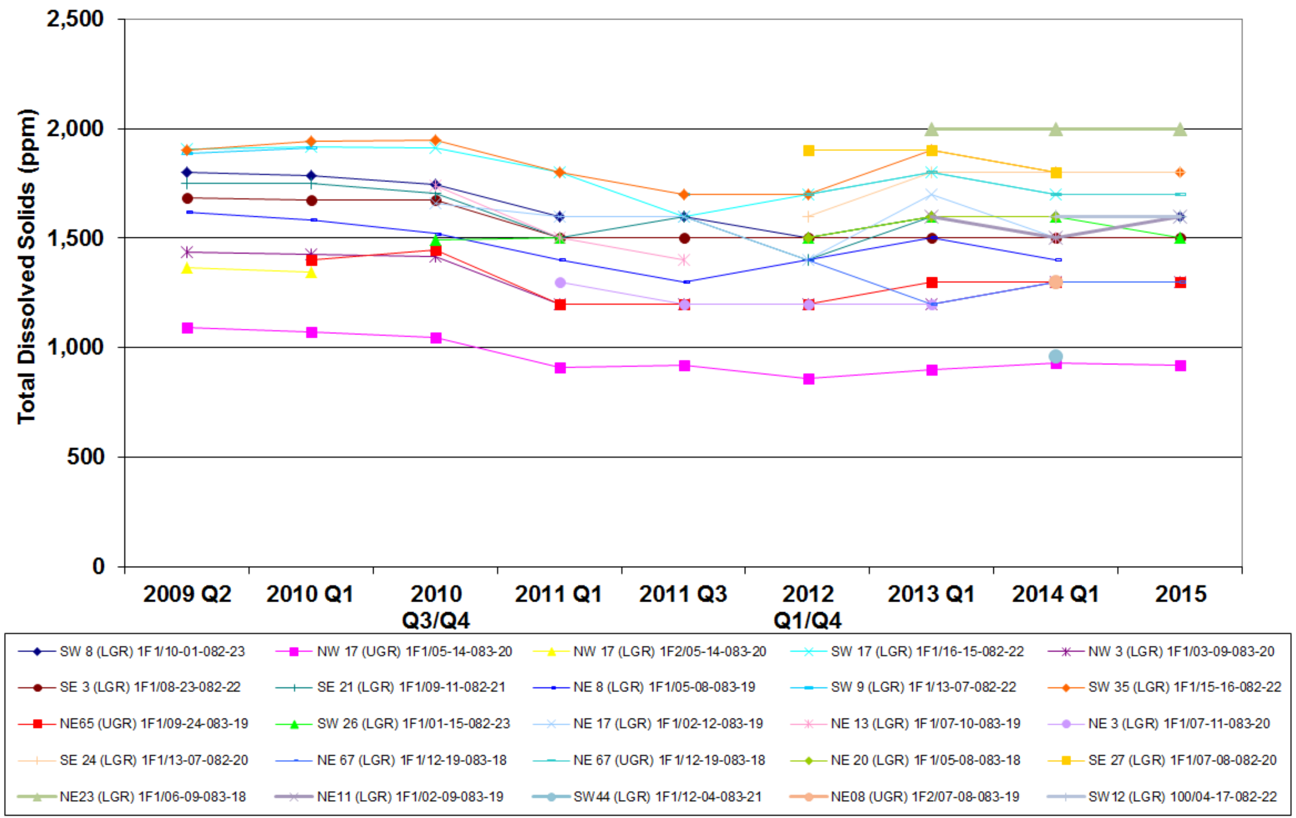
Wabiskaw Observation Wells

SITE	ZONE	UWI	D.H. PRESSURE		D.H. TEMP	
16-12 OW (Tubing Side)	WAB	100/16-12-082-21	8288	kPaa	14.4	degC
Obs. Well 16-16-083-20	WAB	100/16-16-083-20	-1006	kPag	1006.	degC
Obs. Well 15-10-083-20	WAB	100/15-10-083-20	~~6252~~	kPag	~~13.8~~	degC
Obs. Well 03-17-083-20	WAB	102/03-17-083-20	2993	kPag	14.7	degC
PAD E1	WAB	100/11-23-082-22	0	kPaa	0.0	degC
SE24.7 (814m)	WAB	100/08-06-082-20	1564	kPaa		
SE24.7 (820m)	WAB	102/10-06-082-20	2087	kPaa		
SE24.7 (866m)	WAB	100/07-07-082-20	1871	kPaa		
SE24.7 (1006m)	WAB	105/02-06-082-20	1769	kPaa		
SE29 Thermal (Heel)	WAB	100/12-32-081-20	4482	kPaa	16.4	degC
SE29 Thermal (Middle)	WAB	100/09-32-081-20	3718	kPaa	16.4	degC
SE29 Thermal (Toe)	WAB	100/11-33-081-20	4379	kPaa	13.5	degC
PAD NE51	WAB	100/10-23-083-20	7798	kPaa	13.4	degC
PAD SW19	WAB	100/15-34-081-23	2254	kPaa	13.0	degC
PAD NE08	WAB	108/01-05-083-19	6193	kPaa	10.1	degC
South of Pad SW9	WAB	100/05-18-082-22	7110	kPaa	15.2	degC
PAD NE09	WAB	102/06-16-083-19	~~3150~~	kPaa	~~11.1~~	degC

WELL UWI	Zone Gauge Int	WELL UWI	Zone Gauge Int	WELL UWI	Zone Gauge Int
100/04-11-082-23W4/00	GR_Obs_A	100/16-25-082-22W4/00	GR_Piezo	100/05-18-082-22W4/00	Wab_Obs
100/08-10-082-23W4/00	GR_Obs_A	102/12-09-083-21W4/00	GR_Piezo	100/07-07-082-20W4/04	Wab_Obs
102/03-11-082-23W4/00	GR_Obs_A	102/12-16-083-18W4/00	GR_Piezo	100/08-06-082-20W4/04	Wab_Obs
103/13-02-082-23W4/00	GR_Obs_A	103/01-08-082-22W4/00	GR_Piezo	100/09-32-081-20W4/00	Wab_Obs
1F1/13-11-083-20W4/00	GR_Obs_A	103/01-14-082-22W4/00	GR_Piezo	100/10-23-083-20W4/00	Wab_Obs
100/09-10-082-23W4/00	GR_Obs_B	103/03-36-082-22W4/00	GR_Piezo	100/11-23-082-22W4/03	Wab_Obs
100/10-09-083-18W4/00	GR_Obs_B	103/06-14-083-19W4/00	GR_Piezo	100/11-33-081-20W4/00	Wab_Obs
100/11-13-083-20W4/00	GR_Obs_B	104/01-35-082-22W4/00	GR_Piezo	100/12-32-081-20W4/00	Wab_Obs
100/12-22-083-19W4/00	GR_Obs_B	104/02-04-083-19W4/00	GR_Piezo	100/15-10-083-20W4/00	Wab_Obs
100/15-12-083-21W4/00	GR_Obs_B	104/03-13-082-22W4/00	GR_Piezo	100/15-34-081-23W4/00	Wab_Obs
100/16-12-082-21W4/00	GR_Obs_B	104/05-15-083-18W4/00	GR_Piezo	100/16-12-082-21W4/00	Wab_Obs
103/12-18-083-22W4/00	GR_Obs_B	104/14-17-082-20W4/00	GR_Piezo	100/16-16-083-20W4/00	Wab_Obs
1F1/05-05-082-20W4/00	GR_Obs_B	105/01-04-082-20W4/00	GR_Piezo	102/03-17-083-20W4/00	Wab_Obs
1F1/05-07-083-19W4/00	GR_Obs_B	105/02-04-083-18W4/00	GR_Piezo	102/06-16-083-19W4/00	Wab_Obs
1F1/05-11-083-20W4/00	GR_Obs_B	105/04-02-083-19W4/00	GR_Piezo	102/10-06-082-20W4/00	Wab_Obs
1F1/06-23-082-22W4/00	GR_Obs_B	105/04-03-083-18W4/00	GR_Piezo	105/02-06-082-20W4/00	Wab_Obs
1F1/11-19-082-21W4/00	GR_Obs_B	105/04-05-082-20W4/00	GR_Piezo	108/01-05-083-19W4/00	Wab_Obs
1F1/13-11-083-20W4/00	GR_Obs_B	105/07-15-083-19W4/00	GR_Piezo	107/04-03-083-19W4/00	GR_Piezo
106/04-05-083-18W4/00	GR_Piezo	106/14-16-082-20W4/00	GR_Piezo	107/07-17-083-18W4/00	GR_Piezo
106/06-15-083-19W4/00	GR_Piezo	106/16-16-082-20W4/00	GR_Piezo	107/15-16-082-20W4/00	GR_Piezo
106/12-18-082-22W4/00	GR_Piezo	108/01-05-083-18W4/00	GR_Piezo	107/16-17-082-20W4/00	GR_Piezo

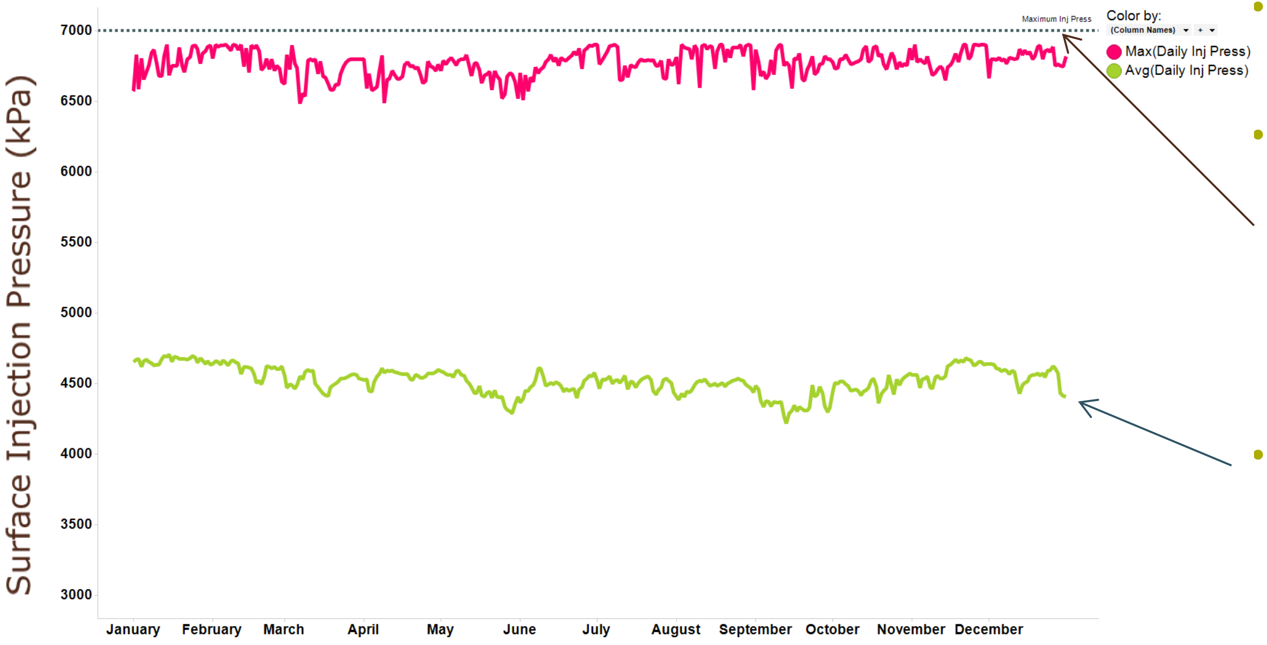
Pressure data from observation wells (Wabiskaw & Grand Rapids) indicate no caprock breach occurred in 2015

