ATHABASCA OIL CORPORATION

AER HANGINGSTONE PROJECT UPDATE

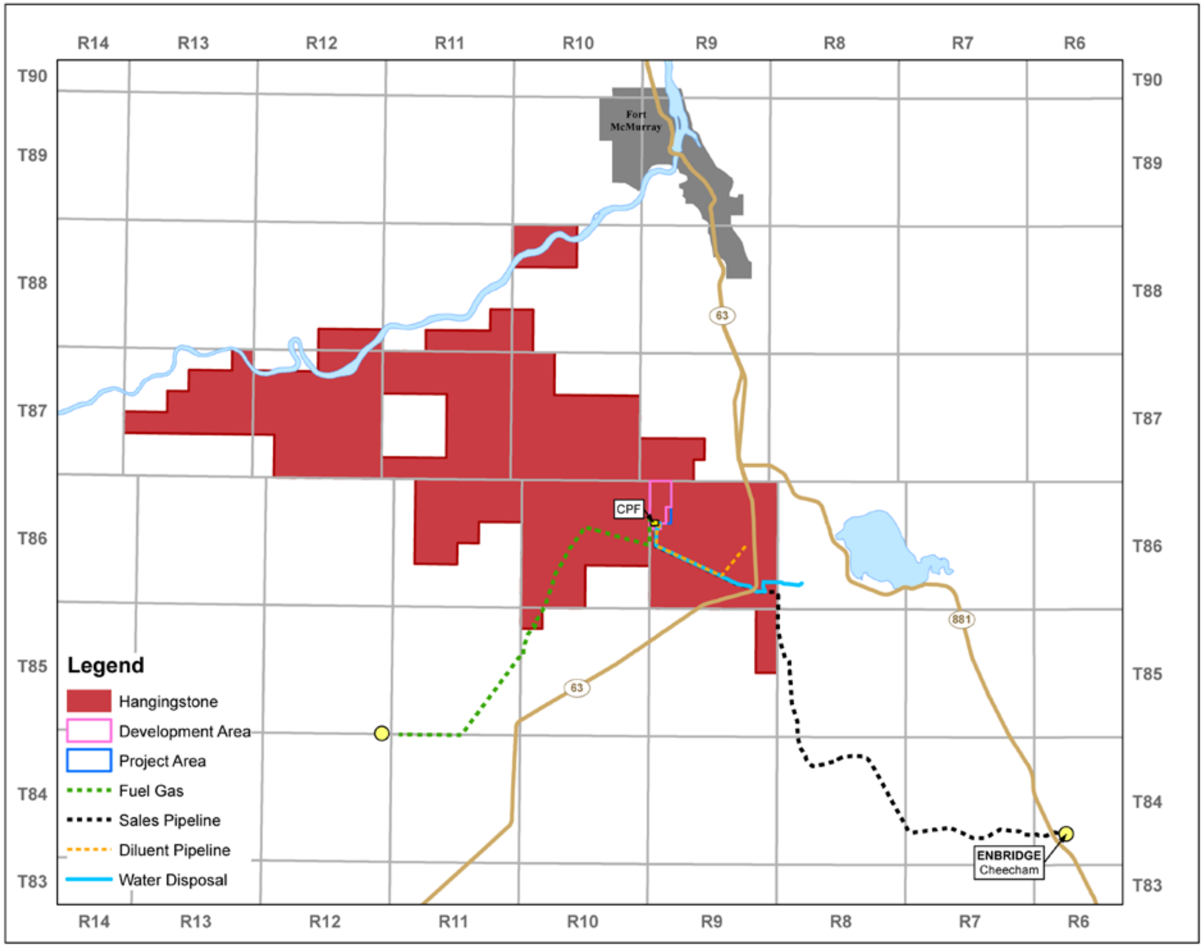
January 2017

ATHABASCA OIL CORPORATION

INTRODUCTION

PROJECT DESCRIPTION AND STATUS	Blair Hockley
SUBSURFACE	
o Geoscience	Lori Dwyer
o Well Design & Instrumentation	Neeraj Patel
• *Drilling & Completions*	
• *Artificial Lift*	
• *Instrumentation*	
o 4-D Seismic & Monitoring	Lori Dwyer
o Scheme Performance	Tarek Hamida
o Future Plans	Tarek Hamida
SURFACE	
o Facilities	Peter Rutherford
o Measurement & Reporting	Peter Rutherford
o Water Production, Injection & Uses	Peter Rutherford
o Sulphur Production	Peter Rutherford
o Compliance	Jerry Demchuk
o Future Plans	Blair Hockley

DEVELOPMENT OVERVIEW

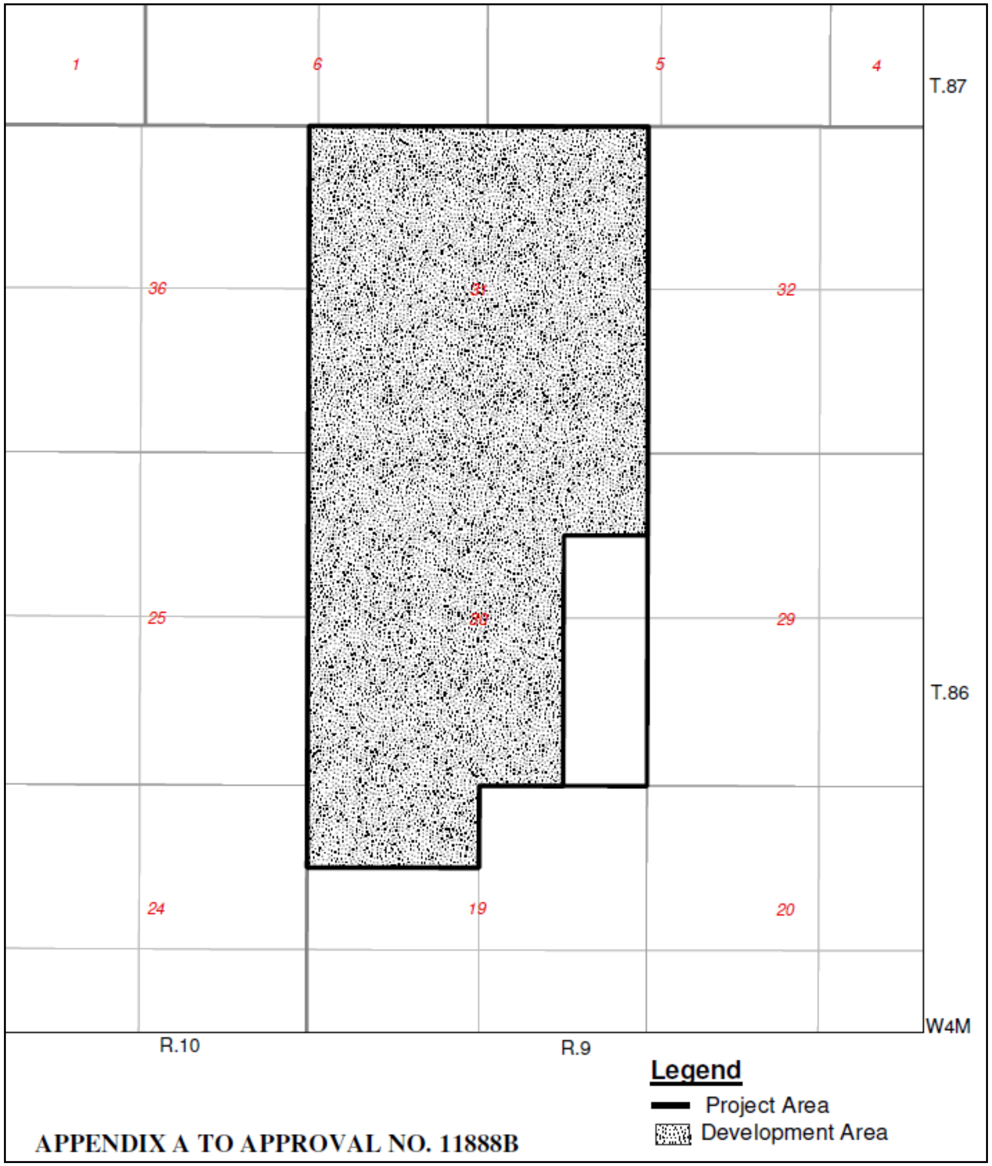


- Project 1 – 1,908 m3/d (12,000 bbl/d) (March 2015 first steam)
- Project 2A – 1,272 m3/d (8,000 bbl/d) (current EIA application)
- Project 2B – 5,087 m3/d (32,000 bbl/d) (current EIA application)
- Project 3 – 4,770 m3/d (30,000 bbl/d) (current EIA application)

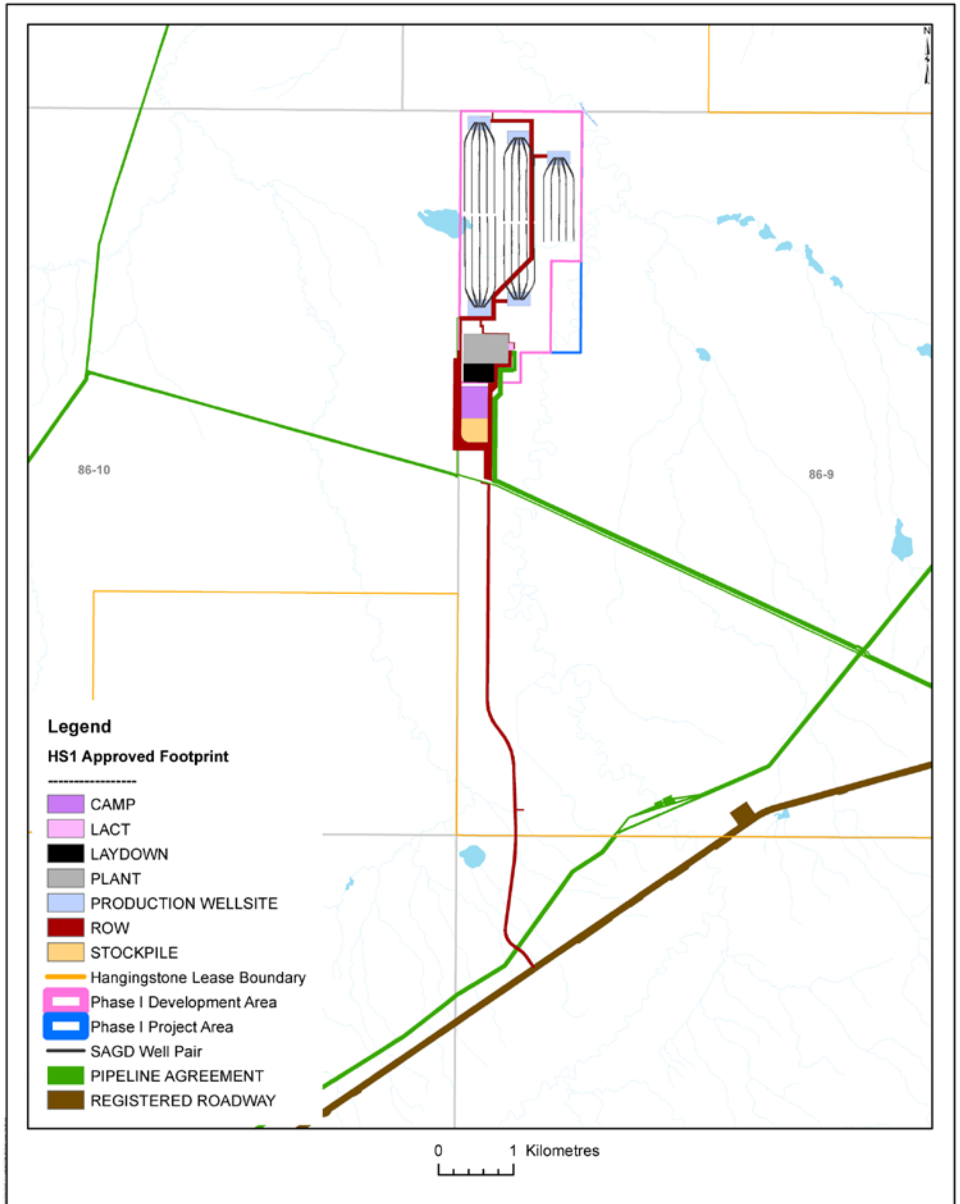
STATUS AND SCHEME MAP

HS1 PROJECT

- First steam (downhole) achieved March 23rd, 2015
- First oil produced July 2015
- Last SAGD conversion mid March , 2016 (AC01 and AE05)
- As of October 31st, 2016 there were 23 well pairs in SAGD mode and 2 well pairs were standing
    - *The two standing wells were drilled as production assurance wells and will be brought on production when there is steam availability*



DESCRIPTION



PROJECT DETAILS

- Located 20 km south of Fort McMurray, AB
- 5 production pads
- 25 horizontal well pairs (5 well pairs per pad)
- Central Processing Facility (CPF) and associated facilities
- Offsite services and utilities

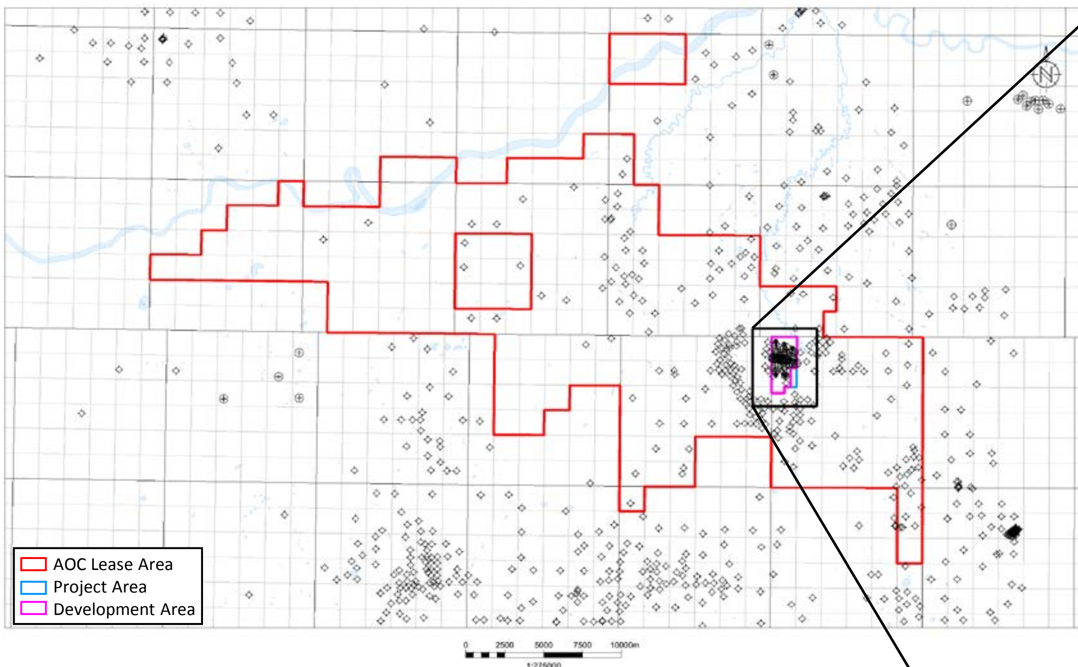
INFRASTRUCTURE

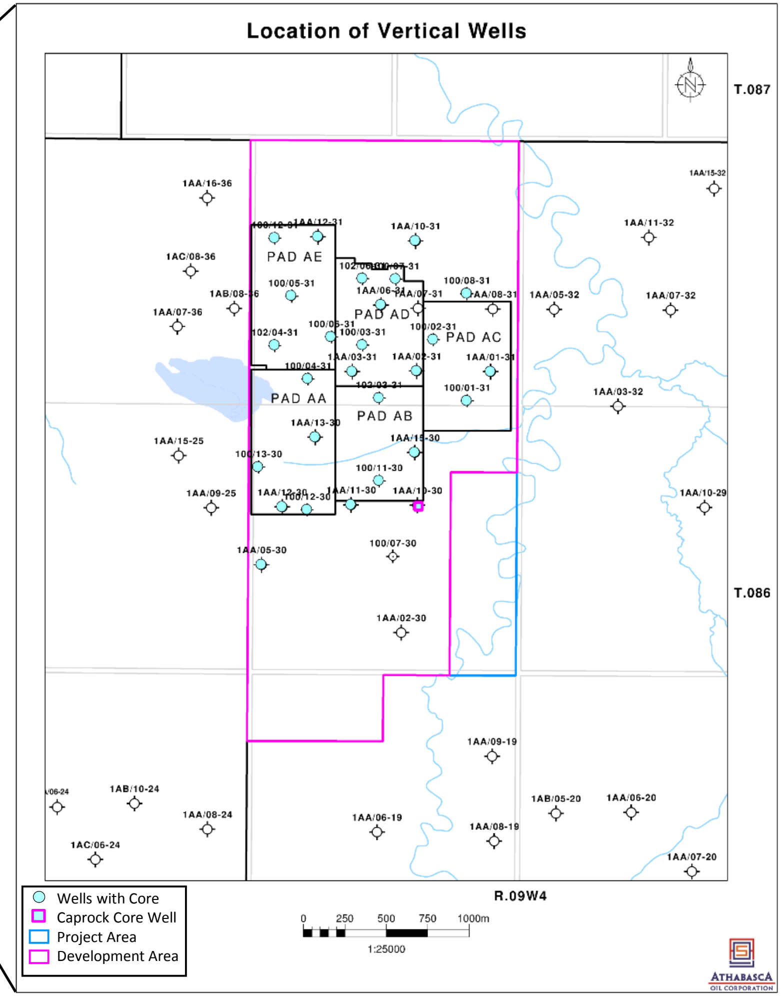
- Fuel gas from TransCanada Pipeline (TCPL)
- Dilbit export to Enbridge Cheecham Terminal
- Diluent from Inter Pipeline (IPL)

SUBSURFACE
GEOSCIENCES

ATHABASCA OIL CORPORATION

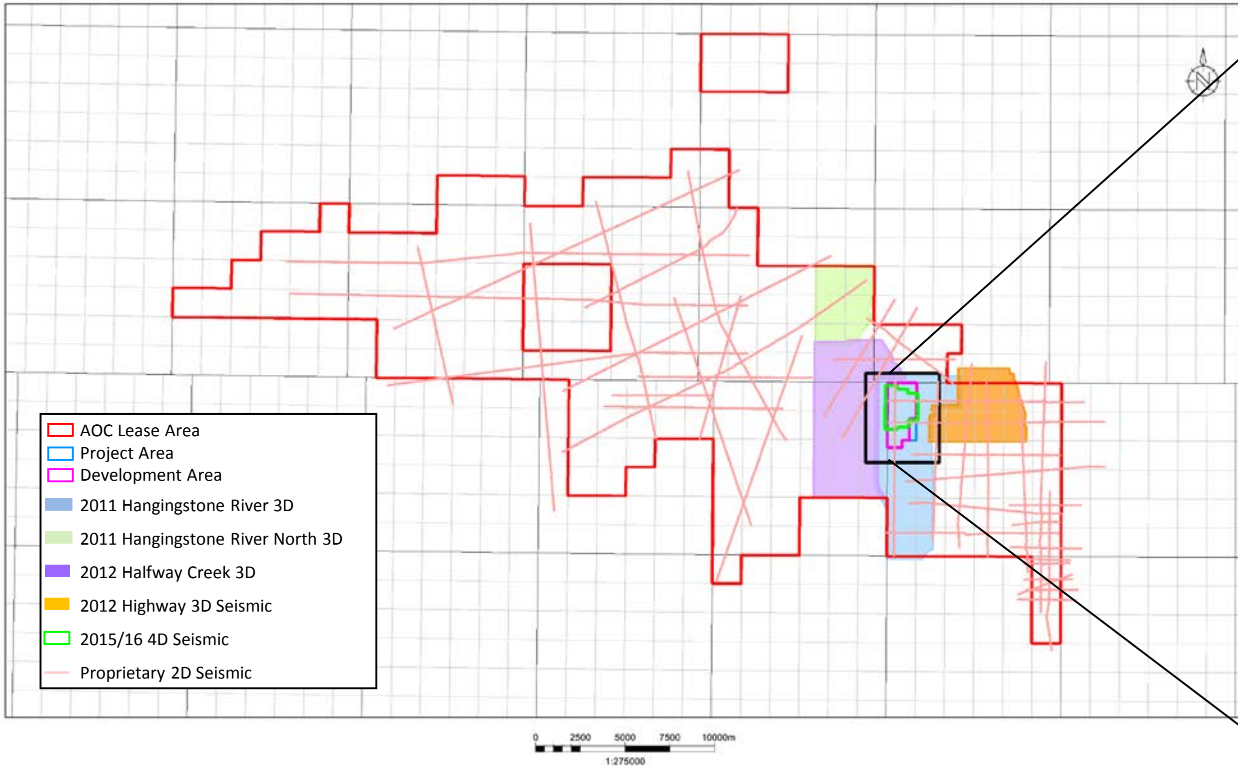
SURFACE DATA OVERVIEW

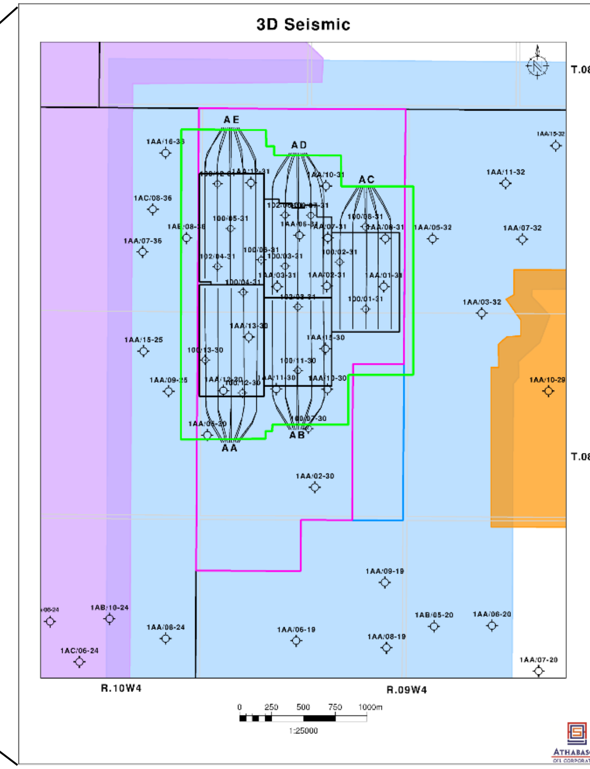




Area	Area (km^2)	MCMR Cored Wells	Image Logs	Caprock Core
Development Area	5.1	26	31	1
Project Area	5.6	26	31	1

SUBSURFACE DATA OVERVIEW





3D ACQUIRED IN 2011 AND 2012, MERGED IN 2012

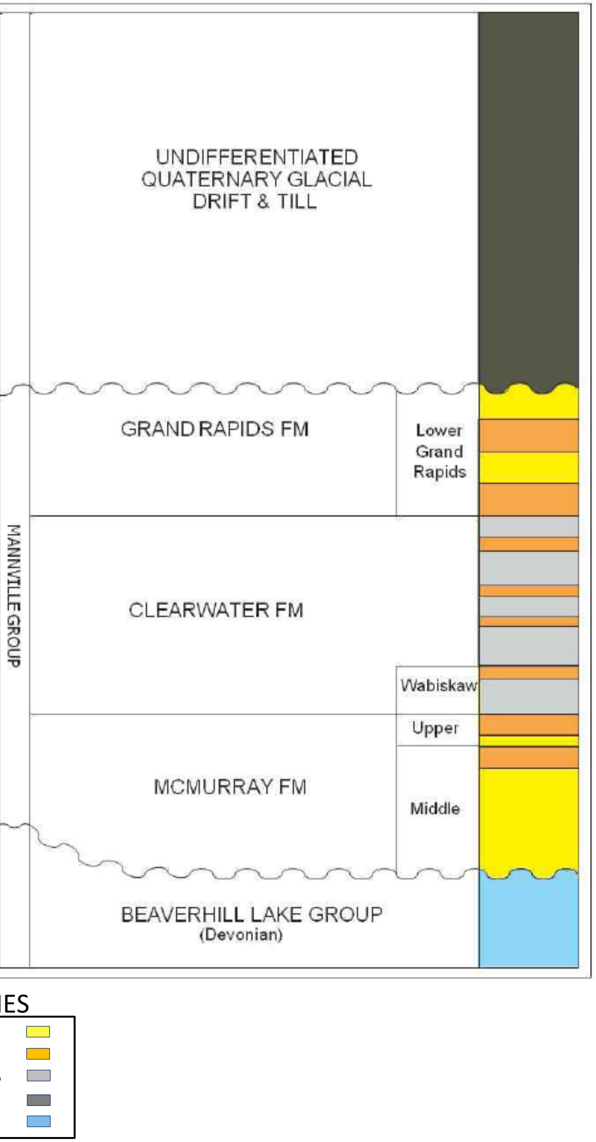
- Total proprietary 2D ~ 450 km
- Total 3D area ~98 km2 (merged)
  - *Covers development area*
- Total 4D area ~3.72 km2
  - *Baseline acquired Q1 2014*
  - *First Monitor acquired Q1 2016*

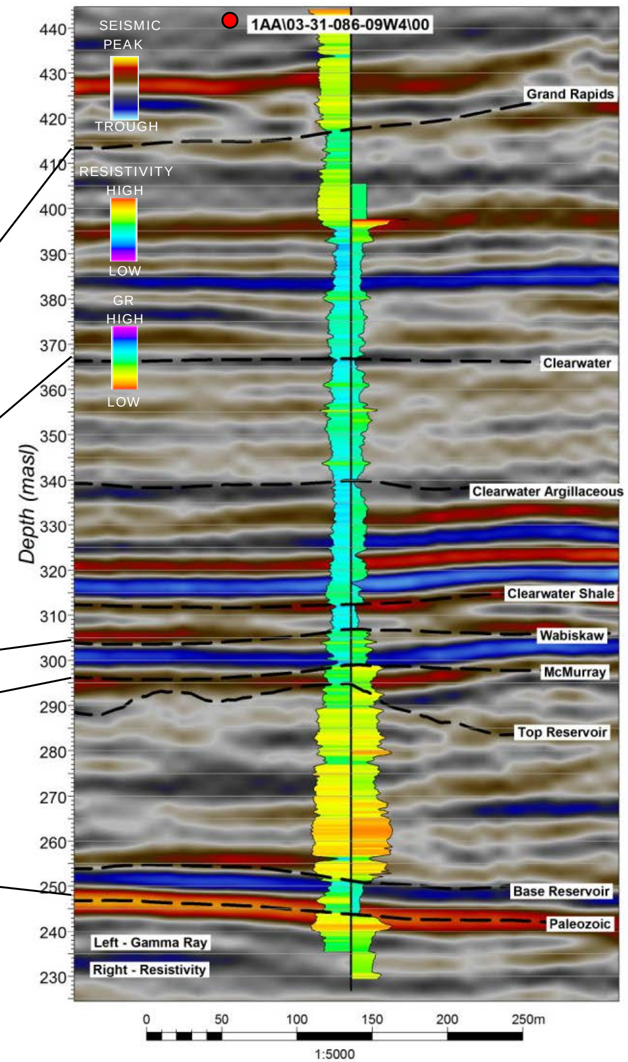
3D/4D PARAMETERS

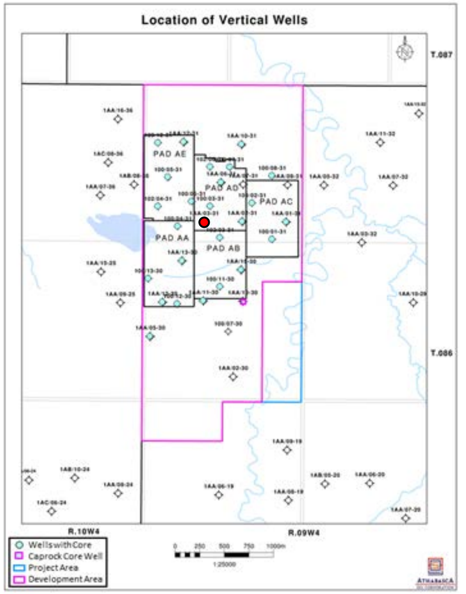
- Source line/source spacing: 60m/ 20m
- Receiver line/receiver spacing: 40-60m/20m

STRATIGRAPHY AND REFERENCE WELL

MIDDLE MCMURRAY TARGET RESERVOIR



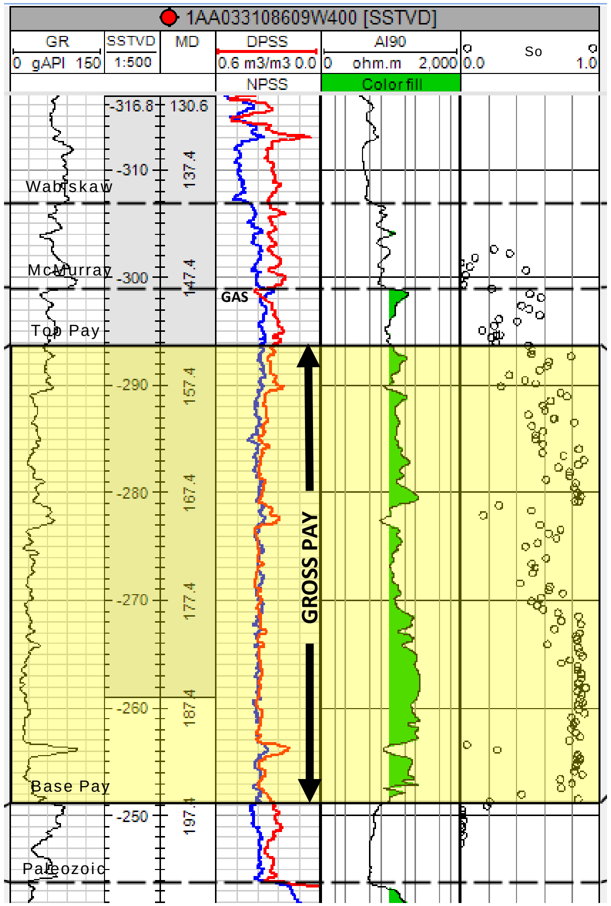


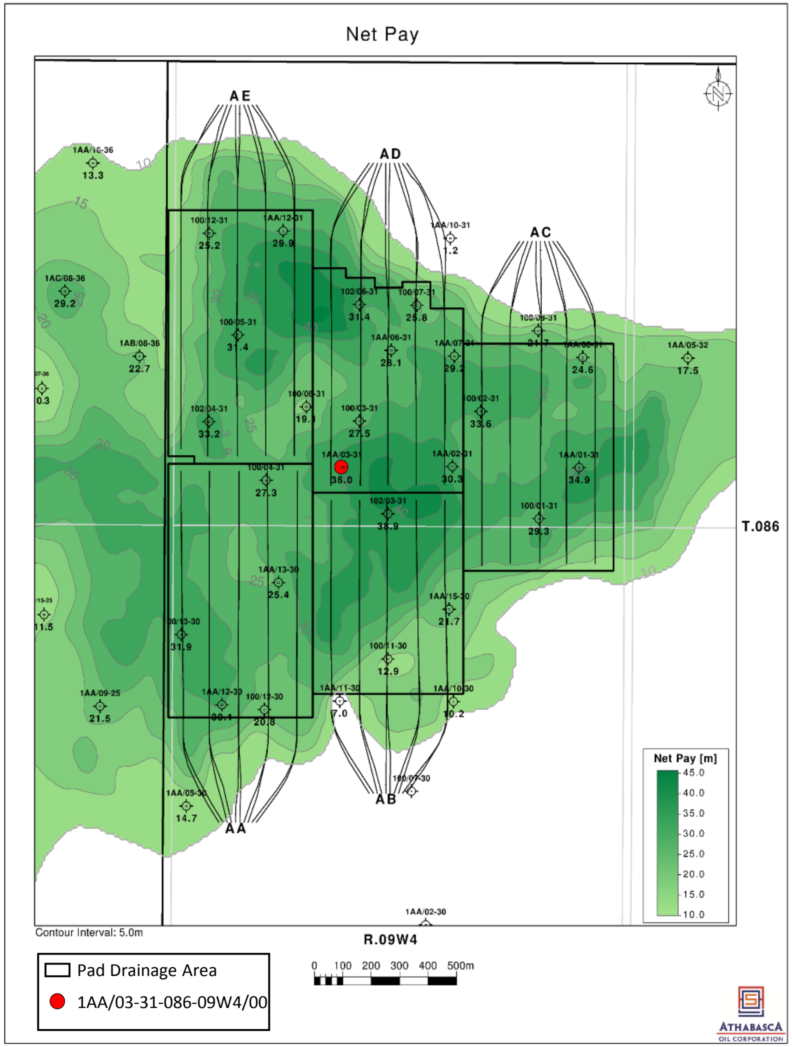


GROSS AND NET PAY

MIDDLE MCMURRAY GROSS PAY DEFINITION

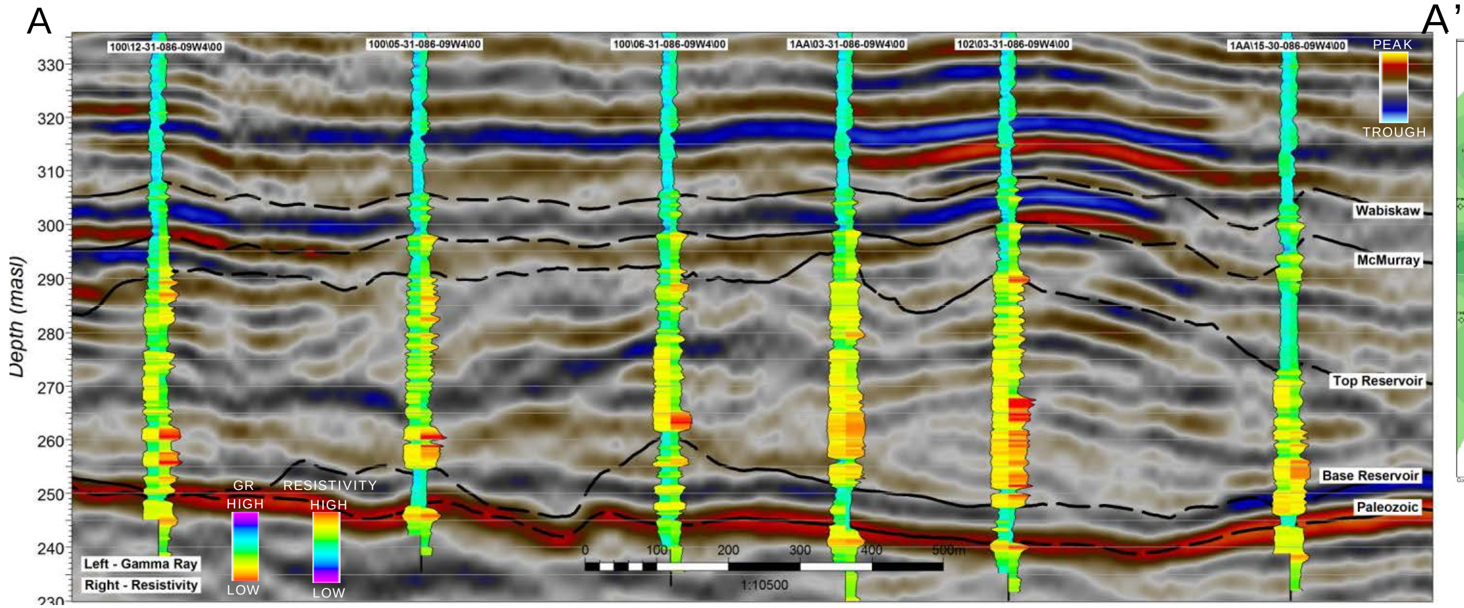
- Calculated between Top and Base Pay
- Thickness >= 10 m
- GR < 70 API
- Density > 27%
- Resistivity >18 ohm-m
- Water Saturation < 50%
- Includes < 1 m thick mud

