Suncor MacKay River Project
2015 AER Performance Presentation: Subsurface
Commercial Scheme Approval No. 8668

December 17, 2015
Reporting Period September 1, 2014 – August 31, 2015

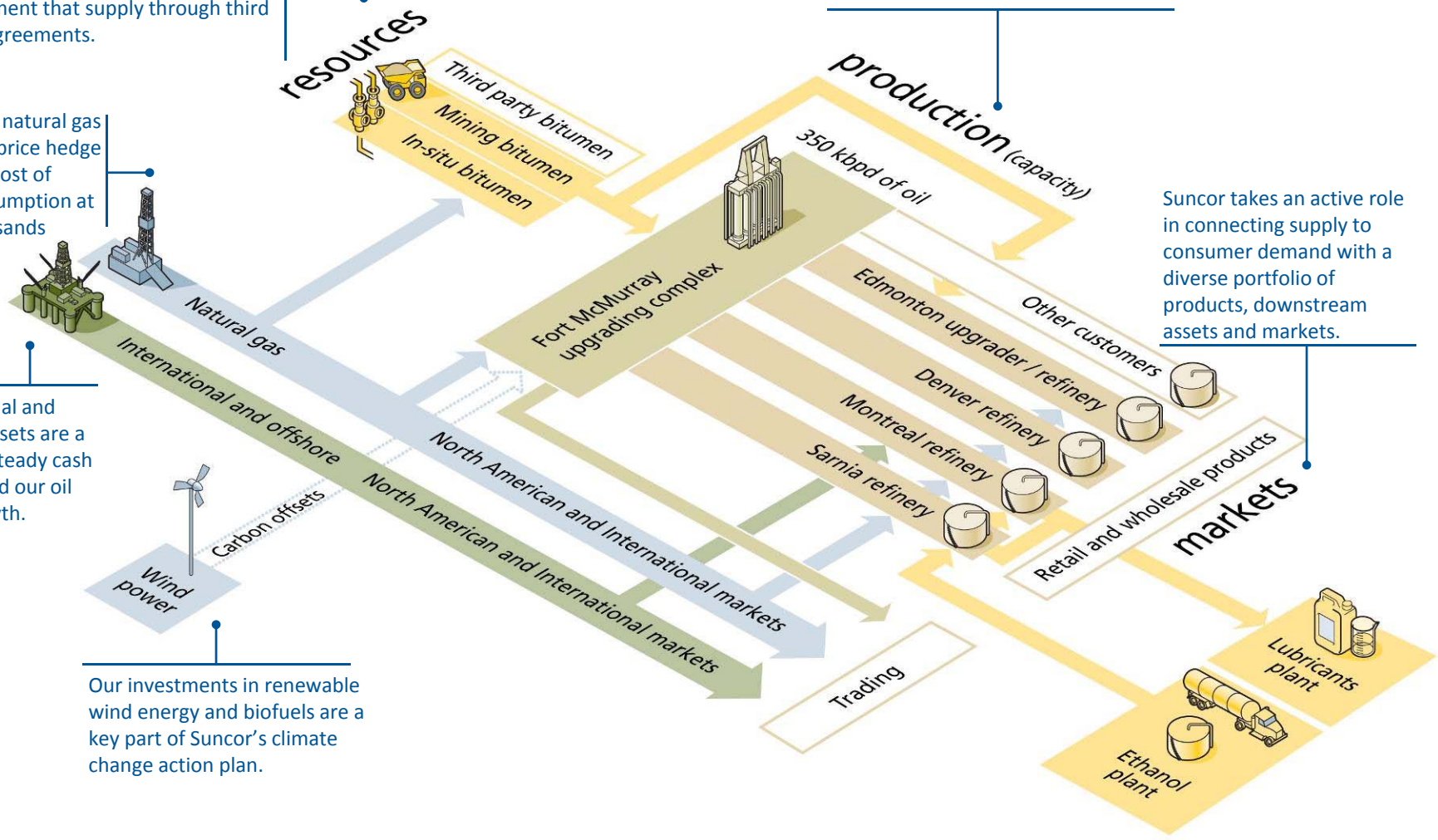
The Suncor Strategy

To provide greater reliability and flexibility to our feedstock supplies, we produce bitumen through mining and in-situ recovery technologies and supplement that supply through third party agreements.

A staged approach to increasing crude oil production capacity allows Suncor to better manage capital costs and incorporate new ideas and new technologies into our facilities.

We produce natural gas as a natural price hedge against the cost of energy consumption at Suncor's oil sands operation.

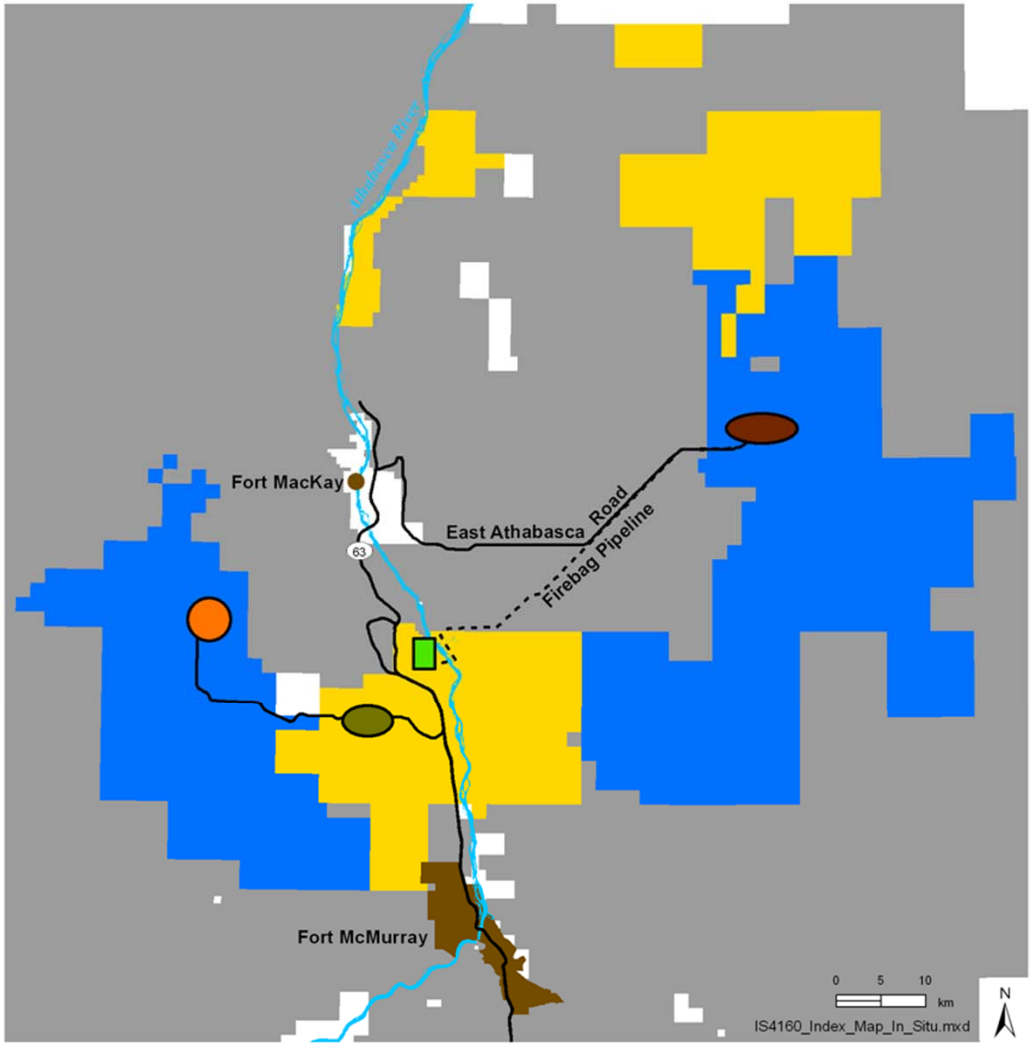
Suncor takes an active role in connecting supply to consumer demand with a diverse portfolio of products, downstream assets and markets.



International and offshore assets are a source of steady cash flow to fund our oil sands growth.

Our investments in renewable wind energy and biofuels are a key part of Suncor's climate change action plan.

Suncor has high quality leases in close proximity



- Suncor Mining Leases
- Suncor In-Situ Leases
- Suncor Base Plant
- Voyageur South Mine
- Firebag
- MacKay River
- Other Oil Sands Developers

AER Directive 054
2015 Performance Presentation

Section 3.1.1 – Subsurface Issues Related to Resource Evaluation and Recovery

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MacKay River Project Overview

- Company's first operated SAGD facility - located 60 km NW of Ft. McMurray
- Current Approved Bitumen Production Rate 11,600 m^3/d (73 kbpd)
- Adjacent to Suncor Dover (UTF/AOSTRA) Project
- Horizontal production wells are placed in the McMurray Formation at a depth of 98 – 145m from surface
- No extensive underlying water or gas over bitumen issues in current development areas
- Initial development had 25 well pairs with first steam in September 2002 and first production in November 2002 (Phase 1)
- 112 well pairs have been subsequently added (137 well pairs in total)
  - 95 producing well pairs
  - 40 non-producing well pairs
  - 2 Abandoned/Planned for Abandonment well pairs

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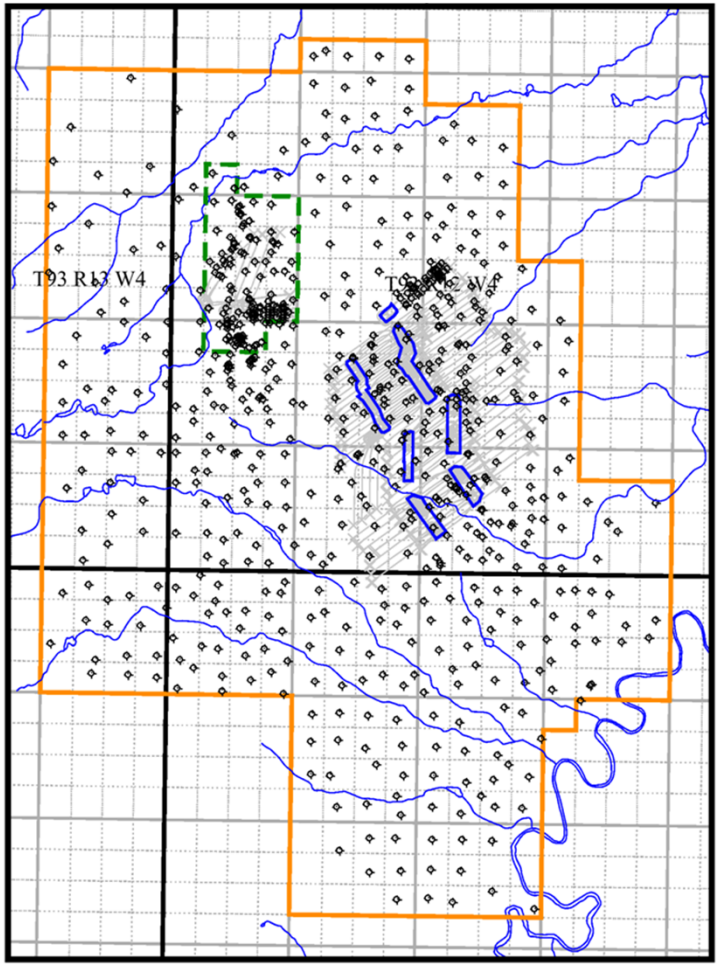
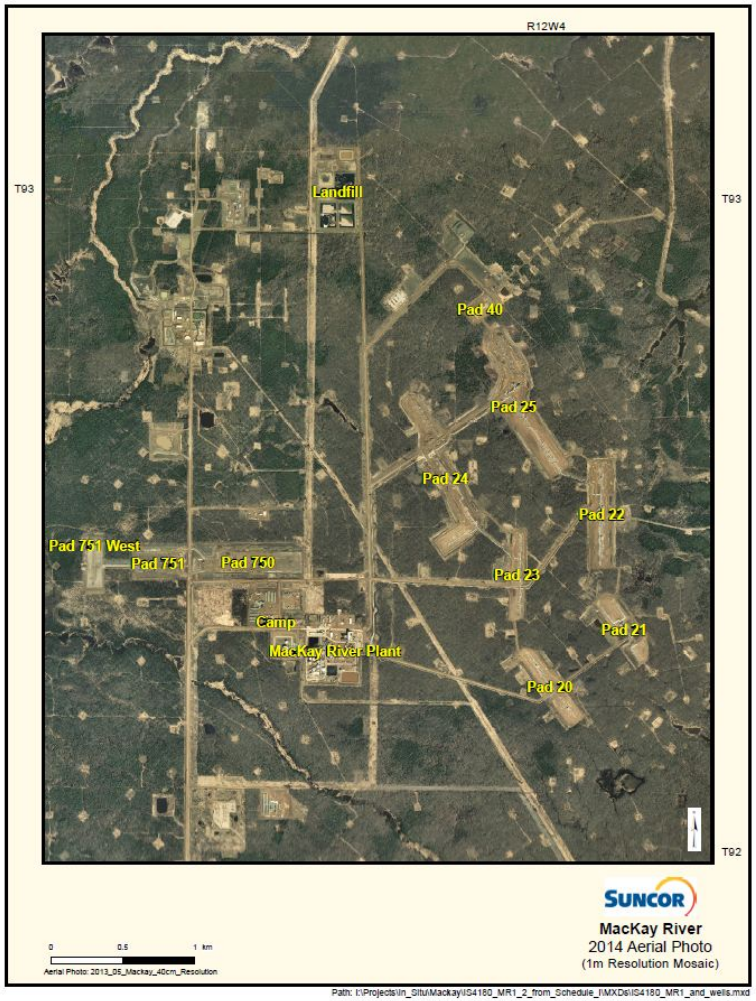
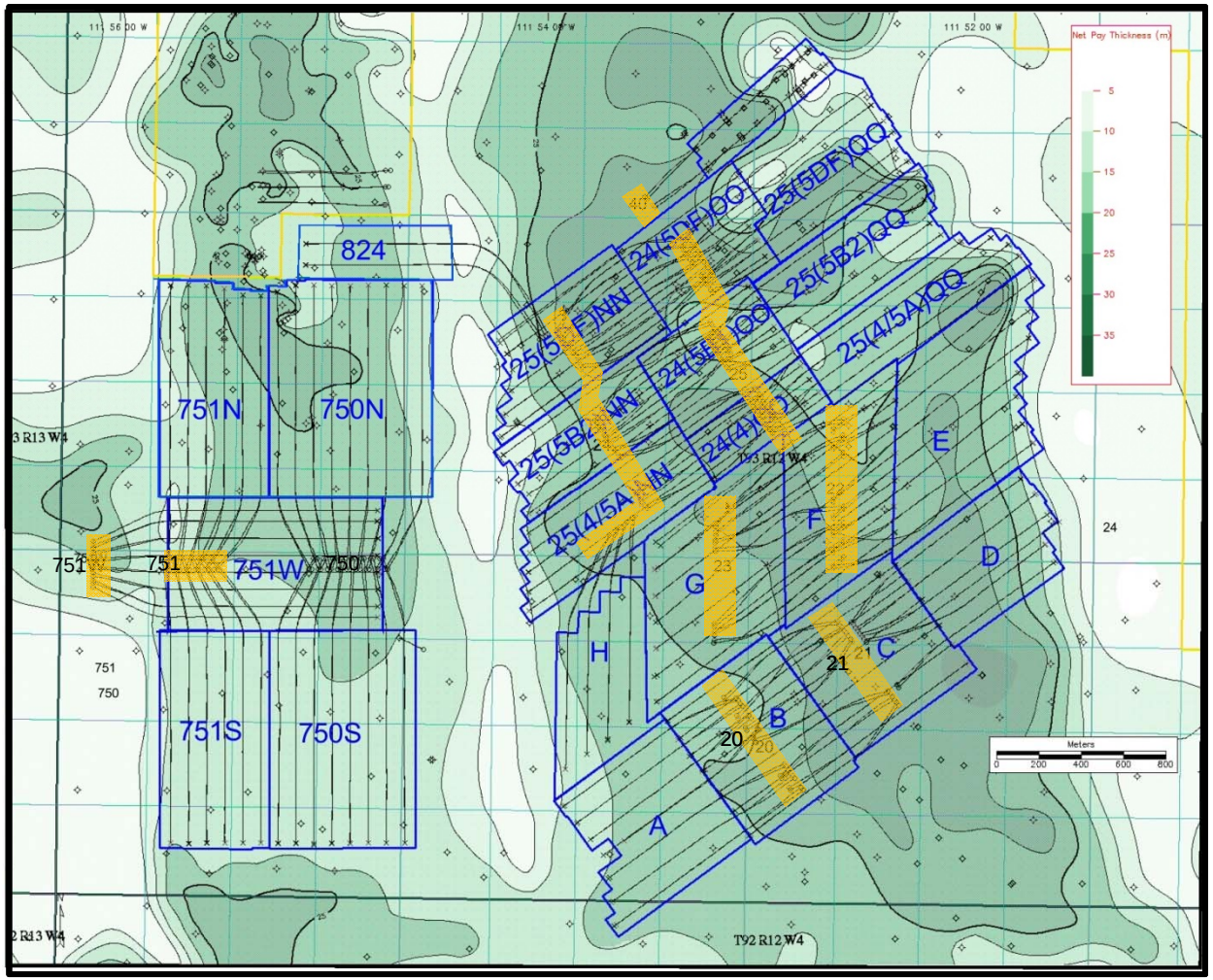
Project Area and Project Site

- Current Project Area (PA) approximately 24 ½ sections





Wellpads and Subsurface Patterns



- 95 producing well pairs at MacKay River (up to Phase 5DF)

Drilling

- 3 Sidetracks, 1 Infill
- 824 -2 well pairs were drilled April 2015

MacKay River Project Overview

Pad	Pattern	Phase	# Well Pairs	Well Pairs	Spacing	First Steam
20	A	1	7	A1 - 7	100	Sep-02
	C		6	C1 - 6	100	
21	B		7	B1 - 7	100	
	D		5	D1 - 5	100	
22	E	2	7	E1 - 7	100	Jan-06
	G		7	G1- 7	100	
23	F	3	7	F1 - 7	100	Sep-07
24	OO	4	3	OO1-3	75	Oct 2008 - Apr 2009
		5B-1	6	OO4-9	75	Feb-12
		5DF	6	OO10-15	75	May-14
	H	4	4	H1 - 4	100	Feb 2009 - Jun 2010
25	QQ	4	2	QQ2-3	75	Nov-08
		5A	2	QQ4-5	75	Jul-11
		5B-2	5	QQ6-10	75	Jan - May 2013
		5DF	6	QQ11-16	75	Jun-14
	NN	4	1	NN1	75	Dec-08
		5A	4	NN2-5	75	Jun - Jul 2011
		5B-2	5	NN6-10	75	Jan - Feb 2013
		5DF	6	NN11-16	75	Jun-14

- Optimal well spacing is evaluated for each new development and is sensitive to geology. Generally, higher quality thicker pay intervals allow for wider spacing with negligible impact to resource recovery.
- Observation well data shows small terminal chamber angles even at 100m spacing.
- Suncor has drilled 3 infill wells in Phase 1 targeting cellar oil and is evaluating additional infill wells pending the results of those infills.