Grand Rapids Water Source Well TDS Tracking



- Continued annual surveillance of Grand Rapids TDS at the observation wells
- No deviation from TDS baseline through time

Injection pressure: Maximum & Average



- Total 628 injection wells
- Allowable Maximum Wellhead Injection Pressure = 7,000kPa
  - SCADA system logic has alarm and shut-downs set below 7,000KPa
- Average injection pressure hasn't changed ~4,530 kPa

Alarm Definitions – Anomalous Injector Behavior

Defined two levels of anomalous behavior

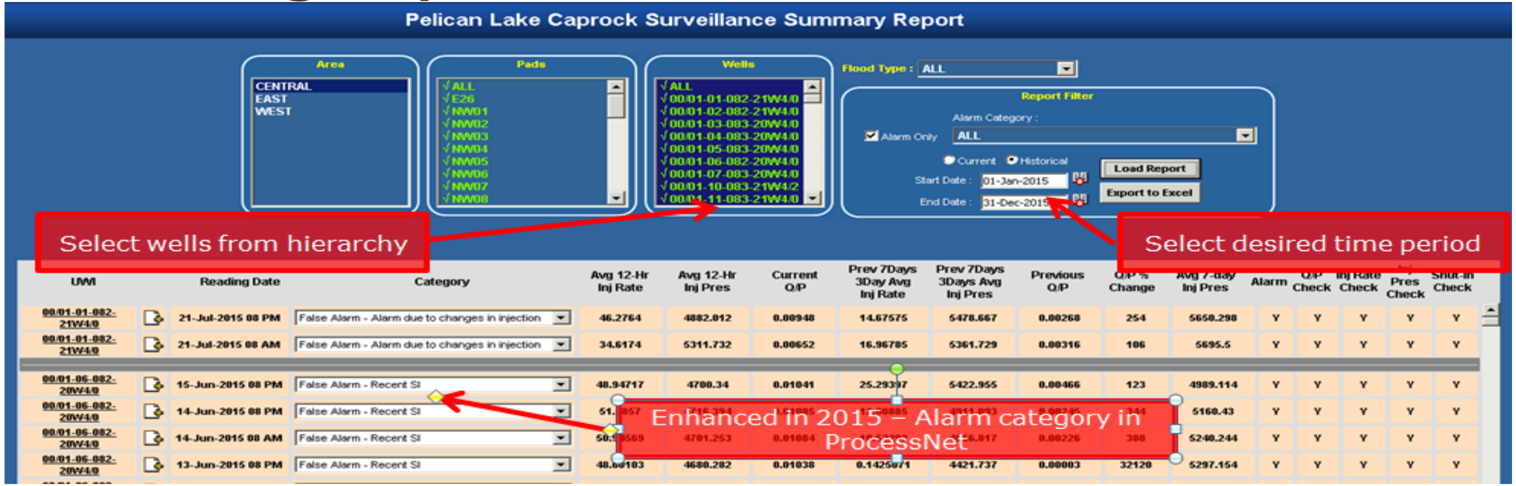
i. Level 1/yellow - Gradual decrease in pressure behavior that is contrary to the expected result. Non-urgent but flagged as a "watch/monitor" with regular reviews to monitor, until stabilization occurs. Some examples would be:
    i. Decreasing pressure after an increase in injection rate
    ii. Decreasing pressure after an increase in polymer concentration
    iii. Decreasing pressure after no change in operational conditions

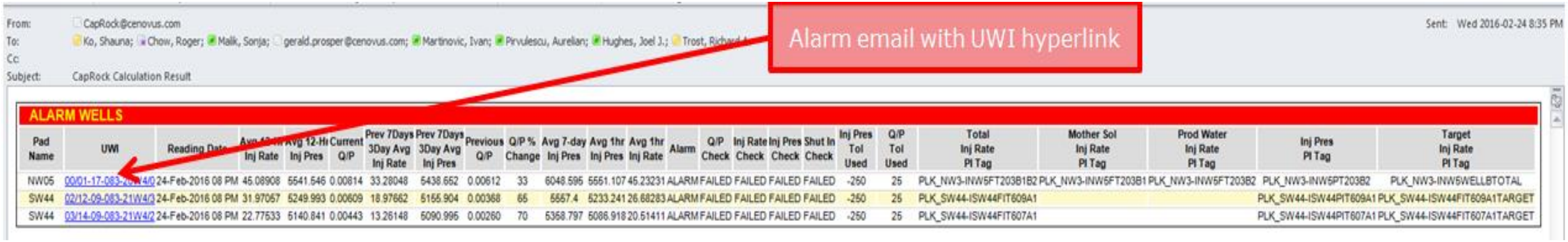
ii. Level 2/red - Large instantaneous drop in injection pressure when either:
    i. There is no change in operating conditions, or
    ii. a corresponding instantaneous increase in injection rate

Level 2 alarm occurrence requires notification of AER within 72 hours

No alarms diagnosed as Level 2

Monitoring System - ProcessNet

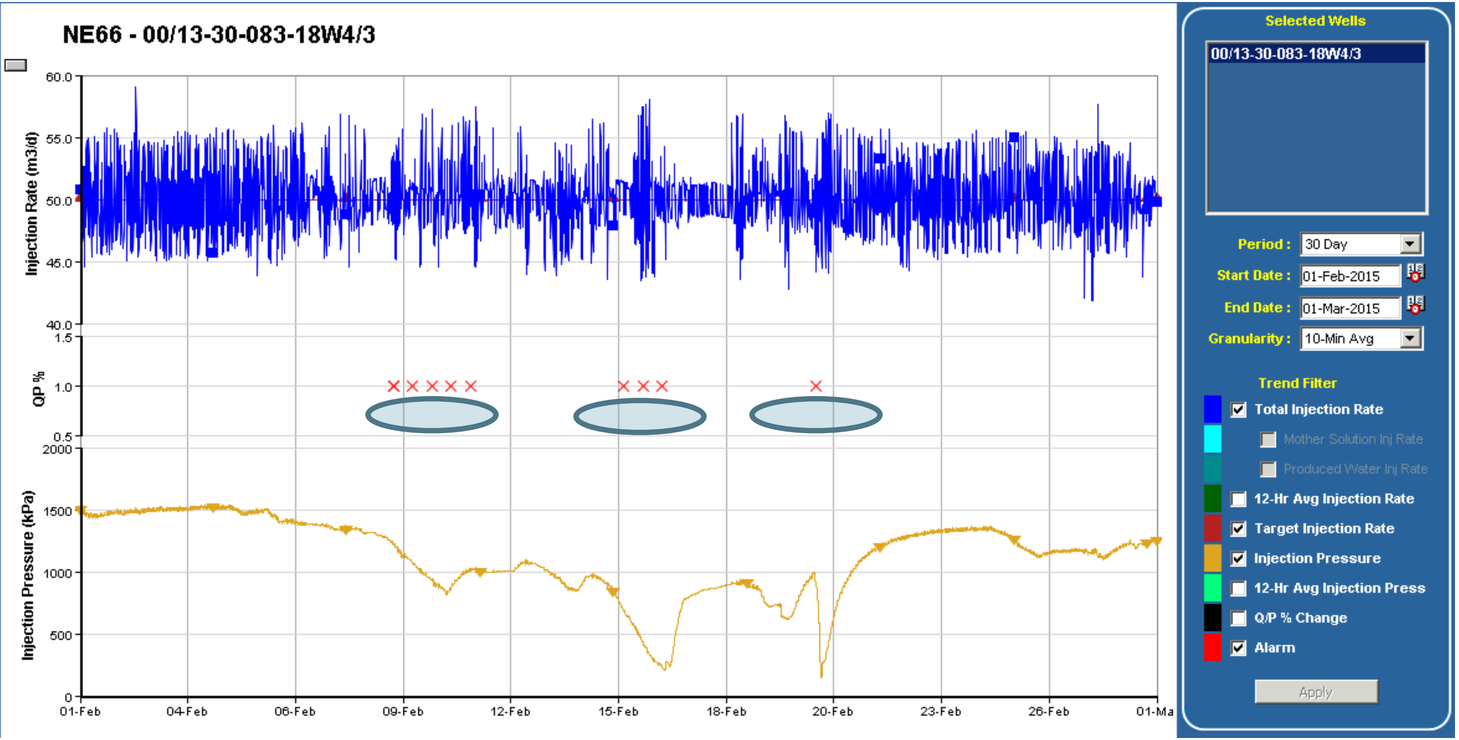




- All alarms are evaluated by the area technical team

No alarms diagnosed as Level 2

Alarm Example: Well adjacent to a gas cap



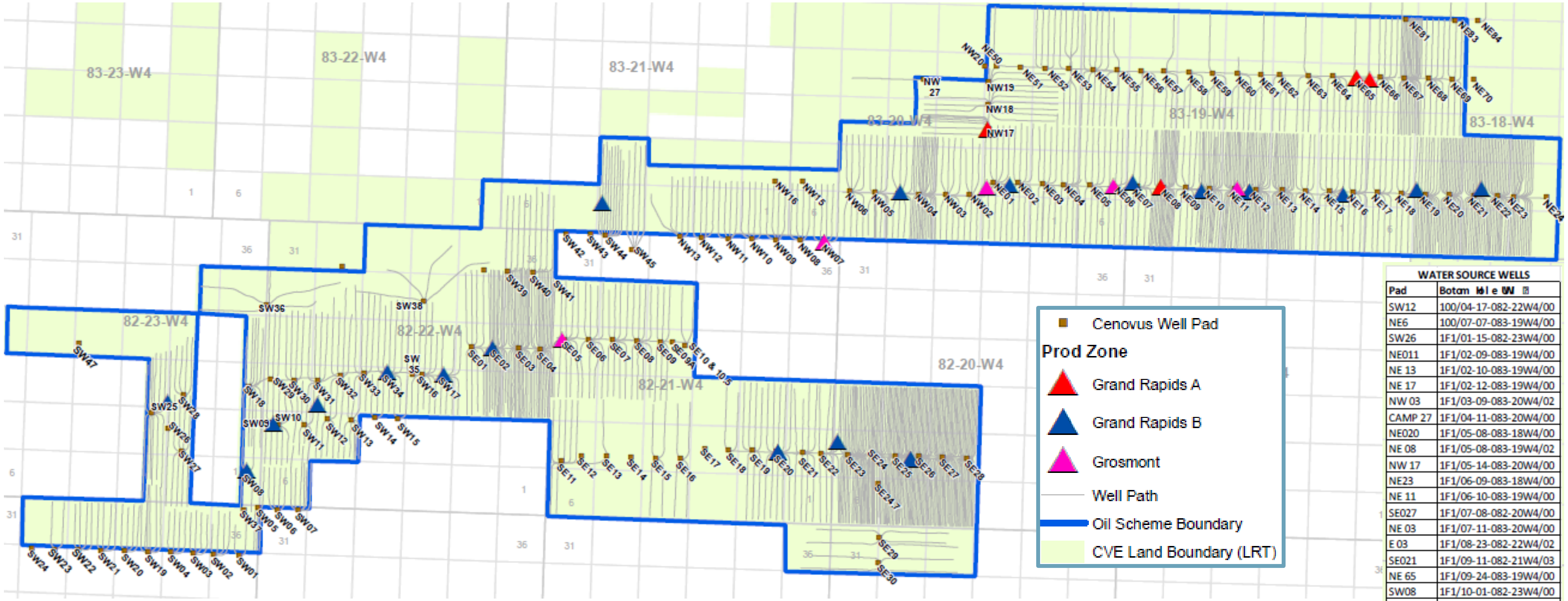
- Typical response from a gas cap. Usually pressure fluctuations filling in gas caps
- Alarm triggered eight times due to pressure fluctuations.