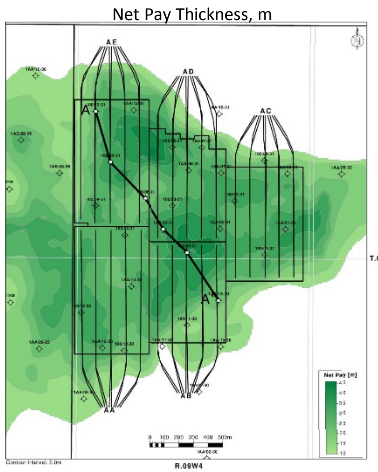


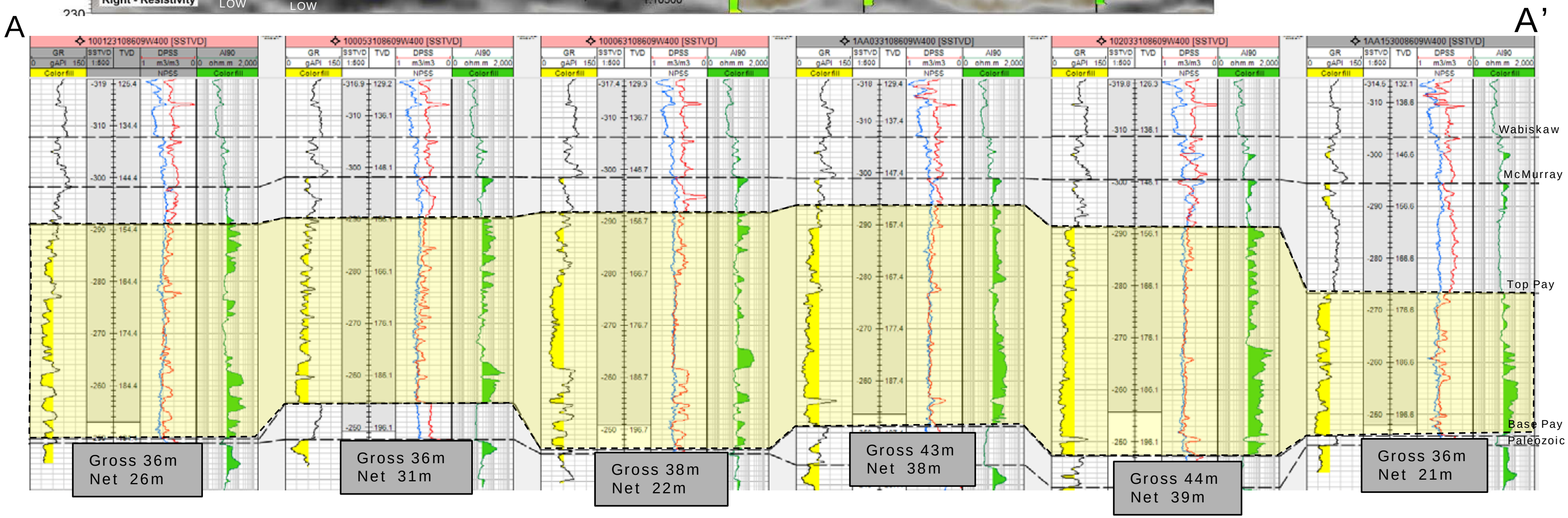


Net pay thickness uses gross pay criteria but excludes mud.

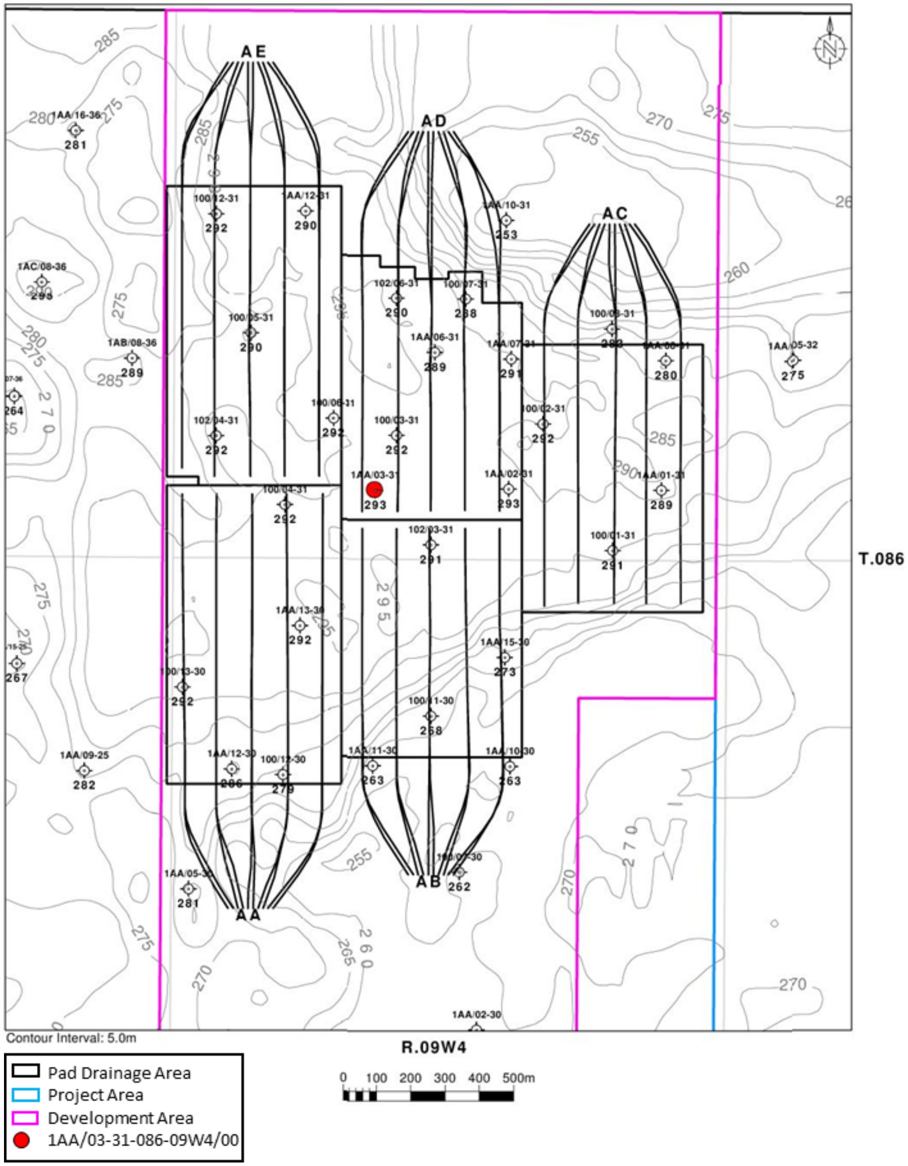
STRUCTURAL CROSS SECTION NW-SE ACROSS HS1 AREA[11]



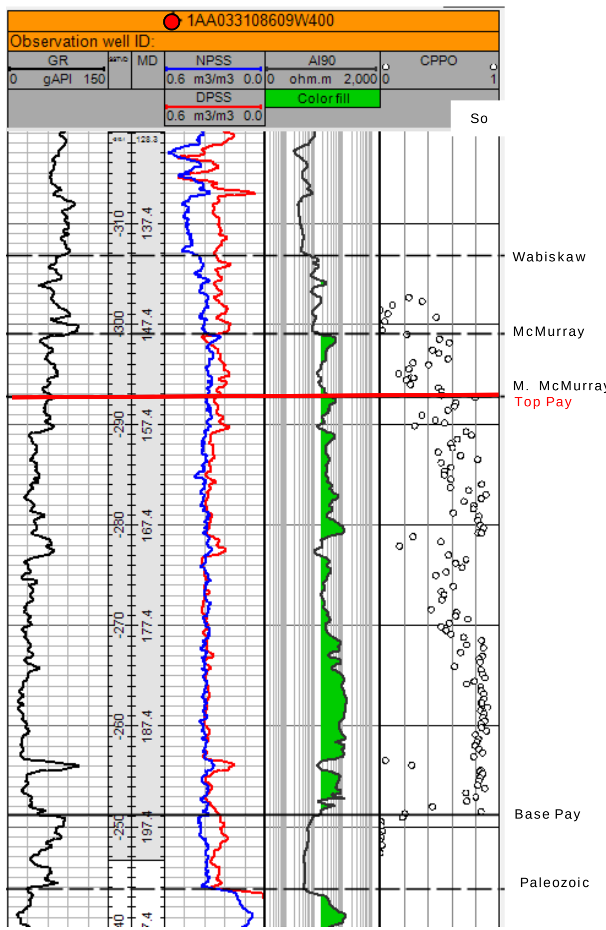




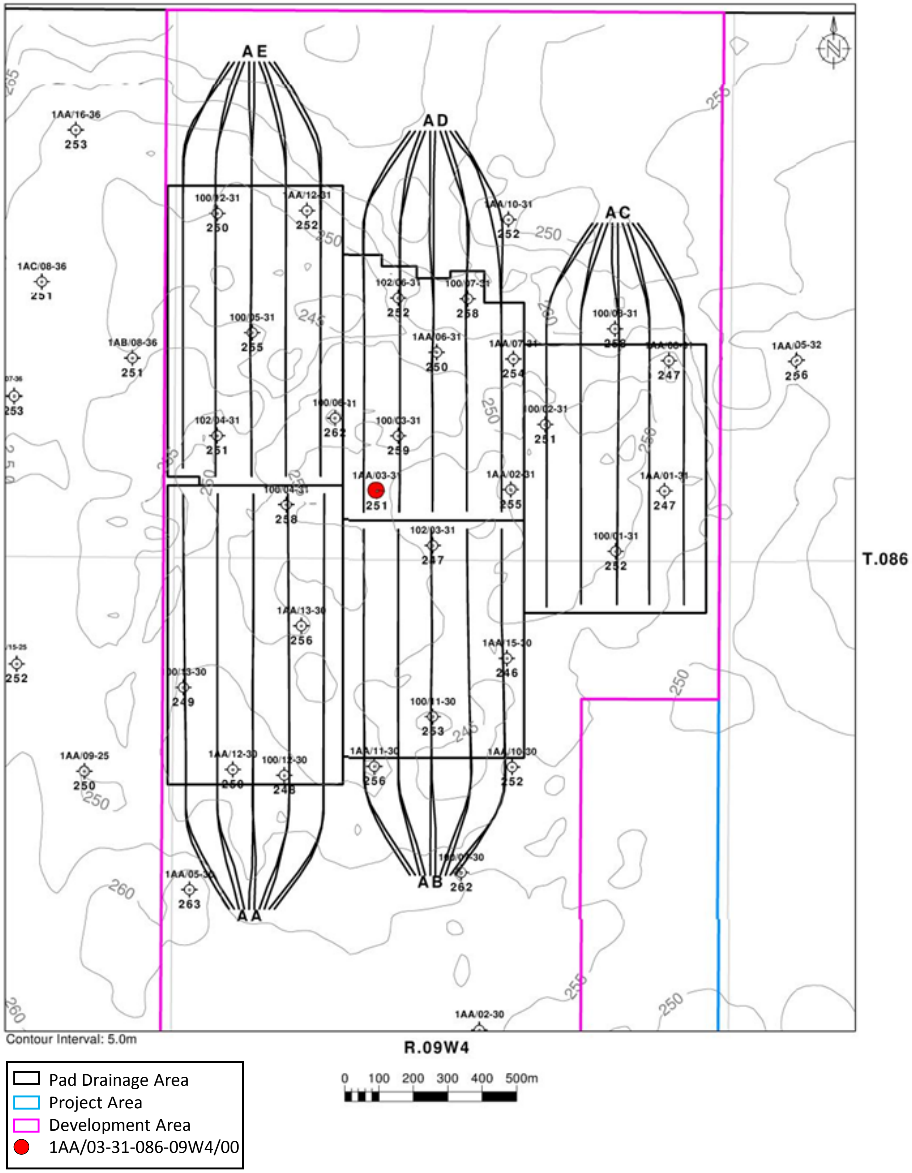
STRUCTURE MAP OF TOP OF BITUMEN PAY



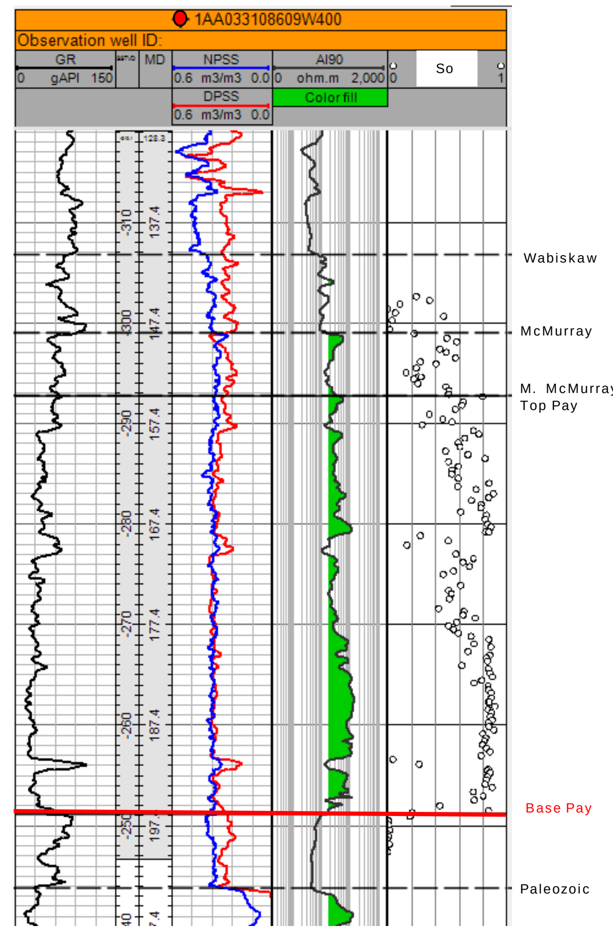
RANGE OF ELEVATION FROM 262 TO 301 MASL, HIGHEST OVER DRAINAGE PADS



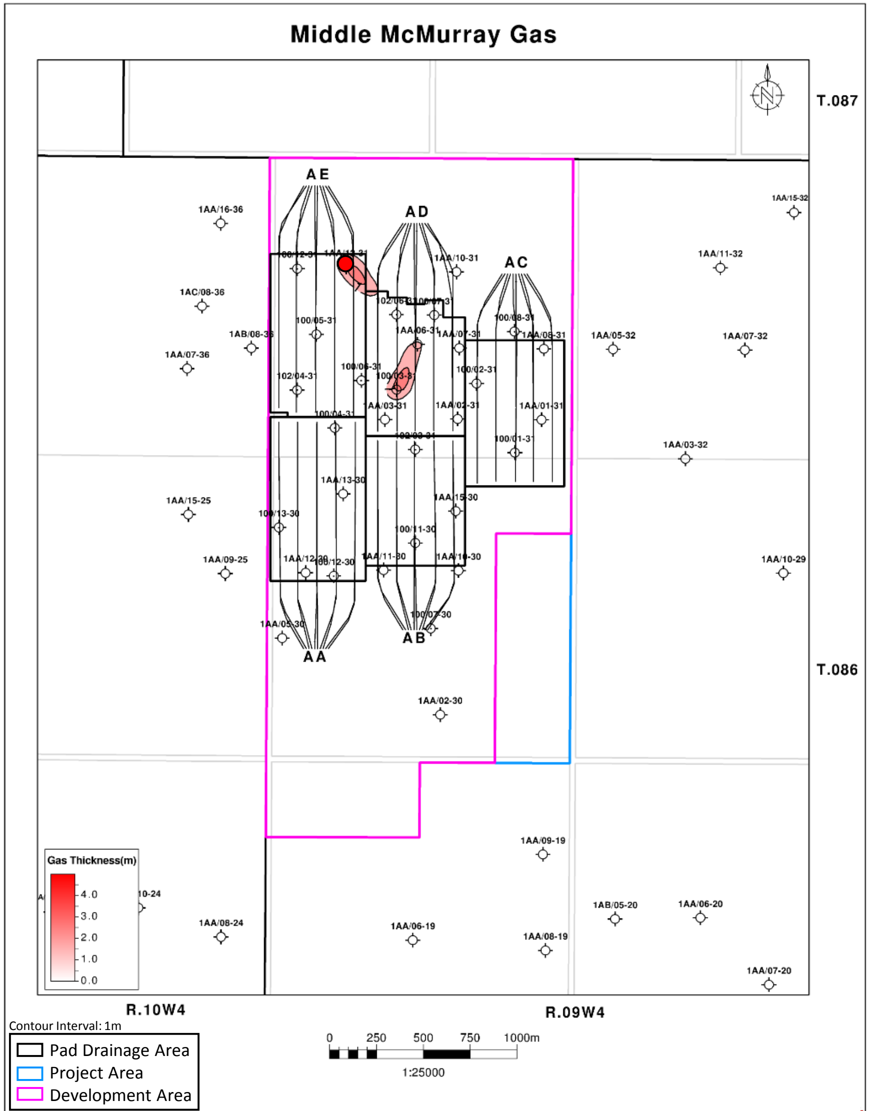
STRUCTURE MAP OF BASE OF BITUMEN PAY



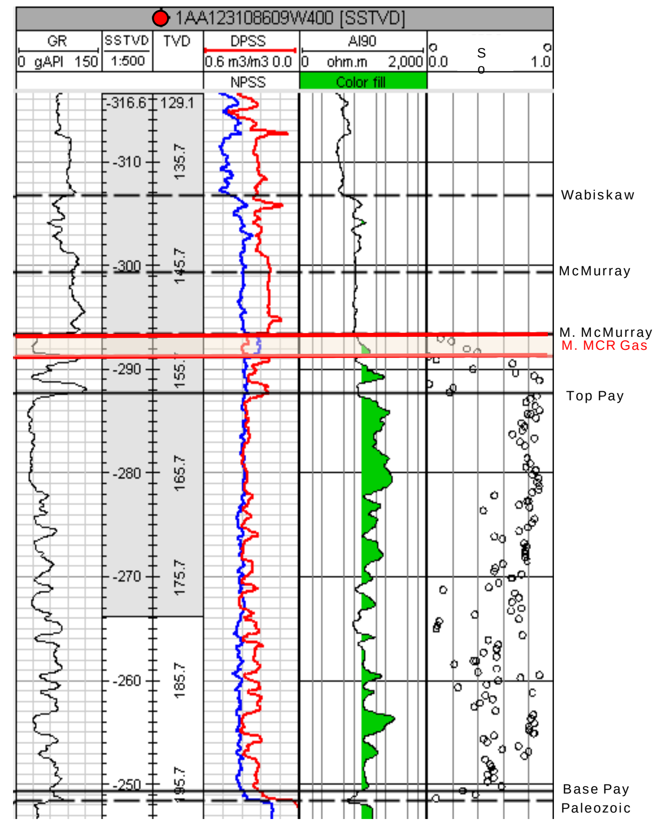
RANGE OF ELEVATION FROM 241 TO 262 MASL, LOW OVER DRAINAGE PADS



ISOPACH MAP OF MIDDLE MCMURRAY FM GAS

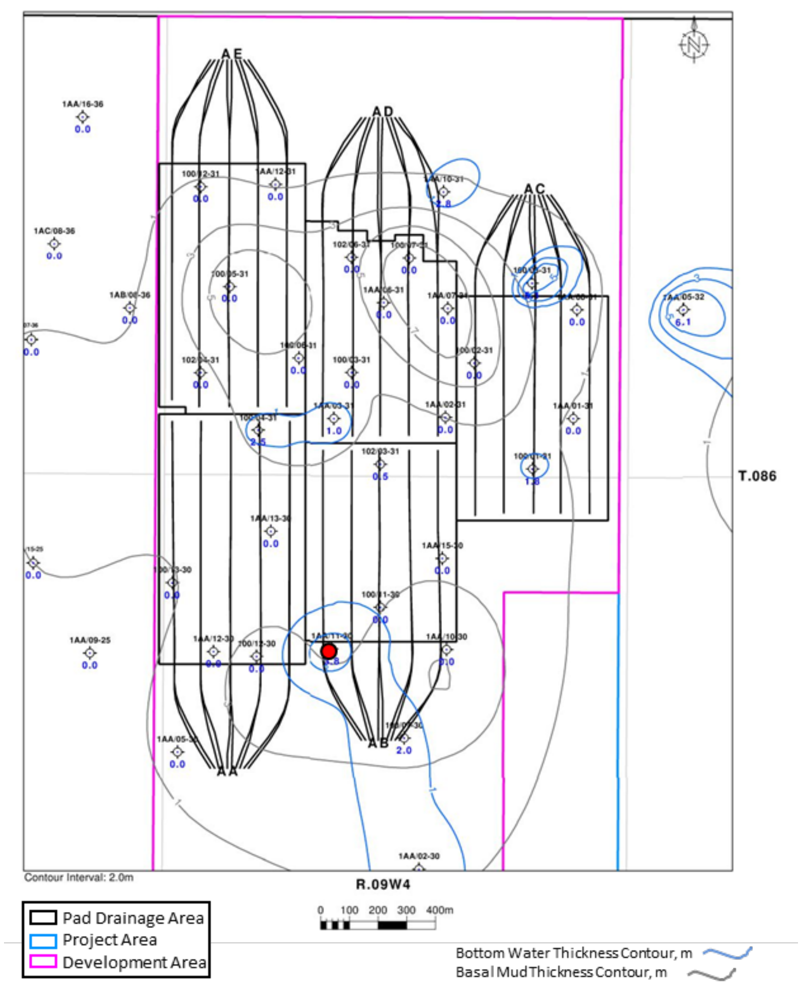


MIDDLE MCMURRAY GAS HAS MINIMAL THICKNESS AND LIMITED DISTRIBUTION WITHIN THE DEVELOPMENT AREA.

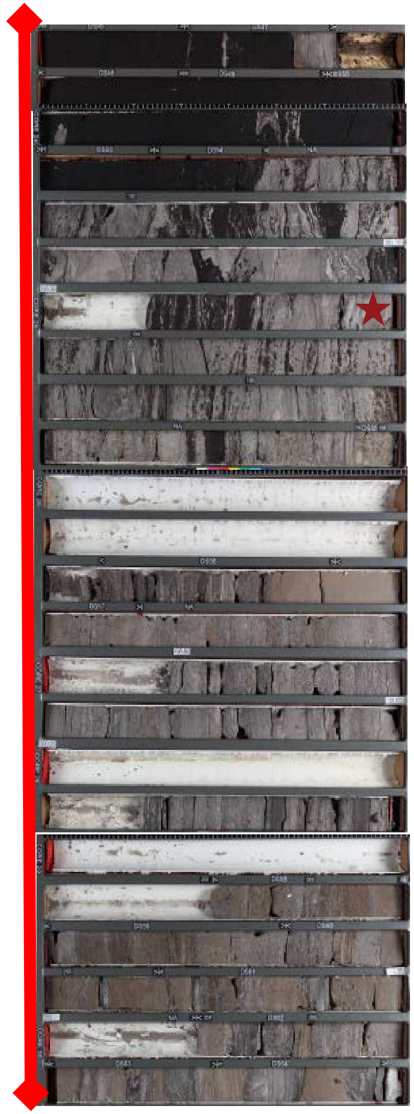


ISOPACH MAP OF MIDDLE MCMURRAY BOTTOM WATER

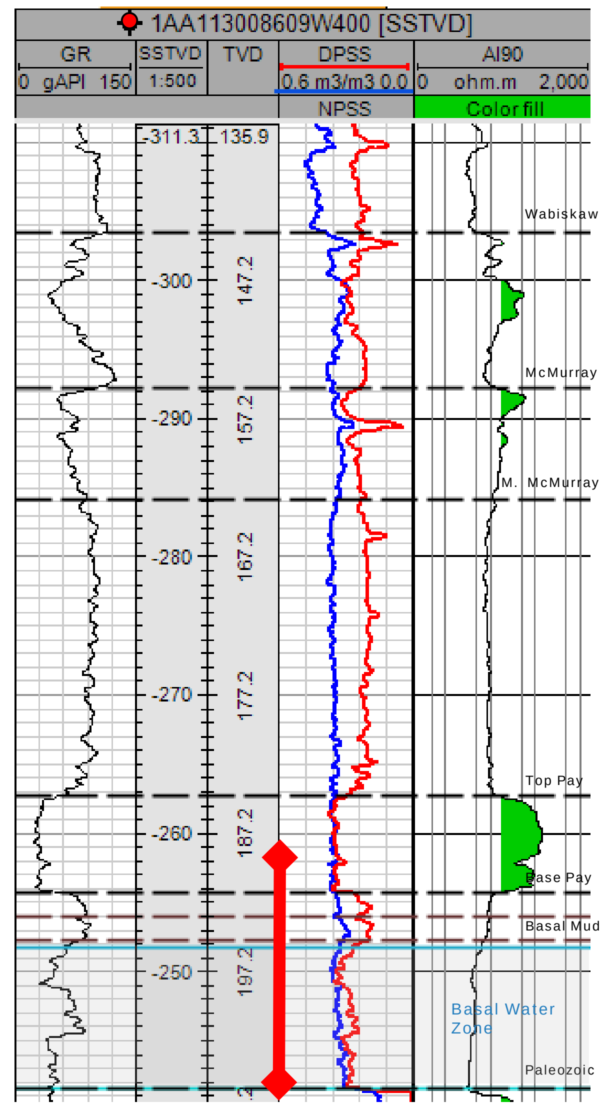
Bottom Water Net Thickness and Basal Mud Thickness



The permeability measured from core within the muddy interval between the bottom water and the bitumen reservoir through interval 193.80 to 193.85 m MD is 4.30 millidarcy (kV) and 71.0 millidarcy (kMax). Denoted on photo by ★ .

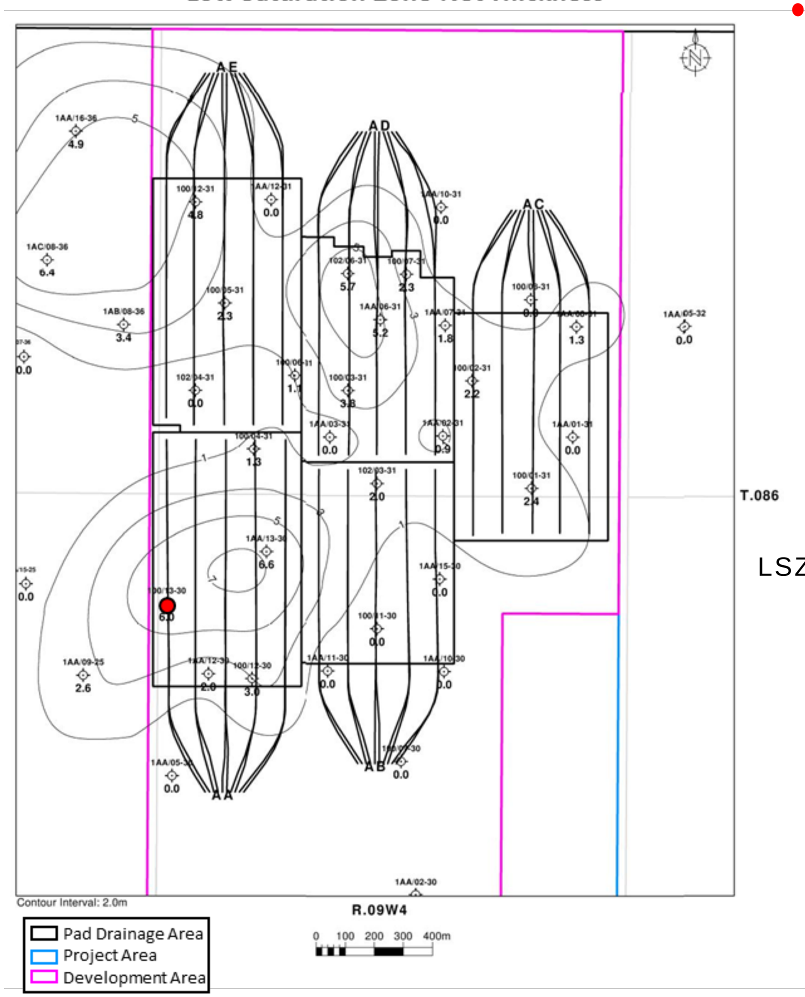


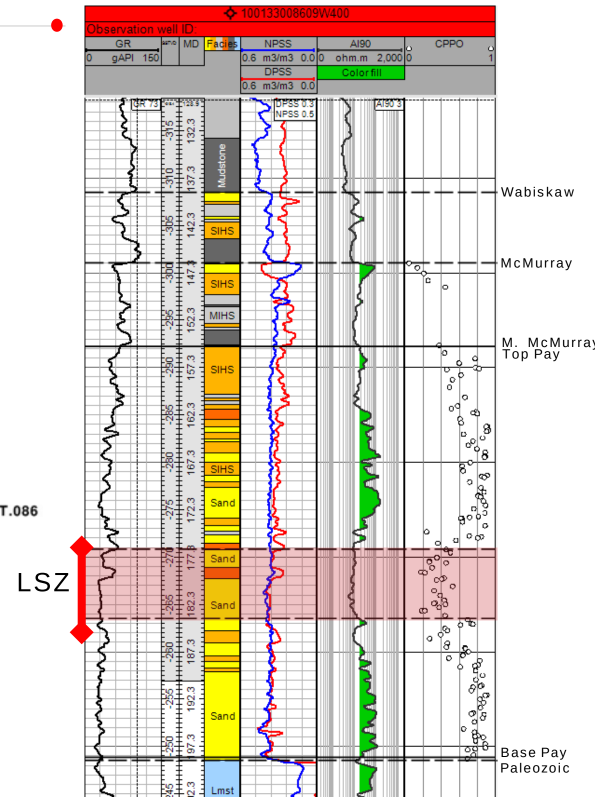
Interbedded mud and water saturated sand