Current Approval Amendments

- Historical approval amendments in Appendices

- **Amendment 8668Z**
  - Pad 828 change from 3 well pairs to 2 wells pairs and correction of well UWIs on Pad 21 Chemical Injection Test (D-Pattern Injectors) approval issued December 10, 2014
- **Amendment 8668AA**
  - Phase 1 NCG design amendment approval issued December 19, 2014
- **Amendment 8668BB**
  - Phase 2 and Phase 3 Chemical Co-Injection (E, F and G Patterns) approval issued January 1, 2015
- **Amendment 8668CC**
  - Approval for E1P Sidetrack well issued January 27, 2015
- **Amendment 8668DD**
  - Approval for NN6P Sidetrack well issued February 3, 2015
- **Amendment 8668EE**
  - Approval for VX™ multiphase meter on Pad 824 issued February 19, 2015
- **Amendment 8668FF**
  - Approval for NCG Test at OO5I well on pad 24 issued March 17, 2015

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Current Approval Amendments

- **Amendment 8668GG**
  - Approval to conduct CO_2 Co-Injection at the OO9 well pair on Pad 24 issued April 13, 2015
- **Amendment 8668HH**
  - CO_2 Co-Injection amendment to change to OO8 well pair on Pad 24 issued
- **Amendment 8668II**
  - Pad 824 Thermal Compatibility Assessment approval issued July 14, 2015
- **Amendment 8668JJ**
  - Approval for NCG Test at OO7I issued July 29, 2015

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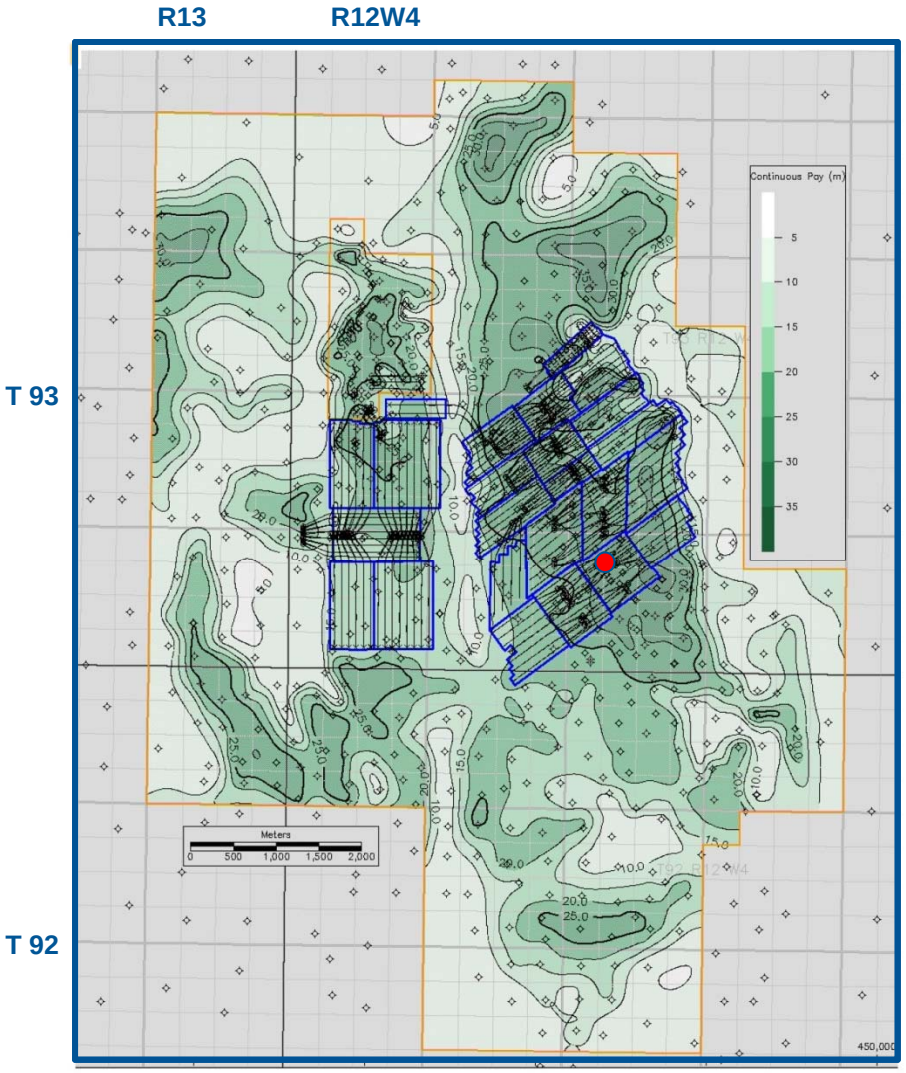
Current Amendments / Applications

- **Application No. 1835073**: MOP Strategy Trial at QQ5 – QQ16 submitted July 24, 2015 and approved October 9, 2015 (8668KK)
- **Application No. 1838202**: C2IPB Sidetrack and well conversion application submitted September 2, 2015 and approved October 13, 2015 (8668LL)

MacKay River Performance Presentation

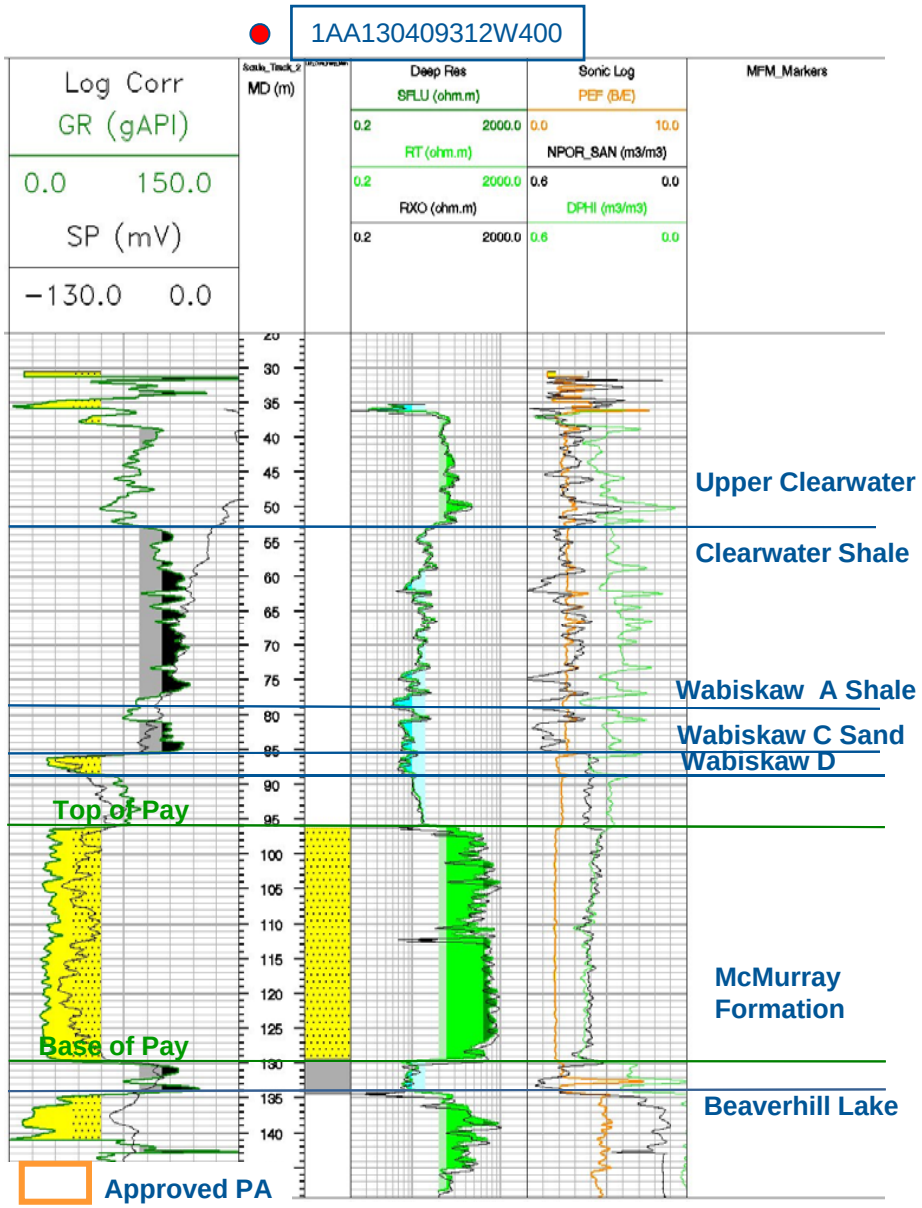
Geoscience

MacKay River Stratigraphy



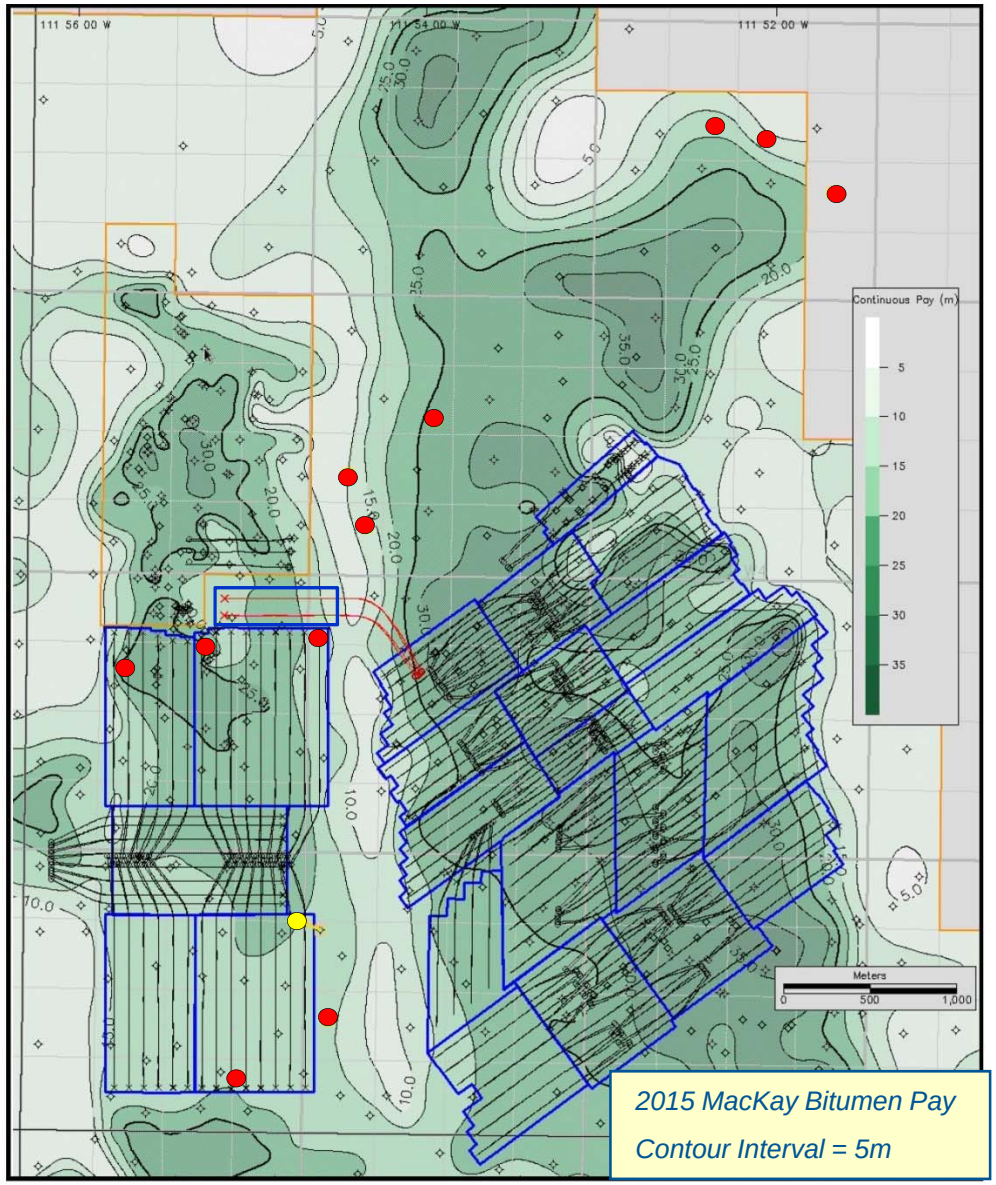
2015 MacKay Bitumen Pay

Contour Interval = 5m



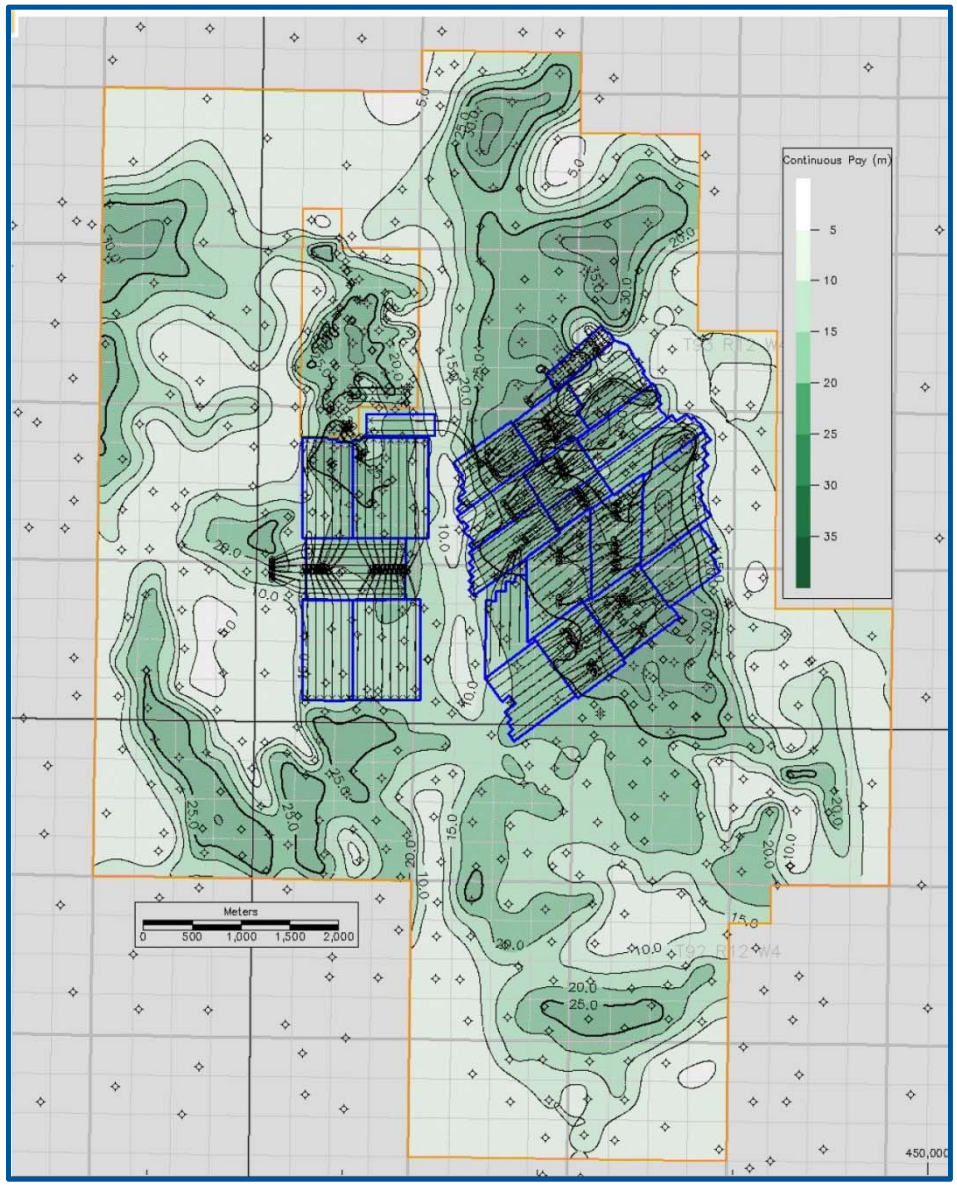
2014-15 Activities – Vertical & SAGD Drilling