Other Common Causes:

- Injection rate change
- Well started/stopped
- Pressure reading deviation well within normal operating range

Water Usage Update

Water Source Well Map

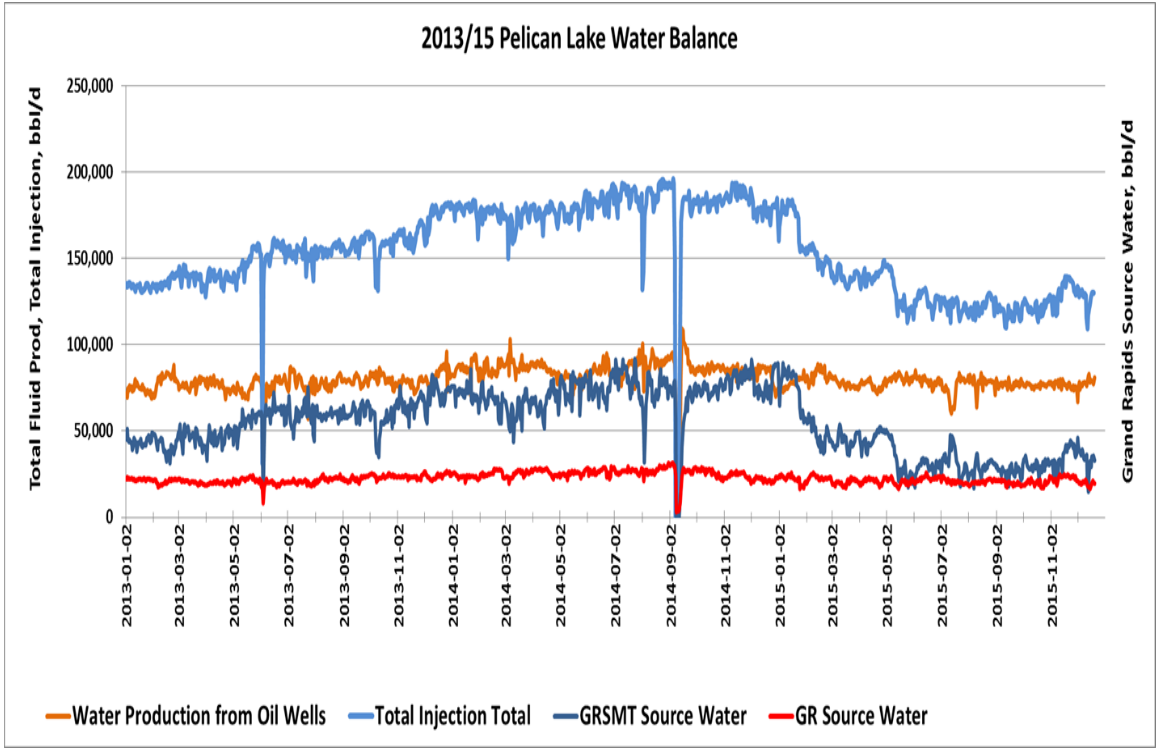


WATER SOURCE WELLS

Pad	Botom Hole UWI
SW12	100/04-17-082-22W4/00
NE6	100/07-07-083-19W4/00
SW26	1F1/01-15-082-23W4/00
NE011	1F1/02-09-083-19W4/00
NE 13	1F1/02-10-083-19W4/00
NE 17	1F1/02-12-083-19W4/00
NW 03	1F1/03-09-083-20W4/02
CAMP 27	1F1/04-11-083-20W4/00
NE020	1F1/05-08-083-18W4/00
NE 08	1F1/05-08-083-19W4/02
NW 17	1F1/05-14-083-20W4/00
NE23	1F1/06-09-083-18W4/00
NE 11	1F1/06-10-083-19W4/00
SE027	1F1/07-08-082-20W4/00
NE 03	1F1/07-11-083-20W4/00
E 03	1F1/08-23-082-22W4/02
SE021	1F1/09-11-082-21W4/03
NE 65	1F1/09-24-083-19W4/00
SW08	1F1/10-01-082-23W4/00
SW044	1F1/12-04-083-21W4/00
SE 05	1F1/12-19-082-21W4/00
NE67	1F1/12-19-083-18W4/00
NE67	1F1/12-19-083-18W4/02
SE24	1F1/13-07-082-20W4/00
SW09	1F1/13-07-082-22W4/00
SW035	1F1/15-16-082-22W4/00
NW 07	1F1/15-36-082-21W4/00
SW17	1F1/16-15-082-22W4/00
NE08	1F2/07-08-083-19W4/00

- Grand Rapids non-saline water source wells are predominantly located at polymer make-up sites throughout Pelican Lake
- Five saline Grosmont wells are used to supplement injection volumes required to meet well target injection rates

2015 Pelican Water Usage



- Produced water recycle over 97%
- Non-saline Grand Rapids use is effectively managed
- Reduced injection
- Reduced Grosmont saline water use in 2015 through optimized VRR and reservoir management

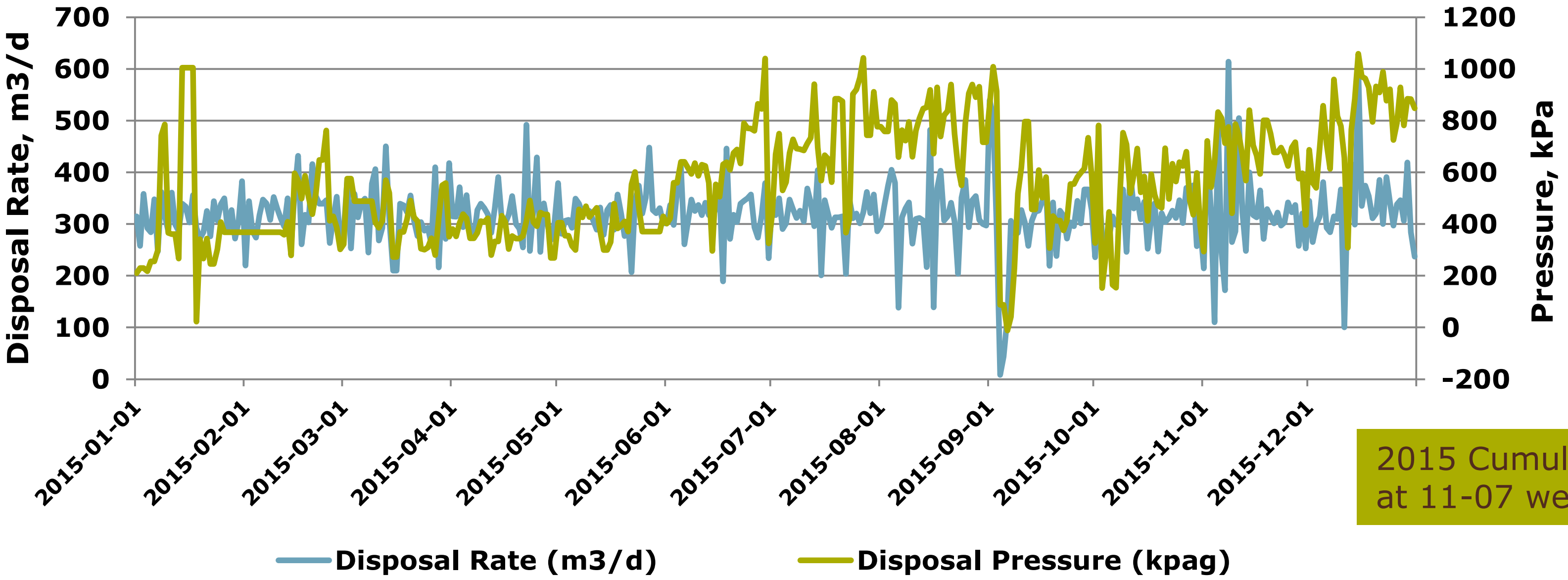
cenovus ENERGY

Non-saline Water Use Summary

Well Location	Zone	Licensed Rate (m3/d)	Licensed Volume (m3/year)	2015 Average Diversion Volumes (m3/d)	2015 Total Diversion Volumes (m3/year)
1F1/01-15-082-23W4/00	Grand Rapids	713	260245	465	169777
1F1/07-11-083-20W4/00	Grand Rapids	400	146000	161	58677
1F1/05-08-083-19W4/02	Grand Rapids	368	134320	183	66703
1F2/07-08-083-19W4/00	Grand Rapids	300	109500	174	63629
1F1/02-09-083-19W4/00	Grand Rapids	313	114172	155	56680
1F1/02-10-083-19W4/00	Grand Rapids	125	45625	0	0
1F1/02-12-083-19W4/00	Grand Rapids	336	122640	122	44488
1F1/09-24-083-19W4/00	Grand Rapids	175	63875	40	14778
1F1/03-09-083-20W4/02	Grand Rapids	324	118260	112	40732
1F1/05-14-083-20W4/00	Grand Rapids	400	79205	9	3115
1F1/08-23-082-22W4/02	Grand Rapids	600	219000	331	120923
1F1/09-11-082-21W4/03	Grand Rapids	700	255500	300	109361
1F1/13-07-082-20W4/00	Grand Rapids	324	118260	252	92106
1F1/10-01-082-23W4/00	Grand Rapids	300	89425	76	27675
1F1/13-07-082-22W4/00	Grand Rapids	509	185785	107	39202
1F1/16-15-082-22W4/00	Grand Rapids	312	113880	0	0
1F1/15-16-082-22W4/00	Grand Rapids	600	189800	162	59234
1F1/12-19-083-18W4/00	Grand Rapids	182	66430	131	47809
1F1/12-19-083-18W4/02	Grand Rapids	105	38143	75	27331
1F1/05-08-083-18W4/00	Grand Rapids	253	91250	54	19732
1F1/07-08-082-20W4/00	Grand Rapids	92	32850	64	23426
1F1/06-09-083-18W4/00	Grand Rapids	132	48180	95	34544
100/04-17-082-22W4/00	Grand Rapids	449	163900	169	61753
1F1/12-04-083-21W4/00	Grand Rapids	400	146000	97	35510
1F1/05-11-083-20W4/00	Grand Rapids	250	56575	0	0
1F1/02-09-083-20W4/00	Grand Rapids	139	50735	0	0
Totals		8,801	3,059,555	3,335	1,217,183

- In 2015 Cenovus had 26 water diversion licenses from the AER that allowed for 3,059,555 m^3 of non-saline water usage for polymer injection in the Pelican Lake area
- In 2015, Cenovus used 40% of the total licensed volume
- Optimization projects are continually executed and evaluated to ensure that the non-saline water is being used to its full benefit for polymer hydration

Key Water Disposal Well: 102/11-07-082-22W4



2015 Cumulative disposal at 11-07 well: 115,418 m3

- Required water disposal rates have remained steady
- 102/11-07 well at Main Battery handled approximately 90% of disposal needs in 2015

Facilities Update

2015 Facility Modifications

- 11-07 South Battery shell & tube heat exchanger upgrade (carbon steel to stainless steel tube)
- No major facility modifications planned for 2016