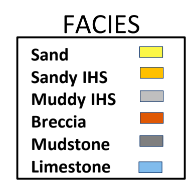


ISOPACH MAP OF MIDDLE MCMURRAY LOW BITUMEN SATURATION

Low Saturation Zone Net Thickness





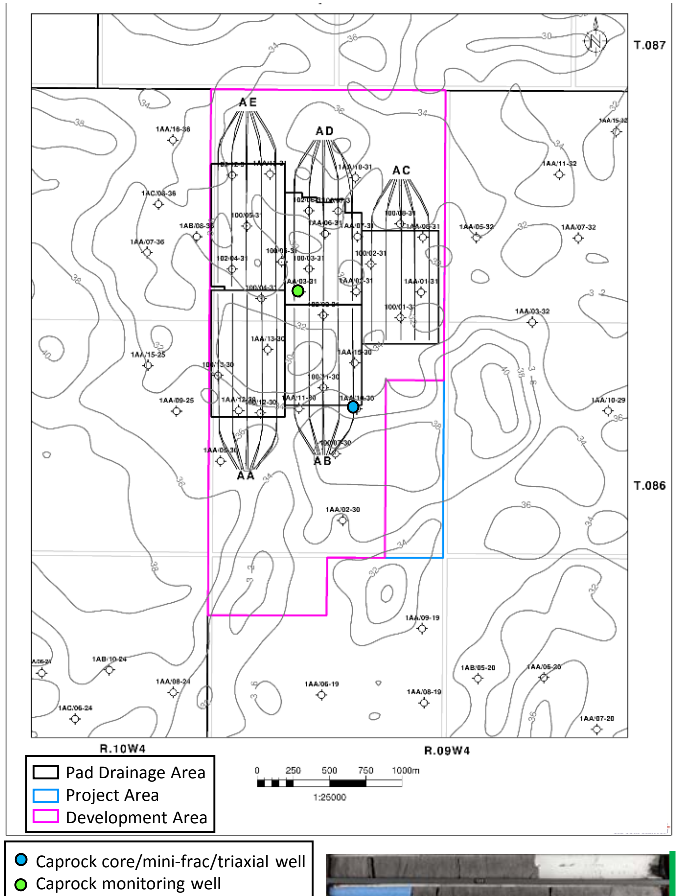


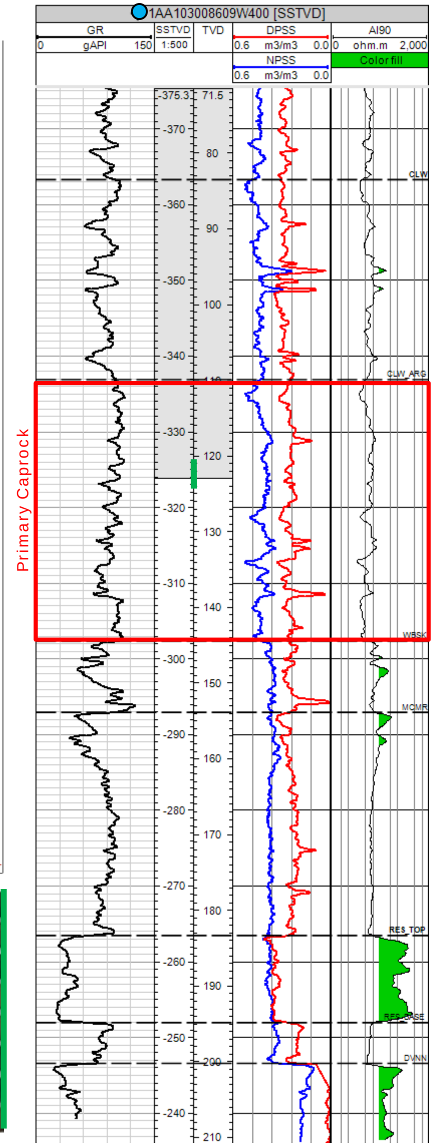
LOW BITUMEN SATURATION ZONE (LSZ)

- GR<60 API, density porosity >0.27 and resistivity 10-18 ohm-m and core water saturation >50%
- Core So= 0.36 and porosity = 0.37, thus the LSZ will still contribute to the overall bitumen production

CAPROCK DESCRIPTION

LOWER ARGILLACEOUS CAPROCK





NO NEW CAPROCK CORE, MINI-FRAC OR TRI-AXIAL TESTING IN 2015/16

- Caprock is defined as the unit between the top of the Clearwater and Wabiskaw
  - *Two main units within the caprock; lower argillaceous and upper silty mud, are composed primarily of shales and siltstones*
- Existing caprock core/mini-frac/triaxial well (2011) was used to define the maximum operating pressure
- One observation well (2012) with one piezometer and two thermocouples in the caprock
  - *No pressure or temperature change has been observed in the Clearwater thermocouples or piezometer for the life of the project*

RESERVOIR PROPERTIES:

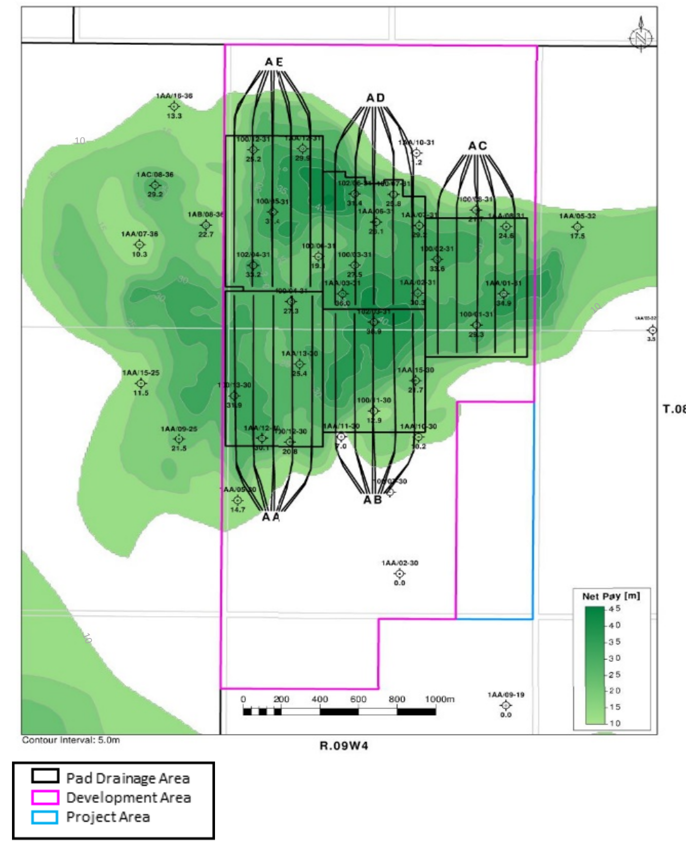
- Typical Producer Depth: 191 TVD (258 masl)
- Initial Reservoir Pressure @ 190m TVD: 600 kPaa
- Initial Reservoir Temperature: 8 degC
- Horizontal Permeability: 3,500-4,300 mD
- Vertical Permeability: 2,800-3,600 mD
- Bitumen Viscosity @ initial reservoir temperature: >1mln cP

Gross OBIP = Thickness from Top to Base Pay x Area x Porosity x So

Minor changes made in Gross OBIP due to revised seismic interpretation of Top and Base Pay surfaces in 2016

	Avg Por (frac)	Avg So (frac)	OBIP (mln m³)
Drainage Areas	0.36	0.72	15.6
Development Area	0.36	0.72	18.6
Project Area	0.36	0.72	18.6

Net Pay Thickness (m) from Top to Base Pay



SUBSURFACE

WELL DESIGN & INSTRUMENTATION

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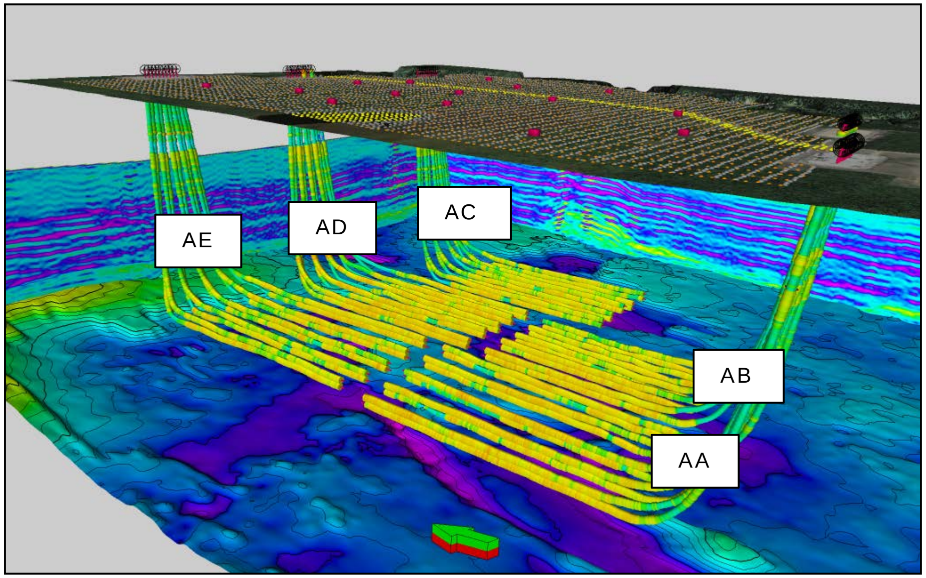
SAGD DRILLING SUMMARY



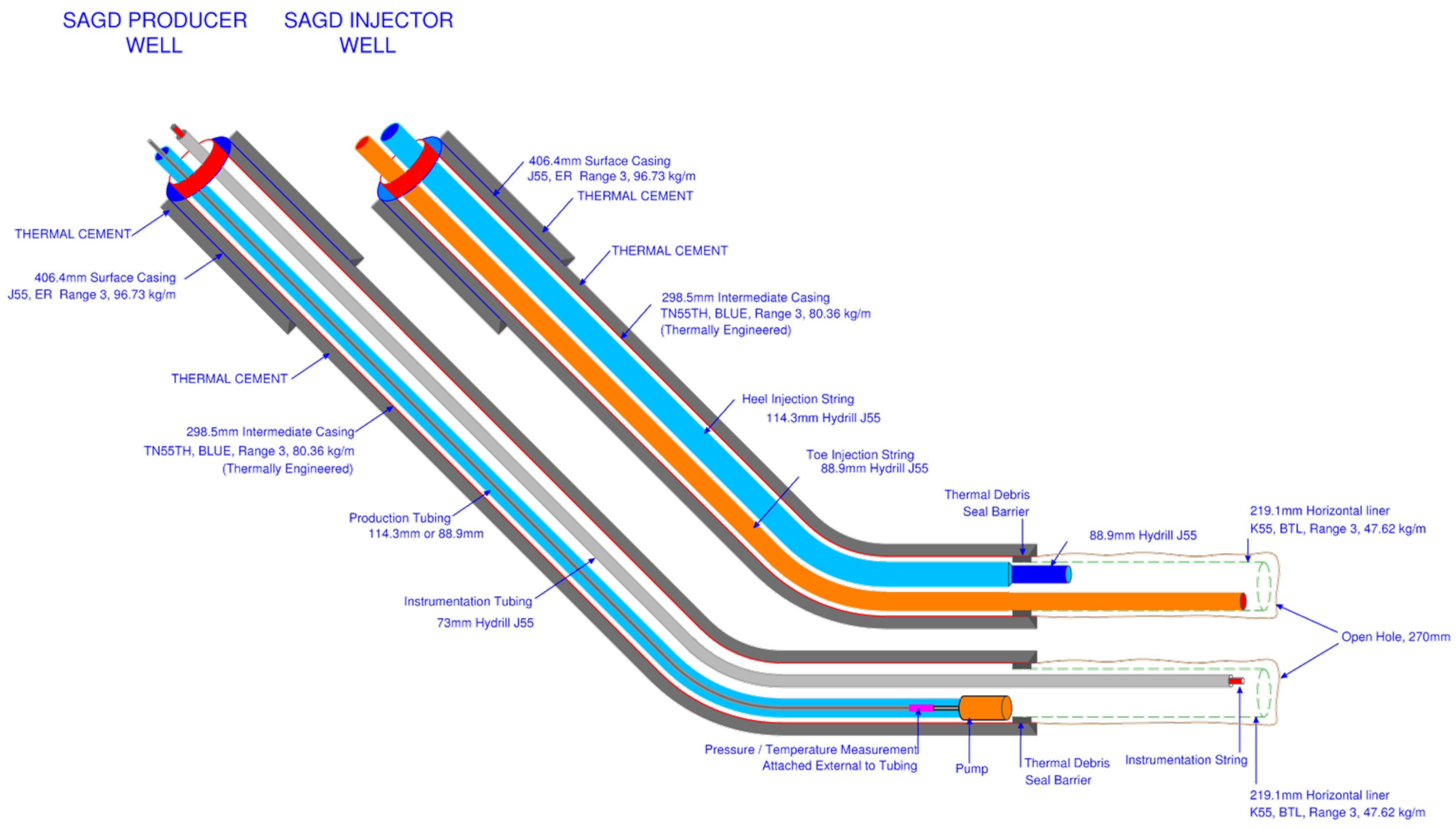
Pad	Average Net Pay thickness above producer (m)	Average Effective Lateral Length in producer (GR<60 API) (m)	Average Percent Reservoir along producer lateral (%)
AA	23.7	715	86
AB	22.4	613	97
AC	24.3	674	94
AD	26.2	614	96
AE	22.6	746	93

SAGD DRILLING SUMMARY:

- 25 well pairs 650-850m long laterals
  - *Wells drilled 2013/2014*
  - *All well pairs were drilled successfully (within range limits of planned well paths and within targeted vertical separations)*
    - *Excellent reservoir percentage for the pads*
  - *Thermal cement used and radial cement bond logs all showed good to excellent cement bond and integrity*
  - *Typically 8 5/8" liners (Wells AA-I4 and AB-I4 injector have 7" liners)*
    - *AE01 and AE05 have tapered injector liners*
      - *Planned liners could not be run to total depth (TD) due to drilling issues – tapered liners were installed to reach TD*
- No new drills between Nov 2015 and Oct 2016

TYPICAL COMPLETION SCHEMATIC

- Mechanical lift required to bring fluids to surface
- 19 active and 2 production assurance wells (not yet on-stream) equipped with all-metal progressing cavity pumps (PCP)
- 4 producer wells with electric submersible pumps (ESP)



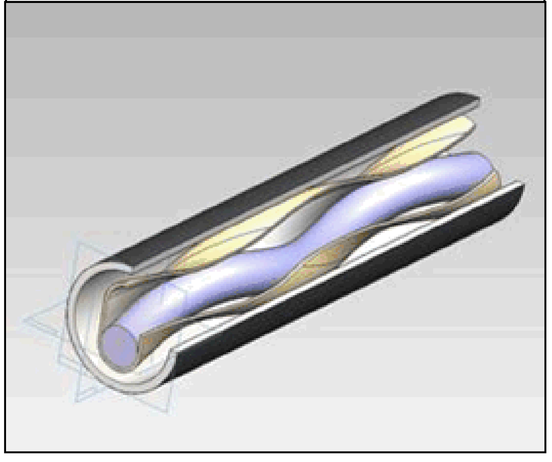
ARTIFICIAL LIFT - TYPES

- All wells initially completed with all-metal PCP
- Four wells converted to ESP
- Wells and facilities were built with the flexibility to easily convert to ESPs from PCPs

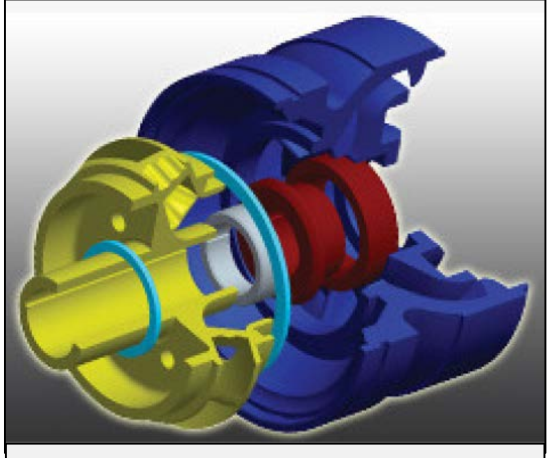
Well	Type
AA1	ESP
AA2	ESP
AA3	PCP*
AA4	PCP
AA5	PCP*
AB1	PCP
AB2	PCP
AB3	PCP
AB4	PCP
AB5	PCP
AC1	PCP
AC2	PCP
AC3	PCP
AC4	PCP
AC5	PCP
AD1	PCP
AD2	PCP
AD3	PCP
AD4	PCP
AD5	ESP
AE1	ESP
AE2	PCP
AE3	PCP
AE4	PCP
AE5	PCP

*Production assurance well

PCP Rotor and Stator



ESP Stage, Impeller, Diffuser



Source: Baker Hughes

ARTIFICIAL LIFT – PCP PERFORMANCE

PCP PERFORMANCE:

- Effective for initial well completion
    - *Successfully steamed through the pump*
    - *Allowed for quick conversion from circulation to SAGD*
    - *Managed a wide range of flow rates*
- All-metal PCPs have performed as expected
- Pumps were replaced on select wells when rates were higher than PCP capacity
    - *Wellhead pressure reduced on some wells to improve pump efficiency*
    - *Expectation is for there to be more ESP conversions in the future as the well pair rates improve and wells mature*

ARTIFICIAL LIFT - ESP PERFORMANCE

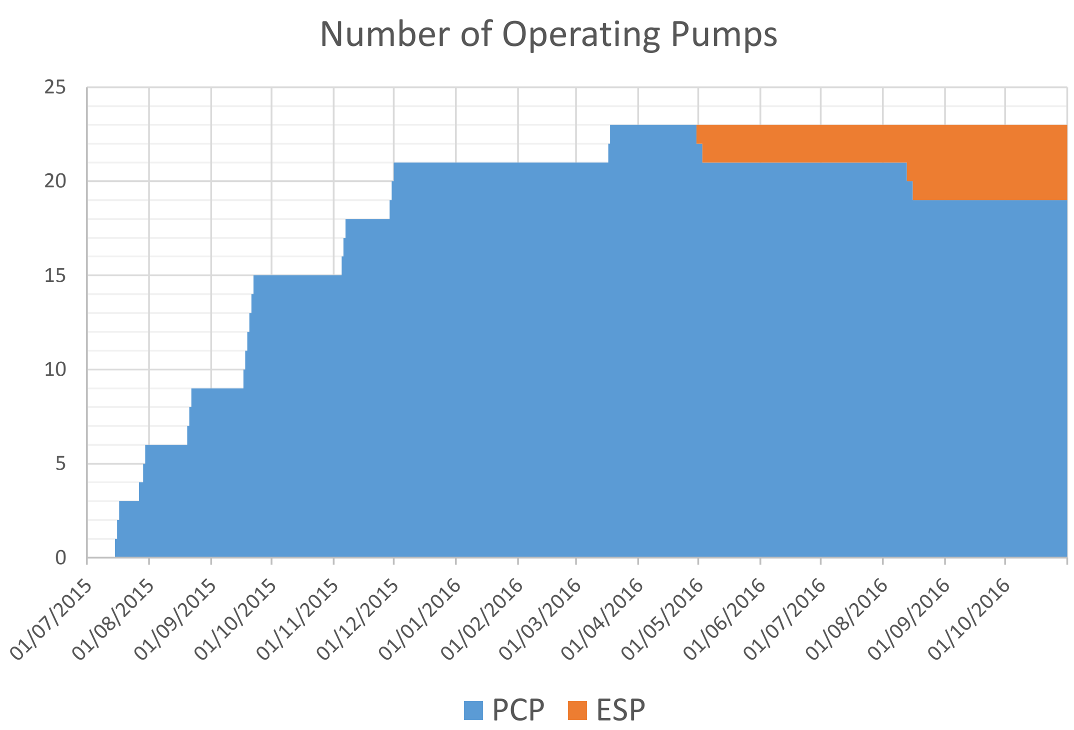
ESP PERFORMANCE:

- Four wells converted to ESPs have operated within design curve
- High temperature rated ESP motors were installed with internal motor temperature sensors

ARTIFICIAL LIFT PERFORMANCE SUMMARY:

- Average run life calculated as total operating time of all systems divided by number of systems (running, pulled and failed) – excluding 2 production assurance wells

*n/a: ESP run life not shown due to minimal exposure time to date



Properties	PCP	ESP
Typical Minimum Rate (m³/d)	100	200
Typical Maximum Rate (m³/d)	600	825
Average Run Life (days)	300	n/a*

Typical Pump Operating Conditions	
Average BHP (kPag)	1700
Average BHT (°C)	170

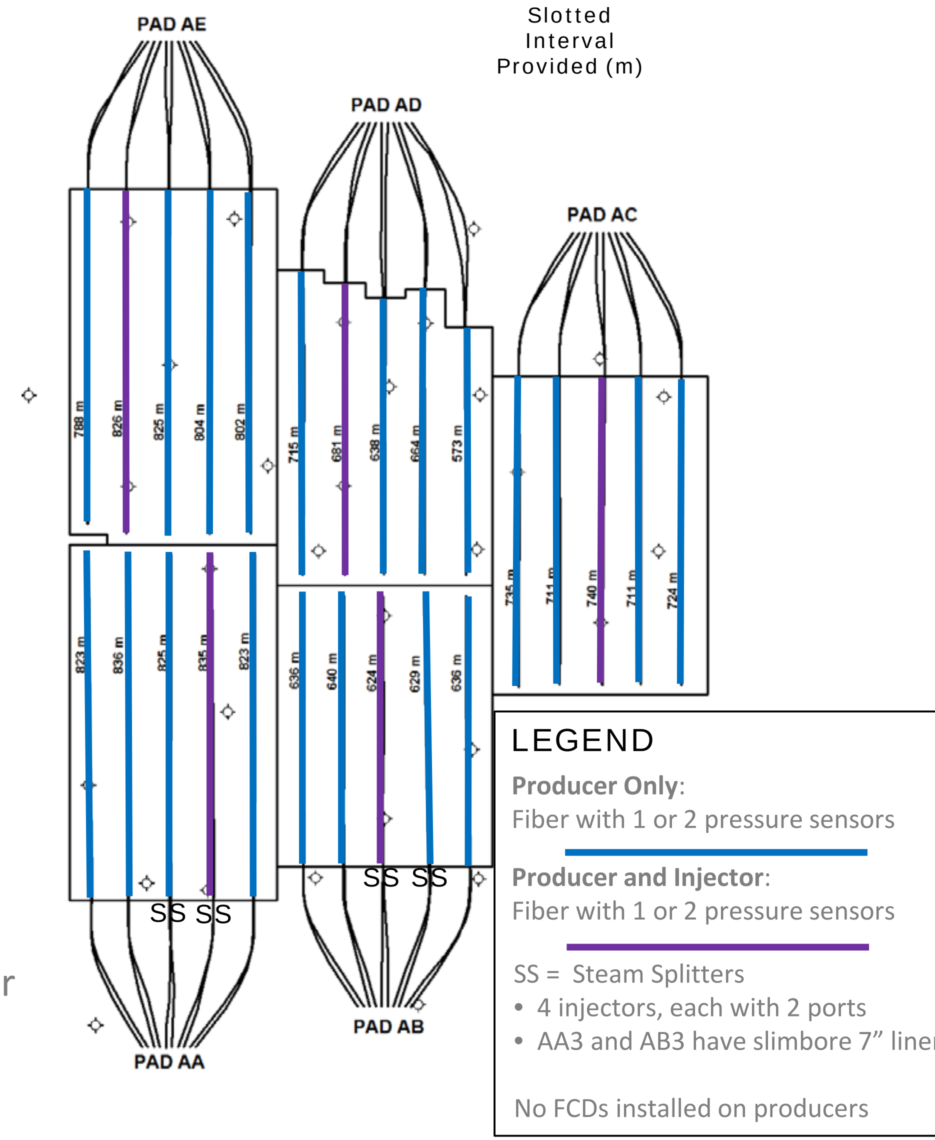
INSTRUMENTATION - SAGD WELL PAIRS

TEMPERATURE:

- Two types of fiber for temperature measurements
  - *Fiber Bragg Grating (FBG) and Distributed Temperature Sensing (DTS)*
- Start-up
  - *Finer resolution with (DTS) – improved warm-up strategy for casing integrity*
- Conversion
  - *Fiber used to assess conversion readiness through fall-offs*
- SAGD
  - *Both systems adequate for temperature management along the wellbore*

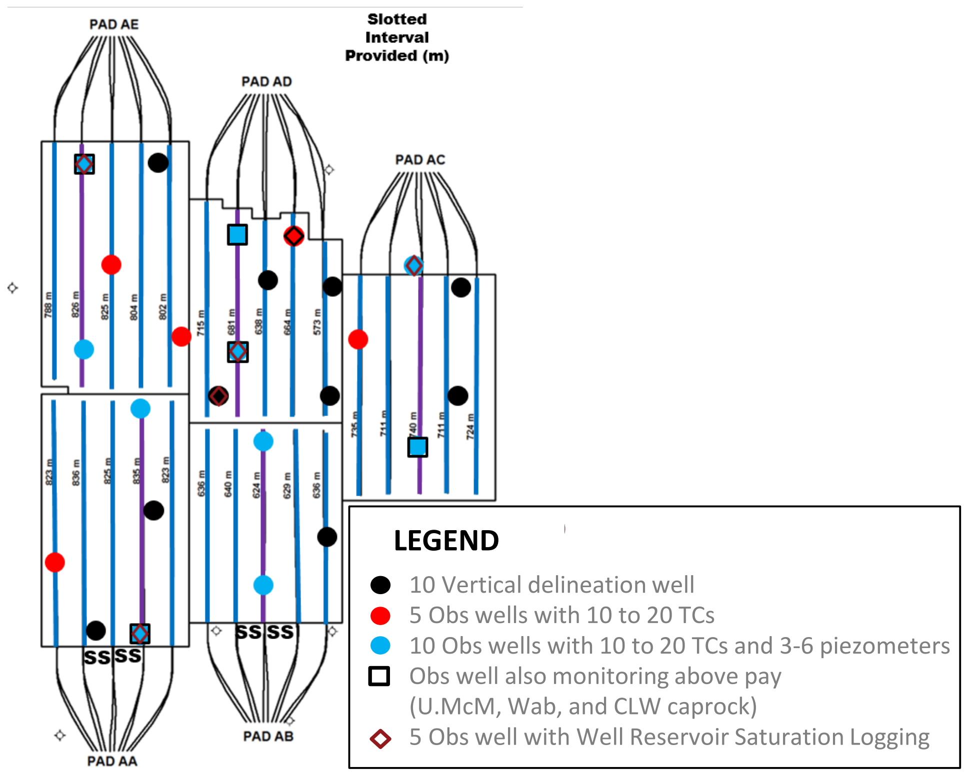
PRESSURE:

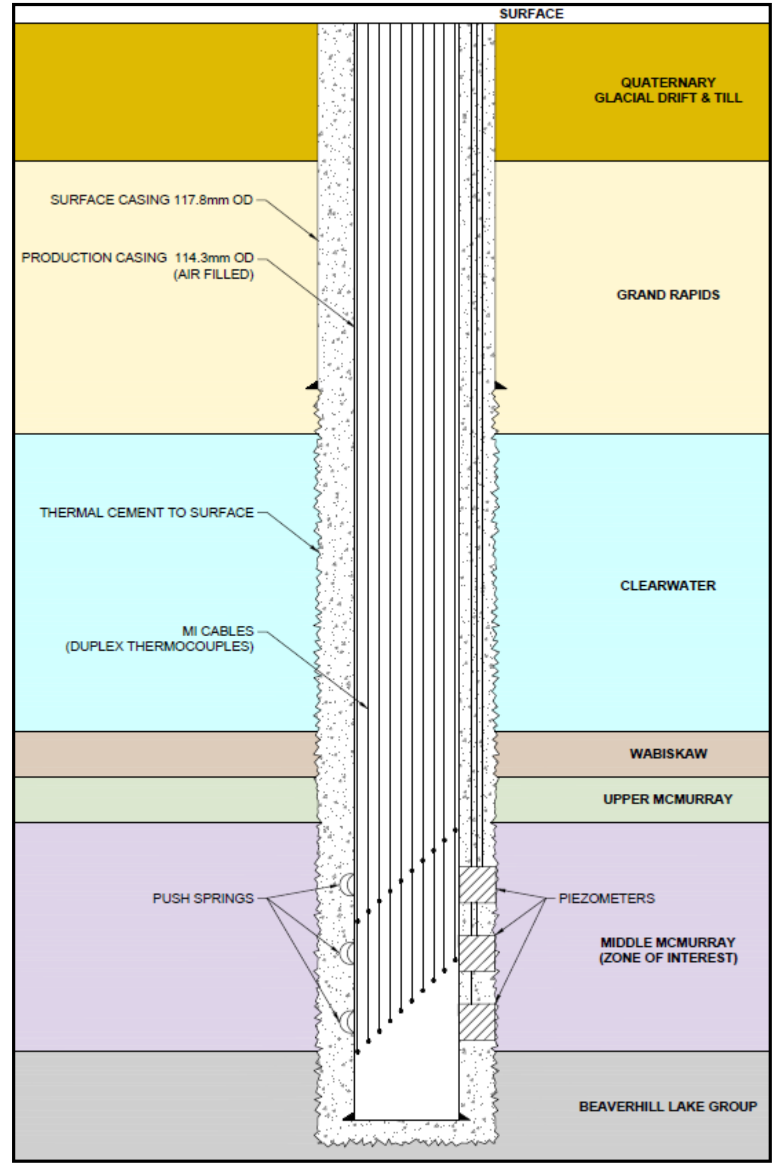
- Injector BHP is measured with blanket gas
- Pressure sensors installed near pump and measure bottom hole pressure (BHP) on producer to determine wellbore sub-cool
- Some pressure sensors have failed and some have been replaced during workovers – producer wells with failed sensors are operated using injector BHP and conservative sub-cool targets



OBSERVATION WELLS:

- Some pressure sensors have failed (typically after steam conditions observed)
- Instrumentation used to monitor reservoir pressure build-up and heat propagation
- Results used to extrapolate reservoir pressure build-up and forecast water retention (source water demand)





SUBSURFACE

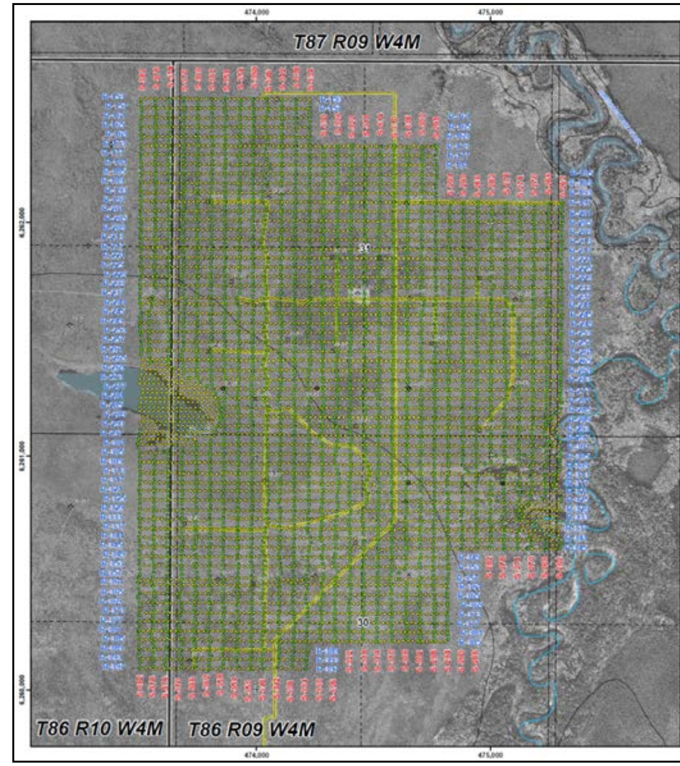
4D SEISMIC & MONITORING

ATHABASCA OIL CORPORATION

4D SEISMIC

4D SEISMIC STRATEGY

- AOC has buried geophones over the five drainage areas to monitor steam growth and conformance using 4D seismic
  - *Baseline was acquired in Q1 2014.*
  - *First monitor was successfully acquired Q1 2016.*
  - *Next monitor scheduled for Q1 2017*
- Buried geophones allow for year round shooting if needed



ACQUISITION PARAMETERS

- Area: 3.72 km2
- Source line interval: 60 m, source interval: 20 m
- Receiver line interval: 40 m, receiver interval: 20 m
- Buried receiver depth: 3 m
- Source depth: 6 m

Area	2014				2015				2016				2017				2018			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Phase 1	★				▲				★				★				★			