- 11 vertical wells and 1 slant well drilled in the PA
  - 6 Delineation Wells
  - 3 McMurray/WabC monitoring wells
  - 1 Wabiskaw C monitoring well (slant)
  - 2 McMurray OB wells
- Horizontal Wells
  - Pad 824 well pairs
  - 3 sidetracks
  - 1 infill well
- Special core analyses conducted in PA:
  - Geochemistry
  - High core (2 wells)



Bitumen Pay Isopach

10 Weight Percent
Bitumen cutoff



T 93

T 92

R13 R12W4

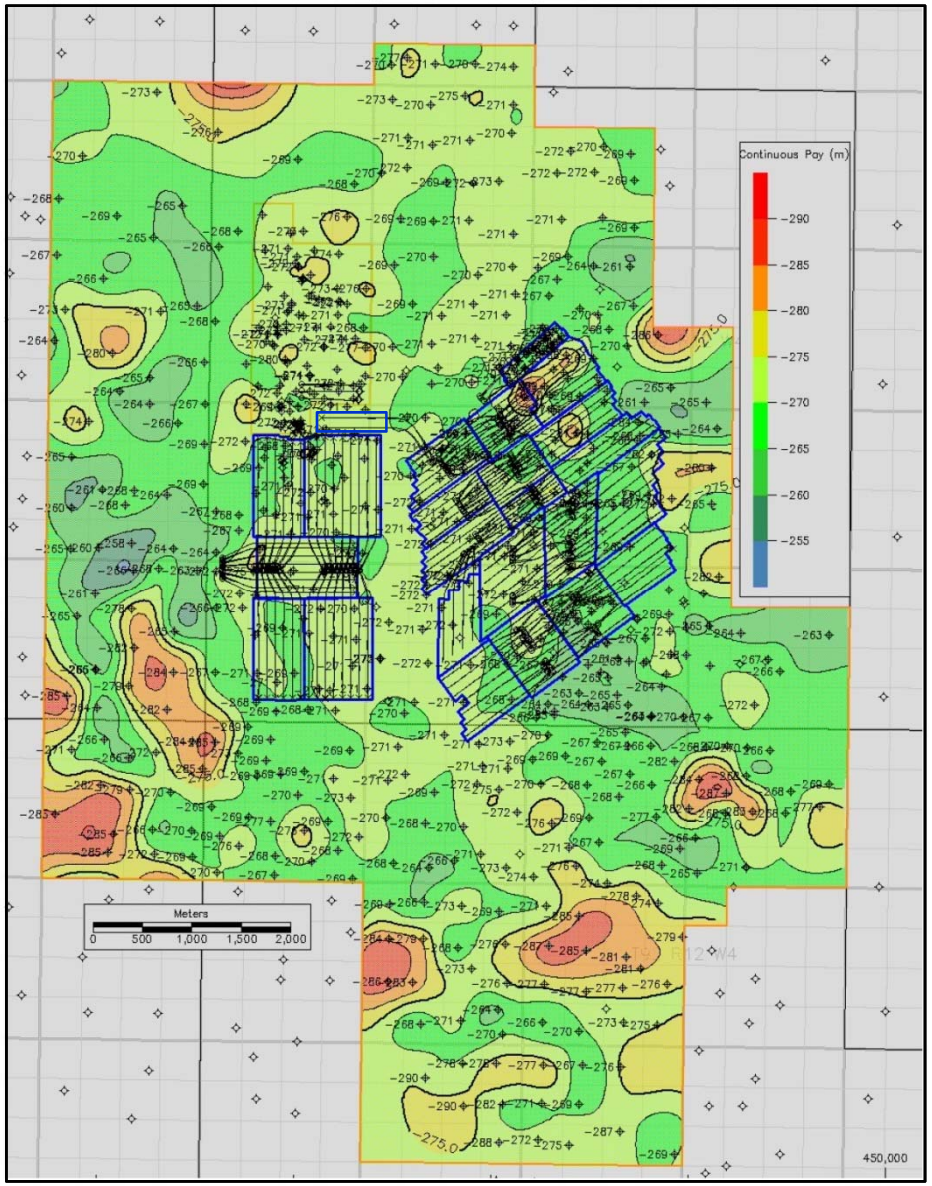
Legend

Approved PA Boundary

Contour Interval =5m

2015 MacKay Bitumen Pay
Contour Interval = 5m

Base of Pay Structure Map



Legend

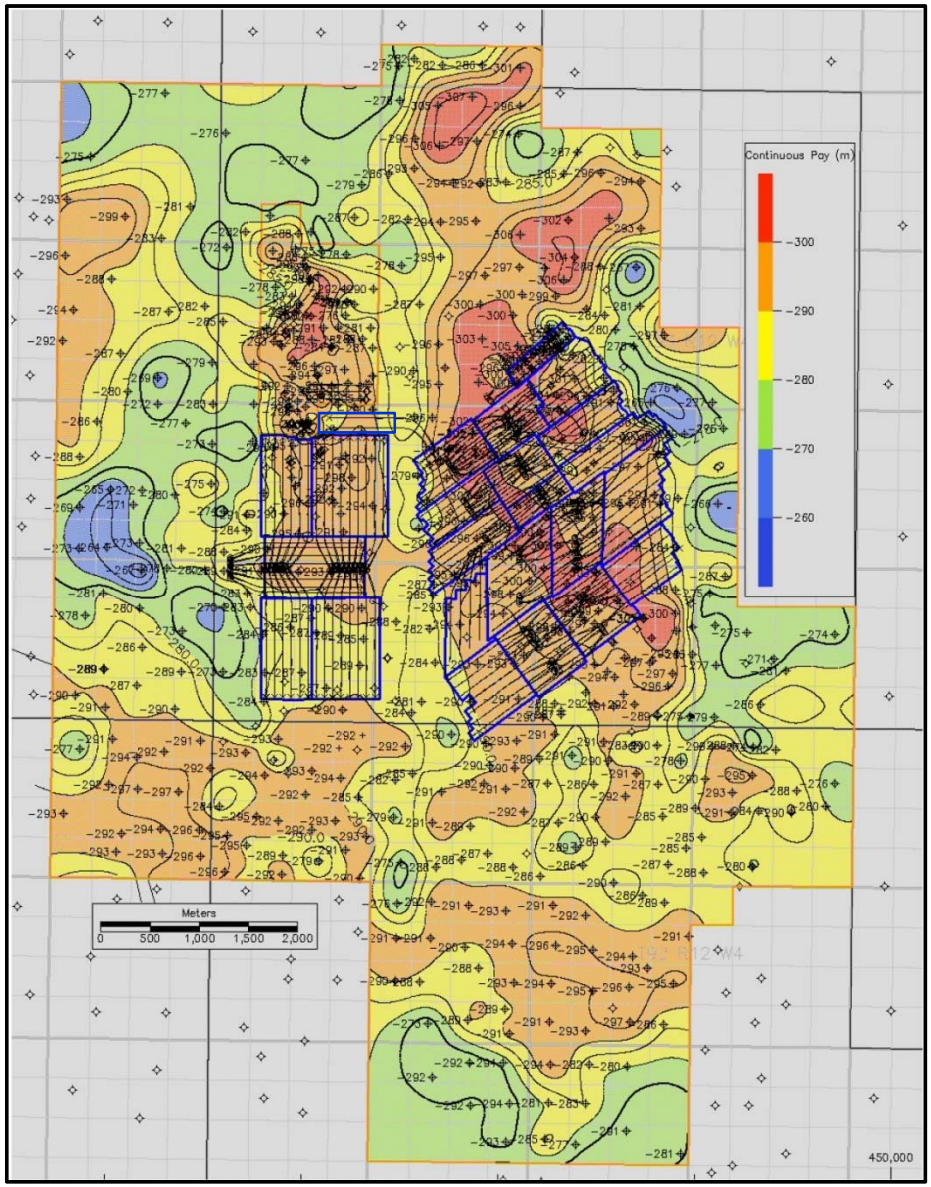
Approved PA Boundary

Contour Interval =5m

2015 MacKay Base of Pay

Contour Interval = 5m

Top of Pay Structure Map



T 93

T 92

R13 R12W4

Legend

Approved PA Boundary

Contour Interval =5m

Oil Sands Facies and Gross Bitumen Pay

Facies:
Defined by visual mud index (VMI)

Cutoffs:
F1 (Sandstone) = 0-5% VMI
F2 (Sandy IHS*) = 5-15% VMI
F3 (IHS*) = 15-30% VMI
F4 (Muddy IHS*) = 30-70% VMI
F5 (Mudstone) = 70-100% VMI
F10 (Breccia) = variable

* IHS = inclined, interbedded, sand and shale

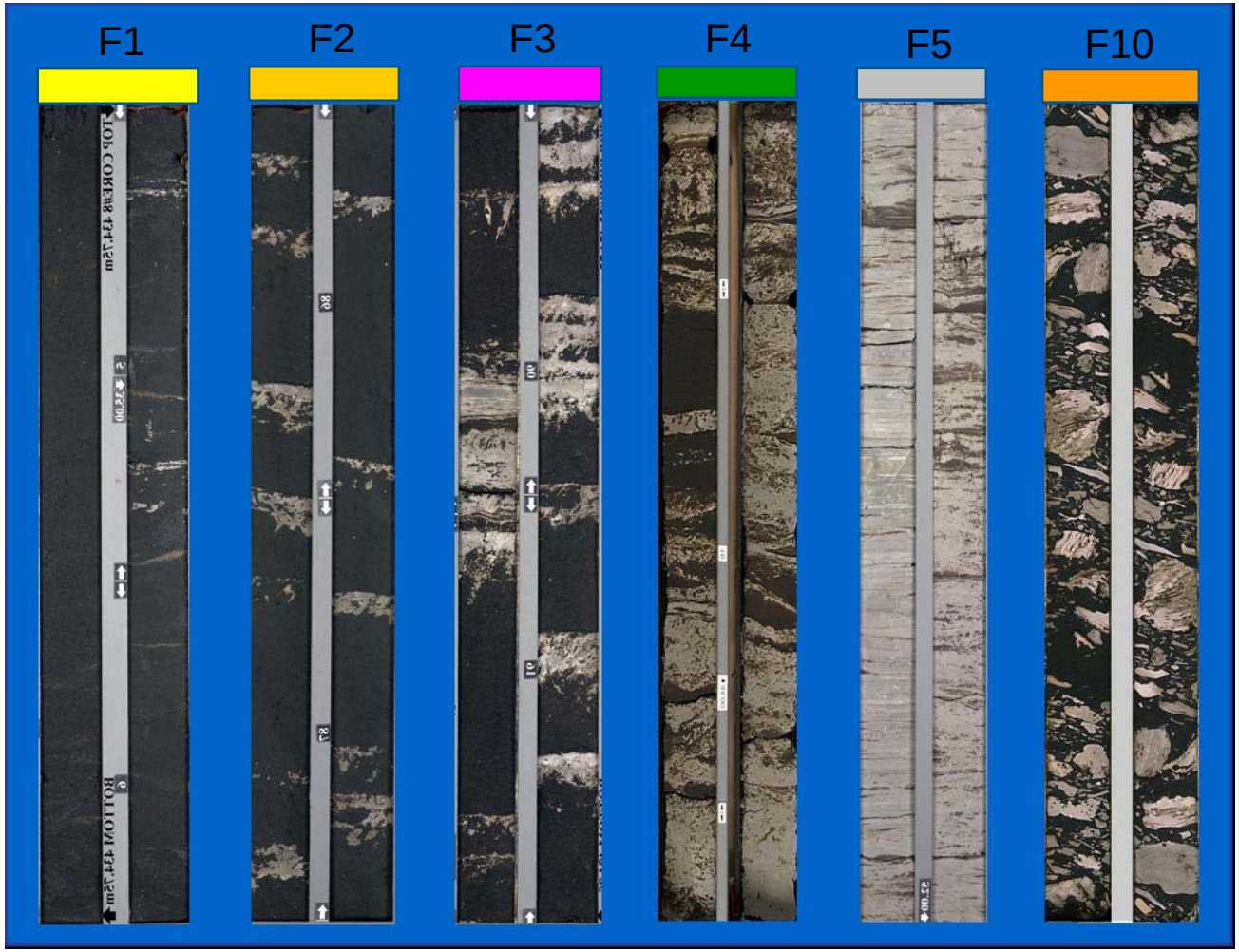
Pay:
Includes Facies F1, F2, and F10
Can include F3-F5, if < 2m thick

Weight percent bitumen > 10%

Generally > 30% Porosity
- PA averages 31.1% in clean sands

Permeability = 1 to 5 Darcie's

> 15m for OBIP volumetric



Pattern OBIP Calculation

Gross Rock Volume (GRV) = total rock volume derived from Continuous Pay map

Net Rock Volume (NRV) = product of Continuous Pay gross rock volume multiplied by the average Net Sand Ratio for each area

Net Sand Ratio (NSR) = a net-to-gross adjustment used to account for pay mapping being done on a continuous (gross) basis

- 15% VMI (visual mud index) cutoff plus the sand component of breccia intervals

Original Bitumen in Place = product of the Net Pay volume multiplied by the average Porosity, and the average Oil Saturation

$$OBIP=GRV*NSR * So * Por$$

New net-to-gross adjustment using Net Sand Ratio map allows for consistent application of a mudstone cutoff while: a) avoiding adjustments based on pattern averages, and b) allowing the differential treatment of sand- versus mud-rich breccia's.