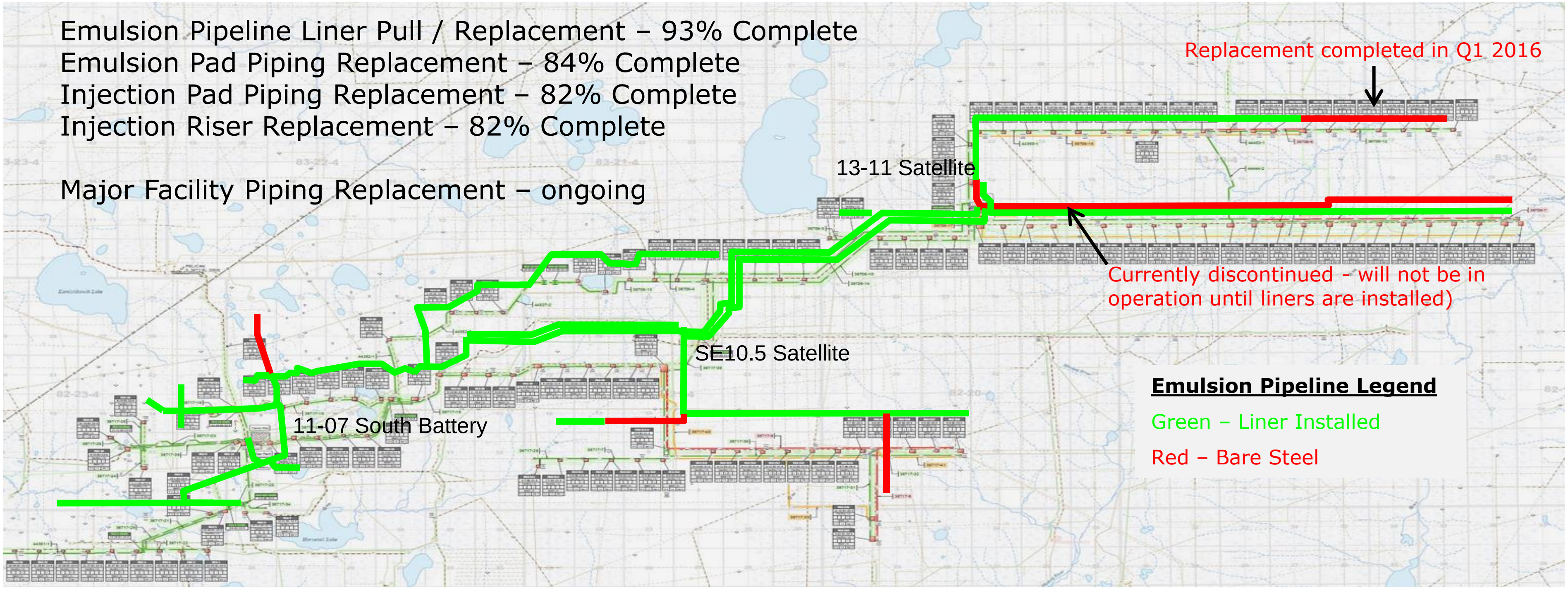
2015 Pipeline Upgrades

- NE63-NE69 bare steel emulsion pipeline replacement (Started Q4 2015 and completed Q1 2016)
- NE59 cathodic bed upgrade
- Water injection riser replacements
    - SW41 to NW11.5, SE16.5 to SE11 & SE24.5 to SE28
- Miscellaneous emulsion pig barrel replacement
- Continued with proactive group emulsion/injection pipeline improvement program
- Target to complete the NE63 to NE69 water injection riser replacement scope in 2016

Pelican Lake Corrosion Mitigation Summary

Emulsion Pipeline Liner Pull / Replacement – 93% Complete
Emulsion Pad Piping Replacement – 84% Complete
Injection Pad Piping Replacement – 82% Complete
Injection Riser Replacement – 82% Complete

Major Facility Piping Replacement – ongoing



Measuring & Reporting Protocol

Methods of Measurement

- Oil and water: Flow meters on every producer and injector
- Solution gas: Proration from Gas Oil Ratio (GOR) testing

Typical Well Testing:

- Frequency and duration; well testing as per Directive 17
- No test tanks on any wells; all wells have flow meters

Field Proration Factors

- Within acceptable range (Oil: 0.90, Water: 0.95)

2015 Greenhouse Gas Emissions

- Vapor Recovery Units (VRUs) installed on production tanks (no routine gas venting off tanks)
- Air compressors (‘instrument air’) installed for operating pneumatic equipment (no gas venting)
- Glycol dehydrator at 11-07 South Battery. Still column vent tied in to Low Pressure flare (vent gas is combusted, not vented to atmosphere)
- Gas conserved on pads where economically feasible
- Total greenhouse gas emissions: 111,666 tonnes CO_2 equivalent

2015 – 2016
Development Activities

2015 Development Initiatives

- No drilling in 2015

- 2015 priorities:
  - Operating cost reductions
  - Optimizing injection rates, non-saline water usage, and polymer consumption
  - Flood Management
  - Polymer efficacy
  - Workover frequency reductions

- Continued reservoir characterization and simulation modeling to enhance long term field development strategy

AER Regulatory Discussion & Key Learnings

AER Regulatory Discussion & Compliance

- Current approval and downspacing is flexible for Cenovus to continue its infill program
- Cenovus is in compliance with will all conditions of the approval and regulatory requirements

- Value in amending approval conditions for Scheme 9404 approval update to the AER every 2nd year?

End

Back-Up Slides

Gas volumes- Total flared gas

- **Total flared gas: 314.6 e3m3/year**

Production Month	Operator BA	Operator Name	Facility ID	Facility Name	Facility Location	Activity	Product	Volume
2015-01	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FLARE	GAS	24.6
2015-02	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FLARE	GAS	19.7
2015-03	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FLARE	GAS	25.4
2015-04	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FLARE	GAS	25.8
2015-05	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FLARE	GAS	22.6
2015-06	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FLARE	GAS	18.3
2015-07	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FLARE	GAS	18.8
2015-08	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FLARE	GAS	19.7
2015-09	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FLARE	GAS	25.2
2015-10	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FLARE	GAS	19.3
2015-11	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FLARE	GAS	54.6
2015-12	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FLARE	GAS	40.6

Gas volumes- Total vented gas

- **Total vented gas: 3,865.3 e3m3/year**

Production Month	Operator BA	Operator Name	Facility ID	Facility Name	Facility Location	Activity	Product	Volume
2015-01	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	VENT	GAS	350.6
2015-02	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	VENT	GAS	328.6
2015-03	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	VENT	GAS	333.5
2015-04	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	VENT	GAS	301.9
2015-05	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	VENT	GAS	316.3
2015-06	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	VENT	GAS	321.9
2015-07	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	VENT	GAS	316.2
2015-08	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	VENT	GAS	329.9
2015-09	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	VENT	GAS	316.2
2015-10	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	VENT	GAS	304.5
2015-11	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	VENT	GAS	293.0
2015-12	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	VENT	GAS	352.7

Gas volumes- Total produced gas

- **Total produced gas: 16,292.8 e3m3/year**

Production Month	Operator BA	Operator Name	Facility ID	Facility Name	Facility Location	Activity	Product	Volume
2015-01	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	PROD	GAS	1457.6
2015-02	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	PROD	GAS	1261.8
2015-03	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	PROD	GAS	1393.4
2015-04	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	PROD	GAS	1235.0
2015-05	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	PROD	GAS	1280.2
2015-06	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	PROD	GAS	1448.7
2015-07	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	PROD	GAS	1547.5
2015-08	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	PROD	GAS	1569.7
2015-09	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	PROD	GAS	1426.8
2015-10	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	PROD	GAS	1137.6
2015-11	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	PROD	GAS	1198.2
2015-12	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	PROD	GAS	1336.3

Gas volumes- Total fuel gas consumed

- **Total fuel gas consumed: 21,357.3 e3m3/year**

Production Month	Operator BA	Operator Name	Facility ID	Facility Name	Facility Location	Activity	Product	Volume
2015-01	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FUEL	GAS	2090.4
2015-02	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FUEL	GAS	1661.9
2015-03	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FUEL	GAS	1772.2
2015-04	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FUEL	GAS	1609.9
2015-05	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FUEL	GAS	1542.2
2015-06	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FUEL	GAS	1800.8
2015-07	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FUEL	GAS	1892.8
2015-08	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FUEL	GAS	1936.0
2015-09	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FUEL	GAS	2012.4
2015-10	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FUEL	GAS	1638.0
2015-11	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FUEL	GAS	1563.2
2015-12	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	FUEL	GAS	1837.5

Gas volumes- Total purchased gas

- **Total purchased gas: 15,974.6 e3m3/year**

Production Month	Operator BA	Operator Name	Facility ID	Facility Name	Facility Location	Activity	Product	Volume
2015-01	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	REC	GAS	1385.2
2015-02	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	REC	GAS	1180.9
2015-03	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	REC	GAS	1266.0
2015-04	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	REC	GAS	1237.1
2015-05	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	REC	GAS	1411.0
2015-06	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	REC	GAS	1713.1
2015-07	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	REC	GAS	1821.7
2015-08	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	REC	GAS	1847.5
2015-09	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	REC	GAS	1911.2
2015-10	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	REC	GAS	704.2
2015-11	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	REC	GAS	652.4
2015-12	A5D4	CENOVUS ENERGY INC.	AB BT 0058285	AMBER BRITNELL 11-7-82-22	00-11-07-082-22 W4	REC	GAS	844.3

Gas volumes- Total fuel gas sold

- **Total fuel gas sold: 0.0 e3m3/year**

Pelican Lake Development History

- 1997 - Primary production (400m spacing), limited AEC exposure
- 1998 – AEC acquires Amber’s Interest in Pelican Lake
- 2001 - Waterflood pilot (400m spacing; infilled with injectors @ 200m)
- 2003 - Commercial Waterflood
- 2004 - Polymer Pilot
- 2006 - Commercial Polymer
- 2010 - Injection rates lowered to arrest watercut increases
- 2010 - Injection shut-in on pads for infill drilling program
- 2011 - Infill Drilling to 100 and 133m interwell spacing
- 2011 - Hot Water Pilot (Pad SE29)
- 2015 – Optimize field (low oil prices)

Typical Well Schematic: Example

Downhole Well Profile

cenovus ENERGY

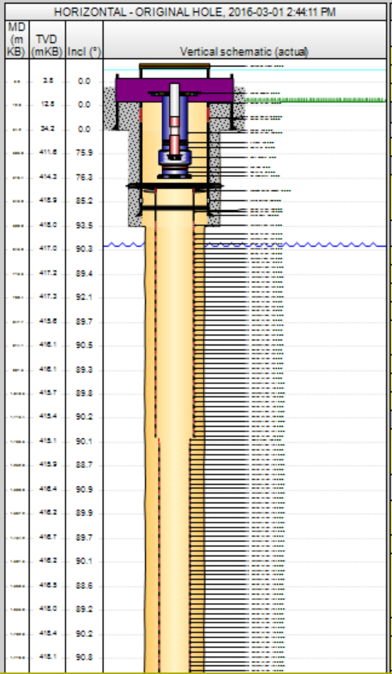
Well Name: CVE 8C-23 2B4 BRINT 4-13-82-22

Bottom Hole UWI	Surface Legal Location	Pad	Field Name	License #	State/Province
103/04-13-082-22W4/00	LSD 08-23-082-22W4	SE002	BRINTNELL	0437500	AB

Profile Type	Orig KB Elev (m)	KB-Grd (m)	KB-CF (m)	KB-TH (m)	Total Depth (mKB)	Sour Class (Licensed)	Sour Status Date
HORIZONTAL	634.00	5.10	5.10		2,667.00	SWEET	2011-10-06 00:00