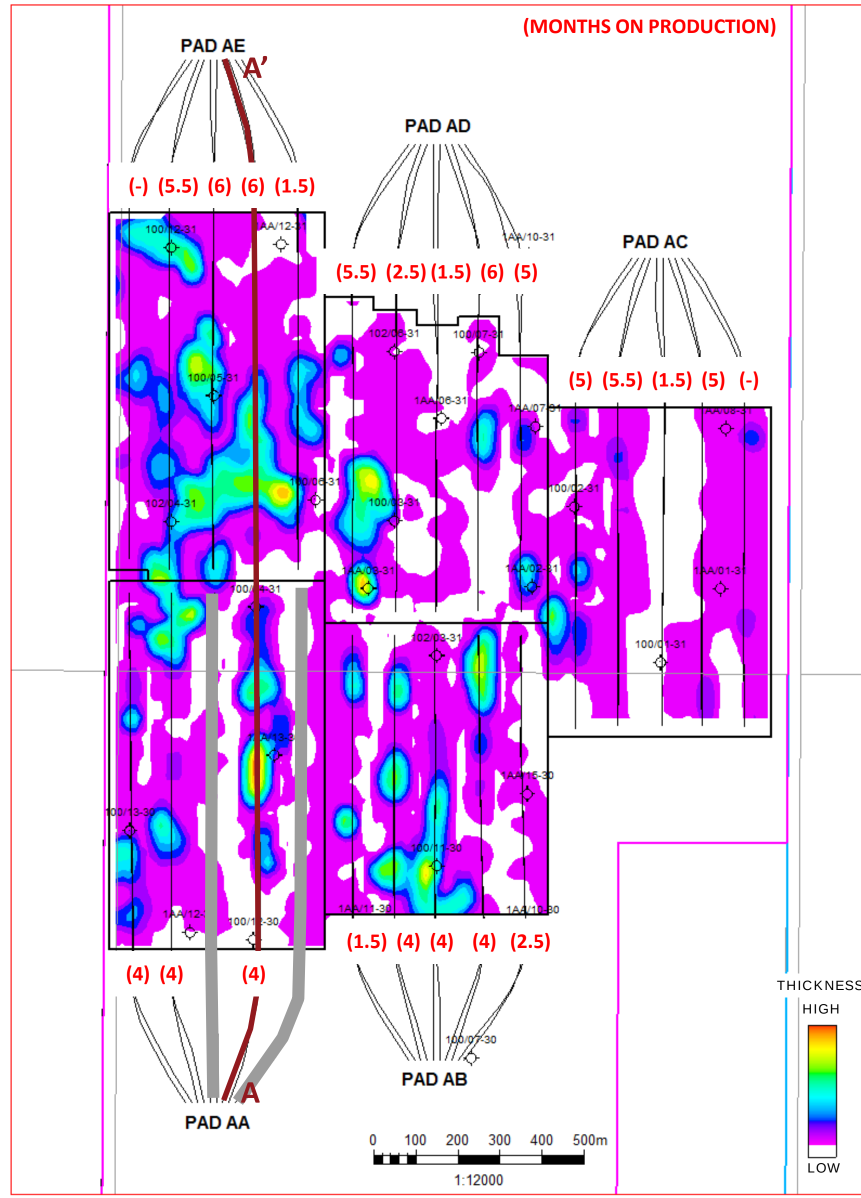
★ Baseline ▲ First Steam ★ Monitor

4D SEISMIC

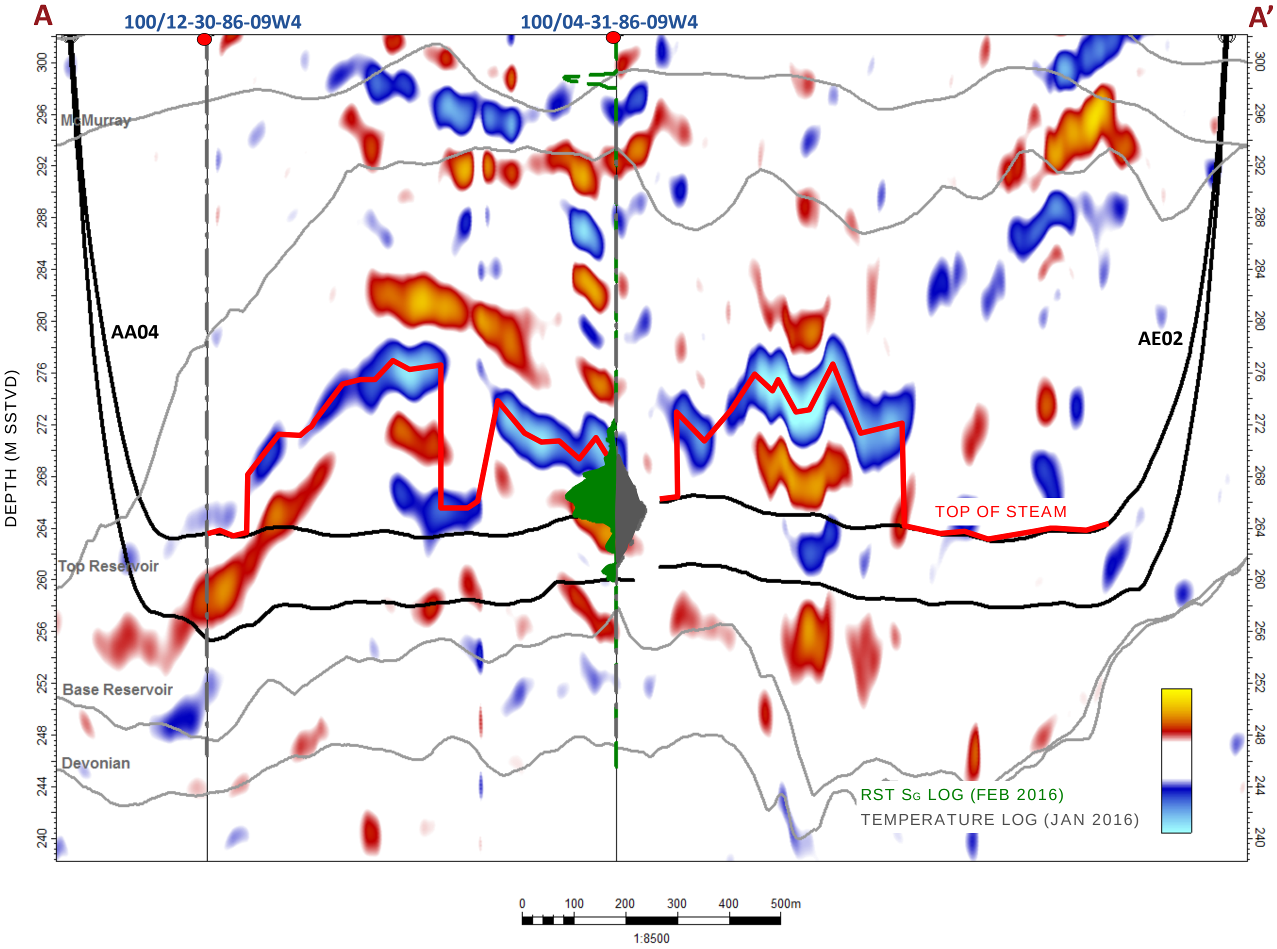
4D SEISMIC FIRST MONITOR:

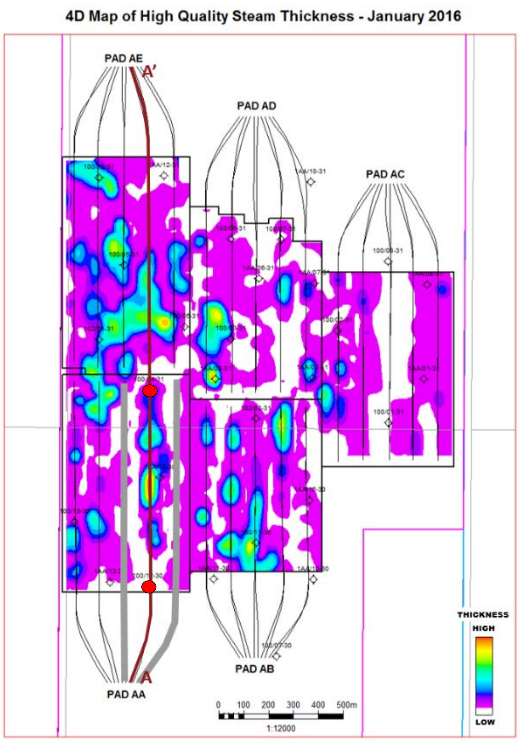
- Acquired in January 2016
  - *Approximately 10 months after first steam*
  - *SAGD conversions range from 0-6 months prior to 4D acquisition*
- Well pairs AA3 and AA5 are production assurance wells (not on production)
- Accelerated steam chamber growth on Pads AA and AE due to bull heading in early production
- Steam growth seen on 4D monitor correlates with temperature and RST logs on associated observation wells

4D Map of High Quality Steam Thickness - January 2016



DIFFERENCE VOLUME (2016 MONITOR-2014 BASELINE)

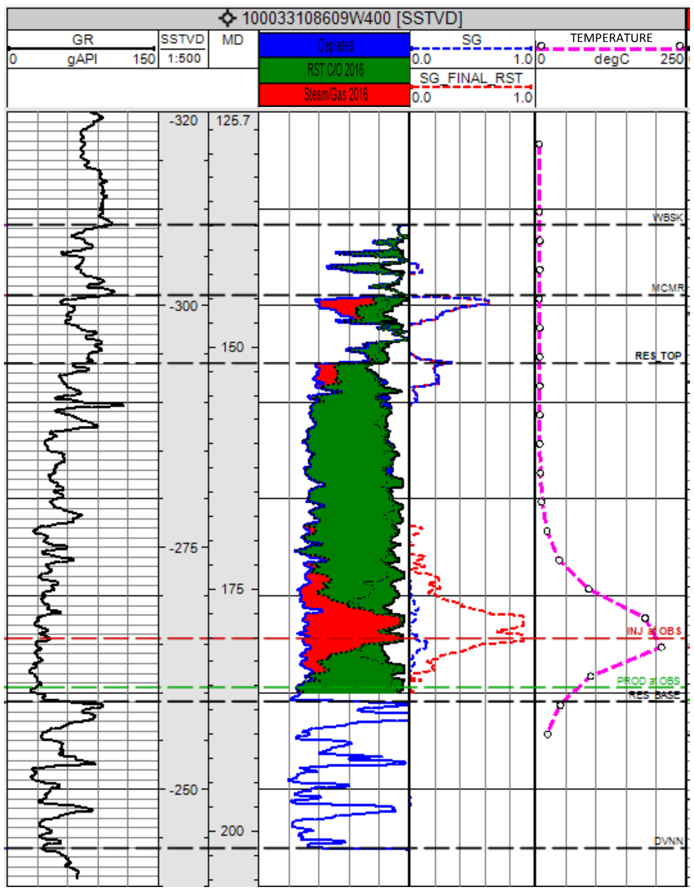


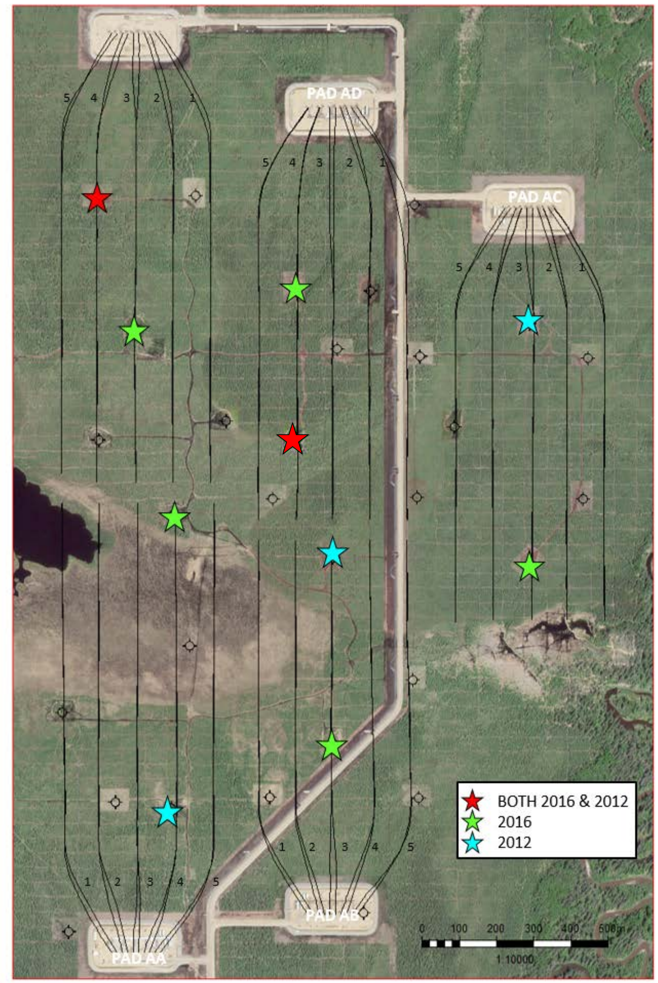


RESERVOIR SATURATION TOOL (RST)

RESERVOIR SATURATION TOOL (RST) RESULTS:

- Originally acquired saturation curves on one well per pad in 2012.
- In February 2016, acquired saturation logs on 7 different wells, one of which overlapped the baseline curves
- RST results show steam chamber thickness correlates with observation well temperature profiles





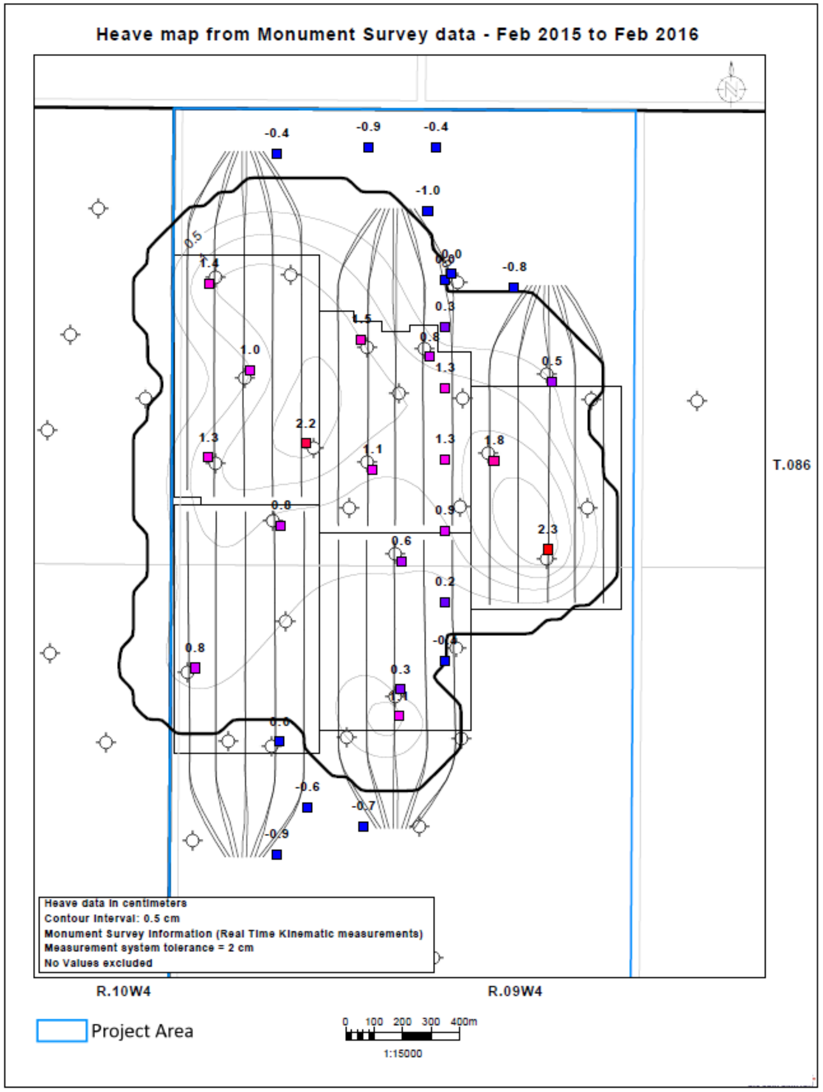
SURFACE HEAVE MONITORING

HEAVE MONUMENT PLACEMENT:

- 31 permanent surface heave monuments (0.30 x 0.30 m plate)
- Primary means for measuring heave across field
- 15 monuments located at the observation wells and 16 along pipeline corridors and pads

2016 SURVEY/RESULTS:

- Real-time Kinematic (RTK) survey method was used. Datum for this survey is ICP009 and position is confirmed by PPP solution
- Minimal change was observed between February 2015 and February 2016. Two monument values fell just outside the RTK survey tolerance range of +/- 2 cm (max heave 2.3 cm)

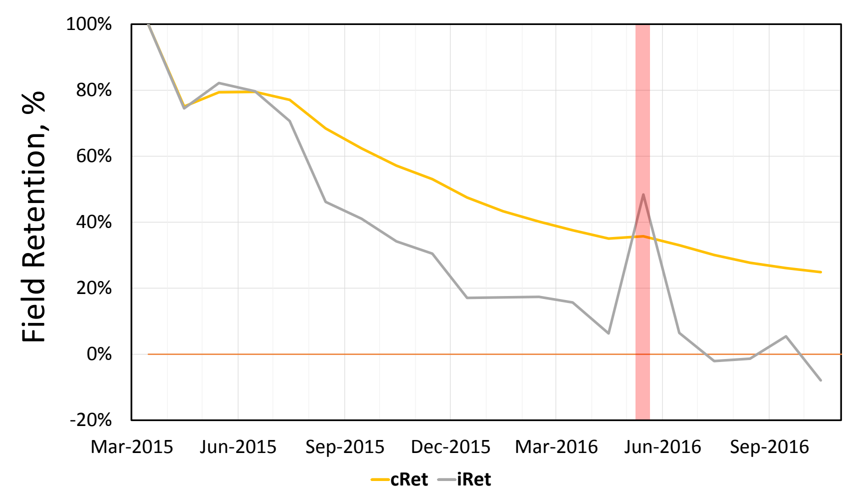


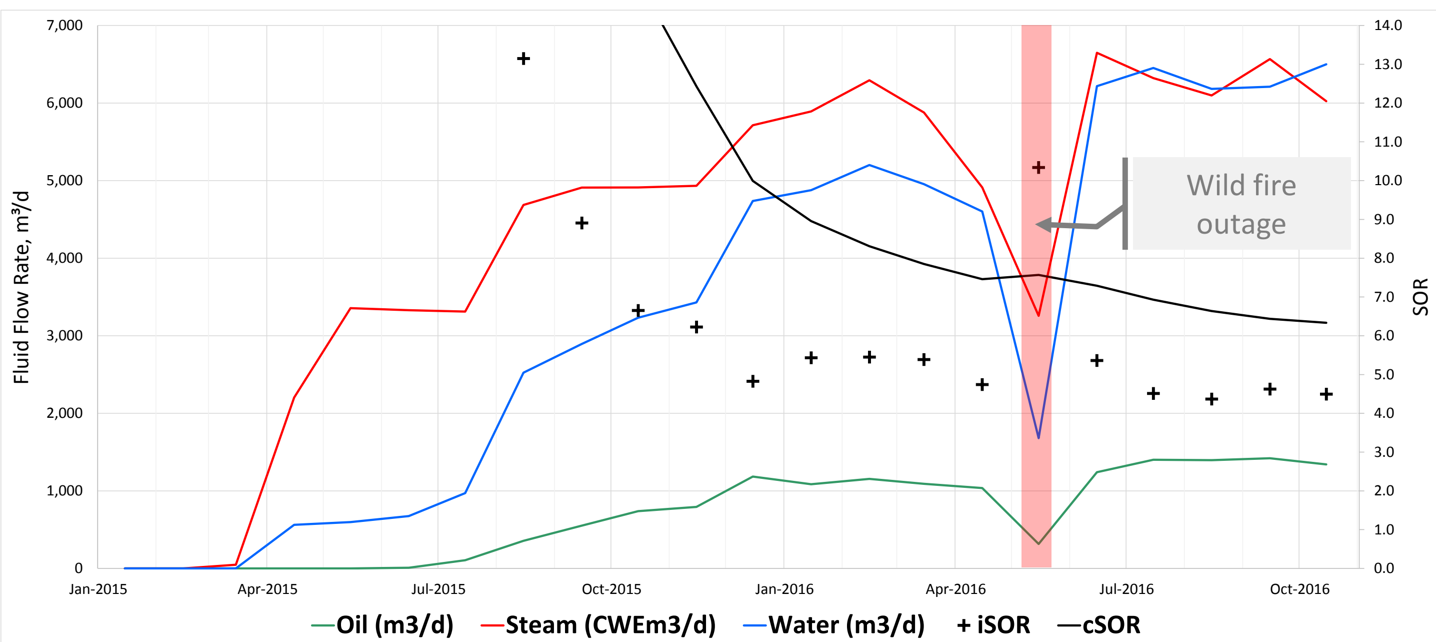
SUBSURFACE
SCHEME PERFORMANCE

ATHABASCA OIL CORPORATION

FIELD HISTORY

- Continuing production ramp-up and field optimization
- Maximum monthly bitumen rate 1,419 m³/d (8,922 bbl/d) with SOR of 4.6
  - *Expect to achieve design capacity of 12,000 bbl/d in 2018*
  - *Currently 23 of the 25 SAGD well pairs on production*
  - *SOR decline will continue as reservoir reaches target operating pressure and upper portions of the reservoir begin to drain*
  - *Improving field sub-cools*
  - *As expected, water retention has reduced over time - providing evidence that the reservoir is bounded*
- Successfully recovered from Ft. McMurray fire outage





MOP & STEAM QUALITY

MAXIMUM OPERATING PRESSURE (MOP):

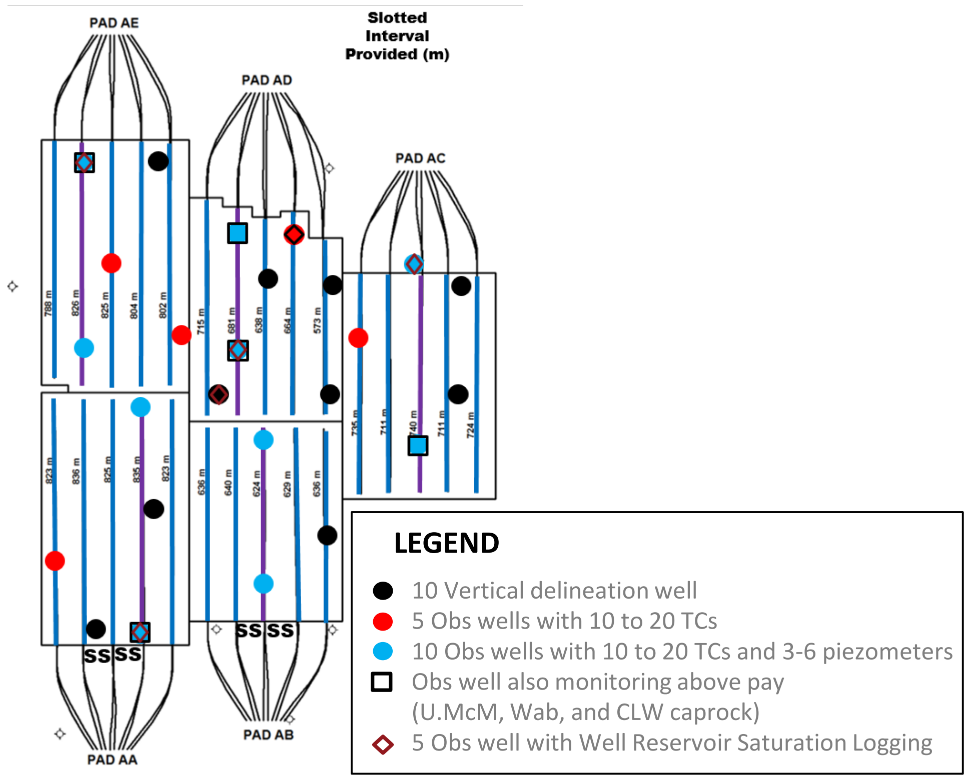
- Approved Maximum Operating Pressure of currently producing pads:
  - *2,100 kPag during startup/circulation*
  - *1,900 kPag during SAGD*
- Request increase of MOP in February 2016 from 1,900 kPag to 2,100 kPag during SAGD mode was approved November 2016
  - *Since approval, started increasing pressure to new MOP*
- Average injection pressure (as measured by blanket gas) is 1,875 kPag

STEAM QUALITY:

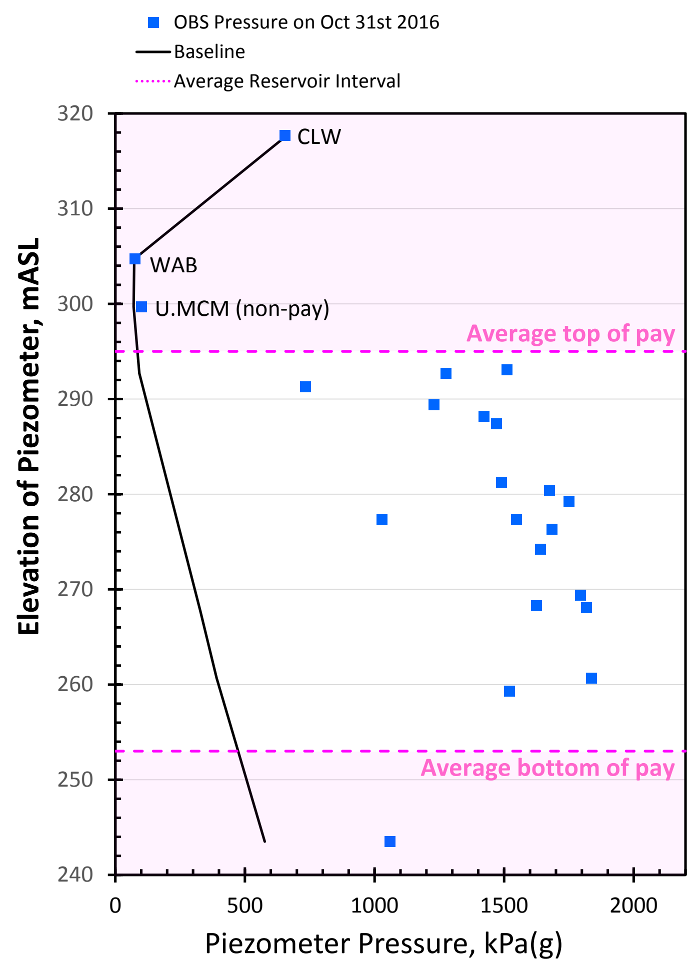
- Steam quality leaving the plant is approximately 98% (incl. Continuous Blow Down(CBD)) at typically 6000 kPag
- Steam quality decreases to wellheads and is not measured, but has been modelled and estimated to be 95%
- These conditions align with the original design

RESERVOIR PRESSURE

- Piezometers placed throughout the field at various elevations
  - *Provides both vertical and areal coverage over the producing pads*
- Field average pressure indicates the pressure has increased from the Baseline and approaching the MOP pressure of 1900 kPag
  - *Evidence of vertical and horizontal pressure communication throughout pay across entire field*
  - *No pressure change in caprock*



Piezometer readings at Obs wells on Oct 31, 2016

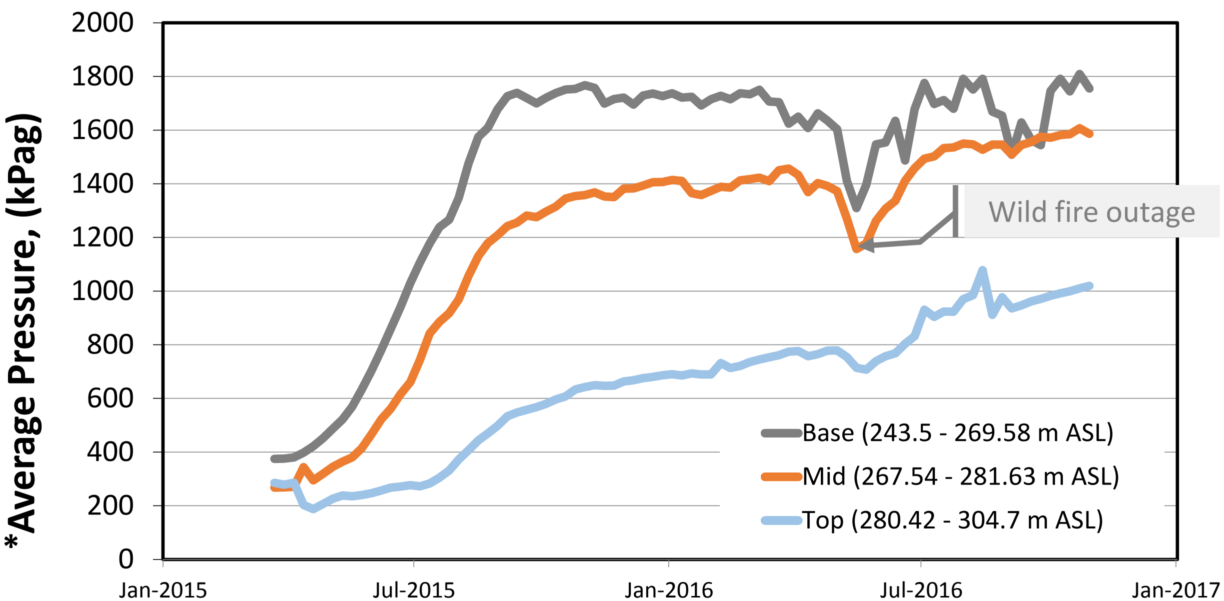


- Plot consists of data from 23 OBS well piezo points
- Average baseline curve taken on 2015-03-25

RESERVOIR PRESSURE

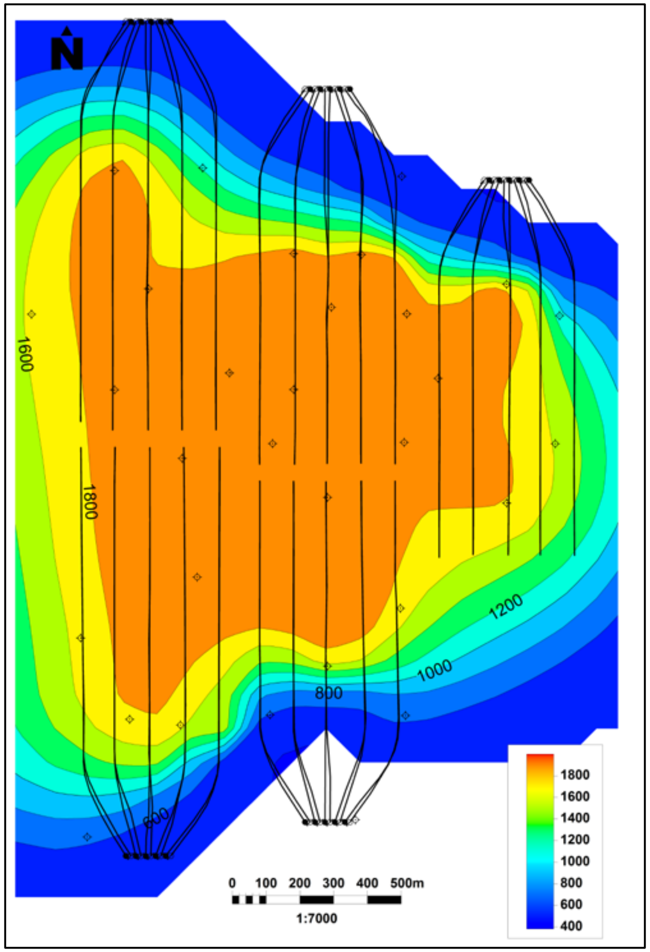
- In 2016, the steam chamber encountered the mid-reservoir low bitumen saturation zone
  - *Pressuring of the low bitumen saturation zone and the associated volumes to the South West of the producing pads took slightly longer than anticipated*
    - *Pressure data shows evidence of pressure communication across entire pay*

Average field pressure at base, middle and top of reservoir



*Pressure represents average of several piezometers from OBS wells at various depths

Field pressure map on Oct 31, 2016



*Pressure normalized from OB wells on October 31, 2016, at 259 mASL (avg. Producer well elevation)

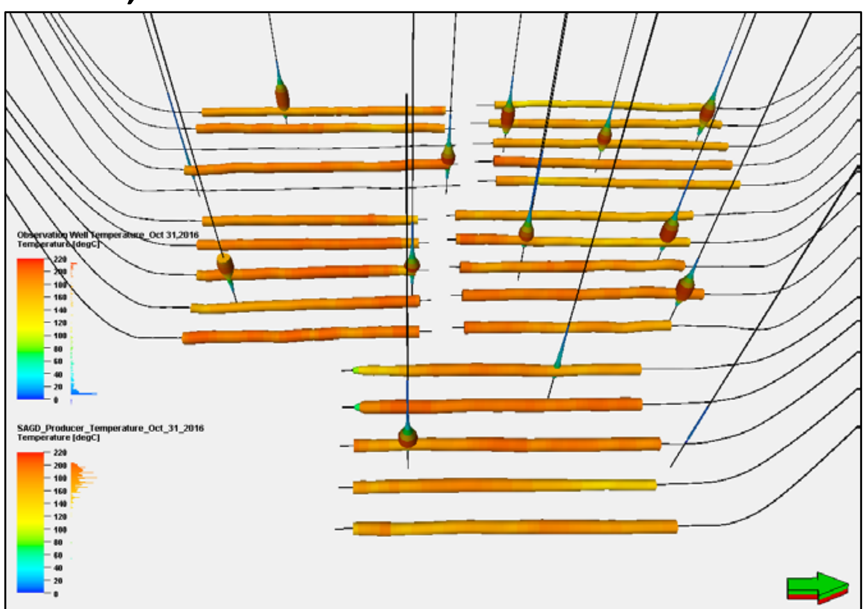
TEMPERATURE CONFORMANCE ALONG PRODUCER WELLS:

- Good temperature conformance in all well pairs

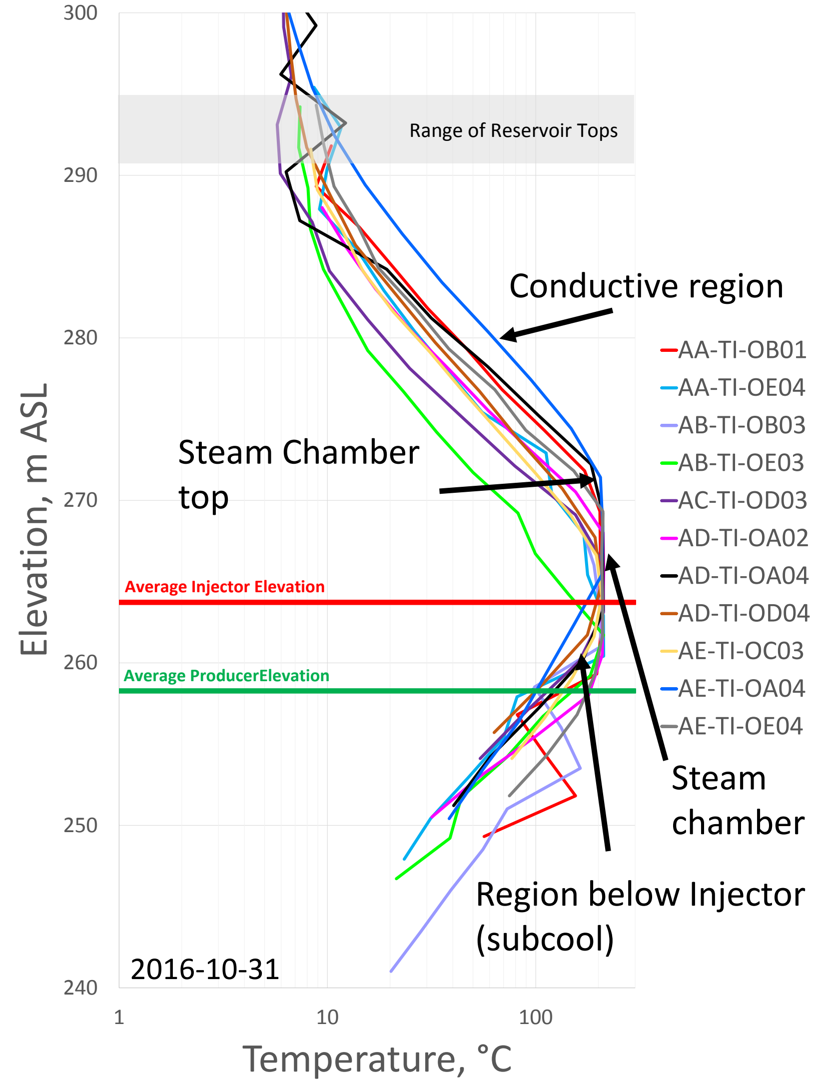
STEAM CHAMBER DEVELOPMENT:

- Observed steam conditions in 11 OBS wells
- Steam chambers are currently progressing through Low Bitumen Saturation Zone

Temperature profiles along Producer wells on Oct 31, 2016



Temperature profiles from 11 Observation wells showing steam conditions



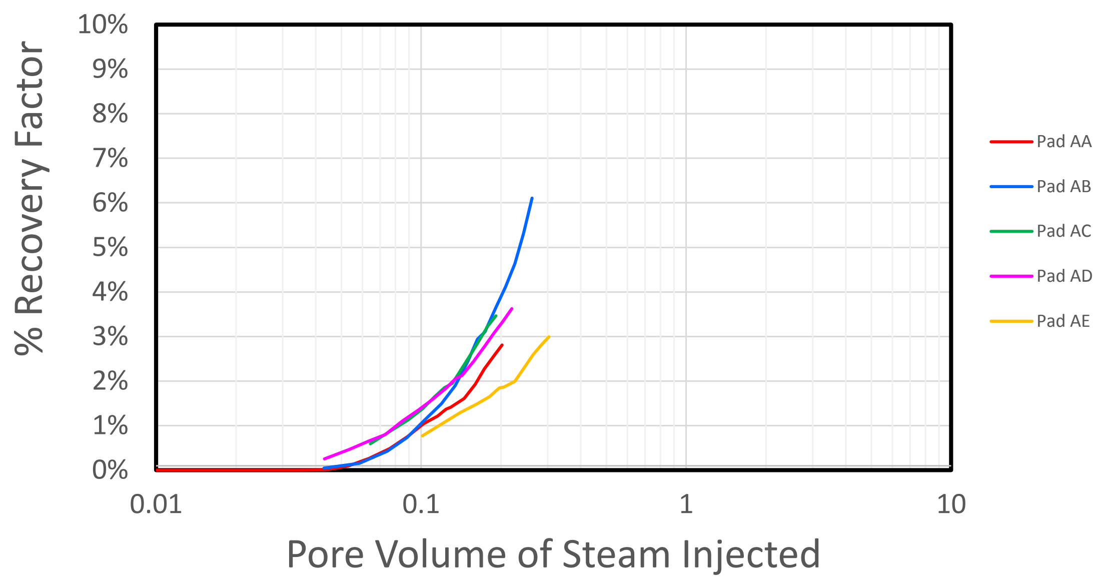
PAD RECOVERY

Pad	Well Pairs	Average Lateral Length (m)	Average Net Pay above Producer (m)	Oil Saturation (frac)	Total Net Pay Porosity (frac)	SAGD-able OBIP (10^6 m^3)	OBIP (10^6 m^3)	SAGD-able Predicted Recovery Factor (%)	SAGD-able Recovery Factor (%)	OBIP-based Recovery Factor (%)	Current Recovered (10^3 m^3)
AA	3/5	850	23.7	0.71	0.35	2.68	3.3	50-70	2.8	2.3	75.3
AB	5/5	640	22.4	0.73	0.37	2.21	2.9	50-70	6.1	4.6	134.9
AC	5/5	750	24.3	0.70	0.36	2.52	3.0	50-70	3.5	2.9	87.3
AD	5/5	670	26.2	0.71	0.35	2.52	3.2	50-70	3.6	2.9	91.3
AE	5/5	830	22.6	0.70	0.35	2.53	3.2	50-70	3.0	2.3	75.6
TOTAL	23/25					12.46	15.6	50-70	3.4	2.7	422.8

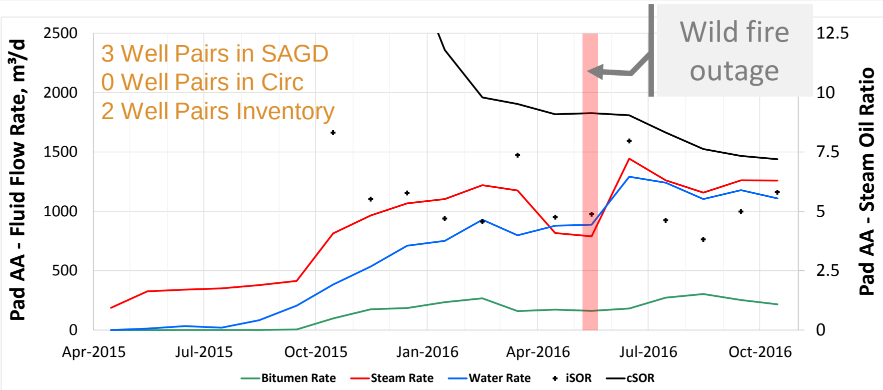
- SAGD-able OBIP values are based on actual producer well placement and reservoir height above producer well. OBIP is gross oil volume between base and top of pay.
- Included 25 m at Heel and Toe of Well in both OBIP volumes

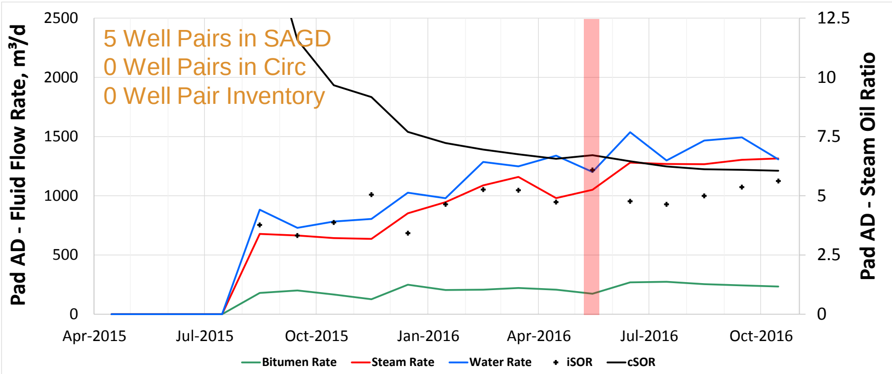
PORE VOLUME (PV) PLOT:

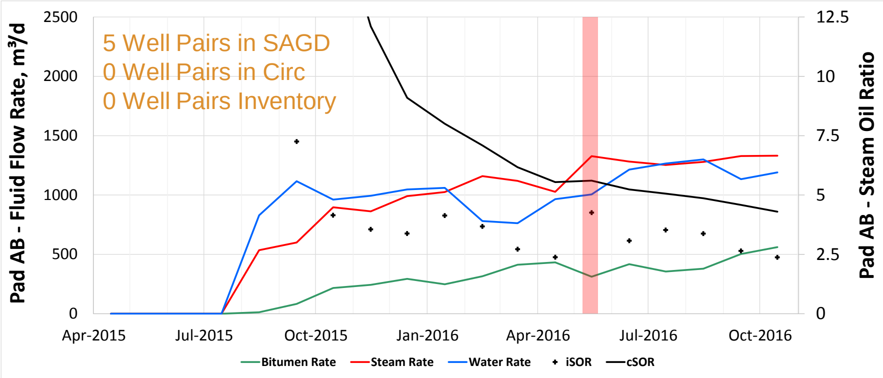
- To date, patterns on the Western edge (connected to additional recoverable volumes) required more steam to pressure up reservoir and far field

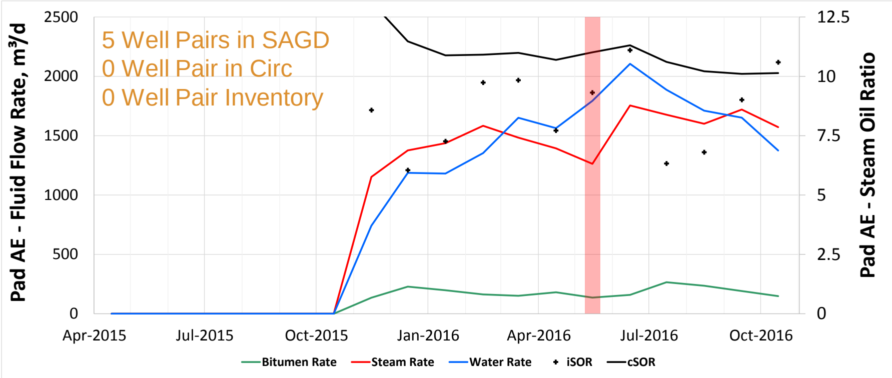


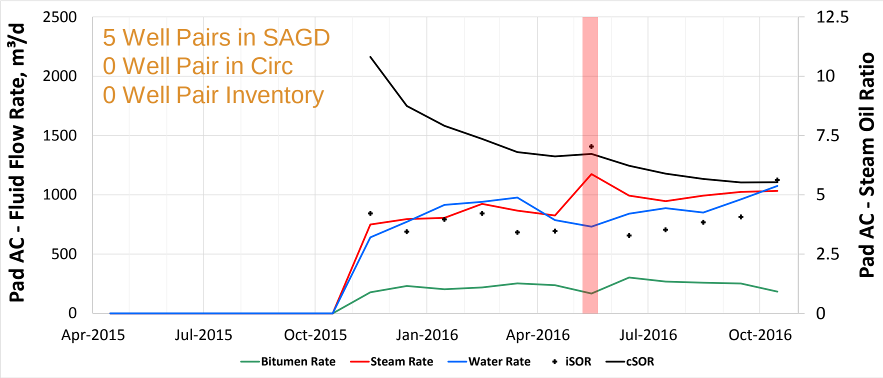
PAD HISTORY







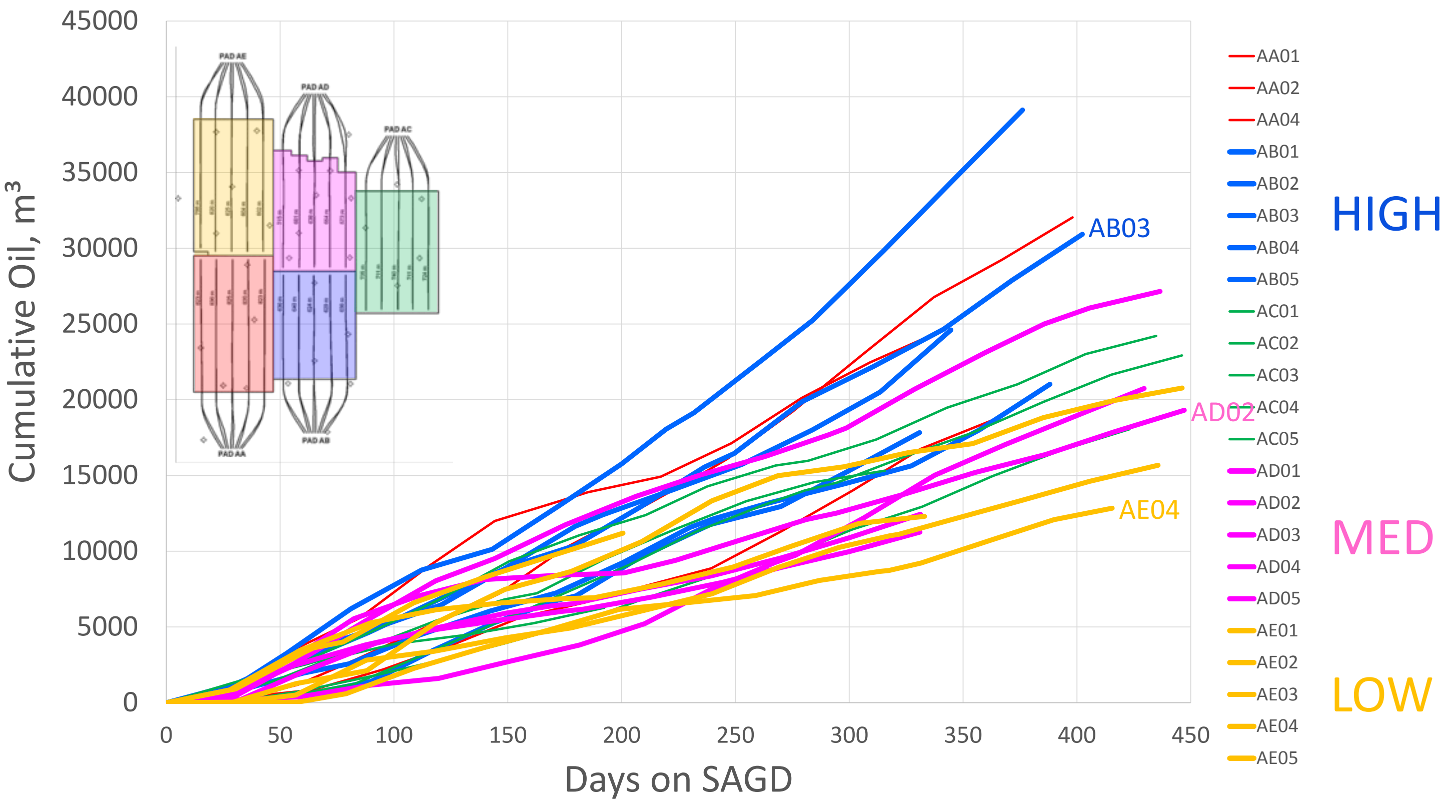




- Oil production continues to ramp up
  - *Monitoring data supports that reservoir is bounded, pressurization of upper zone is ongoing, and steam chambers are continuing to grow*
    - *Expect oil cuts to improve as steam advances into the higher oil saturation zones, resulting in SOR improvement*
    - *Increase in iSOR after Sept 2016 believed to be due to steam chamber advancing through low bitumen saturation zone*

PAD PERFORMANCE

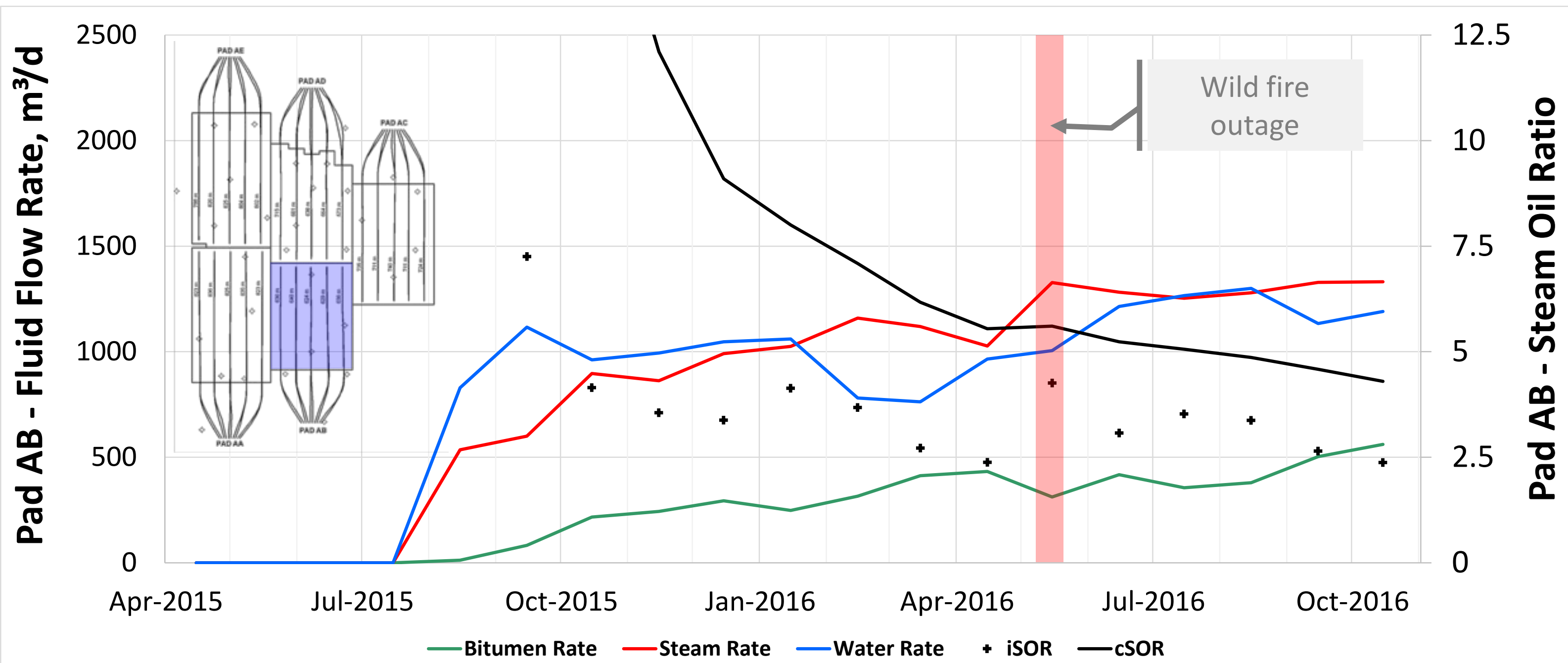
- Variation of pad performance depends on geology, pad boundary, well pair trajectories, pump performance and subcool conformance
  - *Pads AB, AD and AE selected as examples of high/medium/low performing pads*
    - *Selection based on cumulative oil recovery*
    - *Differences in the productivity of the wells primarily due to geological variability*



PAD PERFORMANCE – HIGH: PAD AB

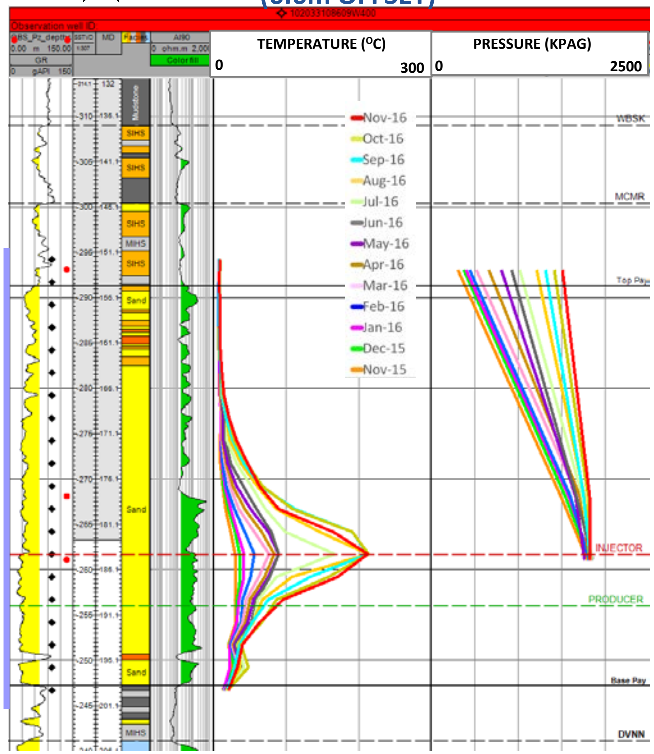
HIGH CASE PRODUCTION PERFORMANCE:

- Pad performance:
  - *Peak bitumen rate ~3,500 bbl/d (560 m³/d)*
  - *Min iSOR ~2.4*
- Well performance:
  - *Average oil rates in 2016 range between 370 – 710 bbl/d (60 – 110 m³/d)*
  - *As of Oct 2016, iSORs range between 2.1 – 2.8*
- Highest reservoir quality
  - *Mostly sandy reservoir*
  - *High oil saturation around well pairs*
  - *Thin low bitumen saturation zone*
- Highest average effective wellbore (97%)
- Partially bounded



PAD PERFORMANCE – HIGH PAD AB

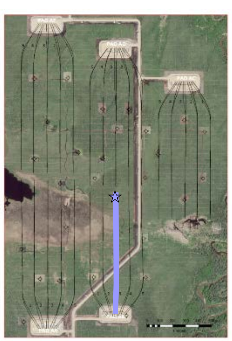
AB03OE, 102/03-31-86-09W4 TOE (6.6m OFFSET)



FACIES

Sand	
SIHS	
MIHS	
Breccia	
Mudstone	
Lmst	

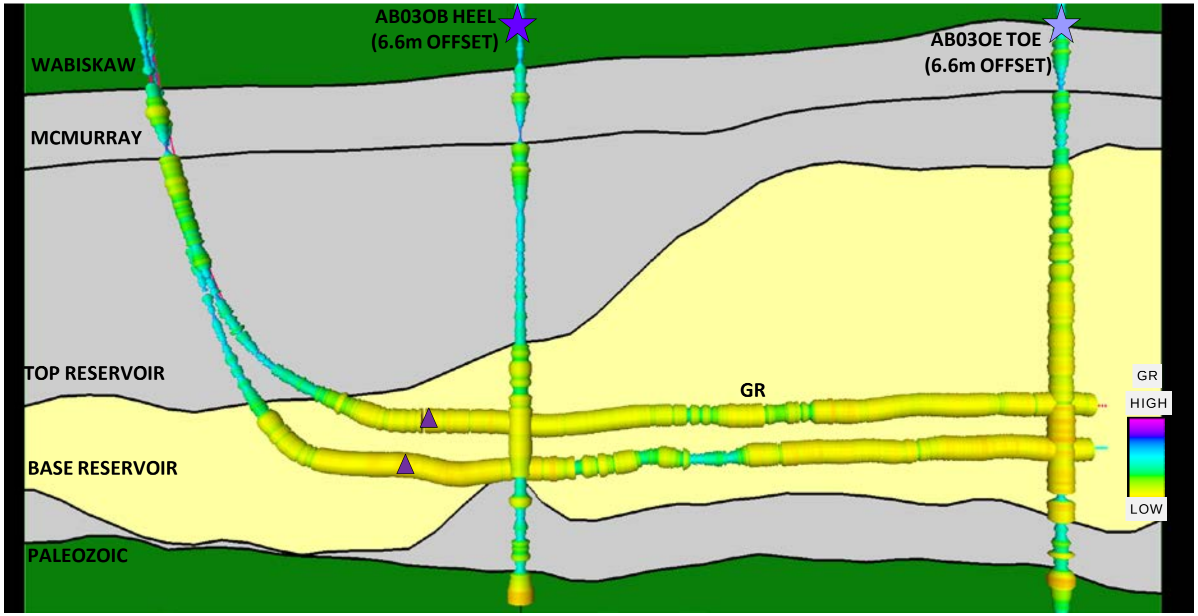
◆ **Thermocouple** ● **Piezometer**

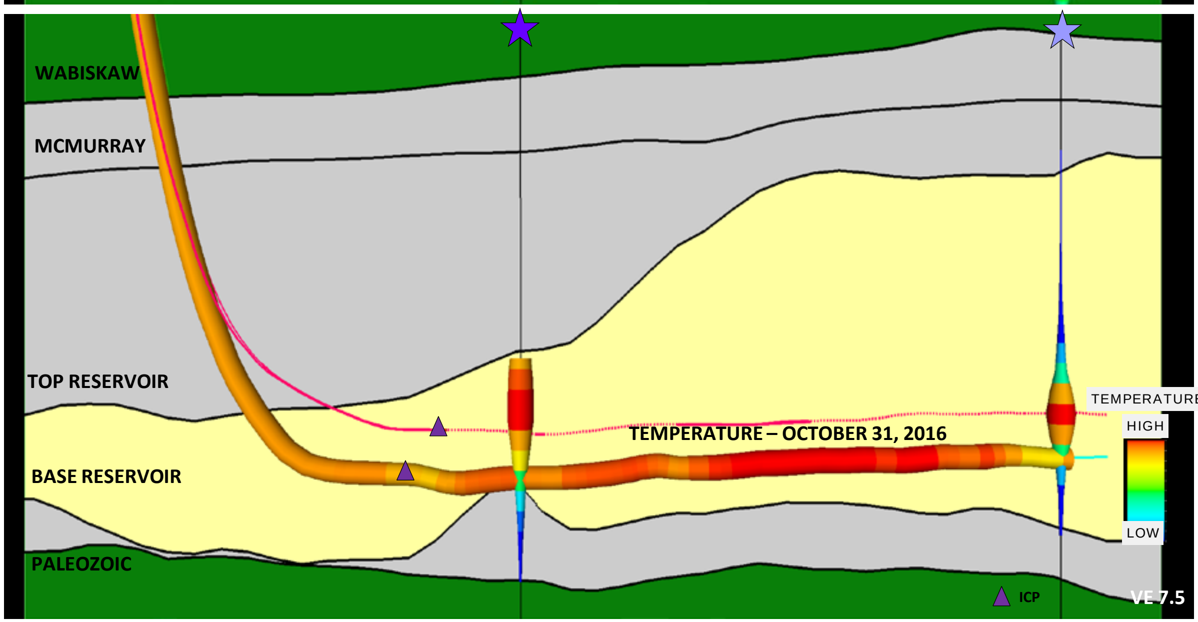


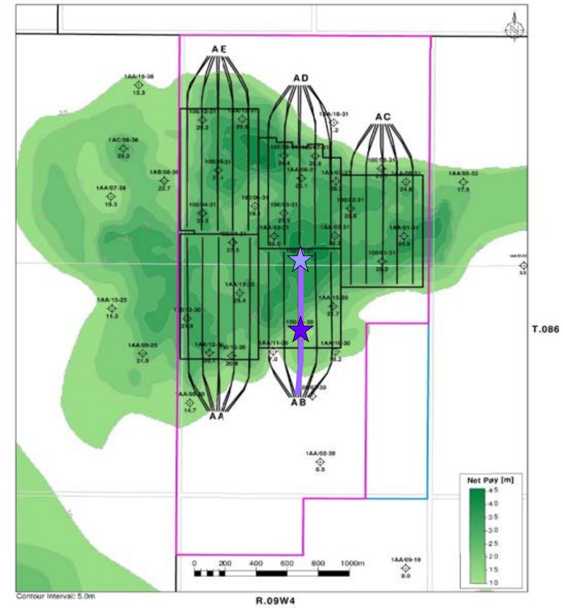
HIGHLIGHTS:

- Pressure increase at top of reservoir through IHS
- Well 03-31 shows steam chamber development near toe of AB03
- Steam chamber along AB03 well pair expected to be more developed than observed at 03-31, based on
  - *High cumulative oil production from AB03*
  - *High temperature/good conformance along producer*
  - *Pressure increase at top of reservoir*

PAD PERFORMANCE – HIGH PAD AB







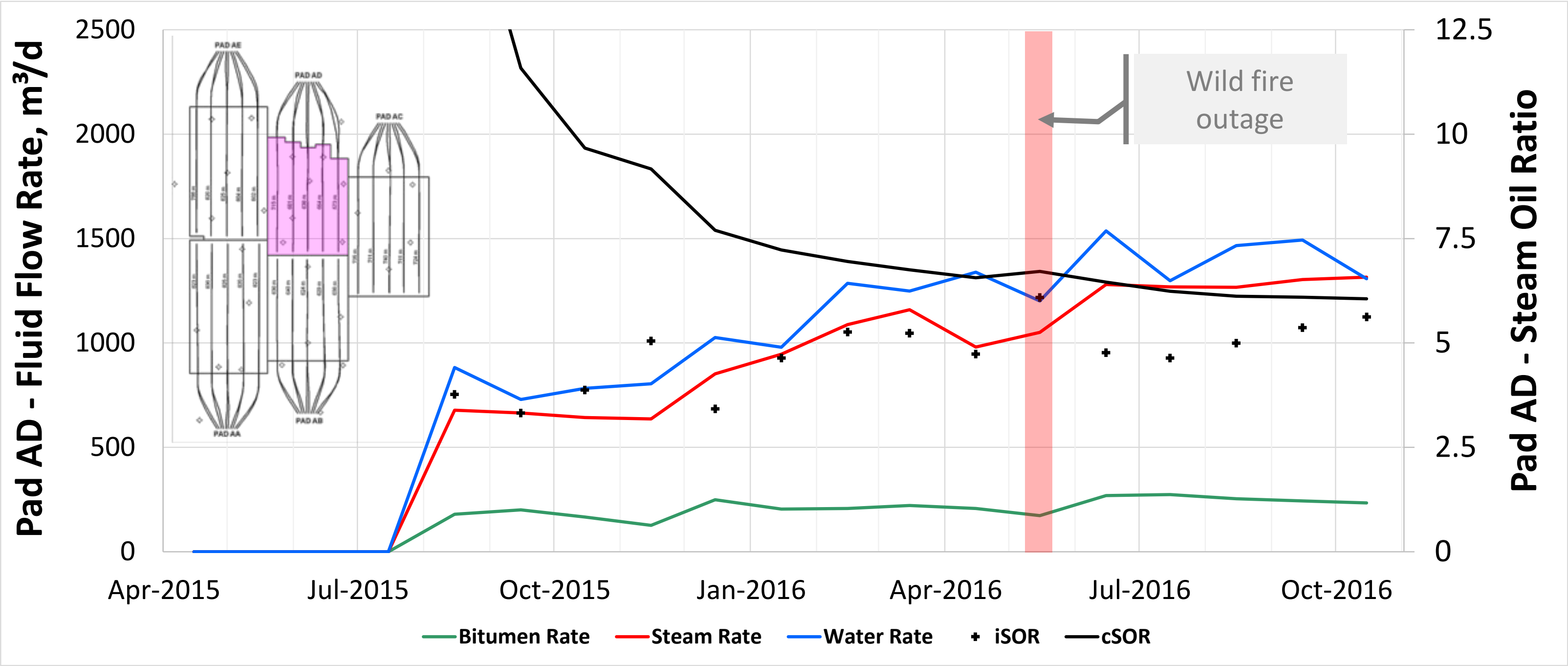
HIGHLIGHTS:

- Steam chamber still developing at toe
  - *High bitumen saturation around well pairs*
- Managing SOR by injecting 100% to toe
  - *Wellbore design enables steam placement to toe to help manage heel subcool*

PAD PERFORMANCE – MID: PAD AD

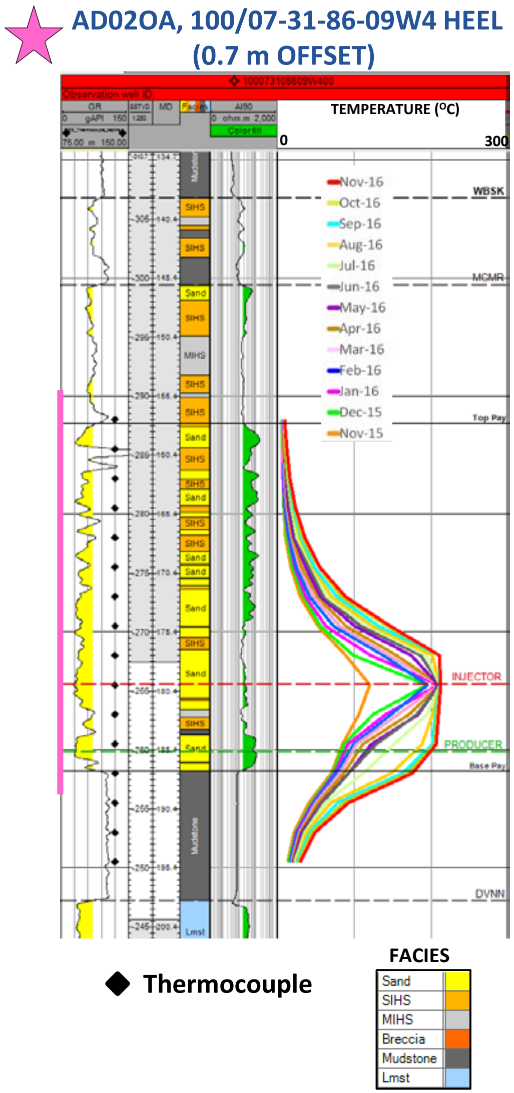
MID CASE PRODUCTION PERFORMANCE:

- Pad performance:
  - *Peak bitumen rate ~1,700 bbl/d (270 m³/d)*
  - *Min iSOR ~4.6*
- Well performance:
  - *Average oil rates in 2016 range between 190 – 400 bbl/d (30 – 60 m³/d)*
  - *As of Oct 2016, iSORs range between 4.4 – 6.8*
- Average reservoir quality
  - *IHS with high oil saturation in upper reservoir*
  - *Thick low bitumen saturation zone above injection well*
  - *Thickest net pay (26.2 m)*
- Shortest wells
- Most bounded pad
- High average effective wellbore (96%)



PAD PERFORMANCE – MID PAD AD

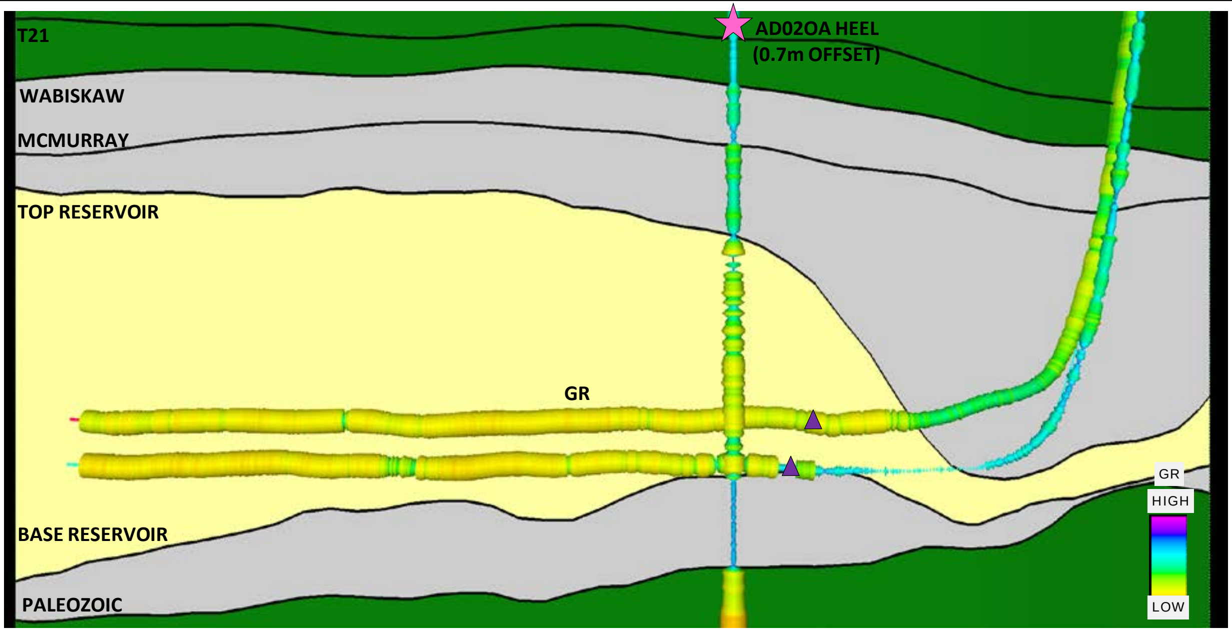
AD02OA, 100/07-31-86-09W4 HEEL (0.7 m OFFSET)