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Reservoir Properties and Base Case OBIP

Average Reservoir Properties					Volumes	
Pattern	Net Sand Ratio	So	Phi	So-Phi		OBIP(e^3m^3)
A	91%	82%	31%	26%		2,389
B	95%	86%	32%	27%		3,319
C	95%	89%	32%	29%		4,238
D	96%	91%	31%	28%		2,741
E	92%	84%	31%	26%		3,728
F	95%	89%	32%	28%		3,616
G	93%	86%	32%	27%		4,155
H	94%	84%	31%	26%		1,756
NN (Phase 4/5)	95%	85%	32%	27%		7,010
OO (Phase 4/5)	93%	84%	31%	26%		5,251
QQ (Phase 4/5)	87%	84%	31%	26%		5,581
					Subtotal	**43,784**
Total PA	**93%**	**86%**	**31%**	**27%**		**171,479**

Average Reservoir Depth = 109 m TVD, Pi = 400 kPa, Ti = 6-7 ^oC , K_{max} = 1.7-8.5 D, K_{min} = 1.1-6.5 D

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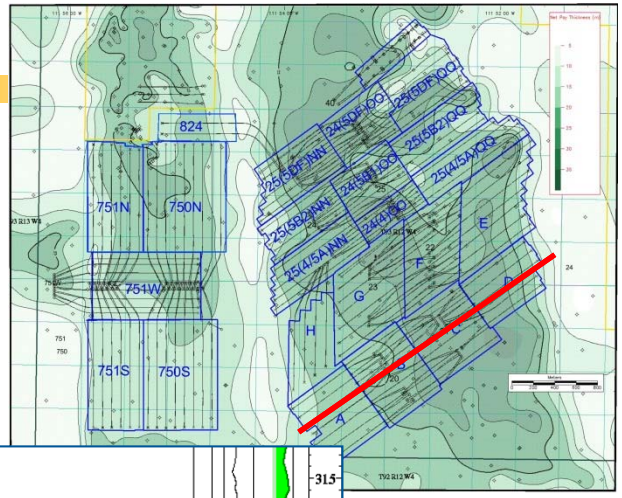
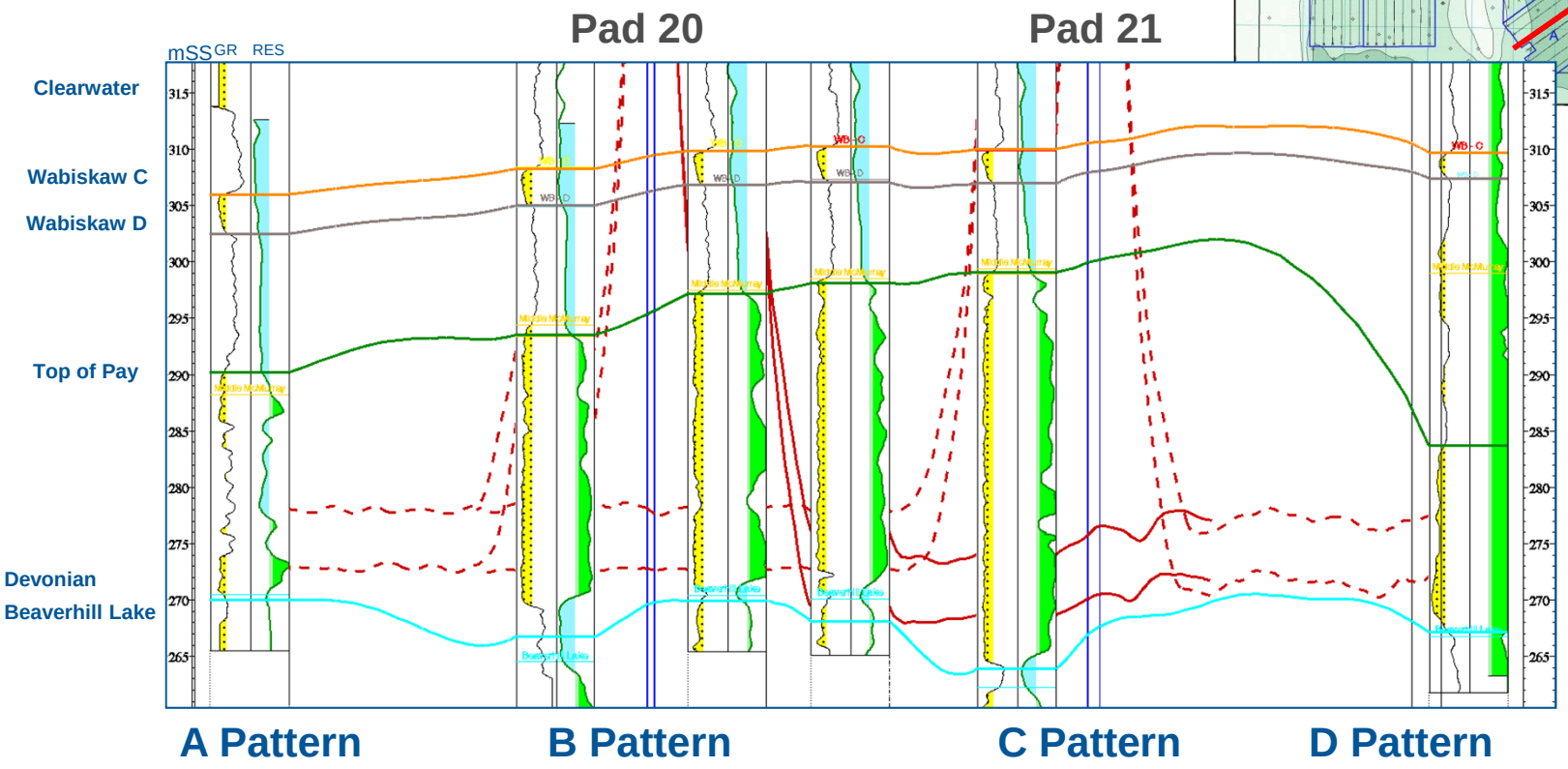
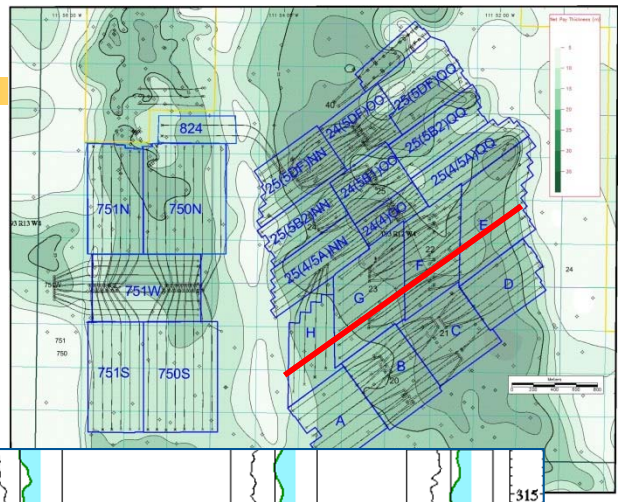
Phase 1


824
751N
750N
751W
751S
750S
E
F
G
H
A


Pad 20
Pad 21
mSS
GR
RES
Clearwater
Wabiskaw C
Wabiskaw D
Top of Pay
Devonian
Beaverhill Lake
315
310
305
300
295
290
285
280
275
270
265
A Pattern
B Pattern
C Pattern
D Pattern

Phases 2, 3 and 4



Pad 22 Pad 23

mSS

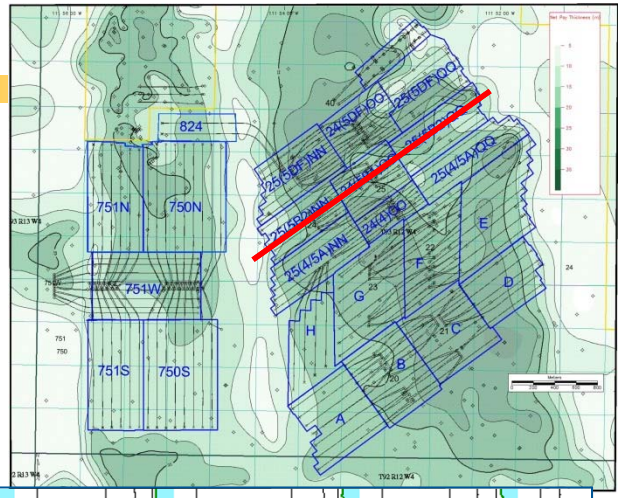
GR RES

Clearwater
Wabiskaw C
Wabiskaw D
Top of Pay
Devonian
Beaverhill Lake

315
307.5
300
292.5
285
277.5
270
262.5

H Pattern G Pattern F Pattern E Pattern

Phase 5

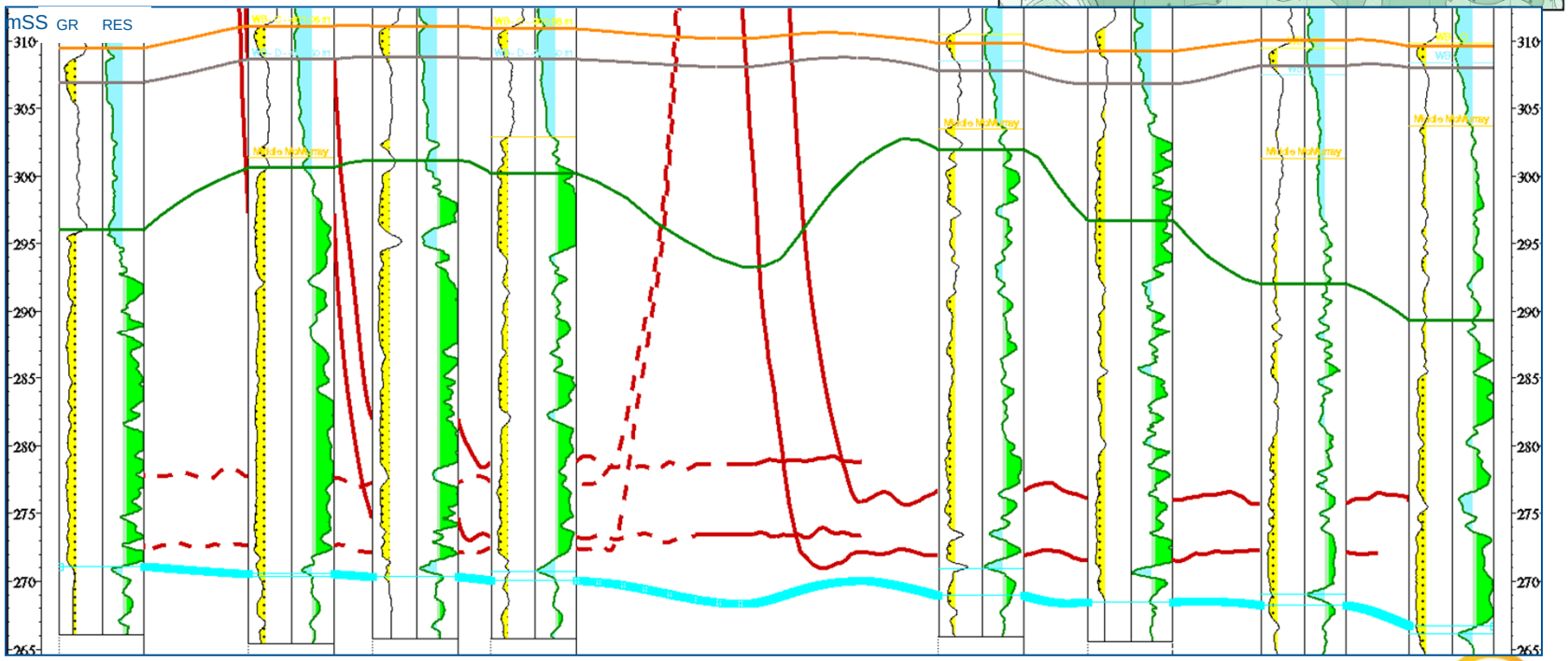


Pad 24 Pad 25

Clearwater
Wabiskaw C
Wabiskaw D

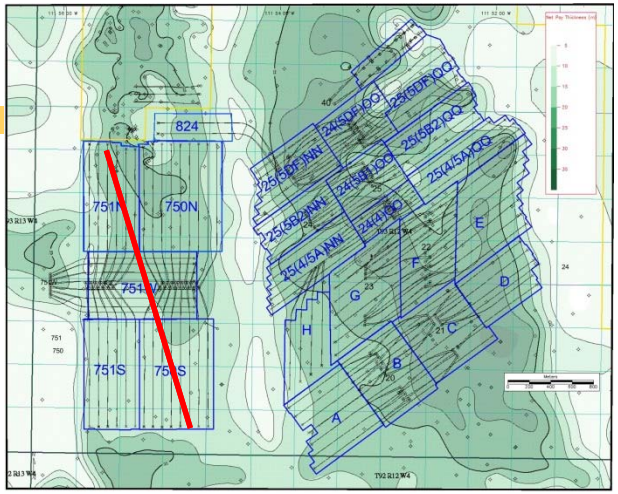
Top of Pay

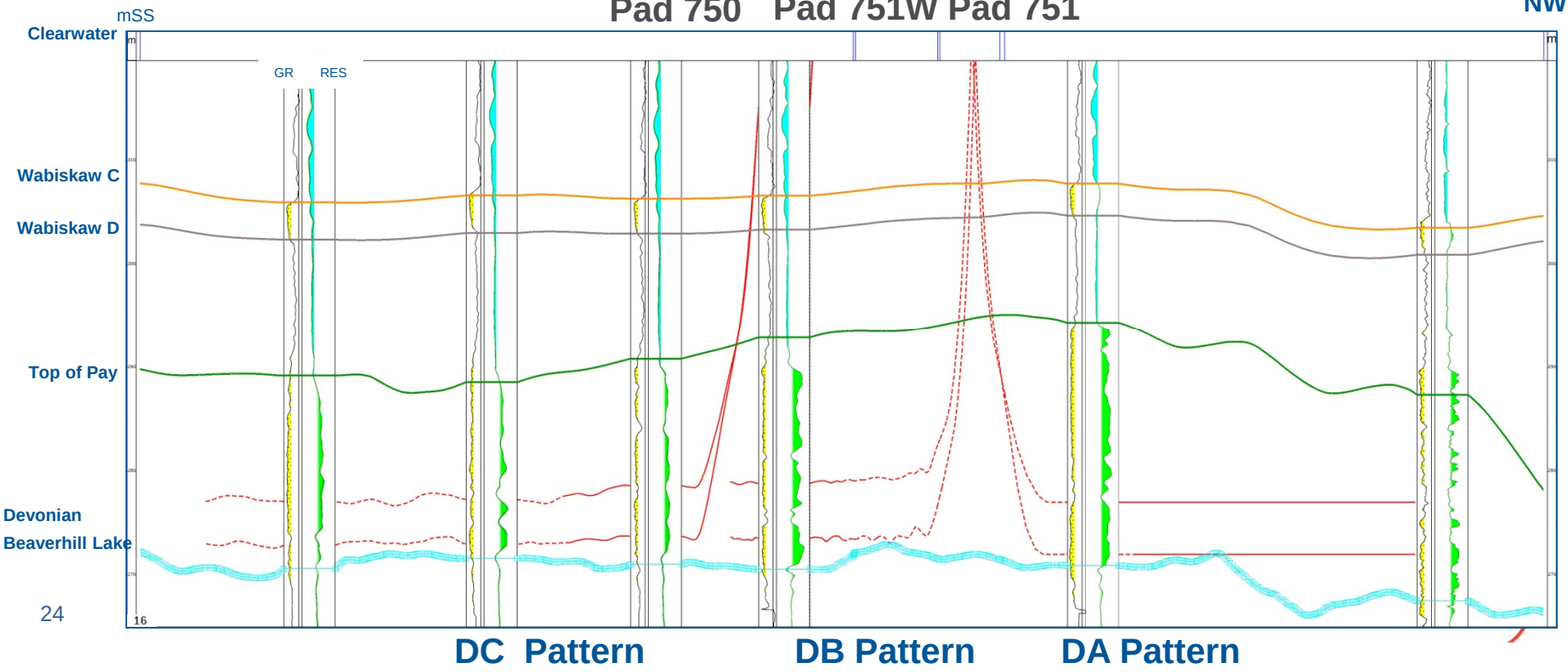
Devonian
Beaverhill Lake



NN Pattern OO Pattern QQ Pattern

Pad 750/751

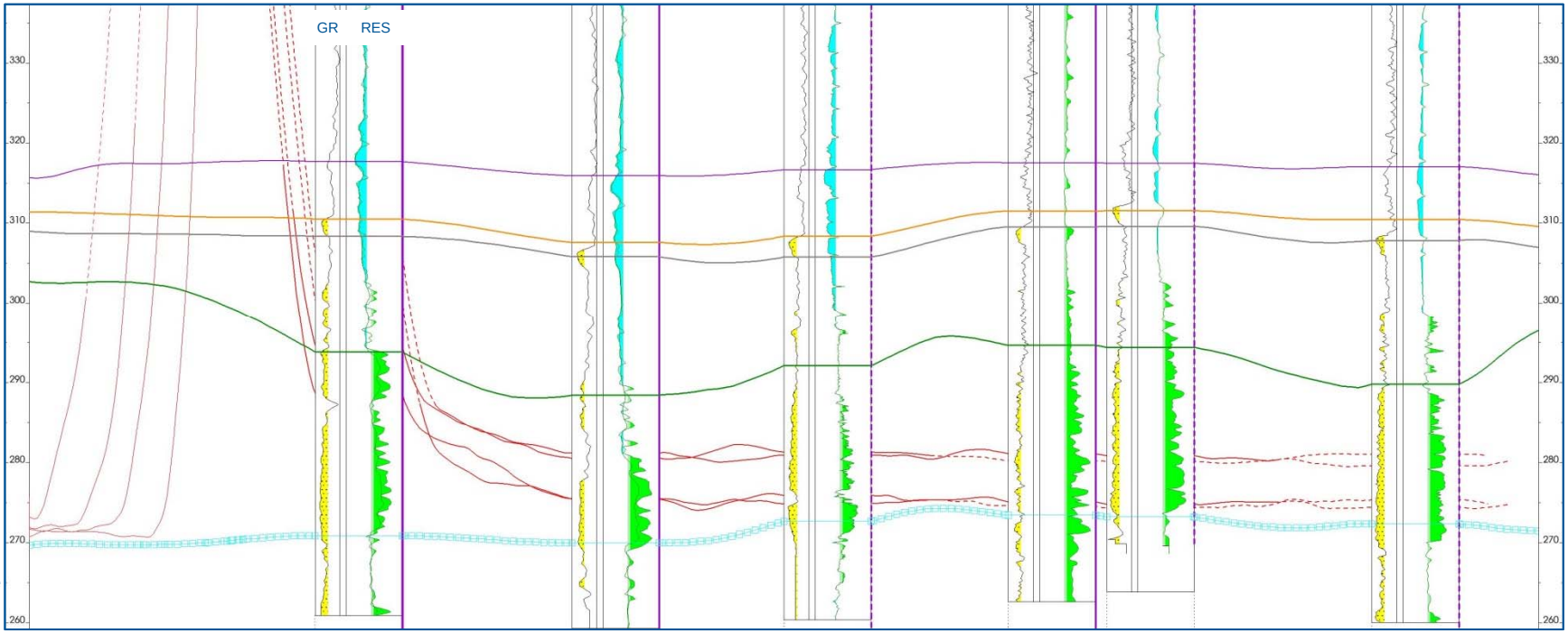

824
751N
750N
751
751S
750S
A
B
C
D
E
F
G
H


SE
NW
Pad 750
Pad 751W
Pad 751
mSS
Clearwater
GR
RES
Wabiskaw C
Wabiskaw D
Top of Pay
Devonian
Beaverhill Lake
DC Pattern
DB Pattern
DA Pattern