Type
CASING BOWL

Des	Make	Model	WP (kPa)	Service	Top WP (kPa)	Top Ring Gasket	Bore Min (mm)
CASING BOWL	ABB VETCO GRAY	C-22L	14,000	GENERAL	14,000	R-53	



Casing Strings

Csg Des	OD (mm)	Wt/Len (kg/m)	Grade	Top Thread	Set Depth (mKB)
CONDUCTOR	406.4	96.731	H-40		34.20
INTERMEDIATE	244.5	59.527	L-80		556.55
LINER	139.7	23.067	J-55	Buttress	2,665.00

Perforations

Date	Top (mKB)	Btm (mKB)	Zone

TUBING - PRODUCTION set at 516.42mKB on 2012-04-23 11:00

Tubing Description	Run Date	String Length (m)	Bottom or Set Depth (mKB)
TUBING - PRODUCTION	2012-04-23	511.72	516.42

Item Des	Jts	Make	Model	OD (mm)	Wt (kg/m)	Grade	Len (m)
TUBING HANGER	1	N/A		179.0			0.15
TUBING	51			88.9	13.840	J-55	498.11
F NIPPLE	1	BAKER		88.9			0.33
PUP JOINT	1	N/A		88.9			1.28
PCP - STATOR	1	WEATHERFORD	95-1000	114.0			10.25
TAG BAR	1	N/A		88.9			0.55
PUP JOINT	1	N/A		88.9			0.53
NO TURN TOOL	1	N/A	TX5	114.0			0.52

NEW COATED MOORE ROD on 2015-01-14 12:00

Rod Description	Run Date	String Length (m)	Set Depth (mKB)
NEW COATED MOORE ROD	2015-01-14	510.92	514.70

Item Des	Jts	Make	Model	OD (mm)	Wt (kg/m)	Grade	Len (m)
POLISHED ROD	1	NORRIS	STAINLESS STEEL	31.7		N/A	10.97
SUCKER ROD	1	NORRIS	GRADE 78	31.8	6.206	D	7.62
CONTINUOUS SUCKER ROD	1	MOORE ROD RUN NEW JAN 14 2015	28.6MM CTD	28.6	5.030	D	475.00
SUCKER ROD	1	NORRIS	GRADE 78	31.8	6.206	D	7.62
PCP - ROTOR	1	WEATHERFORD	95-1000 XL	55.0		N/A	9.71

Directional Schematic and Survey Plot

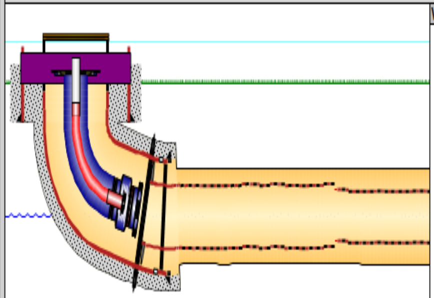
Well Name: CVE 8C-23 2B4 BRINT 4-13-82-22

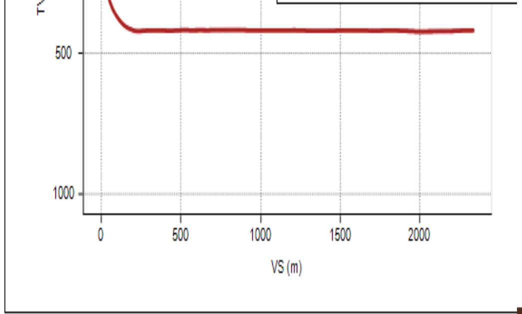
cenovus ENERGY

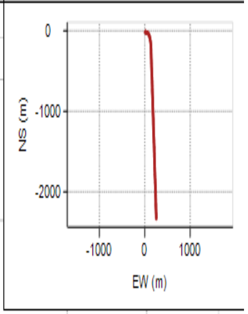
Bottom Hole UWI	Surface Legal Location	Pad	License #	State/Prov	Profile Type	Ground Broke Spud...	Rig Release Date	Orig KB Elev (m)	Working GLE (...	CF Elev (m)	KB-Grd (m)	KB-CF (m)	TD (mKB)
103/04-13-082-22W4/00		SE002	0437500	AB	HORIZONTAL	2011-11-24	2012-03-26	634.00	628.90	628.90	5.10	5.10	2,667.00

HORIZONTAL - ORIGINAL HOLE, 2016-03-01 2:41:53 PM

Directional schematic (actual)

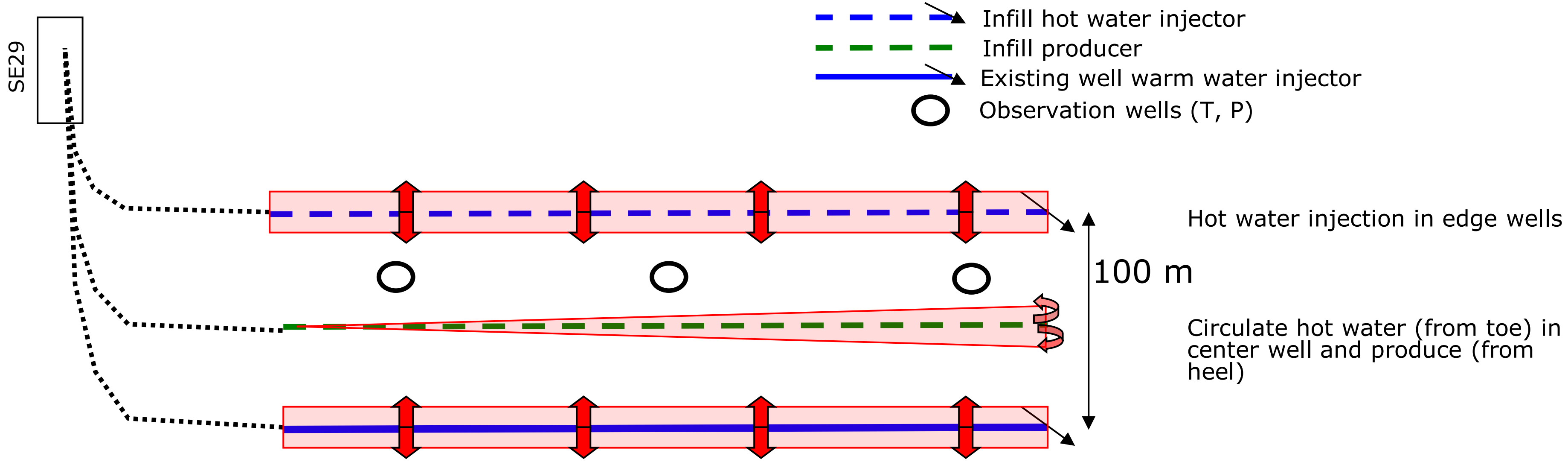




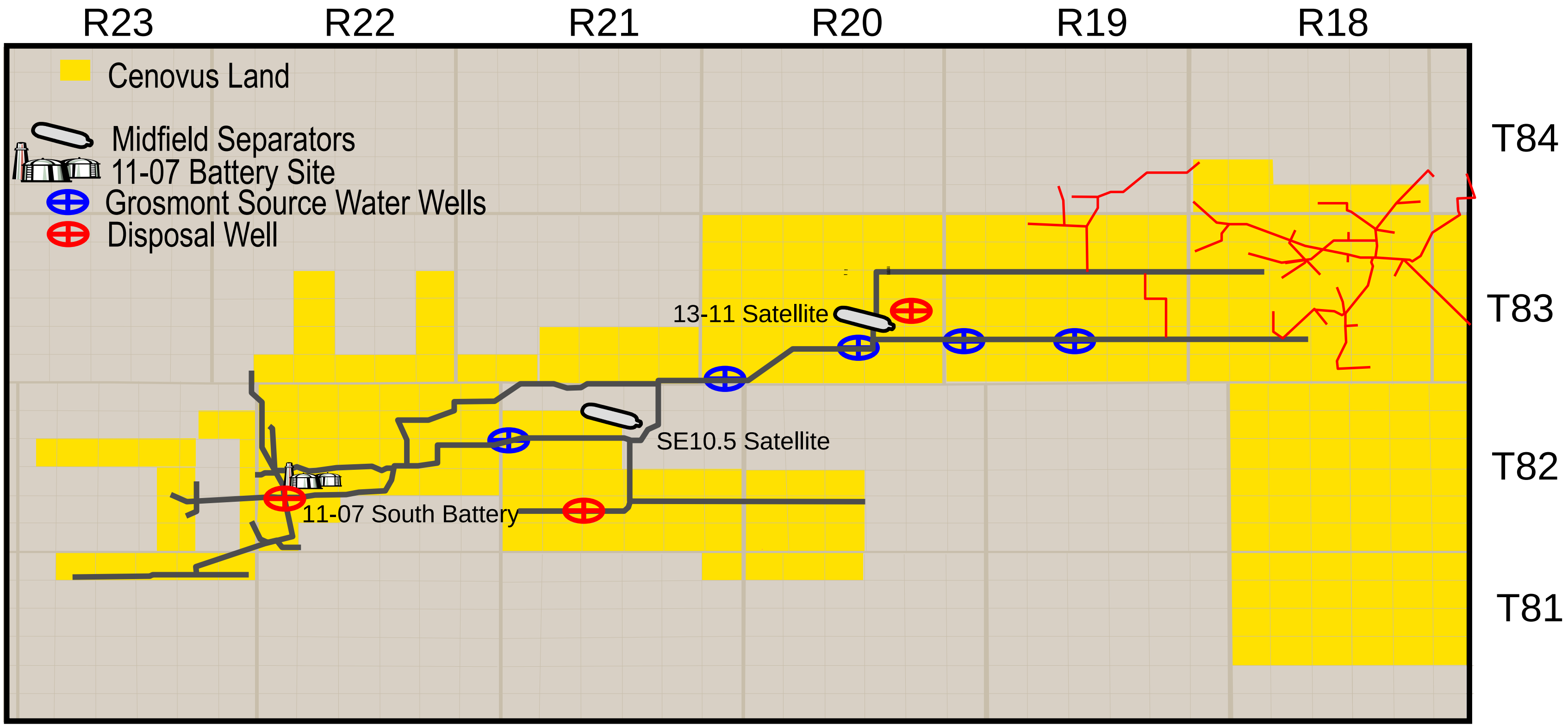


SE29 Hot Water Pilot Well Configuration

Phase 3: Hot water circulation (SE29)



Pelican Lake Facilities Map



Pelican Lake Major Facilities Description

13-11 Satellite

- Utilizes two inclined free water knock out vessels (cold) to remove as much free water as possible from emulsion before sending to South Battery for processing
- Free water is pumped into high pressure injection line