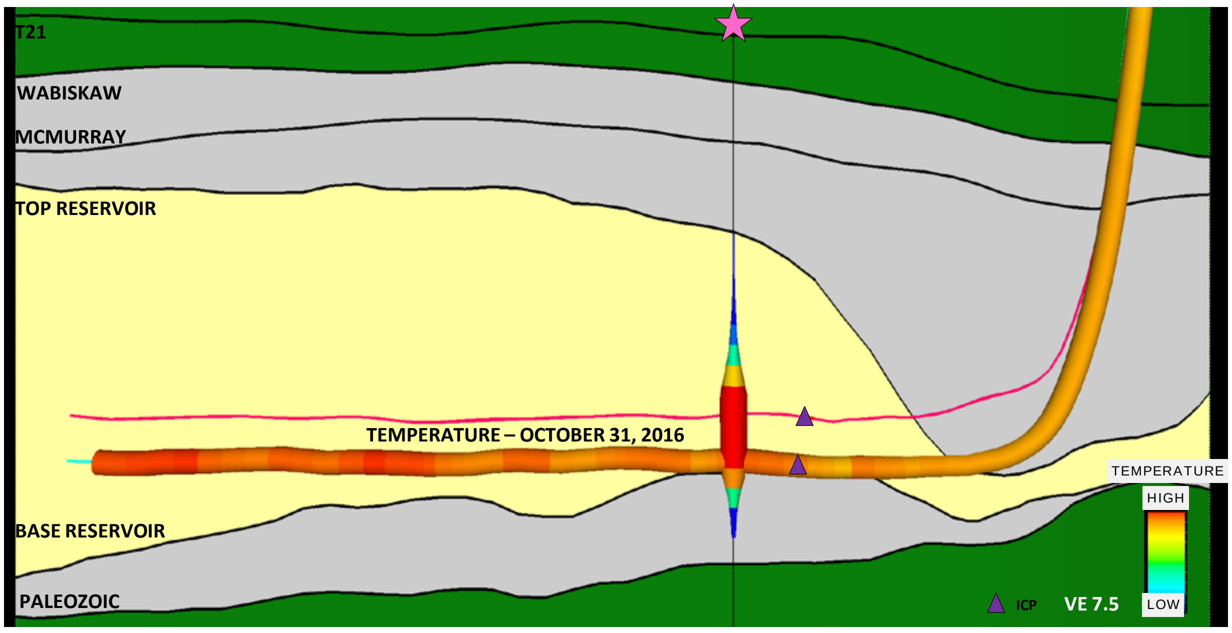


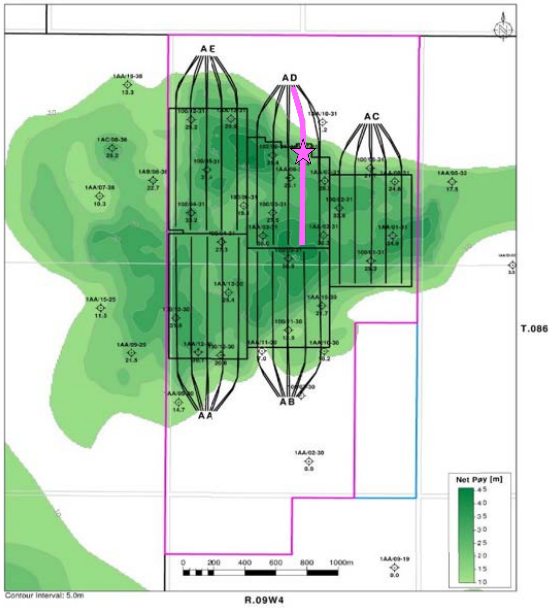
HIGHLIGHTS:

- Well 7-31 shows good steam chamber development at heel of AD02
  - *Temperature increase through IHS*
  - *Steam chamber advancing through LSZ*
- Expect production and SOR to improve once oil rich upper reservoir is accessed

PAD PERFORMANCE – MID PAD AD







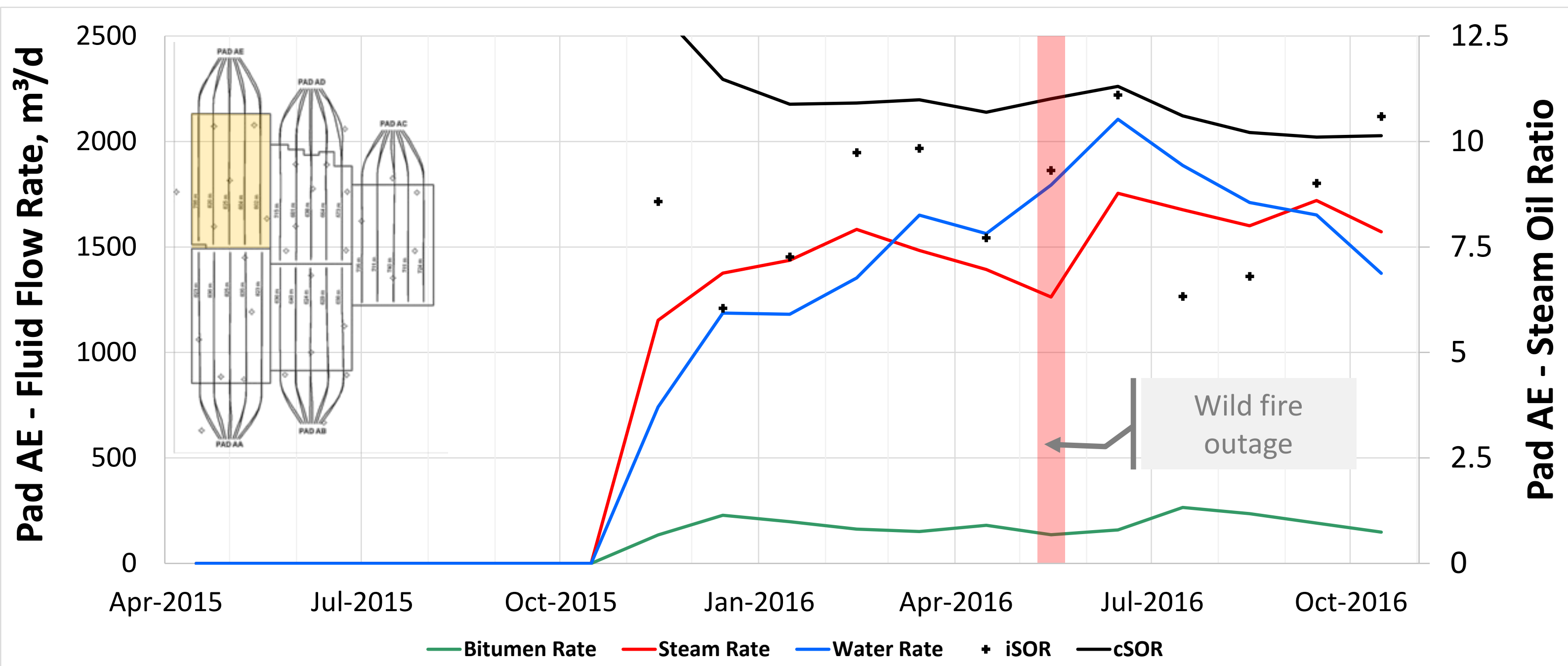
HIGHLIGHTS:

- Uniform reservoir thickness
- High reservoir quality along well pairs
- Good subcool control

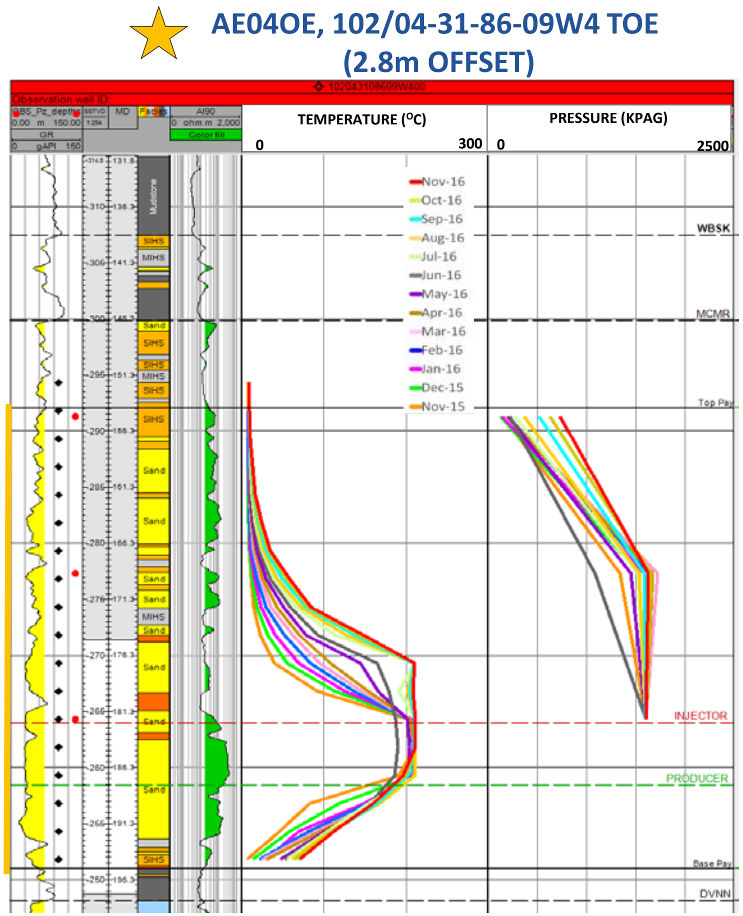
PAD PERFORMANCE – LOW: PAD AE

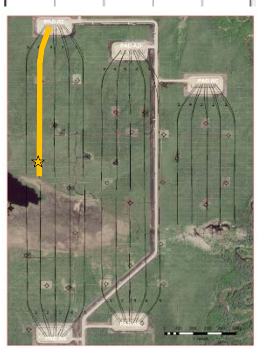
LOW CASE PRODUCTION PERFORMANCE:

- Pad performance:
  - *Peak bitumen rate ~1,650 bbl/d (260 m³/d)*
  - *Min iSOR ~6.3*
- Well performance:
  - *Average oil rates in 2016 range between 180 – 280 bbl/d (30 – 45 m³/d)*
  - *As of Oct 2016, iSORs range between 7.6– 18*
- Average reservoir quality
  - *Breccia dominated*
  - *Thick low bitumen saturation zone above injection well*
- Unbounded towards west
- Wells running at high sub-cool due to start-up pump rate limitation



PAD PERFORMANCE – LOW PAD AE

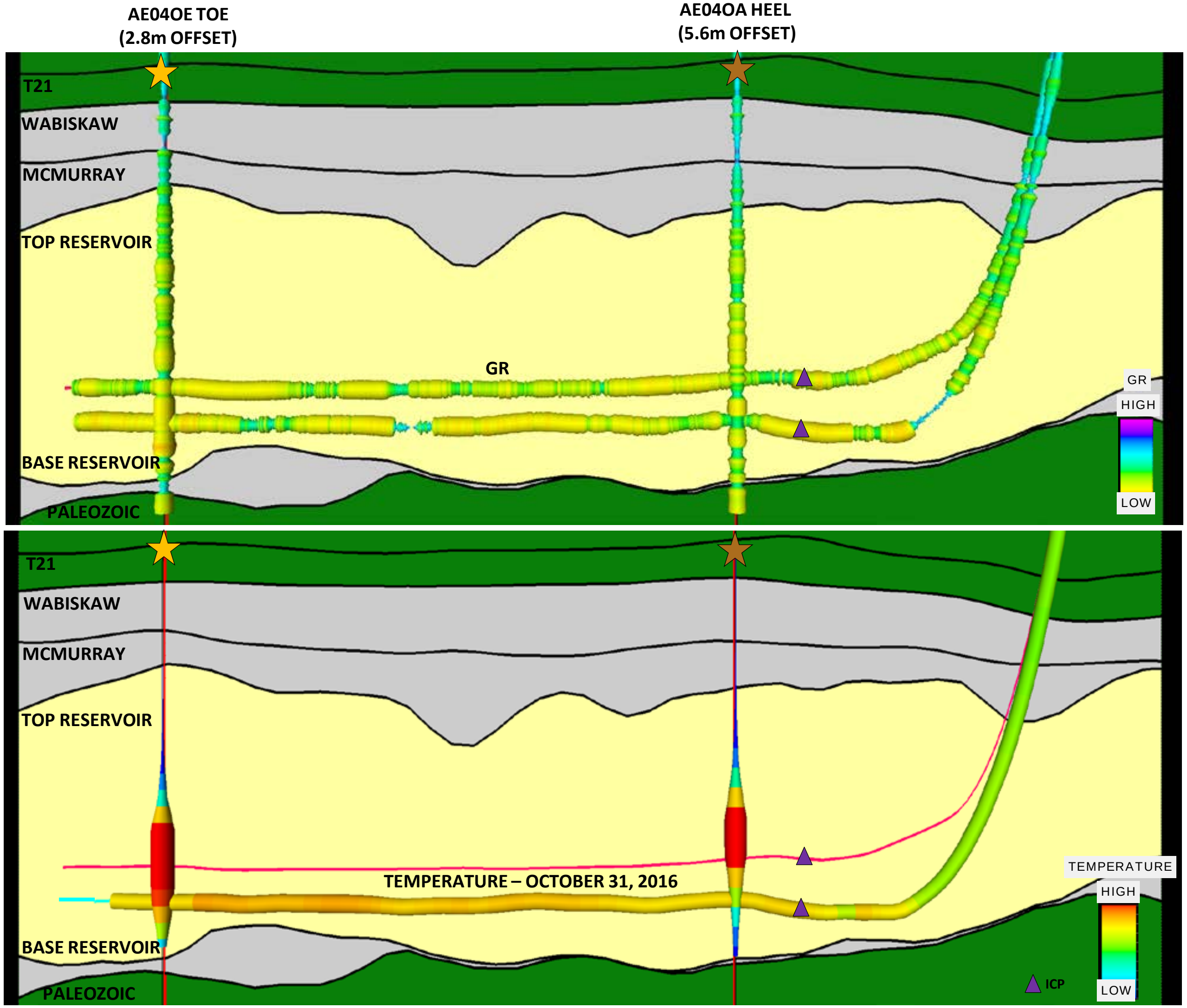


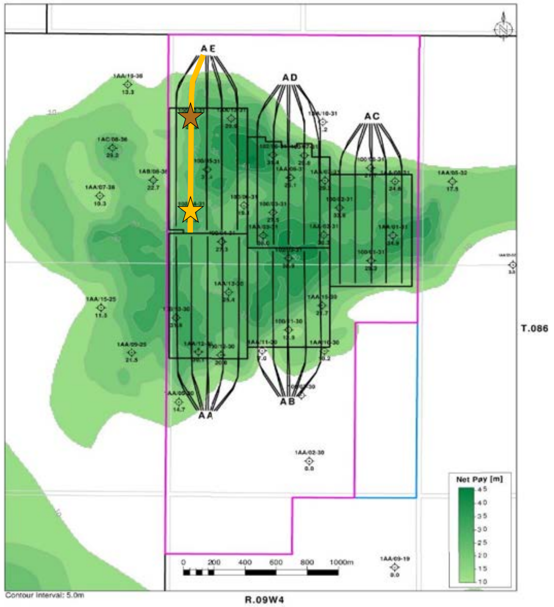


HIGHLIGHTS:

- Well 4-31 shows good steam chamber development at toe of AE04
- Steam chamber top aligns with top of low bitumen saturation zone
- Pressure increases at top of reservoir through IHS
- Temperature increasing above breccia
  - *Fluid movement along bedding planes and through breccia*
- Expect production and SOR to improve once oil rich upper reservoir is accessed

PAD PERFORMANCE – LOW PAD AE





HIGHLIGHTS:

- Uniform pay-thickness along well pairs
- Good steam chamber development around well pairs
- Good well conformance through IHS and breccia

FUTURE PLANS

- No new SAGD drills planned for 2017
- No abandonments planned in the next 5 years
- Four ESP conversions planned for Q4-2016
- Four ESP conversions planned for Q1-2017
- Future ESPs planned to use higher temperature motor and eliminate motor temperature sensor

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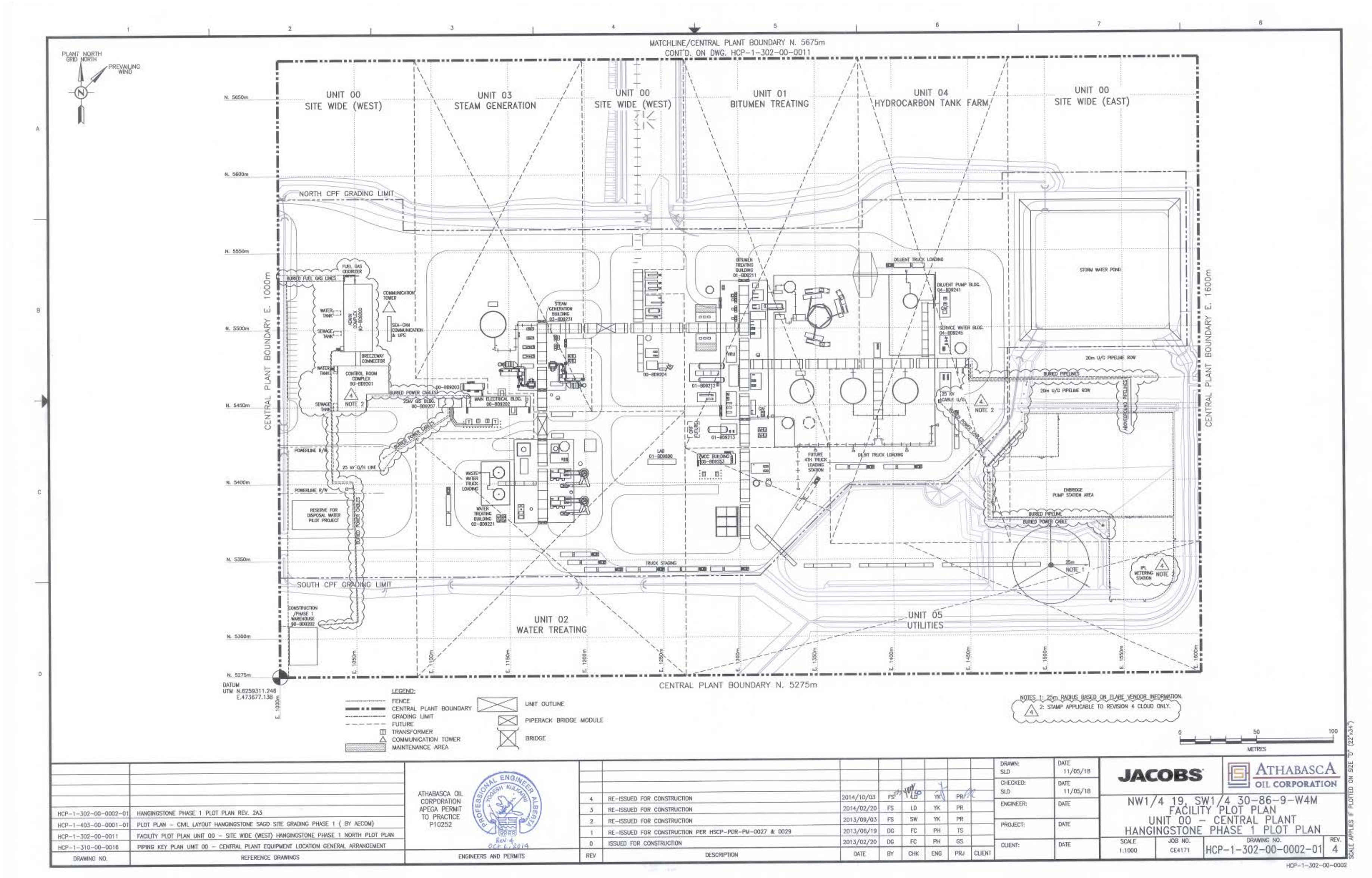
SURFACE OPERATIONS

FACILITIES

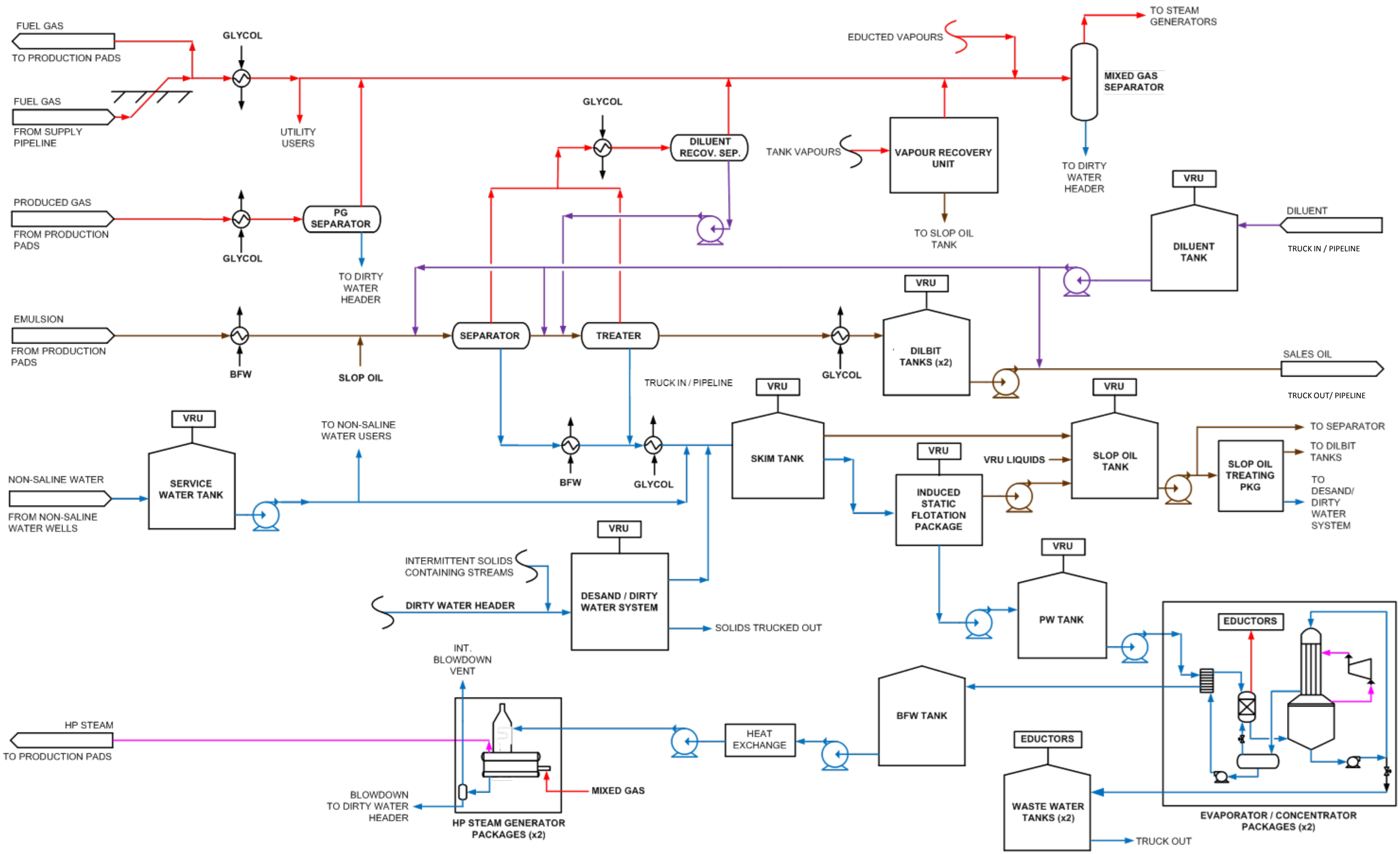
Athabasca Oil Corporation

APPROVED PLOT PLAN



From D078 Amendment Application 1757038

FACILITY SCHEMATIC



SURFACE OPERATIONS

FACILITY PERFORMANCE

ATHABASCA OIL CORPORATION

FACILITY PERFORMANCE

SITE RELIABILITY > 95% (EXCLUDING FORT MCMURRAY WILD FIRE):

- Based on steam performance
- Integrity management program and predictive maintenance programs have been implemented to maintain higher site reliability

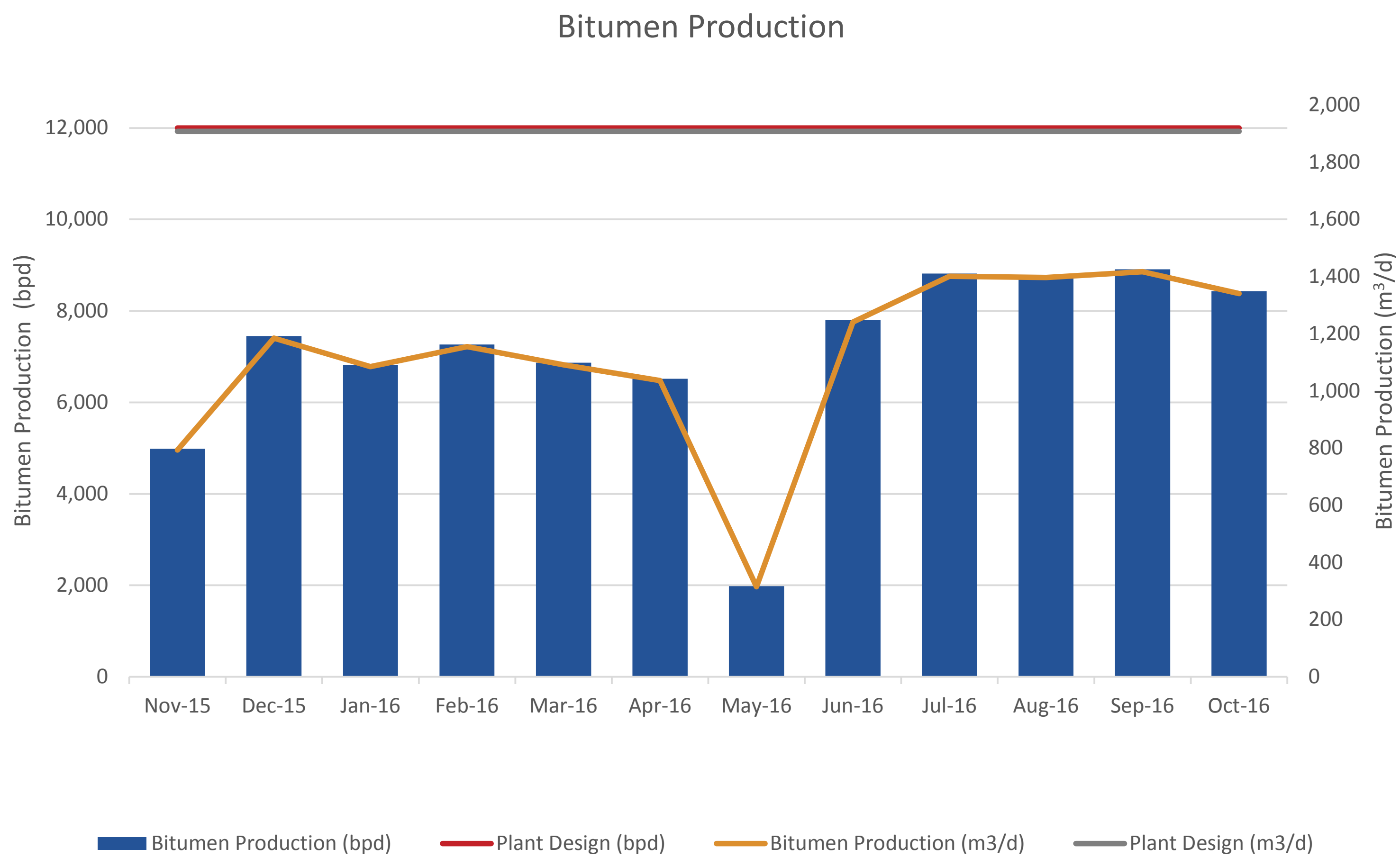
MAJOR ACTIVITIES :

- Boiler inspection (ABSA)
- Separator Cleaning
- Evaporator Cleaning
- Evaporator eductor control modification
- Facility shutdown due to Fort McMurray wild fire
- Annulus gas pipeline winterization

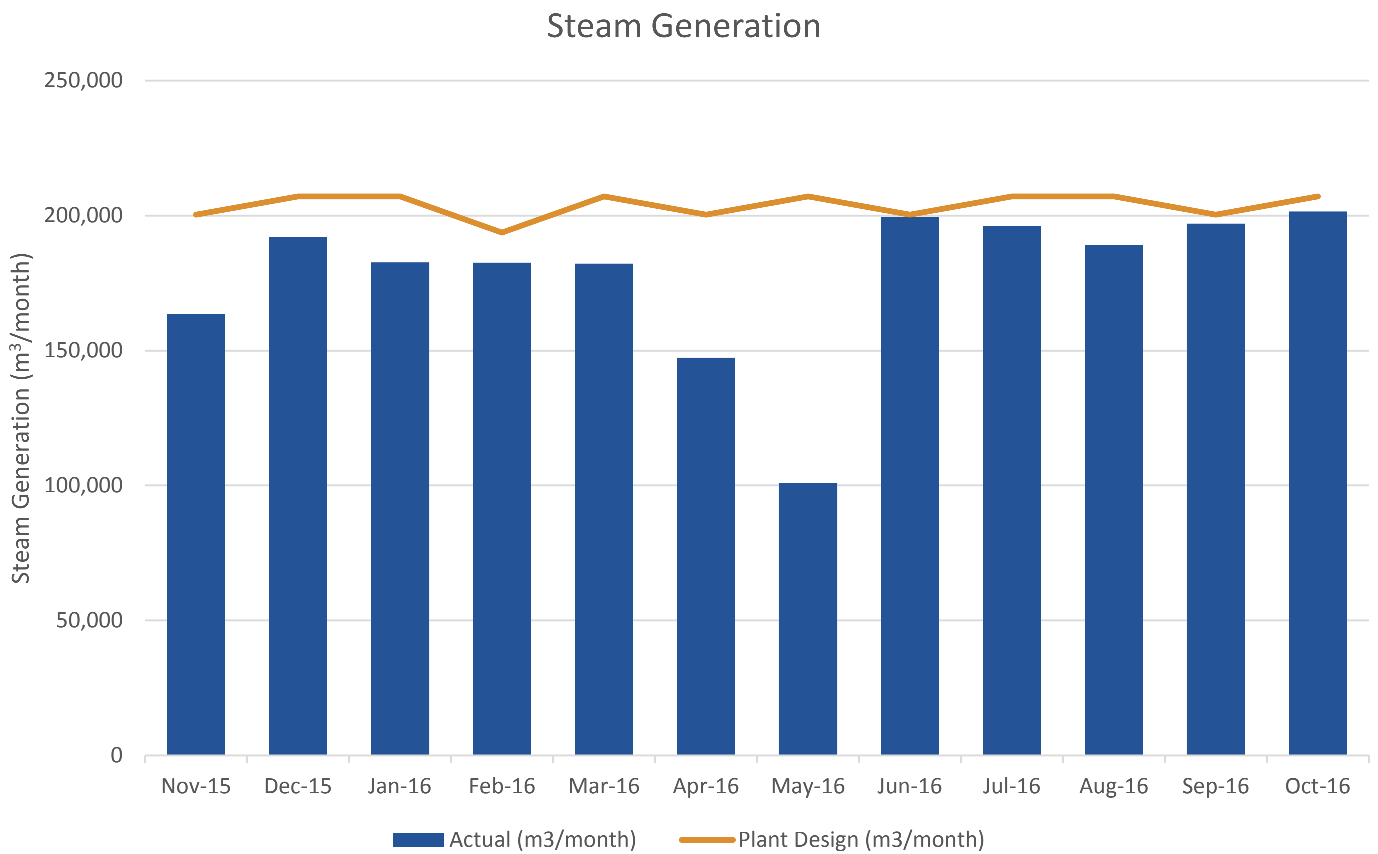
MAJOR CHALLENGES:

- Facility recovery after Fort McMurray wide fire shut-down (e.g. re-pressurization of reservoir, excess process water, etc.)