Pattern 824

SE **Pad 24** **NW**

mSS



OO Pattern **NN Pattern** **824 Pattern**

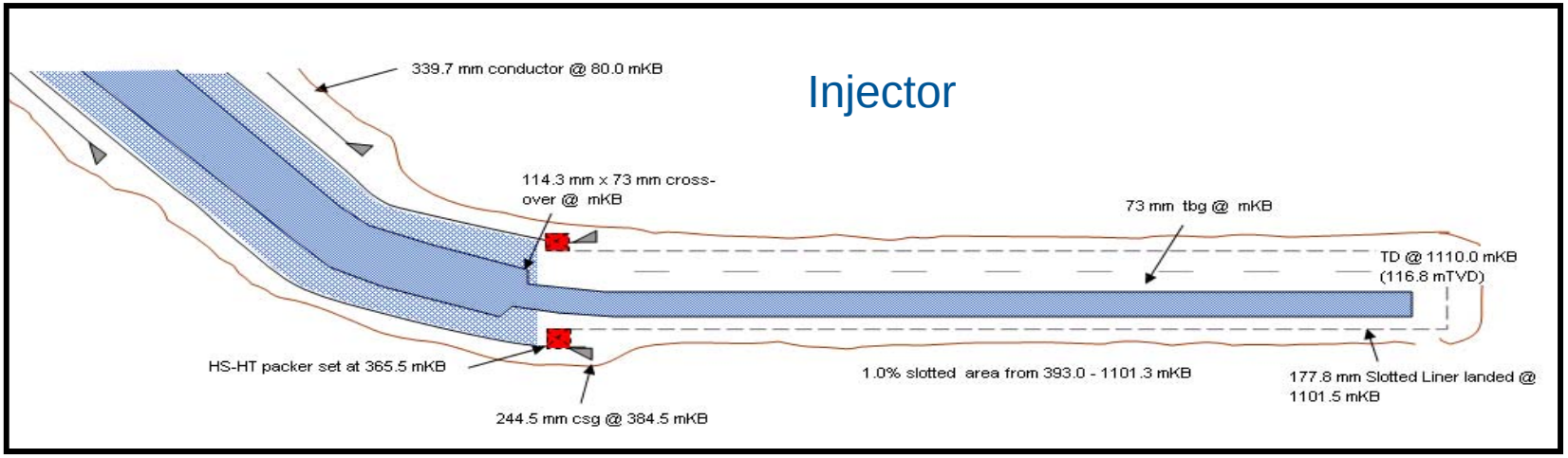
MacKay Steam Chamber Edge as Defined by April 2013 3D Seismic

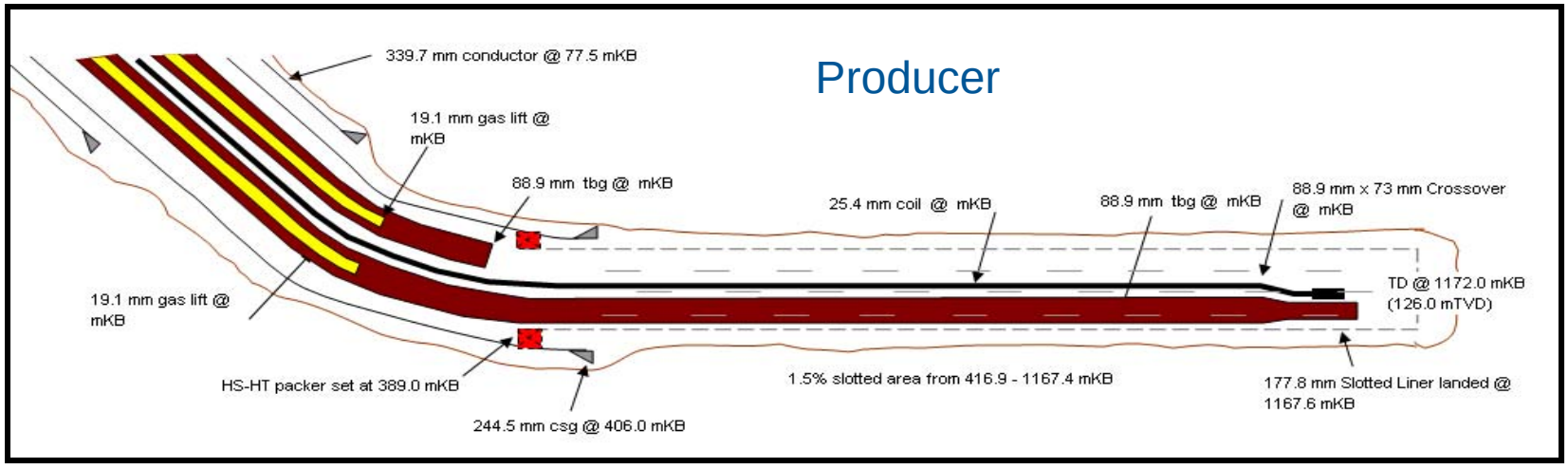
- 2013 3D first full seismic survey over project area
- Aided in estimating steam chamber growth in current operating areas
- 2014 4D seismic survey used to establish steam chamber growth in SE direction
- Seismic interpretations throughout operating area are complete

MacKay River Performance Presentation

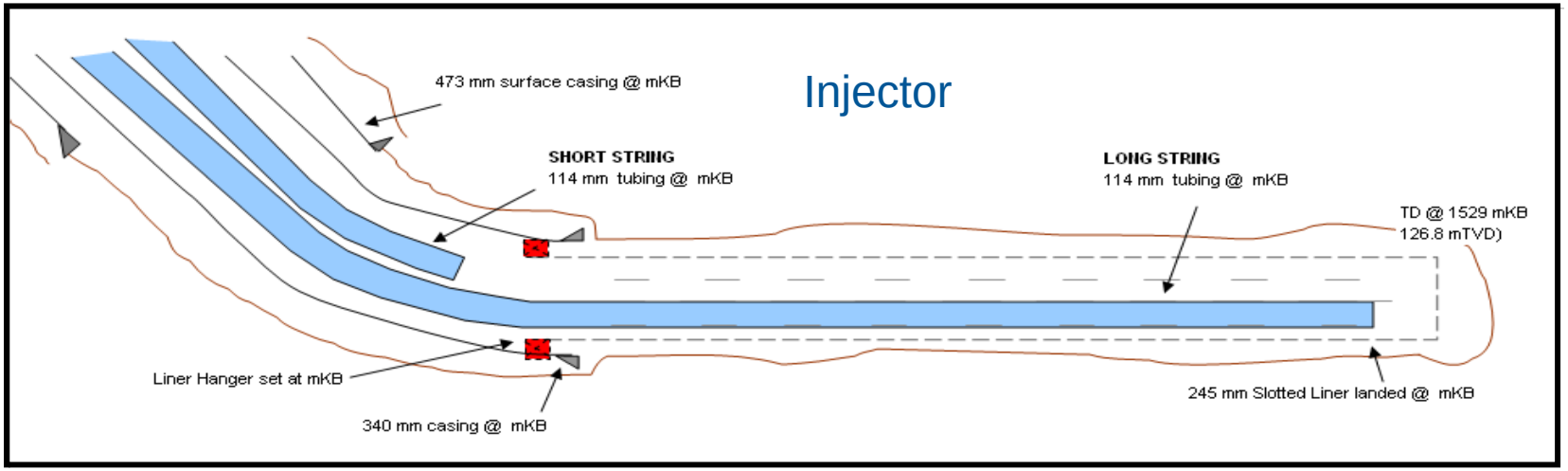
Well Operations

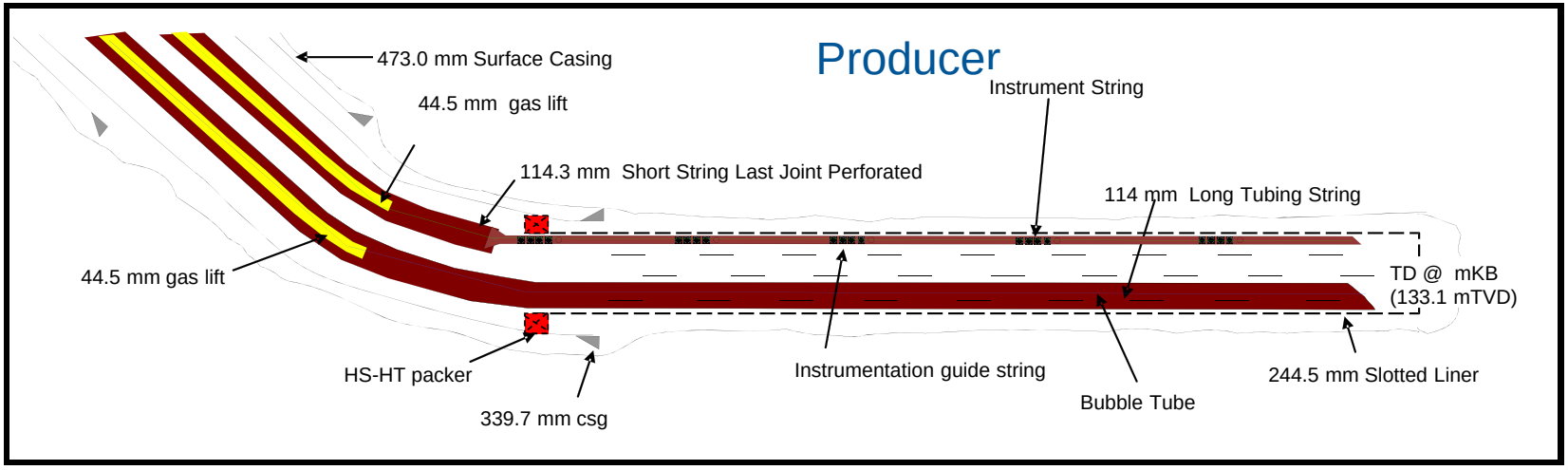
Typical Well Completions – Phase 1 Type





Typical Well Completions – Phase 5 Type





Well Downhole Instrumentation

- Phase 1 (25 well pairs)
  - Temperature optic fibre in 4 producers have been replaced and are functional today (A5, B2, C1, and C2)
- Phase 2 (14 well pairs)
  - Temperature fibre optic installed in G6P
  - P/T gauge installed in G6I
- Phase 3 (7 well pairs)
  - No instrumentation
- Phase 4 (10 well pairs)
  - No instrumentation except temperature fibre optics in OO3 I & P
  - Temperature fibre optic installed in NN1P
- Phase 5A (6 well pairs)
  - Pressure - bubble tube to the toe in every producer
  - Two producers equipped with 6 point thermocouple bundle to the toe (QQ5, NN5)
- Phase 5B-1 (6 well pairs)
  - Pressure - bubble tube to the toe in every producer except OO5
  - All producers equipped with 6 point thermocouple bundle to the toe except OO5 and OO9 which have temperature fibre optic

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Well Downhole Instrumentation

- Phase 5B-2 (10 well pairs)
  - Pressure - bubble tube to the toe in every producer
  - All producers equipped with 6 point thermocouple bundle to the toe
- Phase 5D&F (18 well pairs)
  - Pressure - bubble tube to the toe in every producer except OO well pairs which have pressure gauges
  - All producers equipped with fibre optic to the toe

Artificial Lift

- All existing SAGD production wells designed for gas lift
  - Low cost completion
  - Recover gas
  - No downhole moving parts
- Producing wells with downhole pumps:
  - F1P, ESP since February 2009, current pump installed March 2011
  - OO3P, ESP since October 2009, current pump installed March 2012

Key Learnings: Wellbore Integrity Management

- ***Wellbore integrity management*** is a high priority focused on wellbore containment over a wells' full life cycle
  - **Monitoring and repair of SCVF's**
    - Monitoring using Vent Nanny assembly to monitor pressure, rate & H_2S concentration
    - Gas migration rates continue to decline indicating remediation work may have been successful
  - **Wellbore integrity workovers (liner patches, sidetracks etc.)**
    - Patches determined to be not an effective long term strategy for remediation
    - FCD's used in 3 wells instead of liner patches with successful results to date

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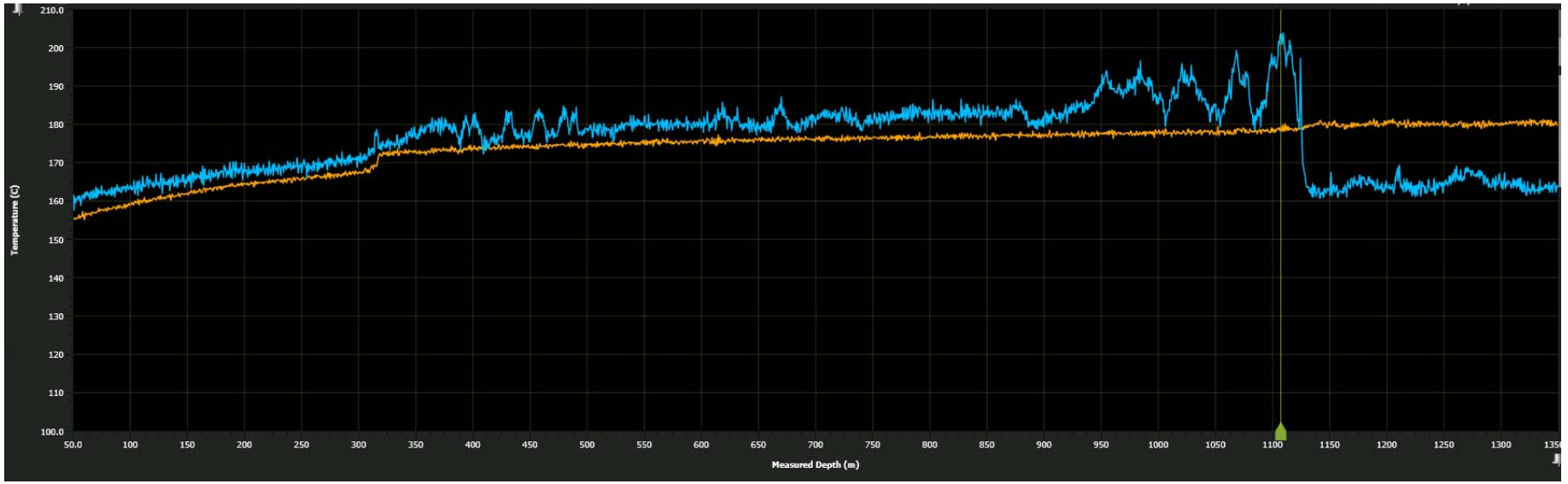
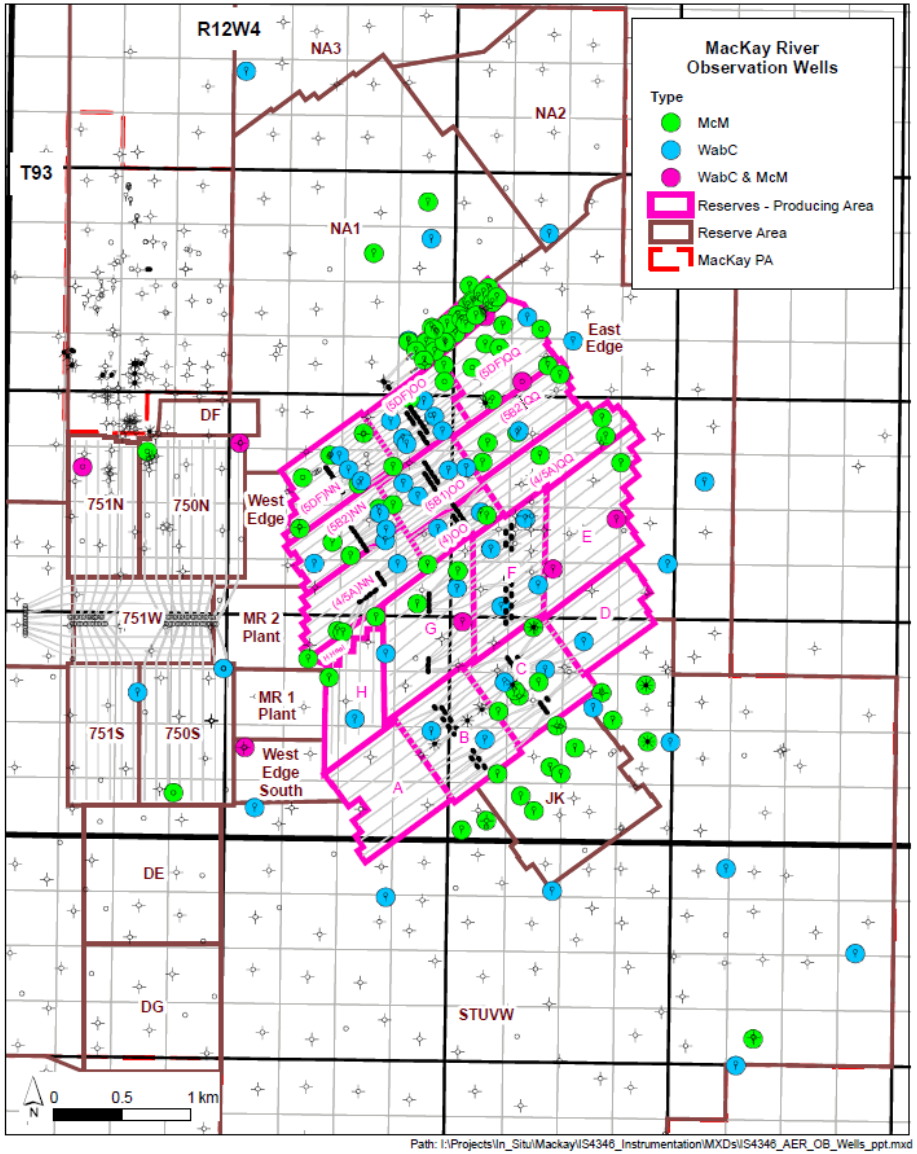
Key Learnings: Well Enhancement Repairs

- ***Flow Control Devices***
  - Used to repair steam break through (SBT) condition, achieve higher and consistent flow rate, reduce risk of future new SBT and potential liner failure
  - FCD completions utilized in new, mature and sidetracked wells using various vendor devices
    - Early results look promising
      - Example of well limited due to hot spots Pre-FCD's (blue) now capable of full drawdown for increased peak production (orange)



Observation Wells



Observation Well Overview

- Total of 145 licensed observation wells at MacKay River
- Observation wells at MacKay River serve three main purposes:
  1. Reservoir optimization (steam chamber monitoring)
     - 37 wells with fibre optic cable from surface to TD
     - 12 wells with fibre optic cable and pressure sensors
     - 36 wells with thermocouple bundles and pressure sensors
  2. Wabiskaw C pressure monitoring
     - 51 wells with a single pressure / temperature sensor
  3. Subsurface Monitoring (outside of producing area)
     - 5 wells with thermocouple bundles and pressure sensors
     - 2 wells with a single pressure / temperature sensor
     - 5 piezometer wells
- Current observation well design incorporates thermocouple measurement as this provides sufficient resolution for steam chamber monitoring and is preferred for remote well locations.