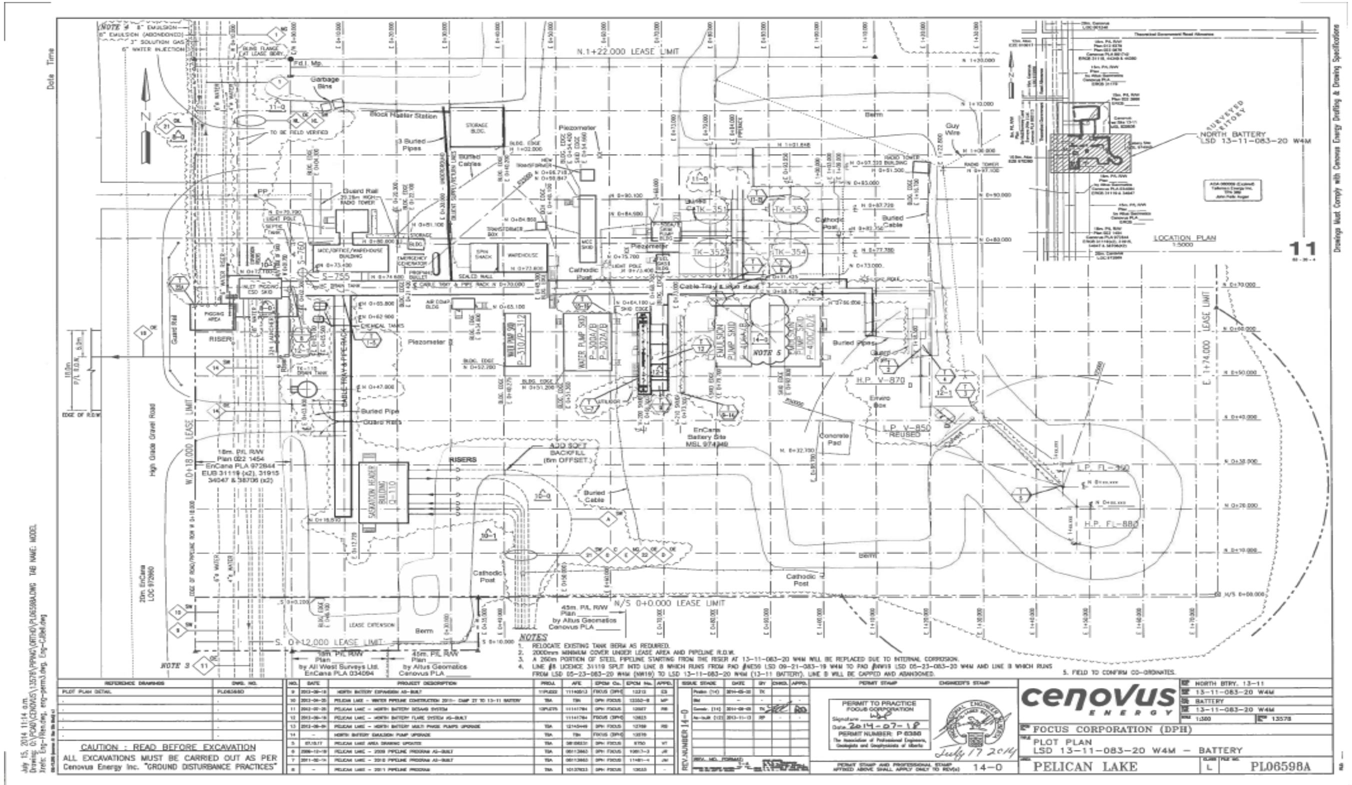
SE10.5 Satellite

- Utilizes one inclined free water knock out vessel (cold) to remove as much free water as possible from emulsion before sending to South Battery for processing
- Free water is pumped into high pressure injection line

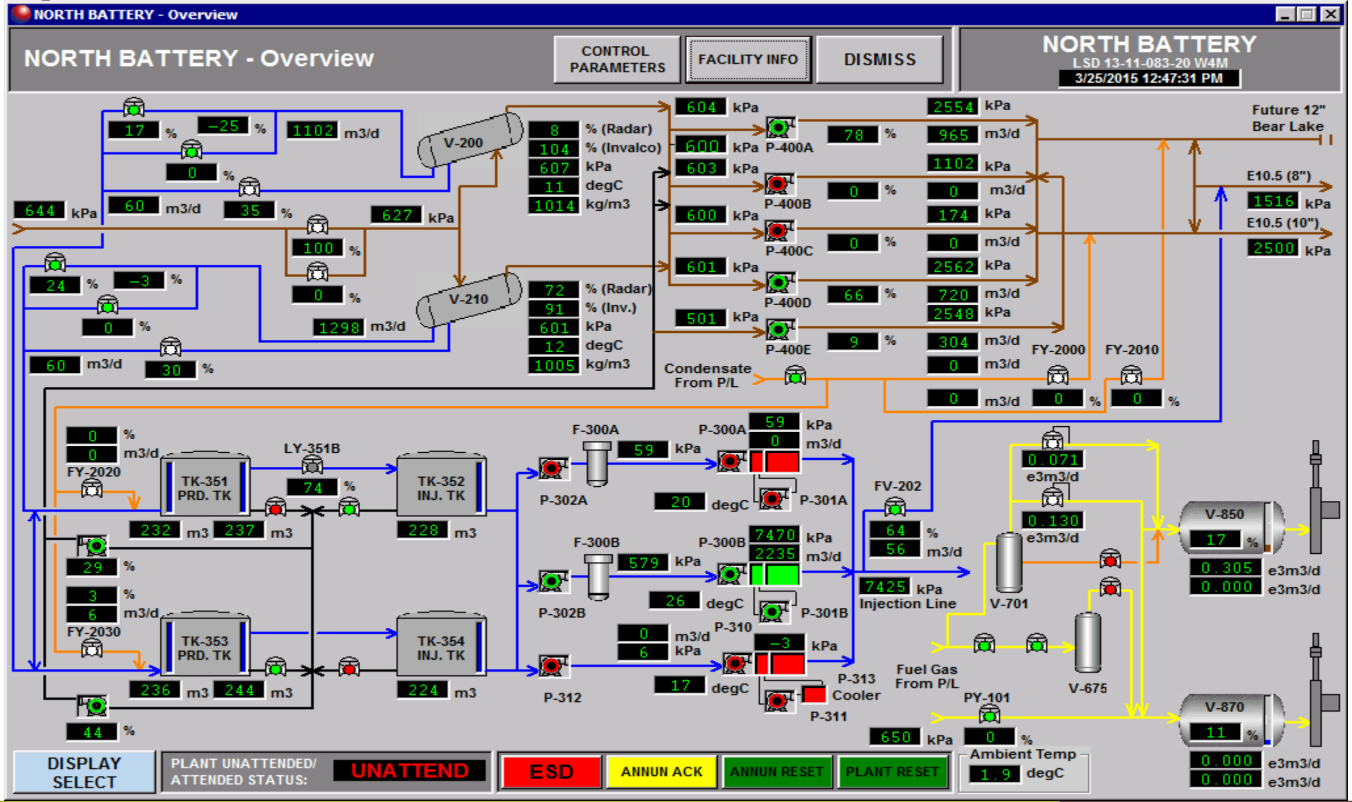
11-07 South Battery

- Utilizes inclined free water knock out (cold), heated knock out vessels, plate and frame heat exchangers, and 5 treaters to dewater emulsion to sales oil spec
- De-oiled water is pumped into high pressure injection line