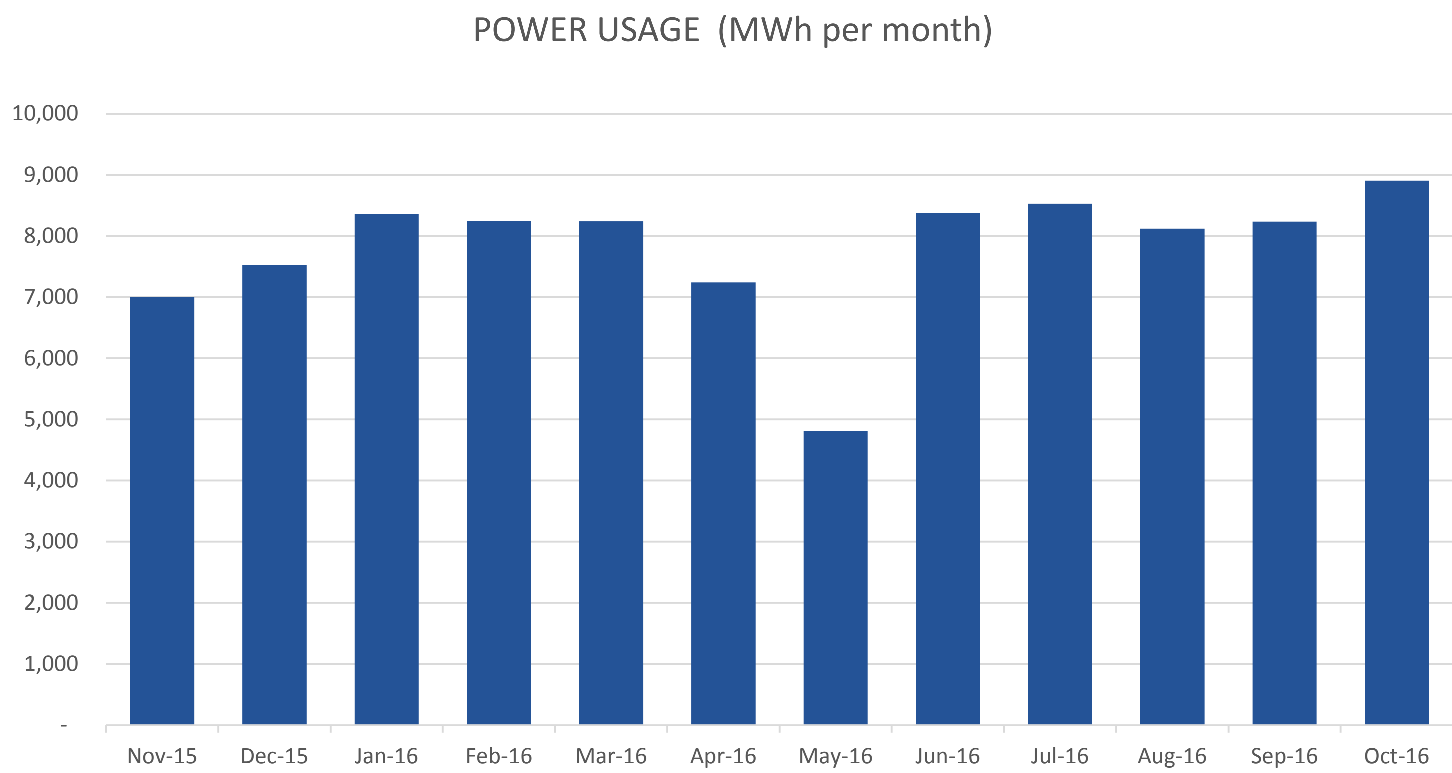
BITUMEN PRODUCTION



STEAM GENERATION

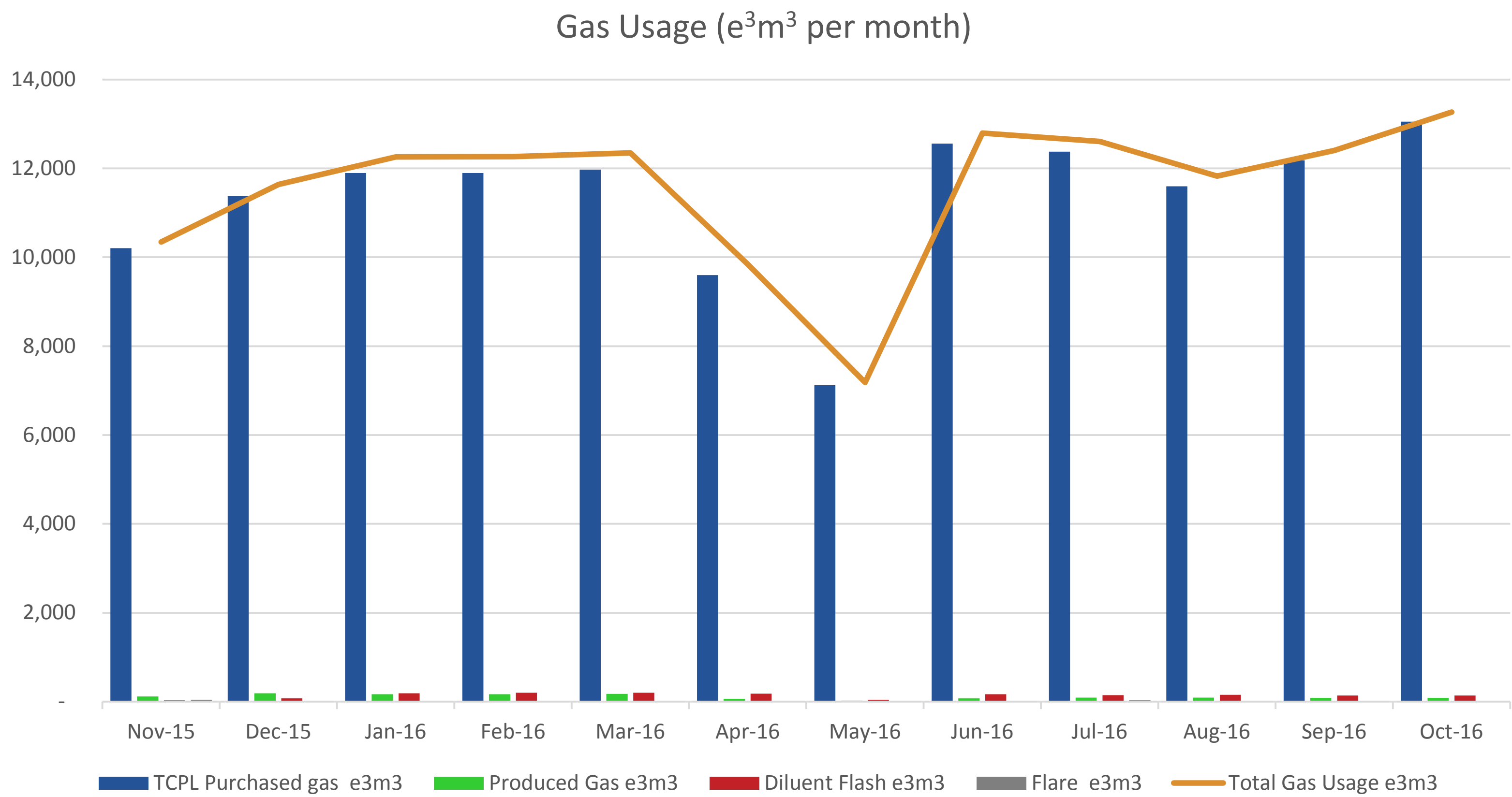


POWER USAGE YTD 93,581 MWH



TOTAL GAS USAGE YTD 138,789 E3M3

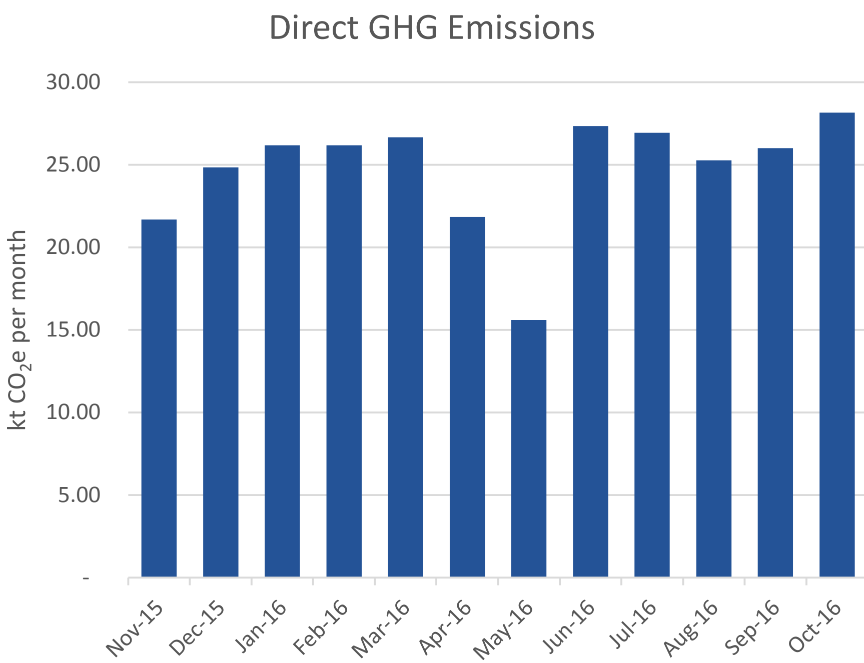
SOLUTION GAS RECOVERY 100%

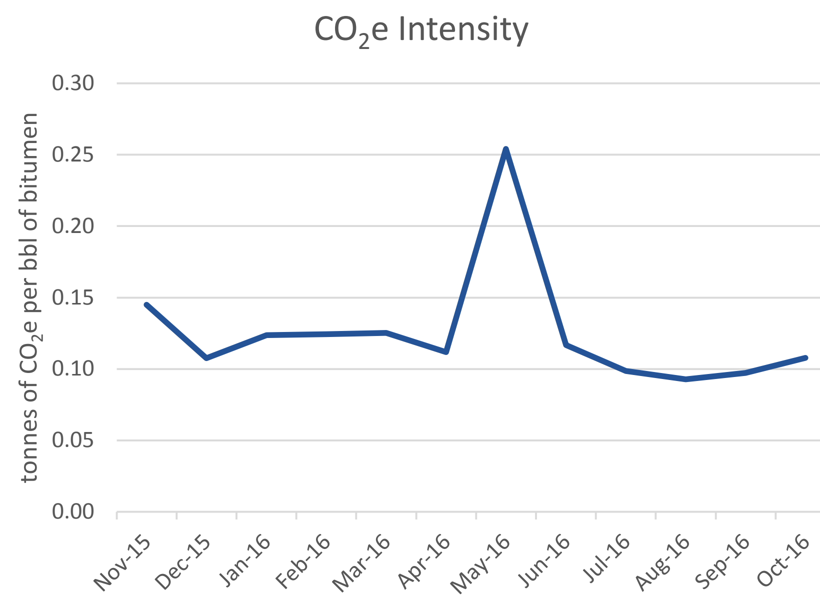


FACILITY PERFORMANCE

DIRECT GHG EMISSIONS FROM NOVEMBER 2015 – OCTOBER 2016 : 296.8 KT CO2E

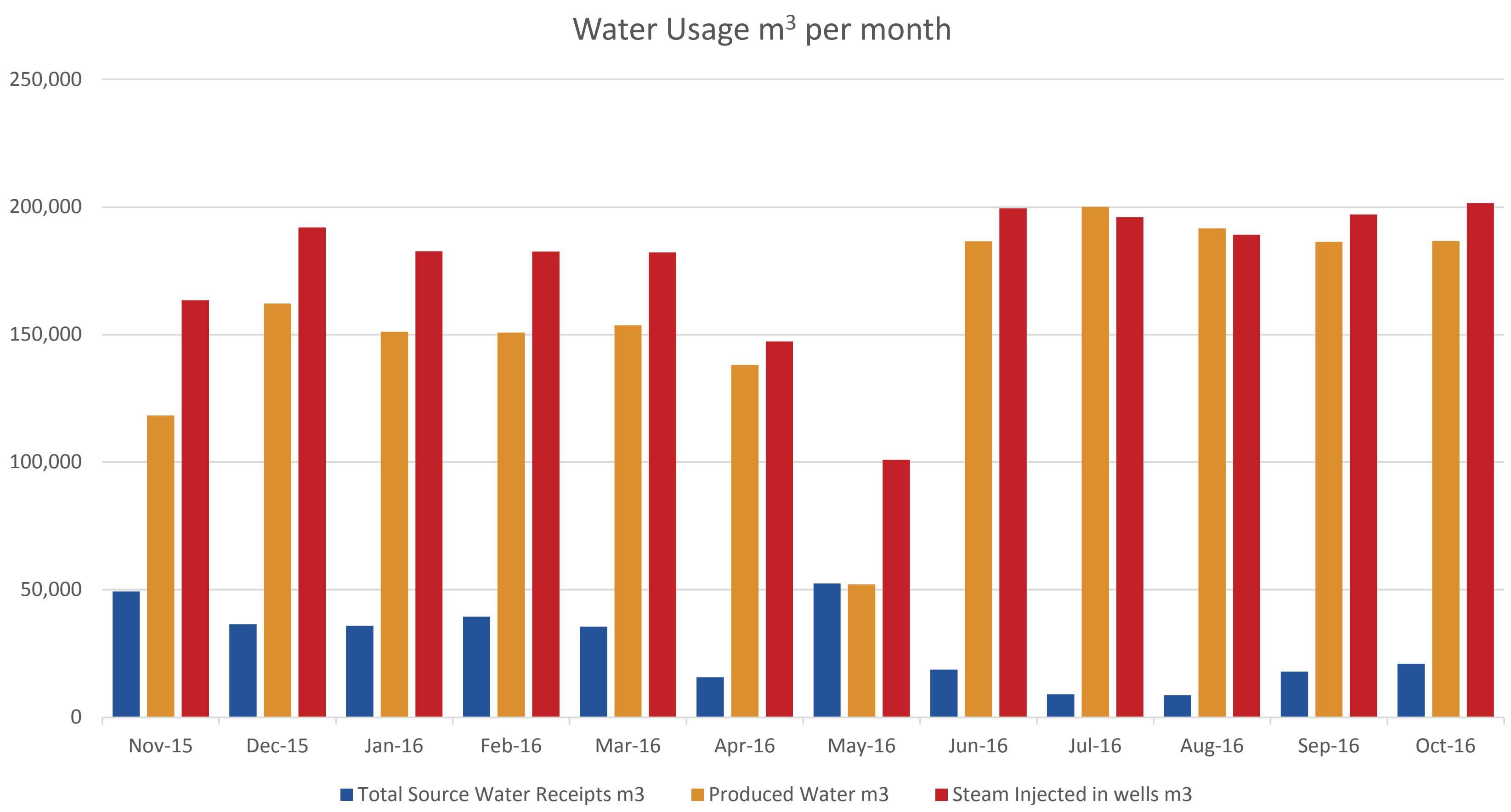
- Sources: stationary combustion, flaring, venting and fugitives
- Calculated using quantification methodology submitted with 2015 SGER data
- Emissions reduction in May 2016 due to Fort McMurray wildfire shutdown





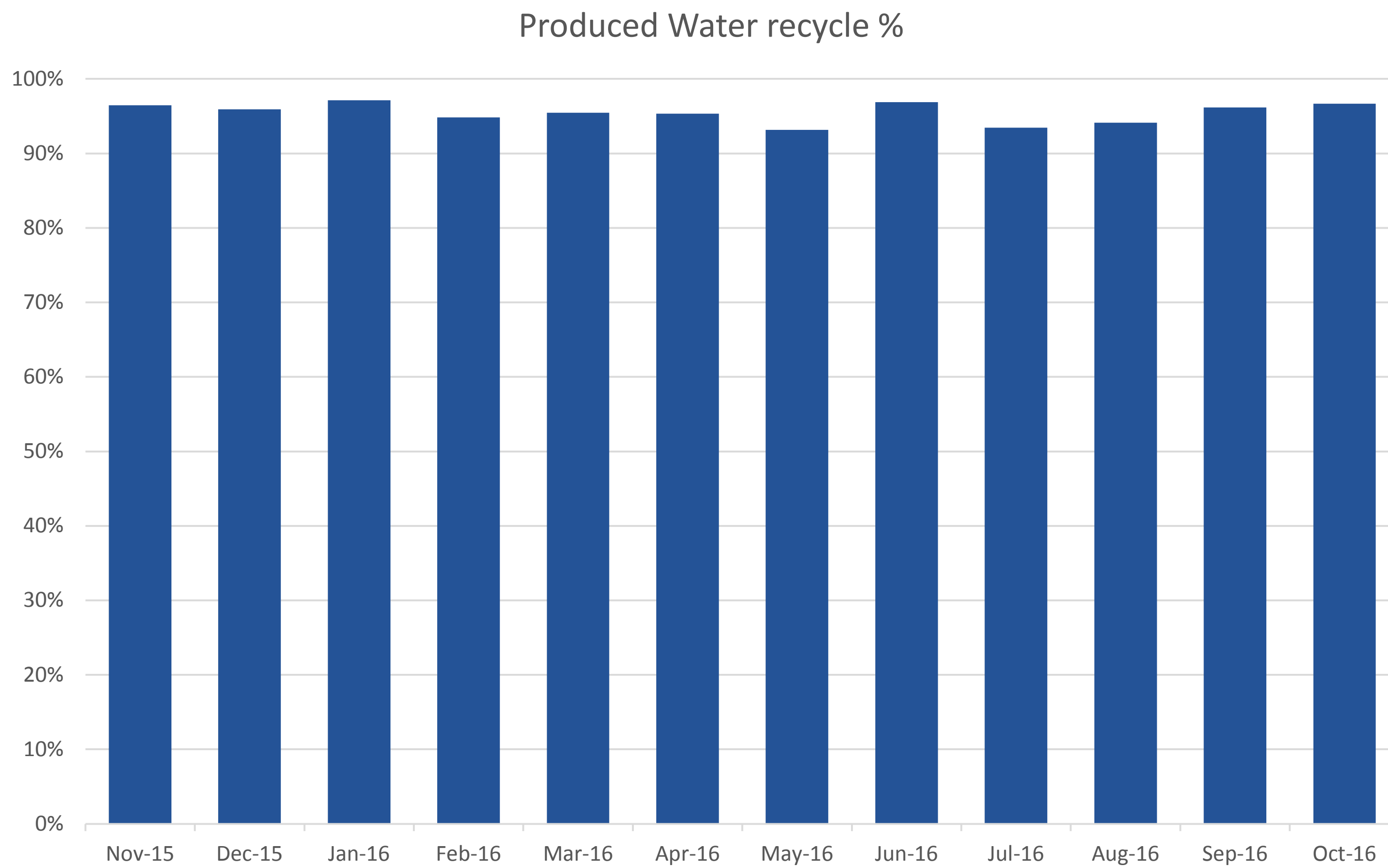
Direct GHG Emissions – Less than design due to rates as well as heat integration incorporated during design phase

WATER USAGE


Water Usage m³ per month
250,000
200,000
150,000
100,000
50,000
0
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Total Source Water Receipts m3
Produced Water m3
Steam Injected in wells m3

PRODUCED WATER RECYCLE (AVG. 95.5%)

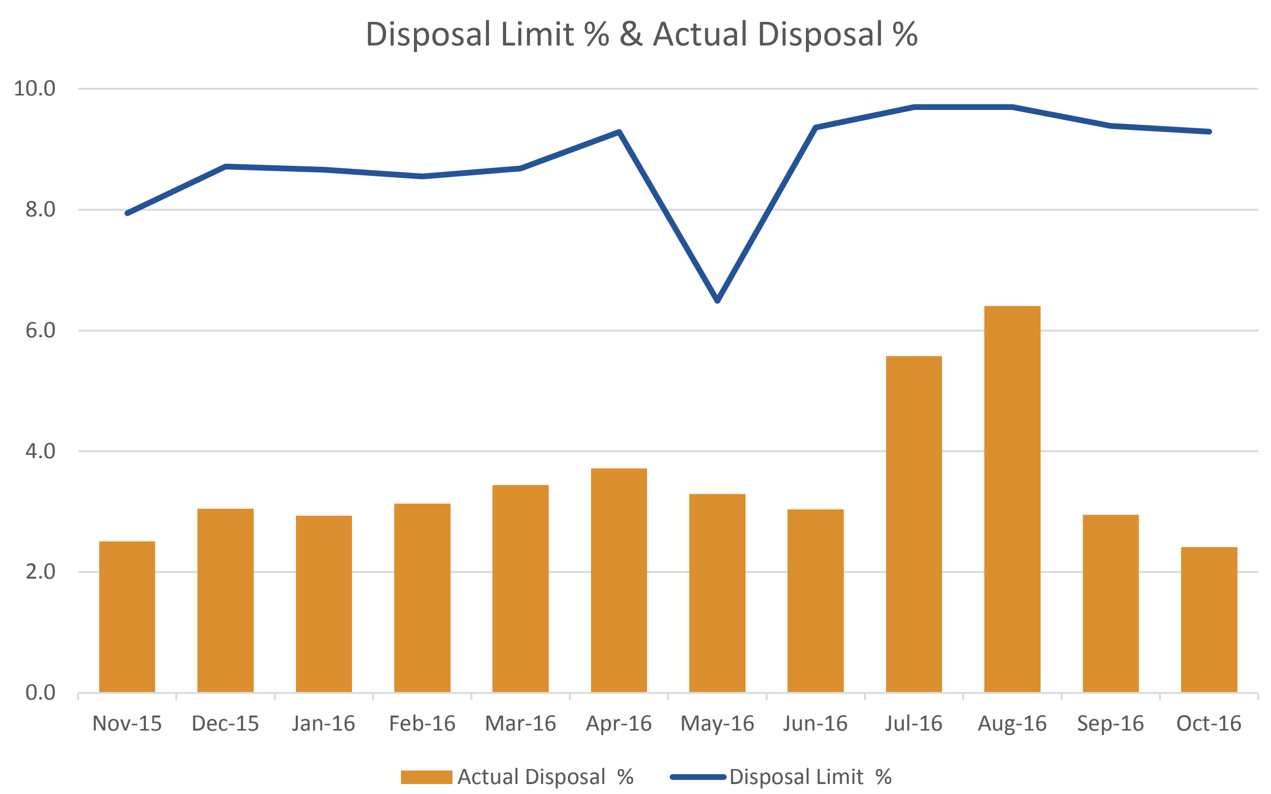
Produced Water Recycle % = ((Steam Injected – Fresh water)/Produced Water)*100



FACILITY PERFORMANCE

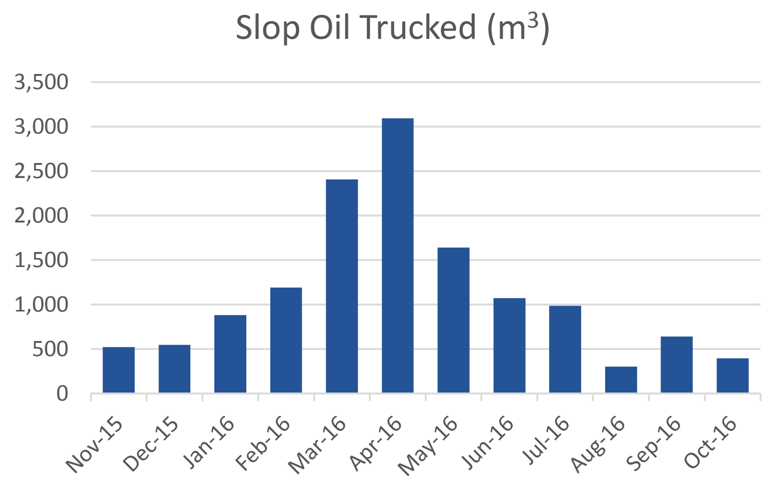
Disposal Limit % = ((FW In * Df (i.e. 0.03) +PW In * Dp (i.e. 0.10)/ (FW In +PW In))*100

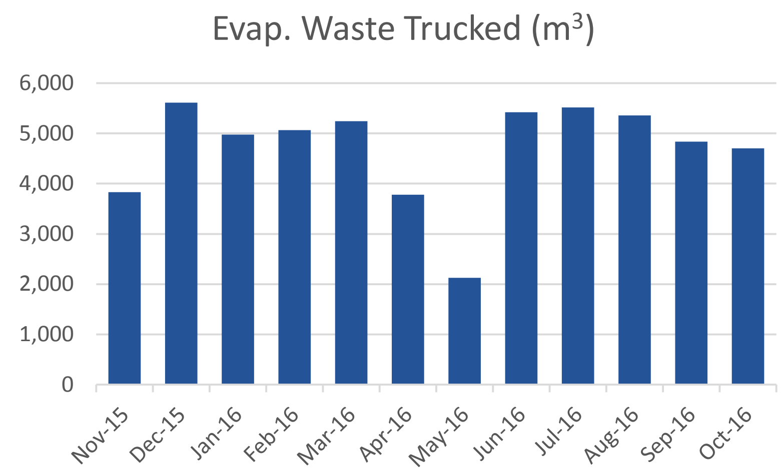
Actual Disposal % = (Total Disposal)/(FW In +PW In) * 100

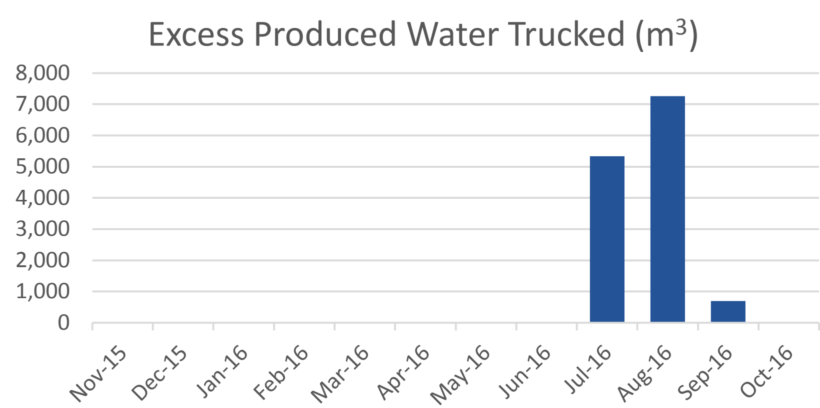


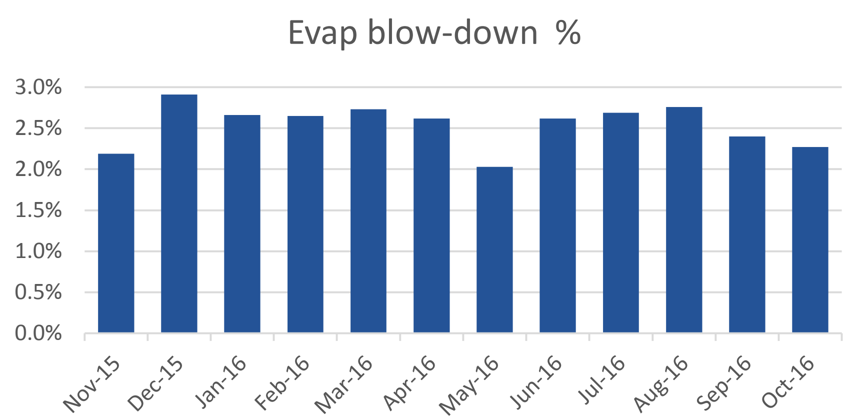
WASTE DISPOSAL

- Waste streams are slop oil, evaporator blowdown and excess produced water









Volumes reported via Petrinex

SURFACE

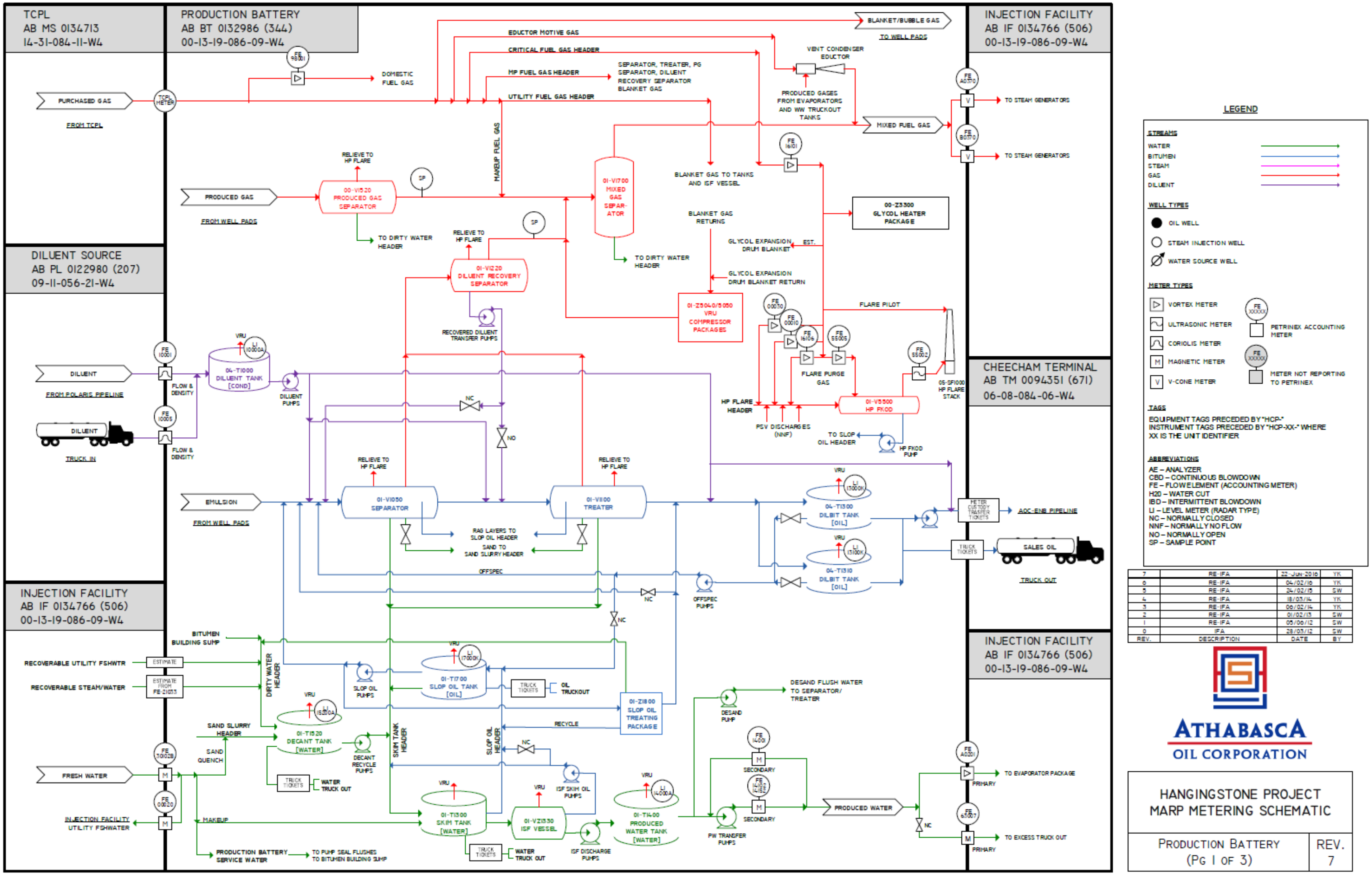
MEASUREMENT, ACCOUNTING AND REPORTING PLAN (*MARP*)

ATHABASCA OIL CORPORATION

MEASUREMENT, ACCOUNTING AND REPORTING PLAN (*MARP*) APPROVAL RECEIVED ON OCTOBER 5, 2012

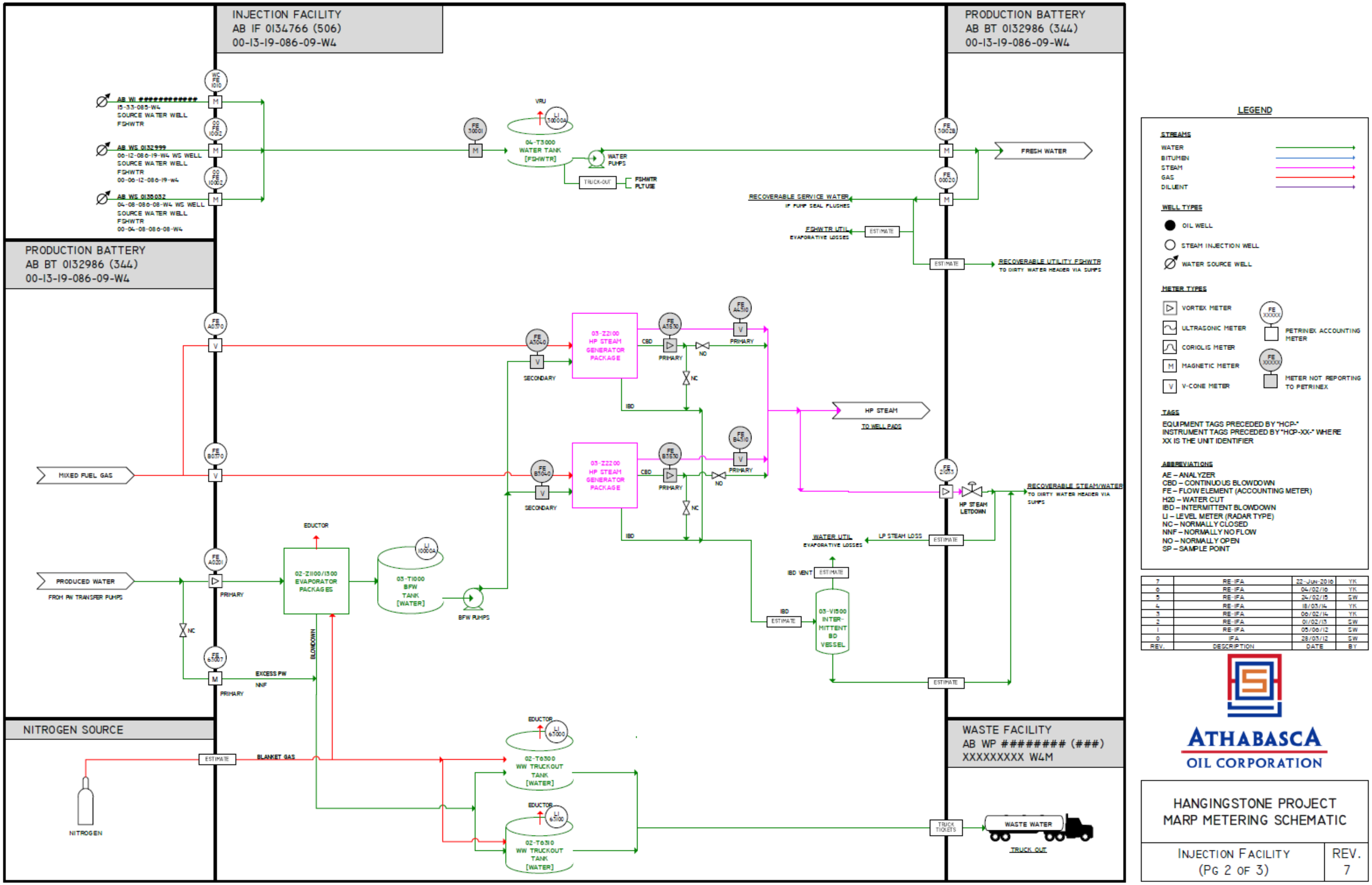
- *MARP* updated in February 2016 and June 2016 to reflect dilbit shipping by pipeline
- AER visited the site on October 6, 2016 as part of the *MARP* audit
  - *Submitted MARP Audit action responses to AER on November 9, 2016*
- Third party audit determined compensation values were in need of adjustment on steam meters from the boilers
  - *Average steam to the wells has been over reported by approximately 7 %*
  - *Steam flow is used to calculate AOC Steam Oil Ratio, Oil cut percentage and reservoir retention*
  - *All Petrinex values were updated by October 21st, 2016*