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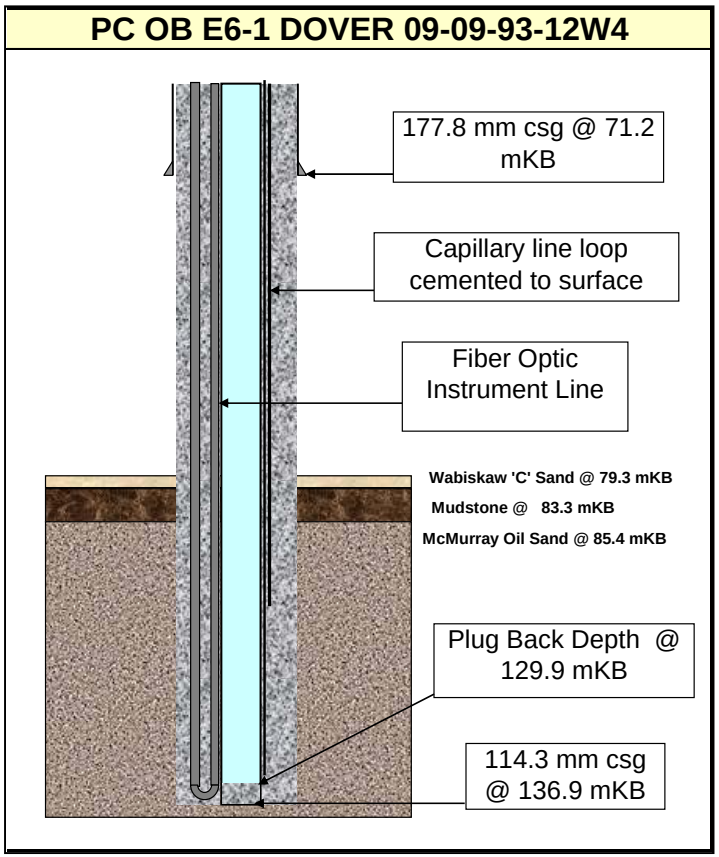
Typical Observation Well Instrumentation

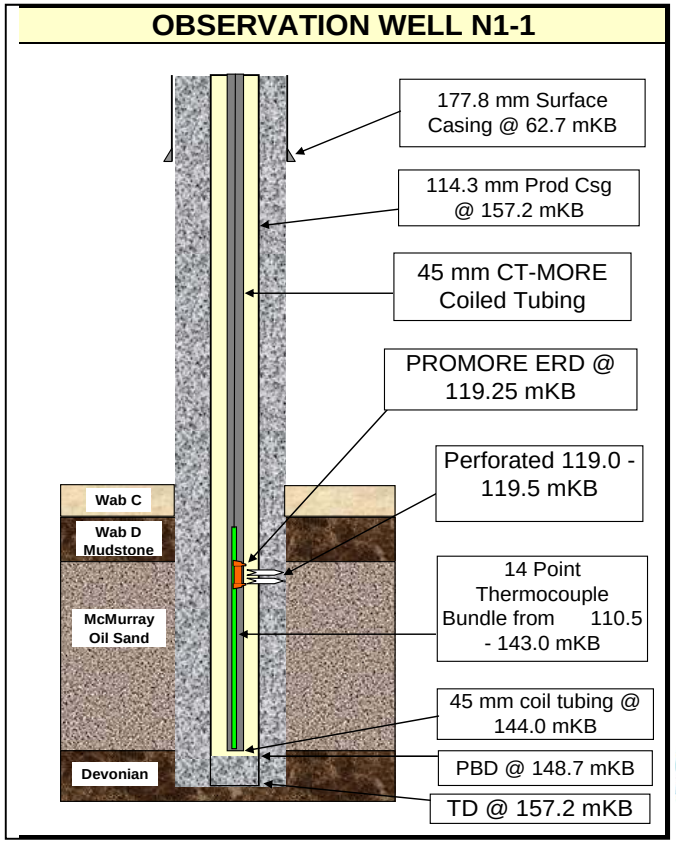
McMurray Observation Well (Type 1):

- Capillary line loop cemented outside casing
- Fibre optic cable pumped into capillary line loop to provide temperature profile along entire vertical well depth
- Allows for close monitoring of steam chamber development



McMurray Observation Well (Type 2):

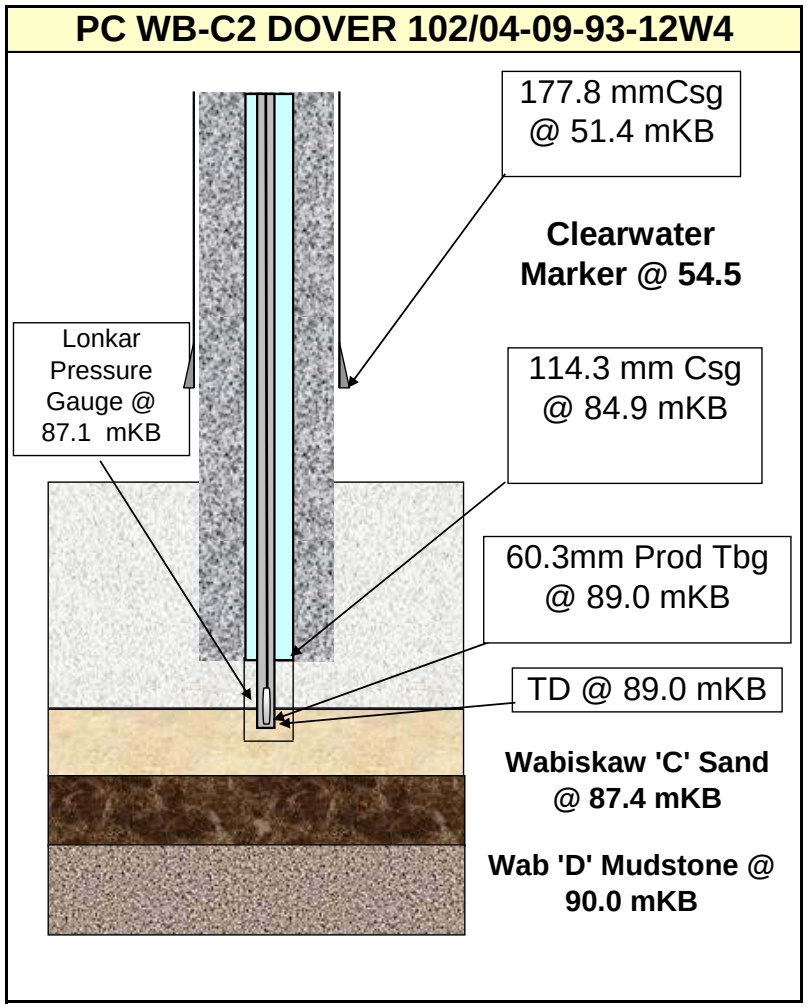
- Coiled tubing instrument string containing 14 thermocouples and 1 P/T gauge run inside 114 mm intermediate casing
- Perforated near the top of the McMurray oil sands zone
- Pressure / temp gauge positioned at MPP
- 14 point thermocouple bundle collects temperature data across the McMurray



Typical Observation Well Design

Wabiskaw C Observation Well:

- Open hole into Wabiskaw C sand
- Wellbore does not penetrate Wabiskaw D mudstone or McMurray sand
- Pressure / temp gauge landed inside tubing
- WBC-40 intermediate casing leak discovered and planned for repair by March 31, 2016
- WBC-29 – anomalous pressure data at from April 2015 to August 2015
    - Investigation confirmed measurements were inaccurate and not representative of formation pressure

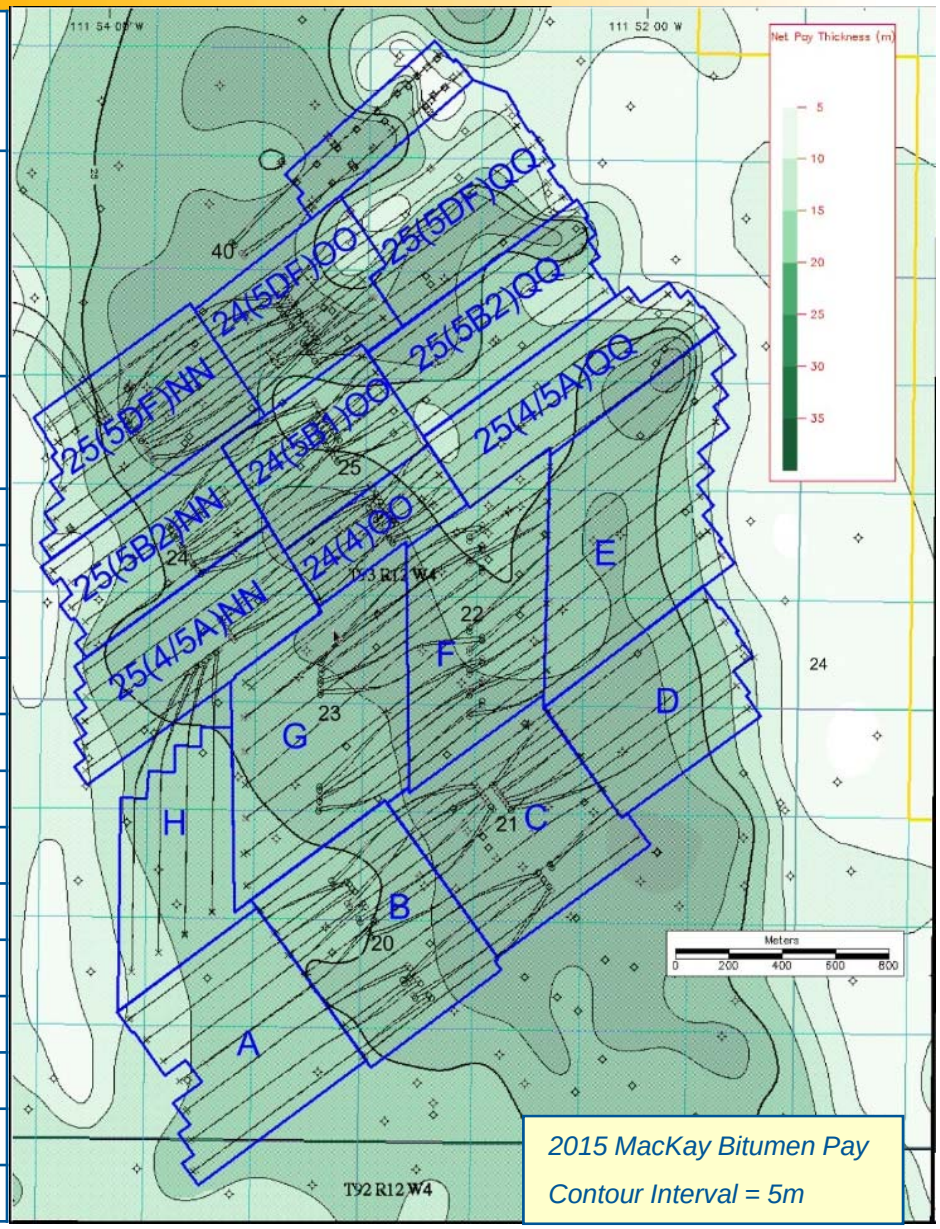


MacKay River Performance Presentation

SAGD Scheme Performance

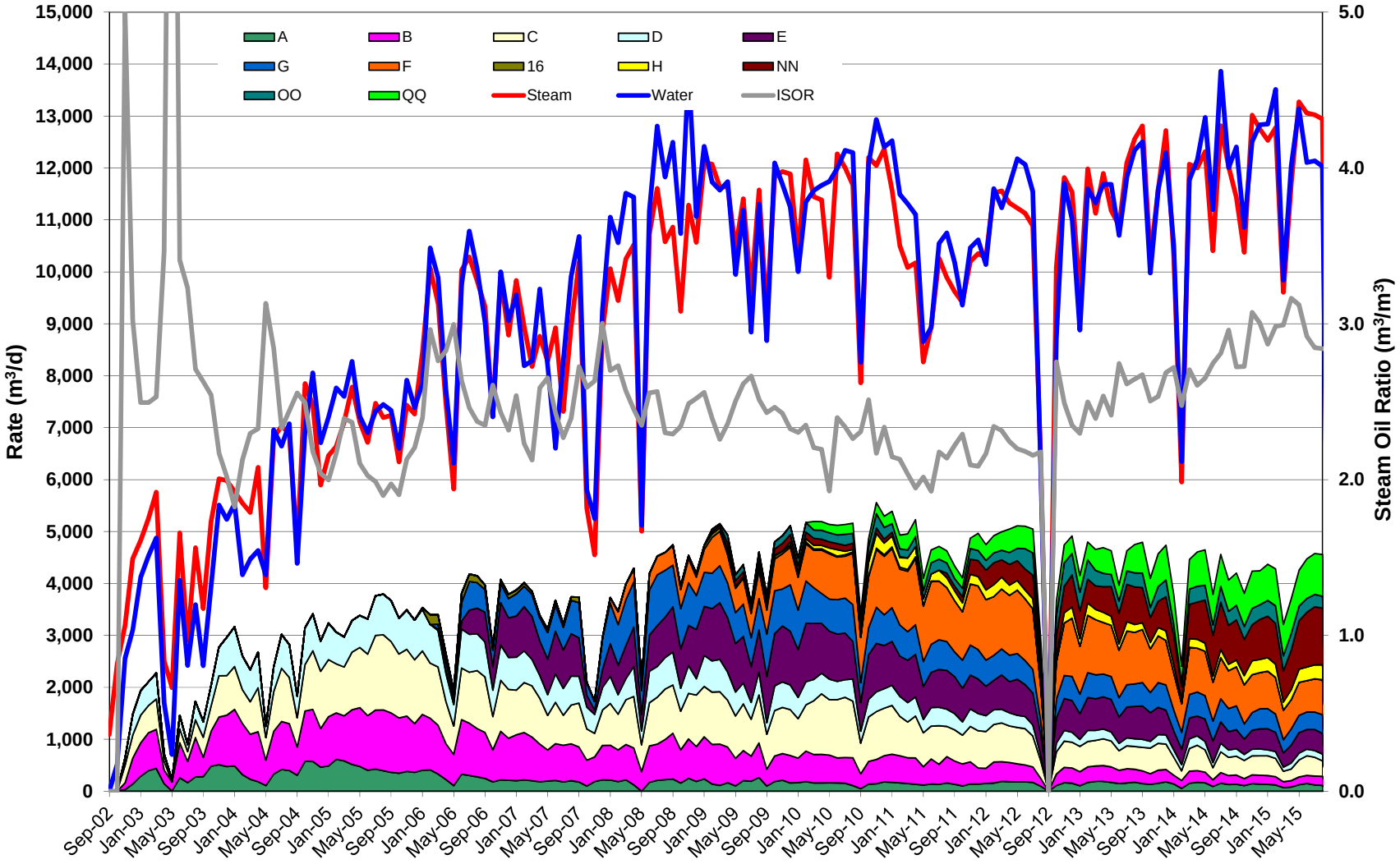
Summary of Operating Wells

Pad	Pattern	Phase	# Well pairs	First steam to Pad
20	A	1	7	Sept 2002
	C		6	
21	B		7	
	D		5	
22	E	2	7	Jan 2006
	G		7	
23	F	3	7	Sept 2007
24	OO	4	3	Oct 2008 - Apr 2009
		5B-1	6	Feb 2012
		5DF	6	May 2014
	H	4	4	Feb 2009 - Jun 2010
25	QQ	4	2	Nov 2008
		5A	2	Jul 2011
		5B-2	5	Jan - May 2013
		5DF	6	June 2014
	NN	4	1	Dec 2008
		5A	4	Jun - Jul 2011
		5B-2	5	Jan - Feb 2013
		5DF	6	June 2014