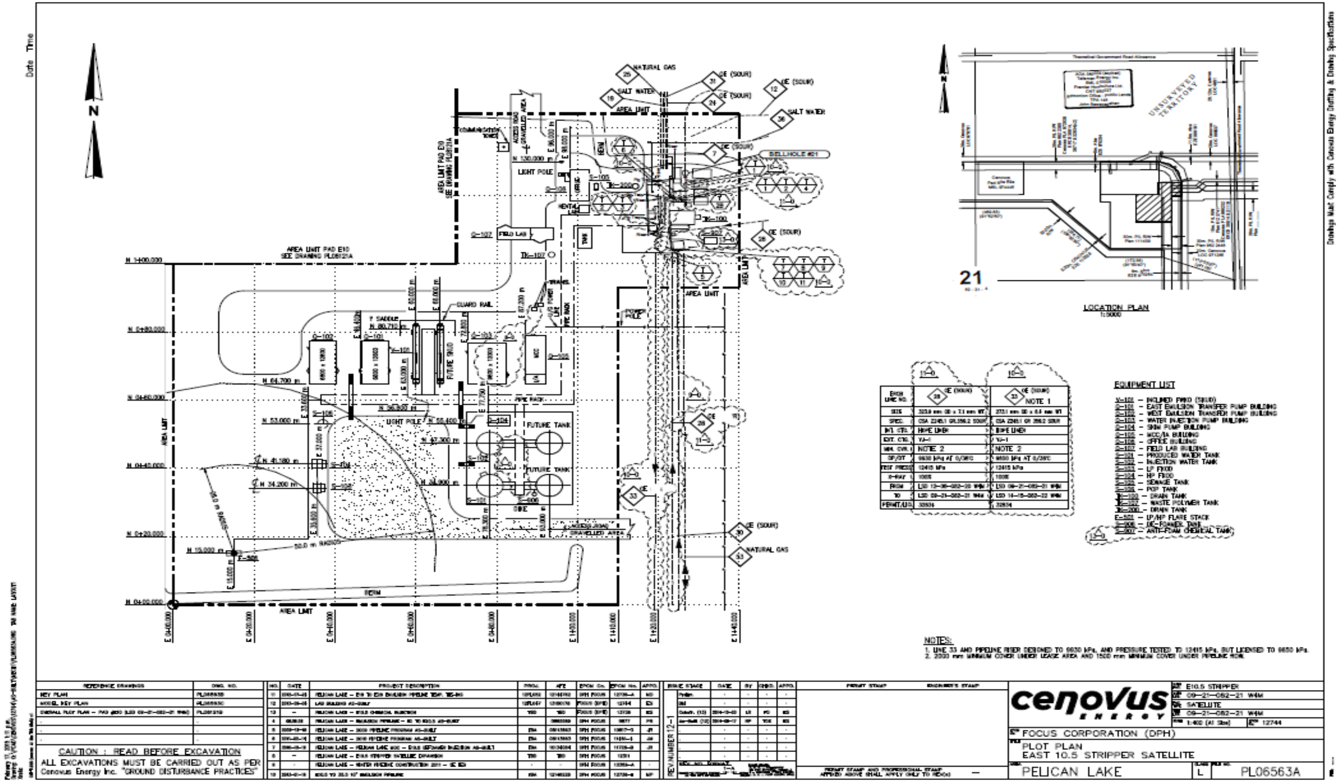
Facility: 13-11 Satellite Plot Plan



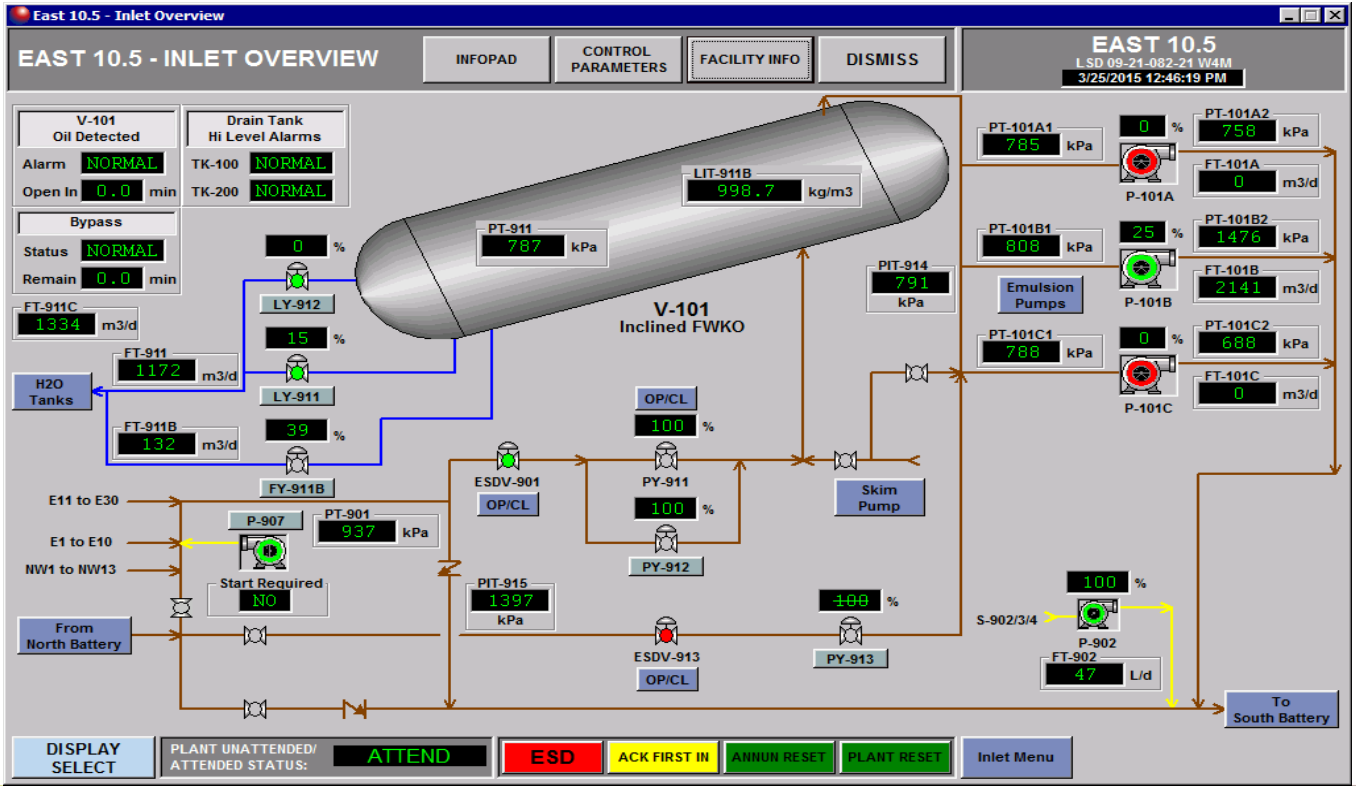
Facility: 13-11 Satellite Process Flow



Facility: SE10.5 Satellite Plot Plan



Facility: SE10.5 Satellite Process Flow



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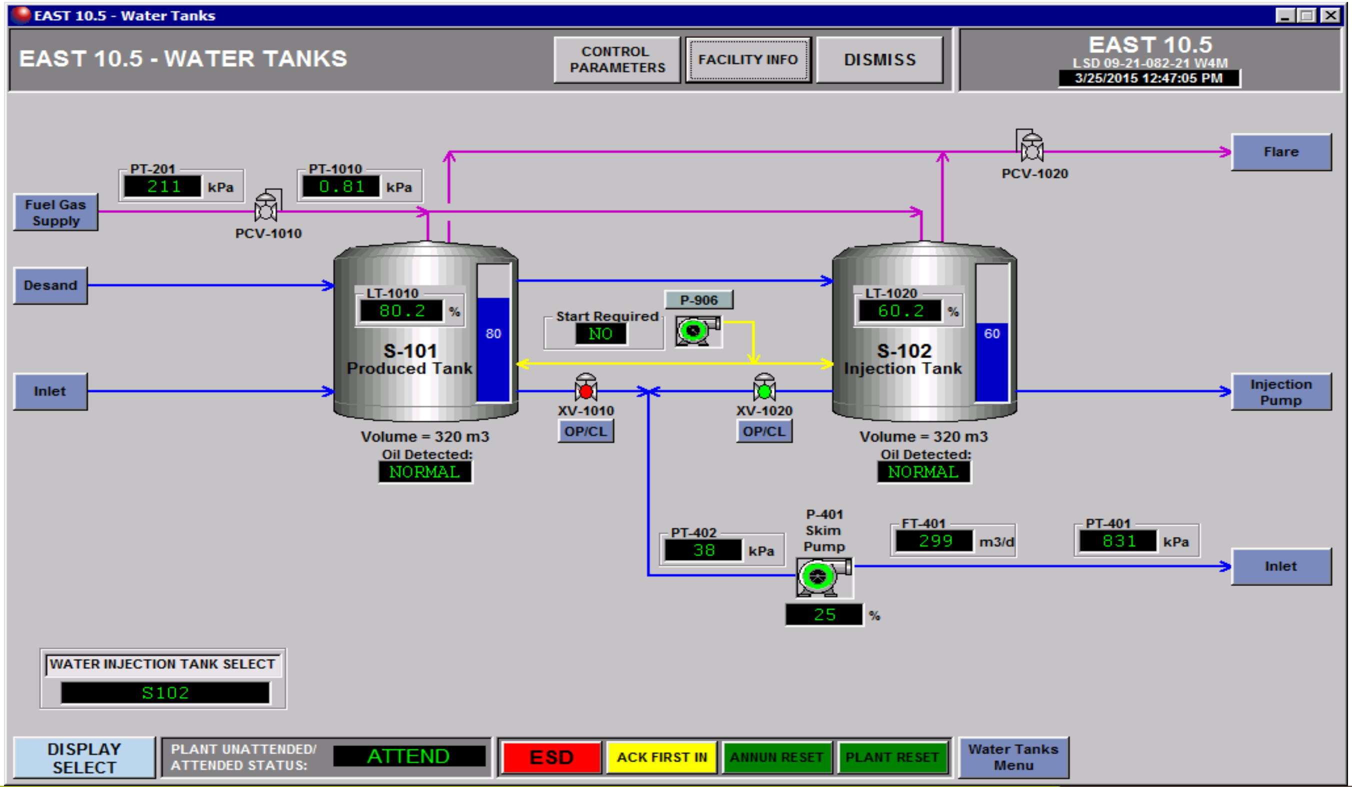
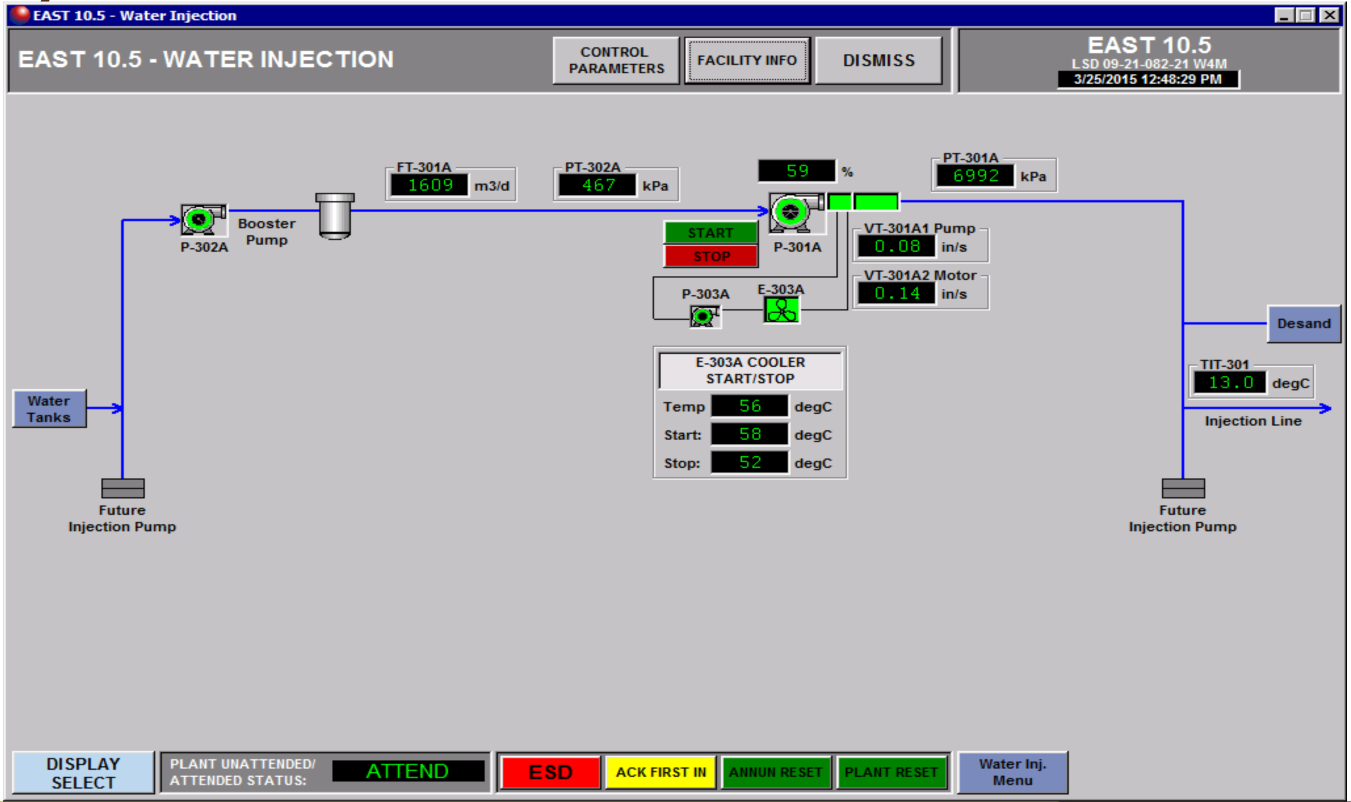
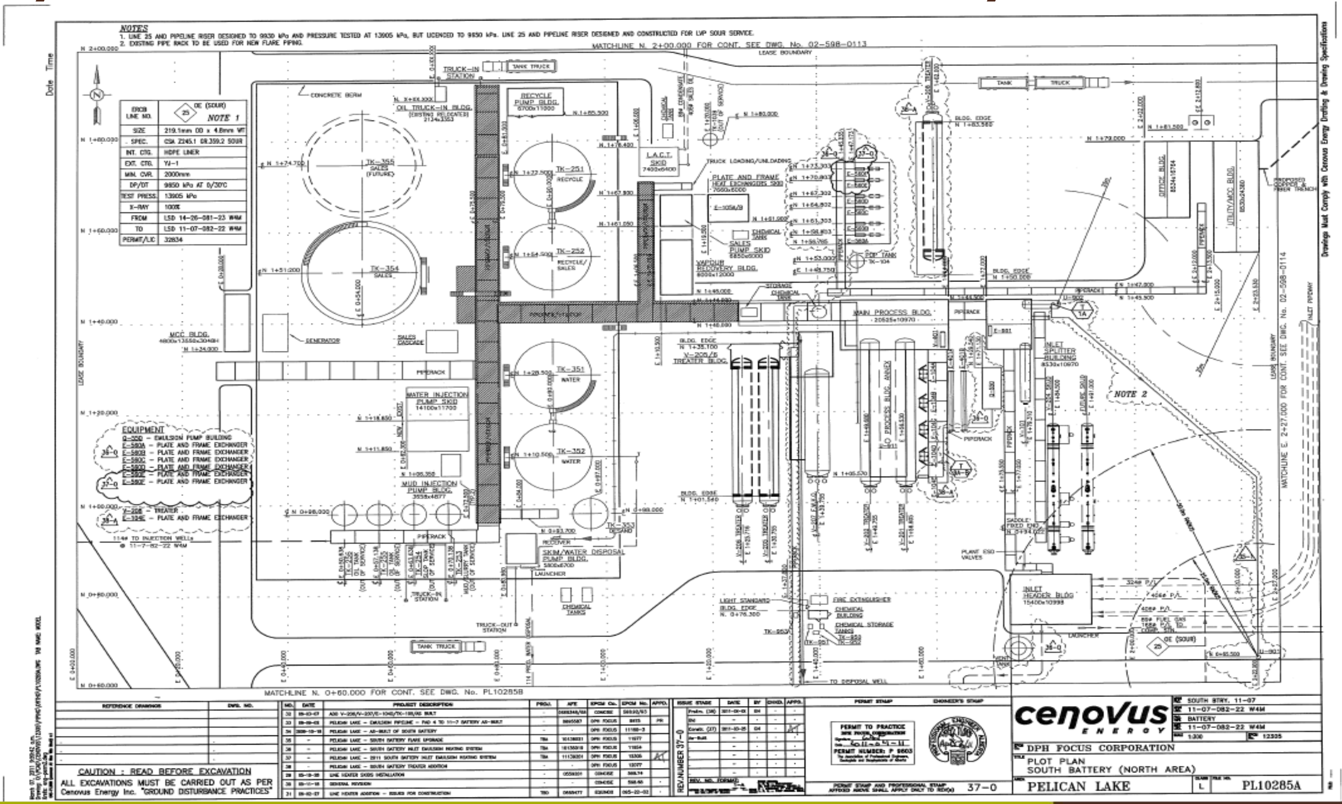
Facility: SE10.5 Satellite Process Flow