MEASUREMENT SCHEMETICS - BATTERY

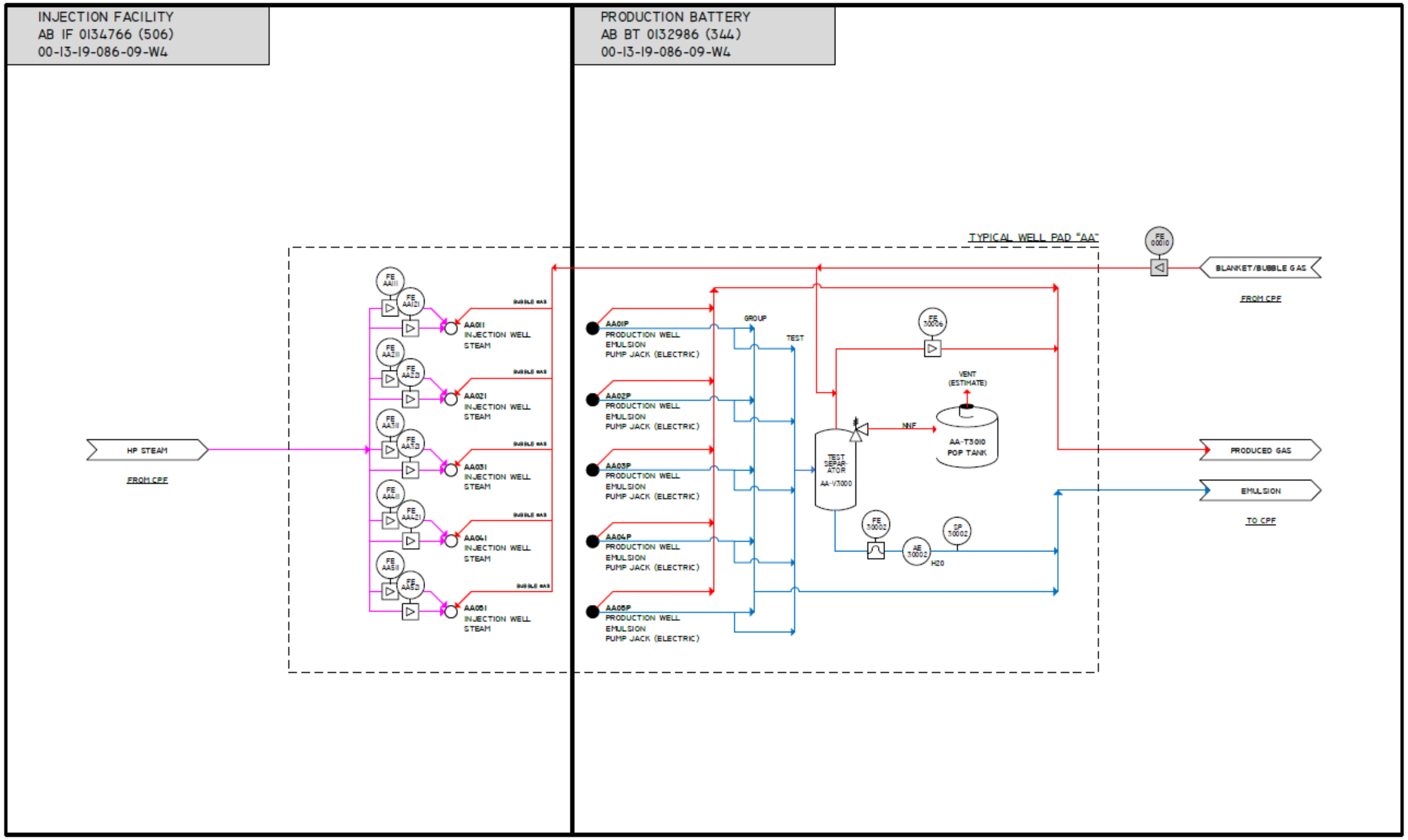


REV.	DESCRIPTION	DATE	BY
7	RE-IFA	22-Jun-2016	YK
6	RE-IFA	04/02/16	YK
5	RE-IFA	24/02/15	SW
4	RE-IFA	18/03/14	YK
3	RE-IFA	06/02/14	YK
2	RE-IFA	01/02/13	SW
1	RE-IFA	05/06/12	SW
0	IFA	28/03/12	SW

MEASUREMENT SCHEMETICS – INJECTION FACILITY



MEASUREMENT SCHEMETICS – WELL PADS



LEGEND

STREAMS
- WATER
- BITUMEN
- STEAM
- GAS
- DILUENT

WELL TYPES
- OIL WELL
- STEAM INJECTION WELL
- WATER SOURCE WELL

METER TYPES
- VORTEX METER
- ULTRASONIC METER
- CORIOLIS METER
- MAGNETIC METER
- V-CONE METER
- PETRINEX ACCOUNTING METER
- METER NOT REPORTING TO PETRINEX

TAGS

EQUIPMENT TAGS PRECEDED BY "HCP-"
INSTRUMENT TAGS PRECEDED BY "HCP-XX-" WHERE XX IS THE UNIT IDENTIFIER

ABBREVIATIONS

AE – ANALYZER
CBD – CONTINUOUS BLOWDOWN
FE – FLOW ELEMENT (ACCOUNTING METER)
H20 – WATER CUT
IBD – INTERMITTENT BLOWDOWN
LI – LEVEL METER (RADAR TYPE)
NC – NORMALLY CLOSED
NNF – NORMALLY NO FLOW
NO – NORMALLY OPEN
SP – SAMPLE POINT

REV.	DESCRIPTION	DATE	BY
7	RE-IFA	22-Jun-2016	YK
6	RE-IFA	04/02/16	YK
5	RE-IFA	24/02/15	SW
4	RE-IFA	18/03/14	YK
3	RE-IFA	06/02/14	YK
2	RE-IFA	01/02/13	SW
1	RE-IFA	05/06/12	SW
0	IFA	28/03/12	SW

ATHABASCA OIL CORPORATION

HANGINGSTONE PROJECT
MARP METERING SCHEMATIC

WELL PADS (PG 3 OF 3)	REV. 7

AOC WELL NAMES AND UNIQUE IDs

PAD AA		PAD AB		PAD AC		PAD AD		PAD AE	
AA01I	105/04-31-086-09W4/0	AB01I	106/03-31-086-09W4/0	AC01I	103/16-30-086-09W4/0	AD01I	109/02-31-086-09W4/0	AE01I	116/03-31-086-09W4/0
AA02I	106/04-31-086-09W4/0	AB02I	107/03-31-086-09W4/0	AC02I	100/16-30-086-09W4/0	AD02I	108/02-31-086-09W4/0	AE02I	114/04-31-086-09W4/0
AA03I	107/04-31-086-09W4/0	AB03I	108/03-31-086-09W4/0	AC03I	102/16-30-086-09W4/0	AD03I	118/03-31-086-09W4/0	AE03I	113/04-31-086-09W4/0
AA04I	108/04-31-086-09W4/0	AB04I	103/02-31-086-09W4/0	AC04I	102/15-30-086-09W4/0	AD04I	117/03-31-086-09W4/0	AE04I	112/04-31-086-09W4/0
AA05I	103/03-31-086-09W4/0	AB05I	104/02-31-086-09W4/0	AC05I	100/15-30-086-09W4/0	AD05I	105/03-31-086-09W4/0	AE05I	104/04-31-086-09W4/0
AA01P	103/04-31-086-09W4/0	AB01P	109/03-31-086-09W4/0	AC01P	106/16-30-086-09W4/0	AD01P	102/02-31-086-09W4/0	AE01P	104/03-31-086-09W4/0
AA02P	109/04-31-086-09W4/0	AB02P	110/03-31-086-09W4/0	AC02P	105/16-30-086-09W4/0	AD02P	107/02-31-086-09W4/0	AE02P	117/04-31-086-09W4/0
AA03P	110/04-31-086-09W4/0	AB03P	111/03-31-086-09W4/0	AC03P	104/16-30-086-09W4/0	AD03P	115/03-31-086-09W4/0	AE03P	118/04-31-086-09W4/0
AA04P	111/04-31-086-09W4/0	AB04P	105/02-31-086-09W4/0	AC04P	104/15-30-086-09W4/0	AD04P	114/03-31-086-09W4/0	AE04P	116/04-31-086-09W4/0
AA05P	112/03-31-086-09W4/0	AB05P	106/02-31-086-09W4/0	AC05P	103/15-30-086-09W4/0	AD05P	113/03-31-086-09W4/0	AE05P	115/04-31-086-09W4/0

MEASUREMENT METHODOLOGY

WELL PRODUCTION AND INJECTION VOLUMES

- Each well pad has a dedicated test separator with liquid flow meter and water cut analyzer to determine well bitumen and water production
- Wells are individually put on test for one valid testing hour for every 20 hours of operation. Valid well test criteria per approved *MARP*
- Well gas production prorated from Battery Level GOR using a proration factor of 1. Battery Level GOR is updated monthly
- Steam injection is metered at each individual wellhead. Primary and secondary steam production metering available at the central steam plant

BATTERY SALES OIL

- Sales oil is shipped via pipeline from the Hangingstone Battery. Custody transfer metering is done at the receiving facility

MEASUREMENT TECHNOLOGY

- Well testing uses standard method of test separators with microwave water cut analyzers. New technologies such as multiphase flow meters may be evaluated later

MEASUREMENT METHODOLOGY

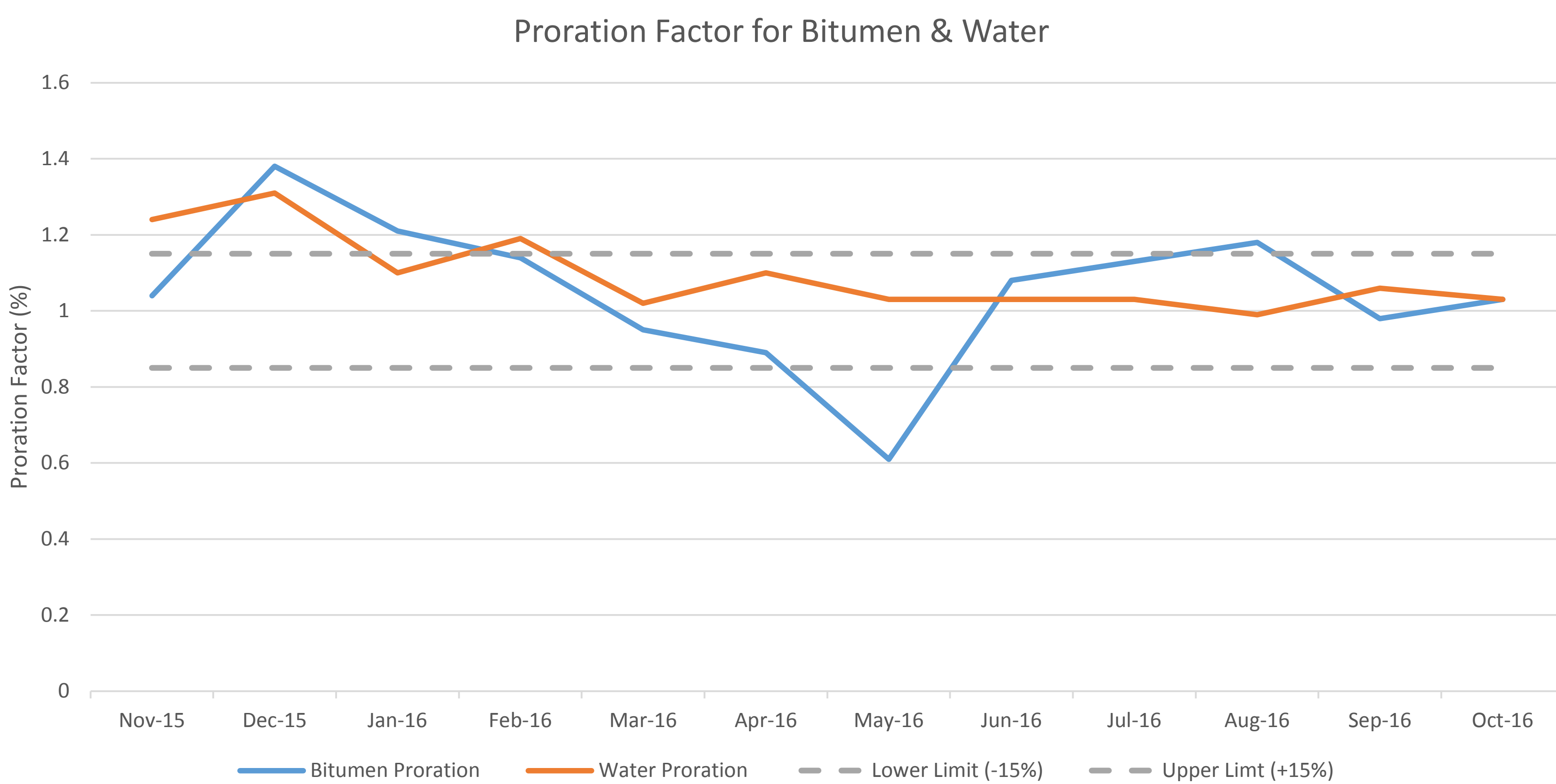
STEAM VOLUMES

- Steam quality leaving the plant is approximately 98%
- A continuous blowdown (CBD) of approximately 2% is added to the steam of each boiler and is injected into the wells
- Intermittent blow down (IBD) flow is estimated at 0.02% of total water out of the facility using sound engineering practices
- Secondary meters are used to report steam production

PRODUCED WATER VOLUMES

- Produced Water into the facility is calculated using the measured Water Disposition to the Injection Facility plus the Water Dispositions from the Plant plus and changes in Water Inventory less any Water Receipts

PRORATION OF BITUMEN AND WATER



SURFACE

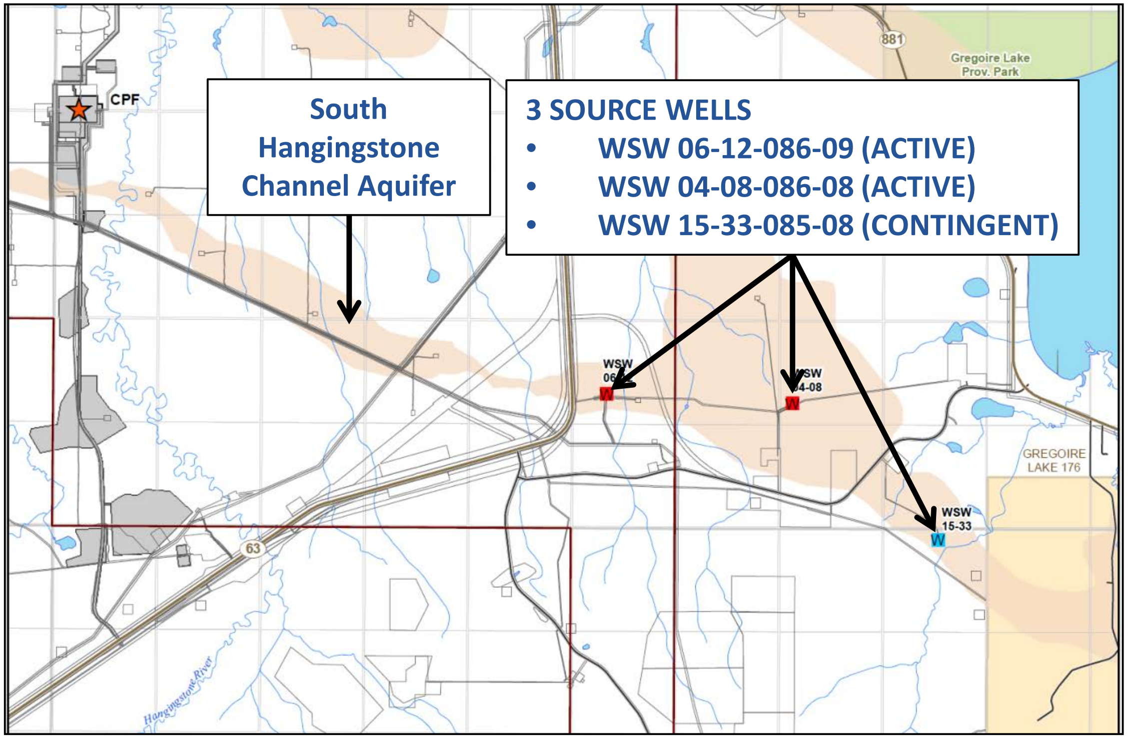
WATER PRODUCTION, INJECTION & USES

ATHABASCA OIL CORPORATION

WATER PRODUCTION, INJECTION AND USES (TDL)

FRESH WATER WELLS

- Water Diversion License 00316166-01-00 amendment received on March 7, 2016 for 479,975 m^3 annually
- Term Water License 00325409 for 231,500 m^3
- TDL approval 00370472 for 90,000 m^3 expired July 14, 2016
  - *AOC diverted 100% of the authorized volume and did not exceed the 90,000 m^3 diversion limit*
- TDL approval 00374595 for 150,000 m^3 expired October 20, 2016
  - *AOC diverted 100% of the authorized volume and did not exceed the 150,000 m^3 diversion limit*



Well ID	Location	Formation	TDS (mg/L)	Maximum Rate of Diversion (m^3/d)
WSW153308508W400	15-33-085-08-W4	Quaternary	286	3,000
WSW061208609W400	06-12-086-09-W4	Quaternary	303	3,000
WSW040808608W400	04-08-086-08-W4	Quaternary	287	3,000

Wells are less than 150 m in depth and not licenced with the AER.
Well IDs are AOC internal identifiers, not UWIs.

WATER ANALYSES – PRODUCED WATER (YEARLY AVERAGE)

RESULTS OF CHEMICAL ANALYSES OF WATER		
	UNITS	**PRODUCED WATER**
Calculated Parameters		
Hardness (CaCO3)	mg/L	37
Total Dissolved Solids	mg/L	2635
Elements		
Dissolved Calcium (Ca)	mg/L	10.8
Dissolved Iron (Fe)	mg/L	0.7
Dissolved Magnesium (Mg)	mg/L	2.5
Dissolved Manganese (Mn)	mg/L	0.1
Dissolved Potassium (K)	mg/L	18.8
Dissolved Sodium (Na)	mg/L	922
Anions		
Dissolved Chloride (Cl)	mg/L	1081.5
Dissolved Sulphate (SO4)	mg/L	6.8
Physical Properties		
Conductivity	uS/cm	4325
pH	pH	8.6
Alkalinity (Total as CaCO3)	mg/L	407
Alkalinity (PP as CaCO3)	mg/L	236
Bicarbonate (HCO3)	mg/L	209.5
Carbonate (CO3)	mg/L	141.8
Hydroxide (OH)	mg/L	0.5

WATER ANALYSES – SOURCE WATER (YEARLY AVERAGE)

RESULTS OF CHEMICAL ANALYSES OF WATER		
	UNITS	**SOURCE WATER**
Calculated Parameters		
Hardness (CaCO3)	mg/L	199
Total Dissolved Solids	mg/L	300
Elements		
Dissolved Calcium (Ca)	mg/L	56.3
Dissolved Iron (Fe)	mg/L	0.3
Dissolved Magnesium (Mg)	mg/L	14.2
Dissolved Manganese (Mn)	mg/L	0.169
Dissolved Potassium (K)	mg/L	2.85
Dissolved Sodium (Na)	mg/L	38.75
Anions		
Dissolved Chloride (Cl)	mg/L	3.05
Dissolved Sulphate (SO4)	mg/L	26.0
Physical Properties		
Conductivity	uS/cm	555
pH	pH	7.7
Alkalinity (Total as CaCO3)	mg/L	261.5
Alkalinity (PP as CaCO3)	mg/L	0.5
Bicarbonate (HCO3)	mg/L	319.0
Carbonate (CO3)	mg/L	0.5
Hydroxide (OH)	mg/L	0.5

WATER ANALYSES – EVAPORATOR BLOWDOWN (YEARLY AVERAGE)

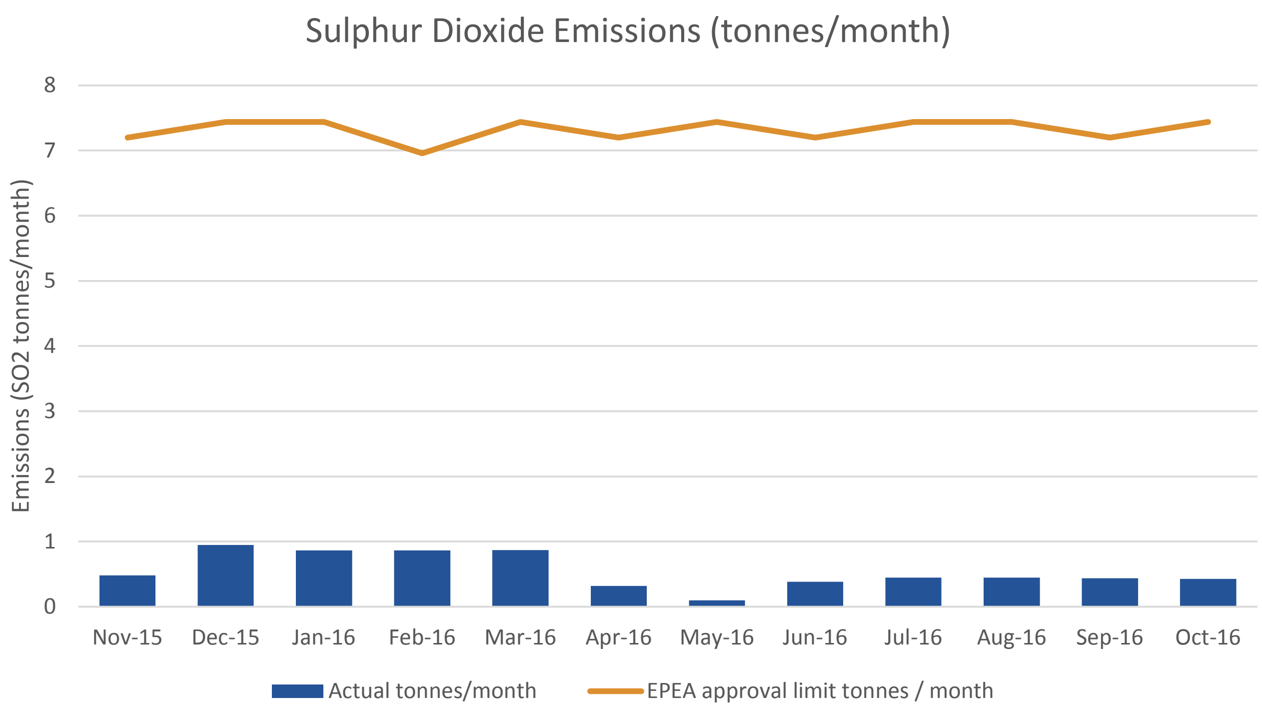
RESULTS OF CHEMICAL ANALYSES OF WATER		
	UNITS	**EVAP 1 SUMP B**
Calculated Parameters		
Hardness ($CaCO_3$)	mg/L	107
Total Dissolved Solids	mg/L	100000
Elements		
Dissolved Calcium (Ca)	mg/L	37.2
Dissolved Iron (Fe)	mg/L	21.2
Dissolved Magnesium (Mg)	mg/L	3.55
Dissolved Manganese (Mn)	mg/L	0.2345
Dissolved Potassium (K)	mg/L	917.5
Dissolved Sodium (Na)	mg/L	39750
Anions		
Dissolved Chloride (Cl)	mg/L	61500
Dissolved Sulphate (SO_4)	mg/L	335.0
Physical Properties		
Conductivity	uS/cm	130000
pH	pH	10.8
Alkalinity (Total as $CaCO_3$)	mg/L	27400
Alkalinity (PP as $CaCO_3$)	mg/L	16150
Bicarbonate (HCO_3)	mg/L	5.3
Carbonate (CO_3)	mg/L	13550.0
Hydroxide (OH)	mg/L	1655

SURFACE
SULPHUR PRODUCTION

ATHABASCA OIL CORPORATION

SULPHUR PRODUCTION:

- Currently there are no sulphur recovery facilities at the Hangingstone Project



- SO_2 emissions are calculated based on analytical results of produced gas samples

COMPLIANCE

ENVIRONMENTAL

ATHABASCA OIL CORPORATION

COMPLIANCE – STATEMENT OF COMPLIANCE

ATHABASCA OIL CORPORATION HANGINGSTONE PROJECT IS IN COMPLIANCE WITH AER APPROVALS AND REGULATORY REQUIREMENTS

- FOR THE PERIOD OF NOVEMBER 1, 2015 TO OCTOBER 31, 2016, AOC HAS NO UNADDRESSED NON-COMPLIANT EVENTS

APPROVALS AND AMENDMENTS

Date	Approval Summary
December 3, 2015	TDL # 00375952 replaces TDL # 00374595
February 23, 2016	Draft EPEA Approval for Hangingstone Expansion Project (00289664-00-02)
February 11, 2016	MOP increase application submitted (approved Nov. 11, 2016)
March 7, 2016	Tier II Water Act Licence Renewal (00316133-01-00)
June 7, 2016	Approval received to temporarily exceed MOP during well work over operations
August 9, 2016	D56 CPF, Pads and Annulus Gas Pipeline Licence amendments to increase H_2S content
August 29, 2016	Standby generator added as an approved emission source to EPEA Approval (000289664-00-01)

COMPLIANCE – MONITORING PROGRAMS

AIR MONITORING

- Monthly air contaminant concentrations for SO_2 and NO_2 summarized monthly and submitted in accordance with EPEA approval requirements
- Passive air monitoring around the facility for SO_2, NO_2 and H_2S
- Performance testing including Cylinder Gas Audits (CGA), Relative Accuracy Test Audits (RATA) and manual stack survey
- The 2016 fugitive emissions survey notes 9 leaks – 4 repaired on the spot, 3 repairs planned for next shutdown and 2 not requiring any action

SURFACE WATER MONITORING

- Industrial wastewater and runoff monitored and tested prior to release and reported annually
- Water use reporting for dust control, winter road construction, OSE, drilling & completion activities, Temporary Diversion Licence (TDL) and Term Water Licence

COMPLIANCE – MONITORING PROGRAMS

EPEA GROUNDWATER AND SOURCE WATER MONITORING

- Semi-annual groundwater and source water monitoring ongoing
- Groundwater quality results are consistent with previous years
- No new wells added to the program in the past 12 months

SOIL MONITORING

- First soil monitoring event did not identify any significant soil impacts
- Soil management program not required

CARIBOU MONITORING

- First Woodland Caribou report submitted May 2016
- Wildlife cameras replaced on above ground pipeline crossings August 2016
- Employee wildlife sighting cards

COMPLIANCE – AUDITS & INSPECTIONS

AUDITS

- Two satisfactory AER Directive 56 Random Audits occurred in August for Pad AA and Pad AD as a result of a Directive 56 licence amendment
  - *No further action required*

INSPECTIONS

- Satisfactory inspection on April 6 – 7 in response to steam release of Well 5 Injector on Pad AD
  - *No further action required*
- Satisfactory inspection on June 1 in response to release of nitric acid in the evaporator building
  - *No further action required*
- Satisfactory inspection on June 3 to ensure compliance with legislative requirements as a result of the Fort McMurray wildfire event
  - *No further action required*

COMPLIANCE – SUMMARY OF NON-COMPLIANCE

- The following list summarizes non-compliance events for the period of November 1, 2015 to October 31, 2016
- For all events, corrective actions were identified and tracked to completion

Event	Corrective Action
December 22, 2015 - CEMS Code Contravention - Failed Availability Requirement	Flowsic probe was cleaned and replacement parts installed
February 10, 2016 - Failure to adequately report daily SO_2 data in the monthly Industrial Air Monitoring (IAM) reports from July until December of 2015	A new IAM monthly report template has been created for use going forward and data requirements have been shared with Process Engineering and Production Accounting
April 6, 2016 – AD05I Heel String Wing Valve Failure	Implement a valve maintenance program for valves, augment operating procedures to minimize valve cycling and also enact a minimum valve opening flow requirement
May 27, 2016 - Spent Evaporator Cleaning Product in Evaporator Building	Repair seal pot drain, conduct a material audit of all systems within the Evaporator building, implement a secondary inspection protocol for any work within the Evaporator building and communicate carbon steel incompatibility. Provide Dangerous Good Responder Awareness training to Operations

COMPLIANCE – SUMMARY OF NON-COMPLIANCE

Event	Corrective Action
June 9, 2016 - Reportable Bitumen Spill at Well AA04	Procedures reviewed for field verification requirements, equipment return to service warning bulletin was issued and further discussion at several post incident meetings
*September 10, 2016 – Third Party Hauling Truck carrying Evaporator Blowdown Rolled on Hwy 63	Third Party generated a hazard alert and reviewed the incident with all of their drivers
October 6, 2016 - Diluent tank vent left open resulting in venting	New procedures and/or a checklist for drivers that have not had a formal signoff on the procedure. Truck loading /unloading procedure signs installed at each location where trucks load or unload product into tanks
October 7, 2016 - The SCU unit failed causing a communication loss between the CEMS GM32 analyzer and CEMSView software	October 20, 2016 – Replacement SCU was installed. CEMS system failure alarms incorporated in the DCS

* AOC reported this incident as the Third Party was hauling AOC product

COMPLIANCE – ANNULUS GAS PIPELINE

ANNULUS GAS PIPELINE VULNERABLE TO FREEZE-UPS

- Original Engineering design anticipated significantly higher gas flow rate
  - *Heat loss calculations indicated insulation alone would be sufficient to prevent freezing*
- Actual measured gas flow rates are significantly below design rates resulting in an increased freezing potential
- Design review conducted to assess possible remedies, two options were considered
  - *Installation of heat tracing over the entire annulus gas line*
  - *Installation of a heated dry gas purge*
- AOC determined electric heat tracing of the annulus gas line was not feasible for the following reasons:
  - *Sections of the annulus line are inaccessible as the line travels beneath access roads within conduit*
  - *Heat trace would not address the accumulated liquids in the line*
- AOC decided to install a continuous heated dry gas purge as the best option to prevent freezing
  - *Installation was completed in November 2016*
- Until completion of the modifications AOC had a continuous steam purge of the line in combination with dry gas sweep
  - *Methanol was added on an intermittent basis to prevent freezing of accumulated liquids at low points in the system*

COMPLIANCE – RELEASE REPORTING

No. of Reportable Spills	Volume Released (m^3)
4	159

No. of Flaring Notifications	Volume Flared (e^3m^3)
3	45.4

No. of Reportable Venting Events	Volume Vented (e^3m^3)
7	7.5

- All spills were cleaned up and have been remediated to eliminate any potential for adverse effect
- AOC tracks all release incidents within the Corporate Compliance and Incident Tracking System

COMPLIANCE – REGIONAL INITIATIVES

AOC IS A FUNDING MEMBER OF:

- Wood Buffalo Environmental Association (WBEA)
- Joint Oil Sands Monitoring Program
- Oil Sands Black Bear Partnership

AOC PARTICIPATES IN:

- Various regional CAPP Committees:
  - *NE Alberta Caribou Working Group*
  - *Lower Athabasca Regional Planning*

OSE ASSESSMENT AND RECLAMATION WORK IS ONGOING

- Hangingstone OSE program #080026 received Reclamation Certification in November 2016.

FUTURE PLANS

HANGINGSTONE EXPANSION PROJECT APPLIED (APPLICATION FILED MAY 2013)

The expansion includes:

- Increased bitumen recovery capacity from the existing approved 1,908 m^3/d (12,000 bbl/d) to 13,037 m^3/d (82,000 bbl/d) to be developed in two phases:
  - *Project 2A & 2B to add incremental 6,360 m^3/d (40,000 bbl/d)*
  - *Project 3 to add incremental 4,770 m^3/d (30,000 bbl/d)*
- Production life extension from 10 to 40 years
- CPF expansion from 35 ha to 76 ha (no additional site clearing required)
- Additional field facilities
- Additional offsite and utility services

ATHABASCA

OIL CORPORATION

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