2015 MacKay Bitumen Pay
Contour Interval = 5m

Fluid Rates


A
B
C
D
E
G
F
16
H
NN
OO
QQ
Steam
Water
ISOR
Rate (m³/d)
Steam Oil Ratio (m³/m³)
15,000
14,000
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
5.0
4.0
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0.0
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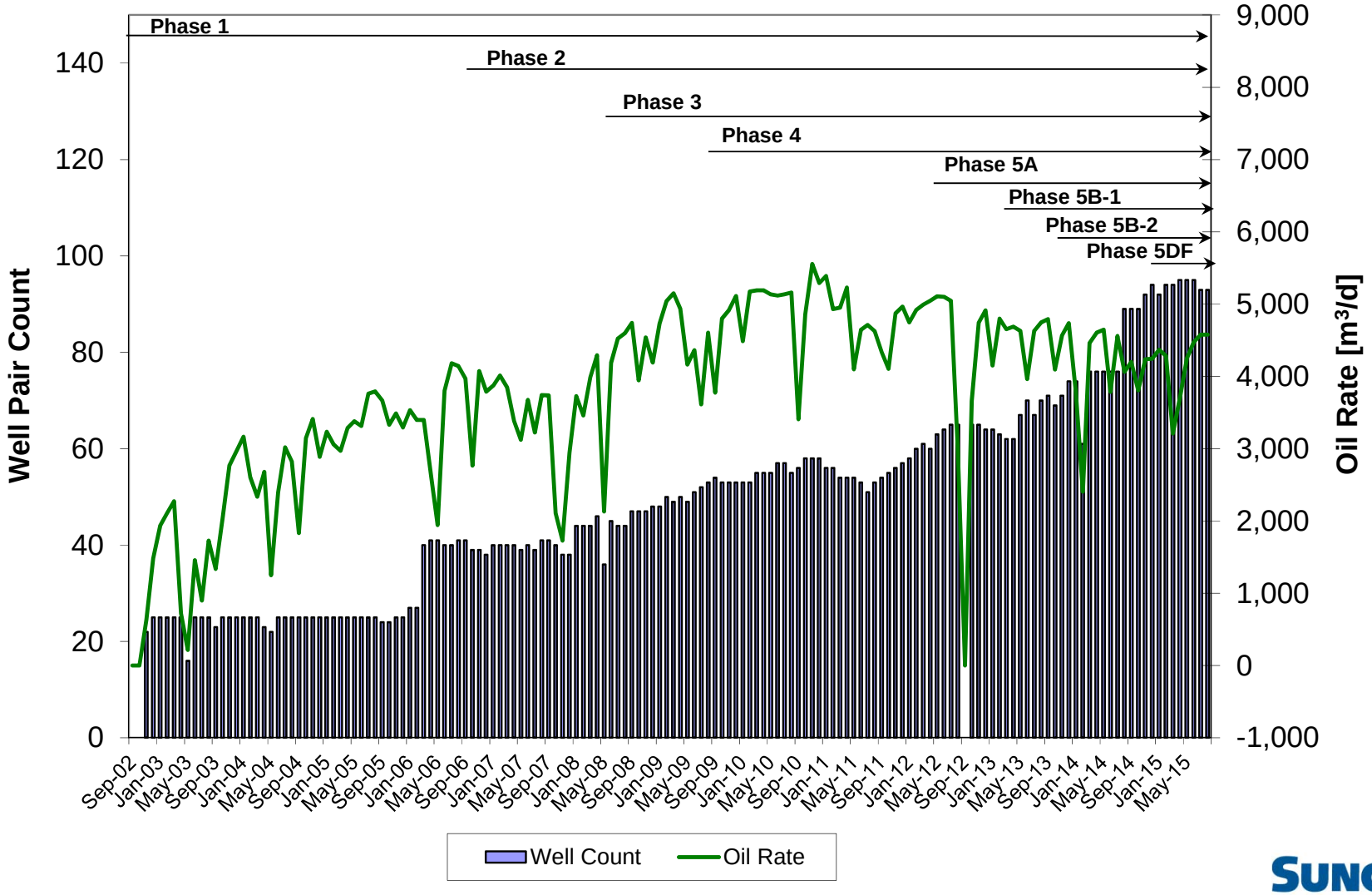
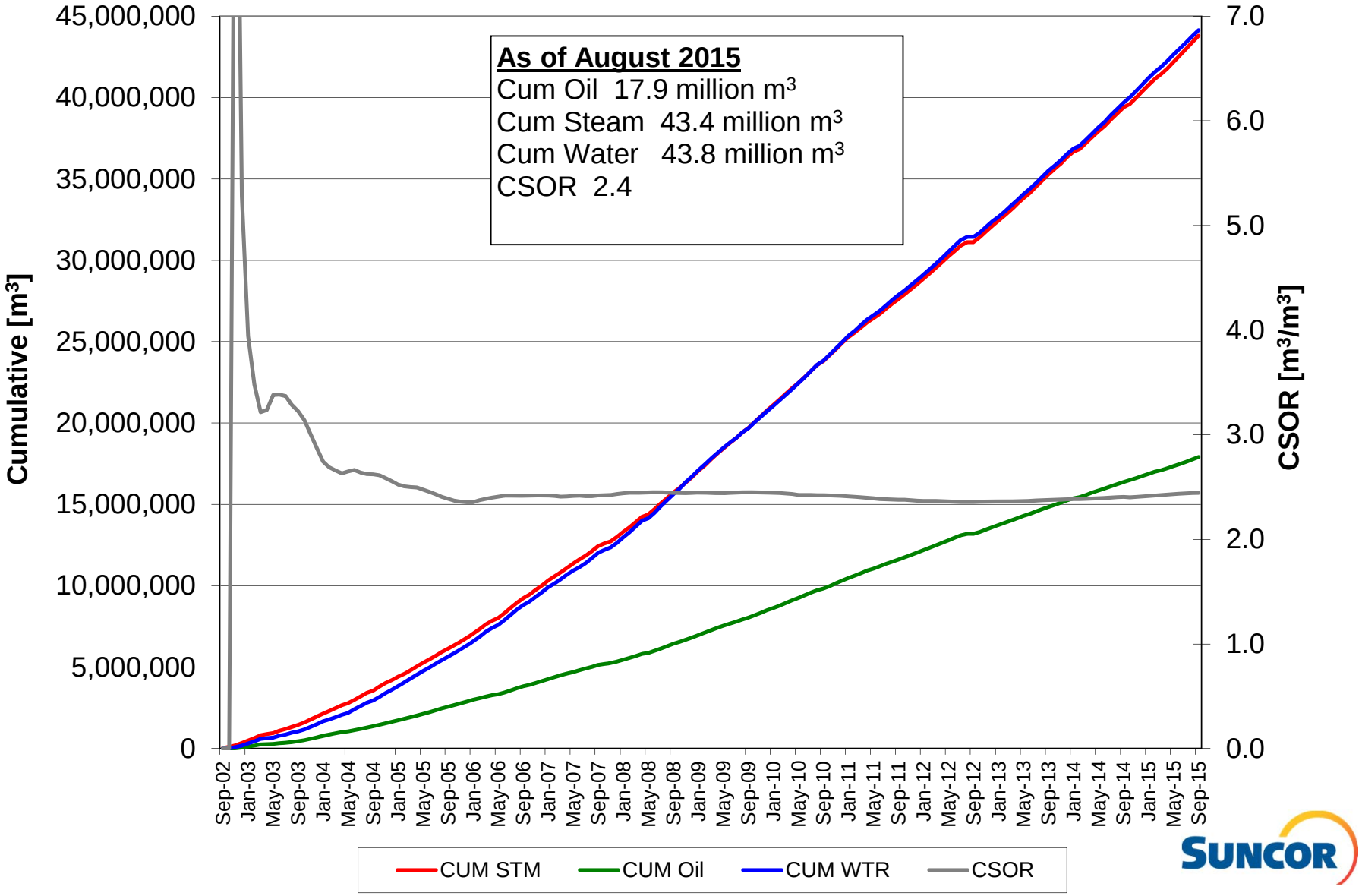
Sep-14
Jan-15
May-15

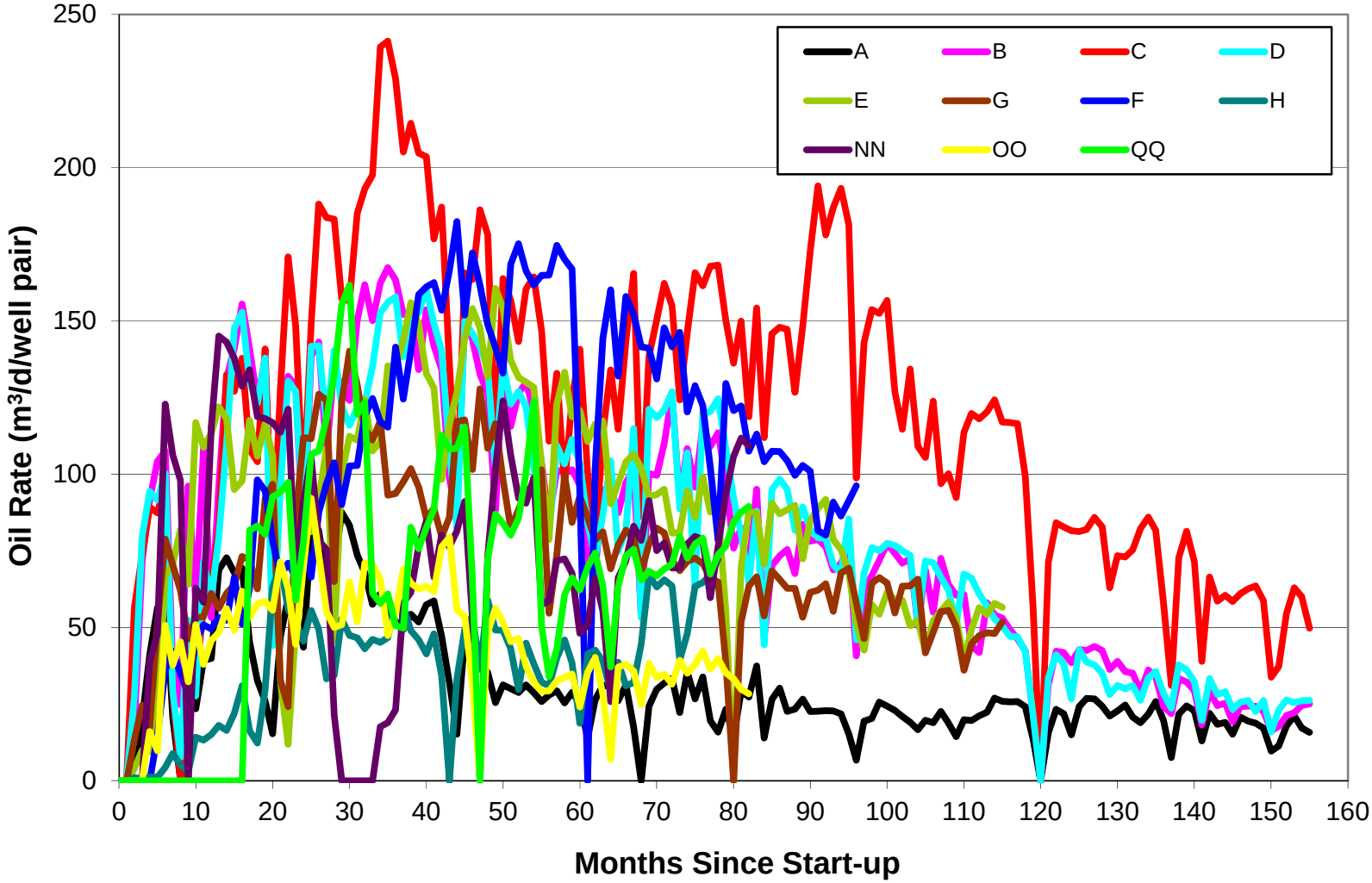
Producing Well Count



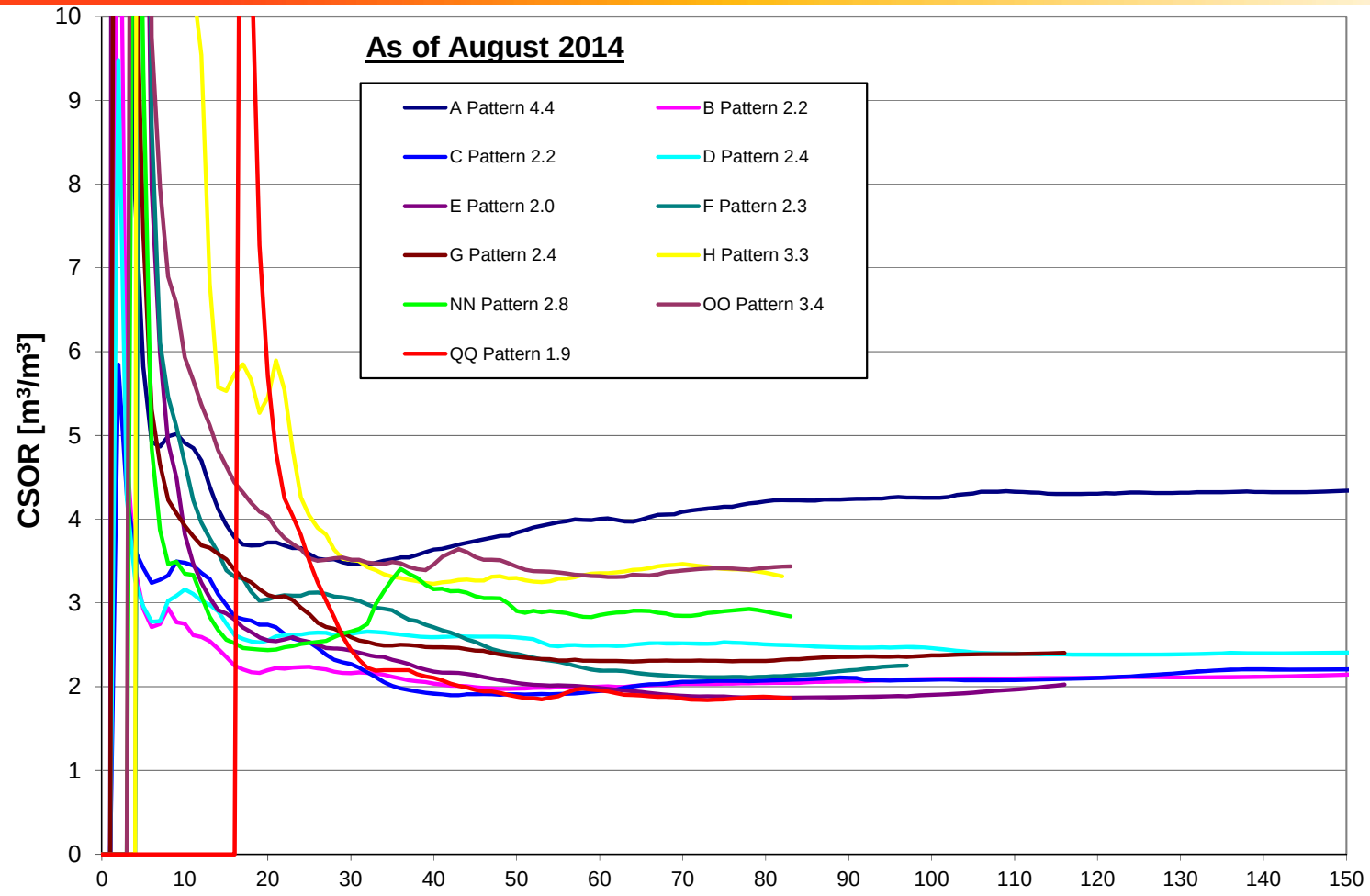
Cumulative Fluid Volumes



Average Oil Rate per Pattern



CSOR by Pattern



- QQ wells have the lowest CSOR
- NN wells have a mid range CSOR
- A Pattern has the highest CSOR