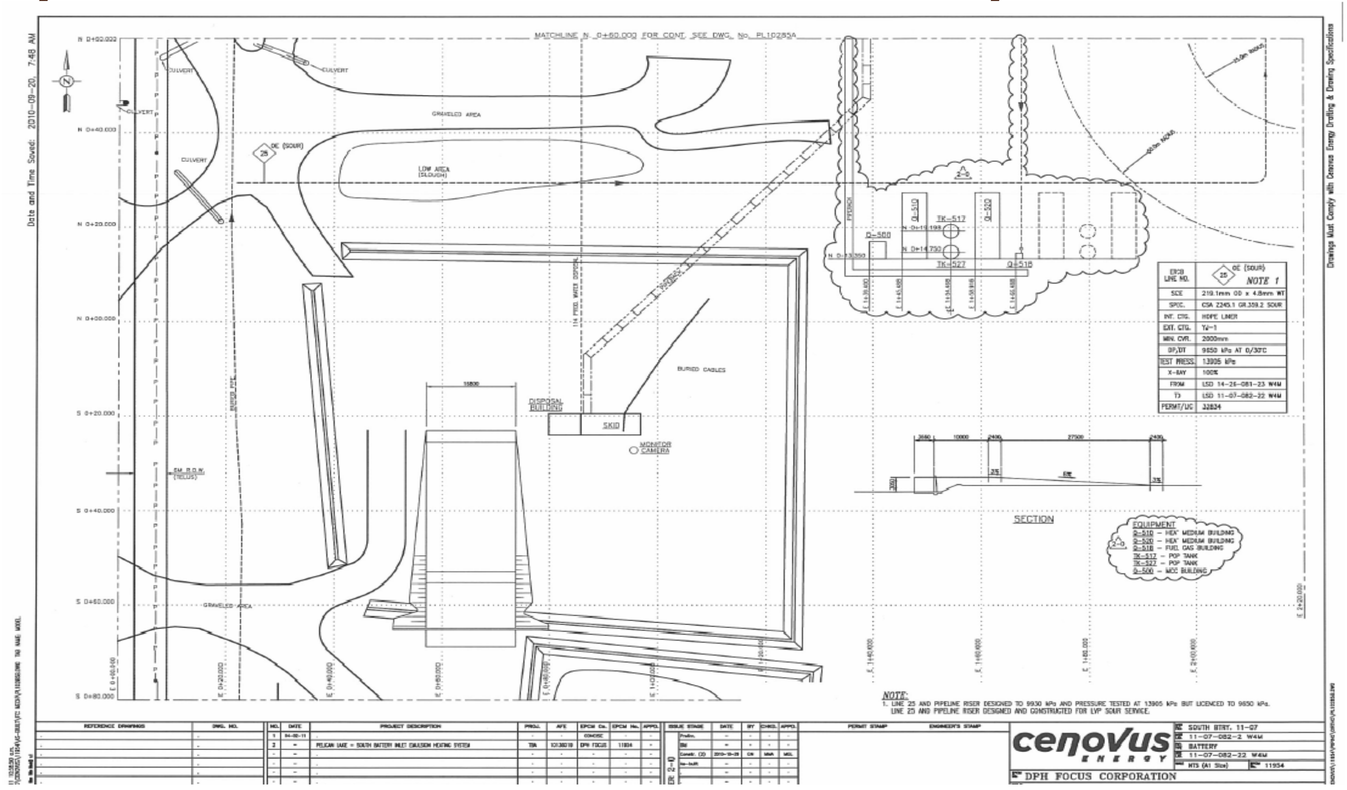
Facility: SE10.5 Satellite Process Flow



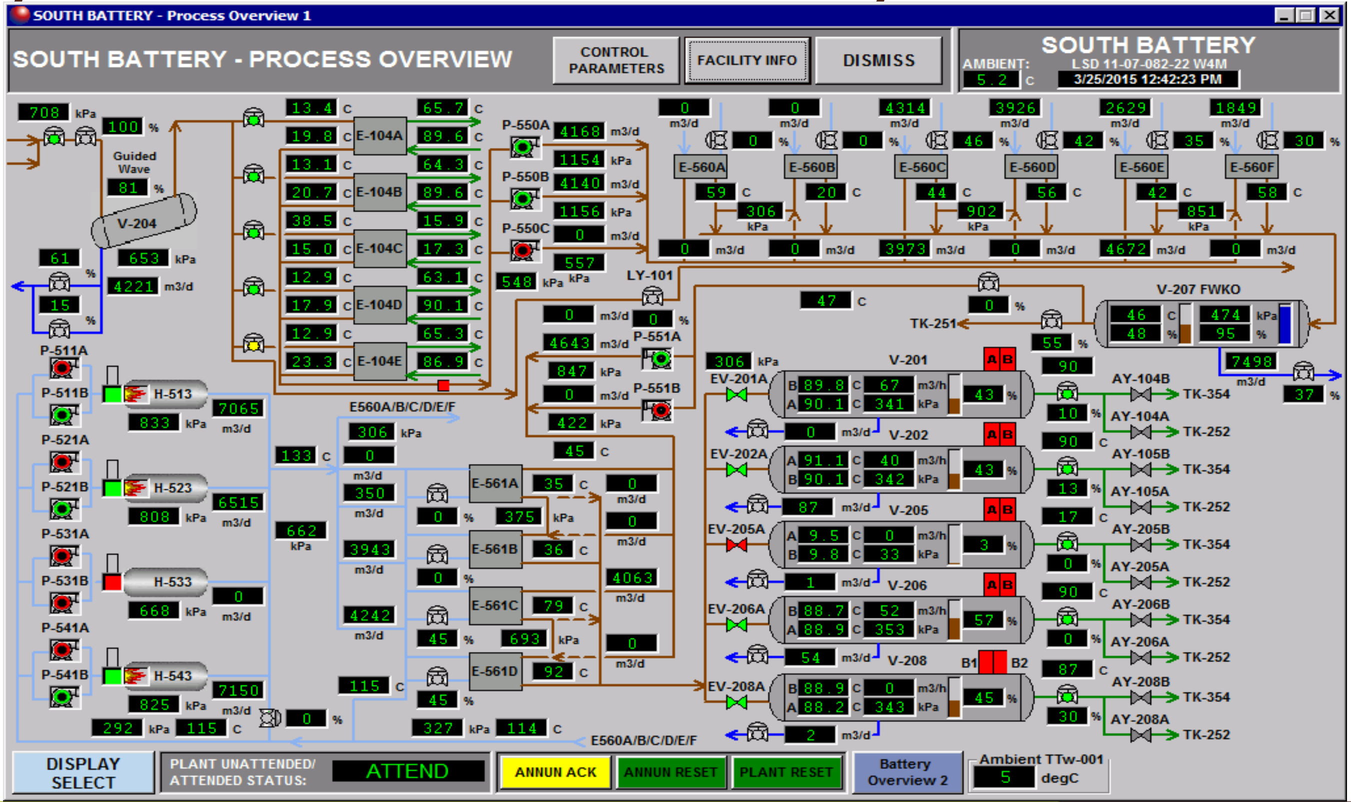
Facility: 11-07 South Battery Plot Plan



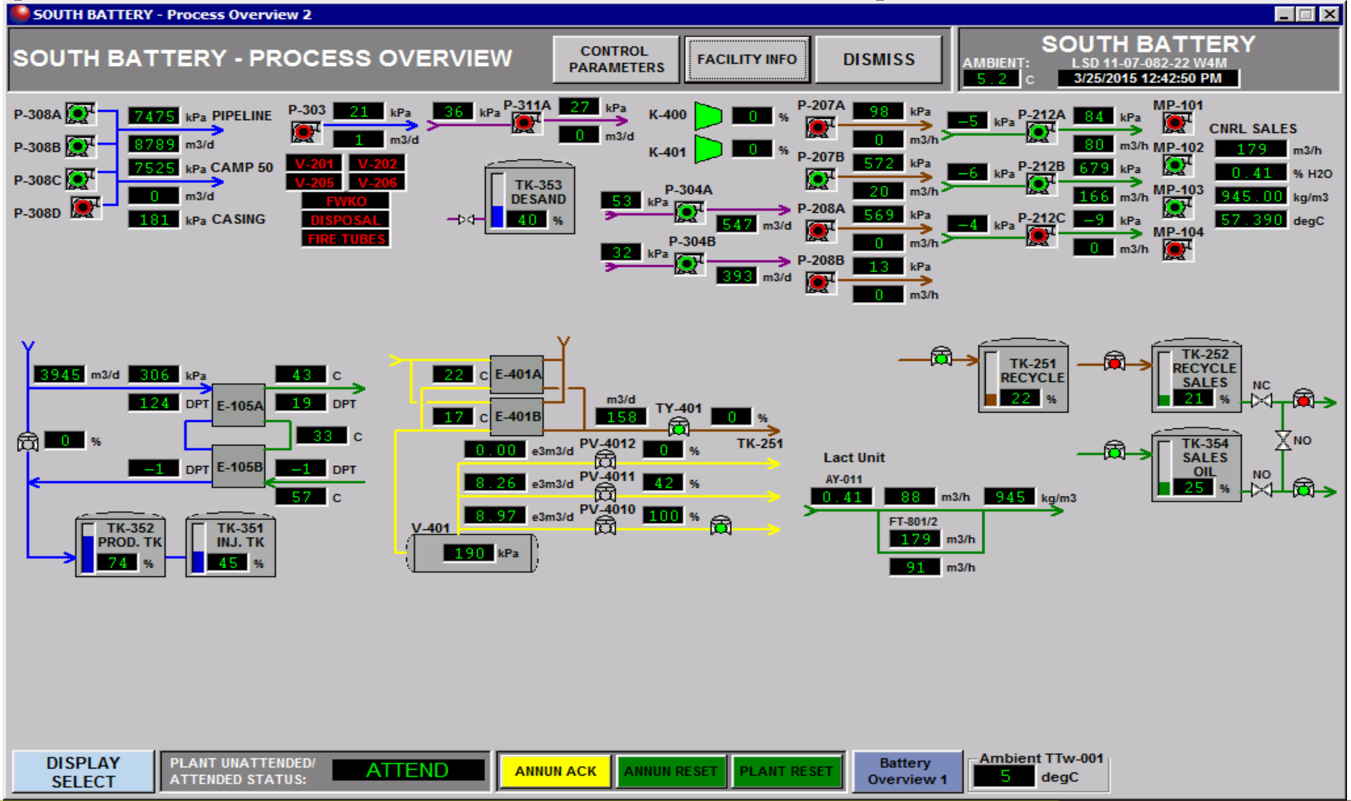
Facility: 11-07 South Battery Plot Plan



Facility: 11-07 South Battery Process Flow



Facility: 11-07 South Battery Process Flow



Facility: 11-07 South Battery Process Flow