Performance Summary by Pattern

Pattern	OBIP [e³ m³]	Cum. Oil [e³ m³]	Recovery up to August 2015 [%]	CSOR [m³/m³]	ISOR (Aug. 2015) [m³/m³]	Ultimate Recovery [%]
Pattern A	2,389	1,000	43.0	4.4	6.9	47
Pattern B	3,319	2,627	72.4	2.2	4.6	82
Pattern C	4,238	3,370	75.5	2.2	3.0	89
Pattern D	2,741	1,870	76.6	2.4	2.9	85
Pattern E	3,728	2,189	55.2	2.0	3.9	70
Pattern F	3,616	2,204	57.8	2.3	2.9	81
Pattern G	4,155	1,796	47.3	2.4	2.8	54
Pattern H	1,756	369	9.7	3.3	2.7	47
Pattern NN	7,010	955	24.6	2.8	2.3	58
Pattern OO	5,251	547	14.1	3.44	4.1	52
Pattern QQ	5,581	950	25	1.9	2.0	55
Total	**43,784**	**17,877**	**45.6**	**2.7**	**3.5**	**64**

Pattern Examples Based on Recovery

	ISOR [m^3/m^3]	CSOR [m^3/m^3]	Cum Oil [10^3m^3]	Peak Oil Rate [m^3/d/well pair]	Current Oil Rate [m^3/d/well pair]	Comments
A Pattern **Low Recovery**	4.4	6.9	1000	73-149	5-45	• Poor geology • 43% recovery to date (ultimate RF: 47%) • Producing for more than 13 years
E Pattern **Medium Recovery**	3.9	2.0	2189	125-235	26-80	• Medium quality geology • 55% recovery to date (ultimate RF: 70%) • Producing for about 9 years
C Pattern **High Recovery**	3.0	2.2	3370	179-299	10-145	• High quality geology • 76% recovery to date (ultimate RF: 89%) • Producing for more than 13 years

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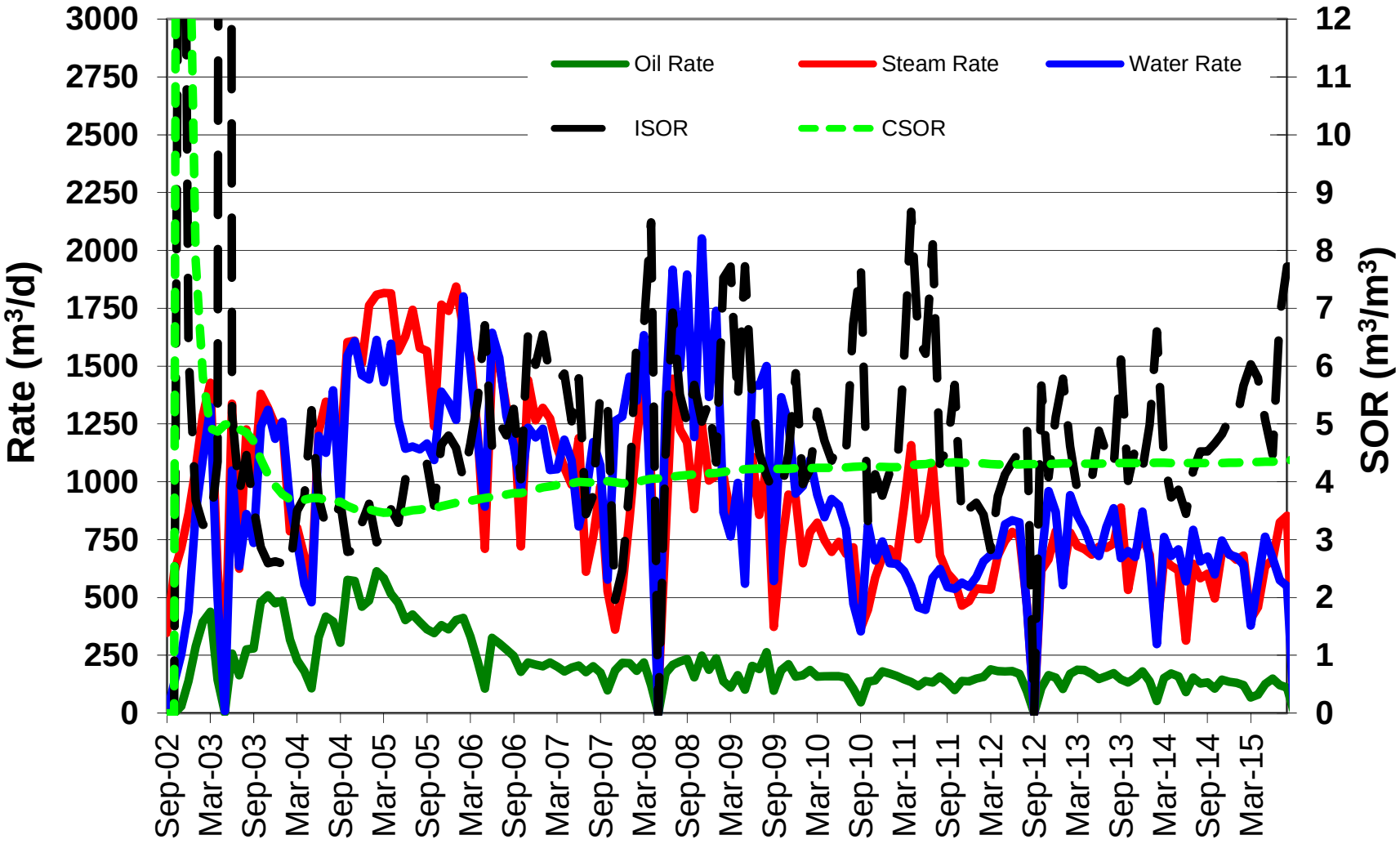
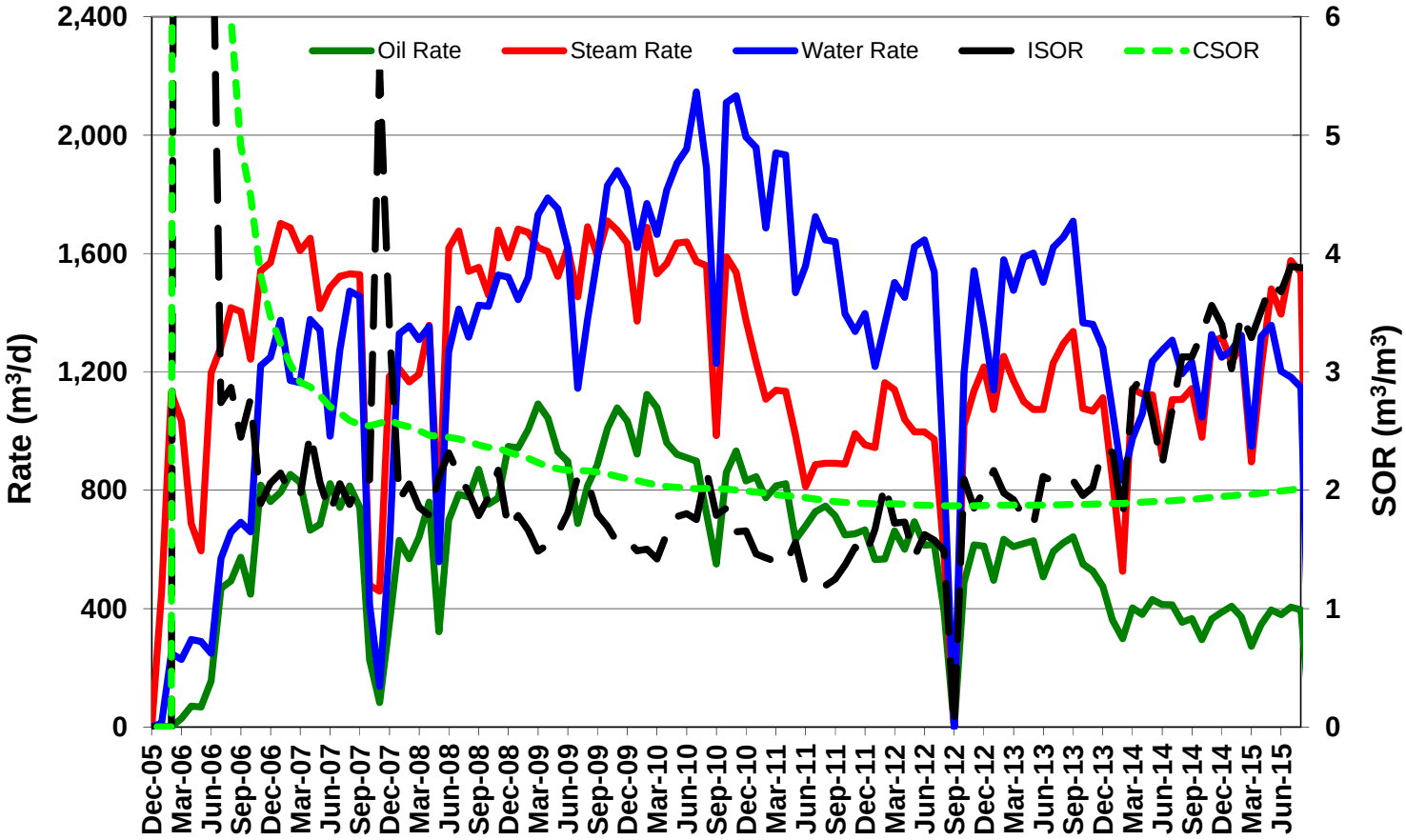
A Pattern – Low Recovery

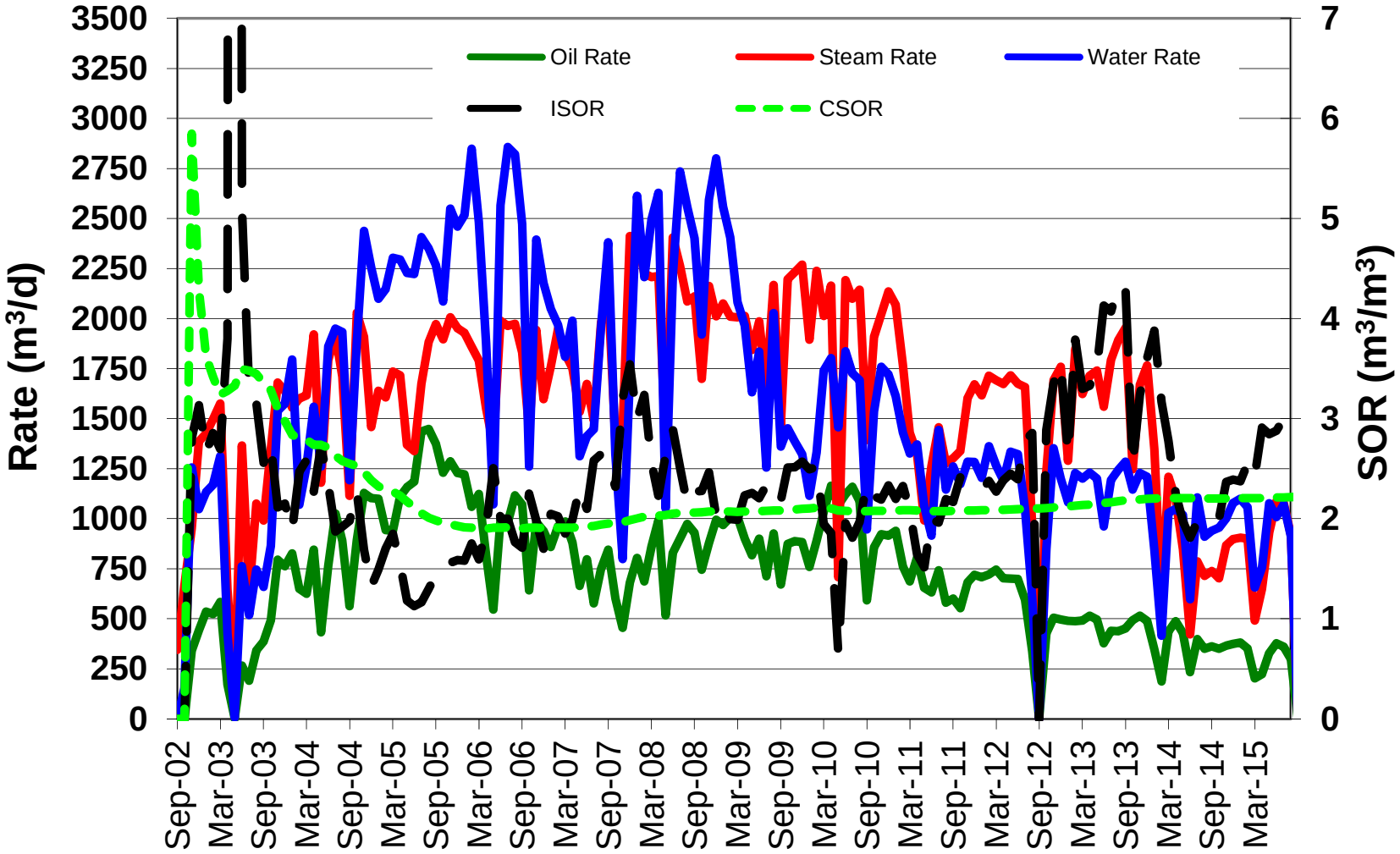


E Pattern – Medium Recovery

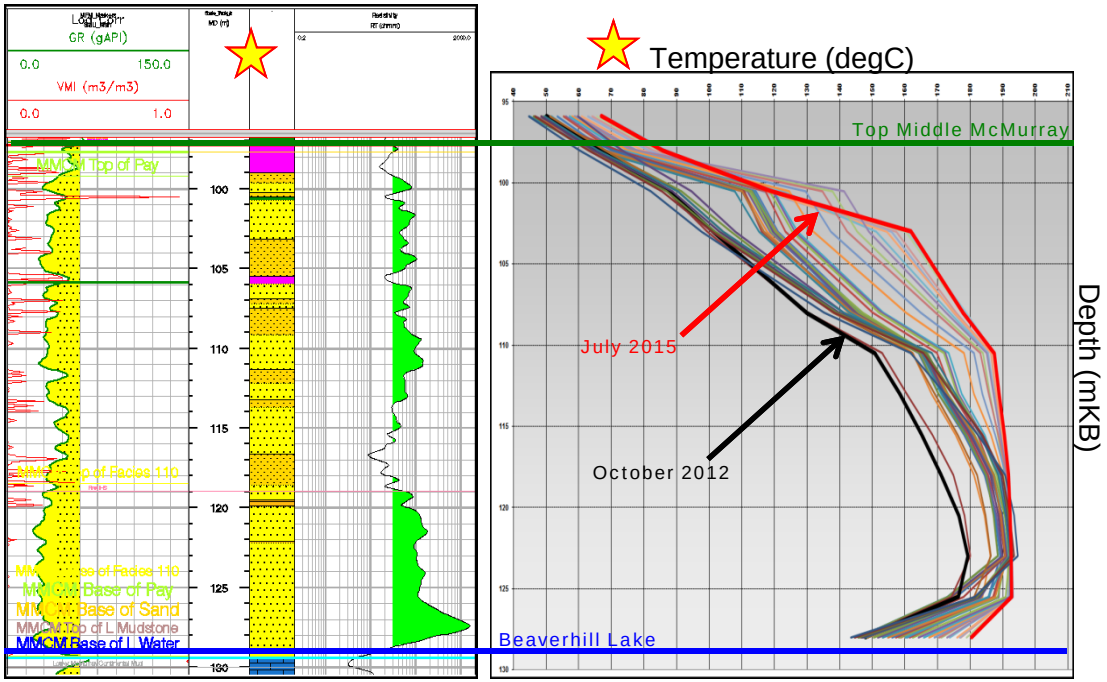


- Increased steam demand in March 2015 was due to the planned cogeneration outage that occurred in late March-early April. Due to large chamber size, low MOP and communication with D pattern, it took several months at higher steam injection rates to re-pressurize the chambers back to pre-outage levels.

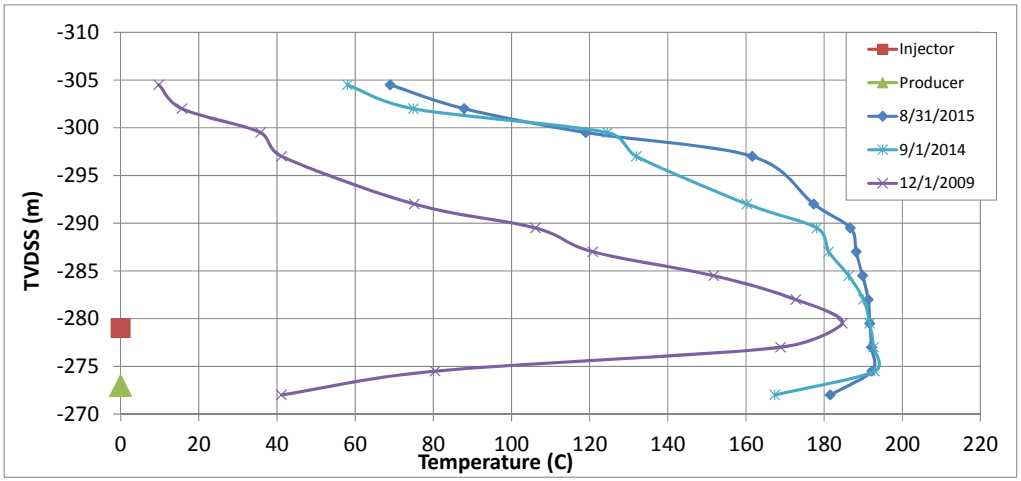
C Pattern – High Recovery



Steam Chamber Growth: OB O1-1 Observation Well



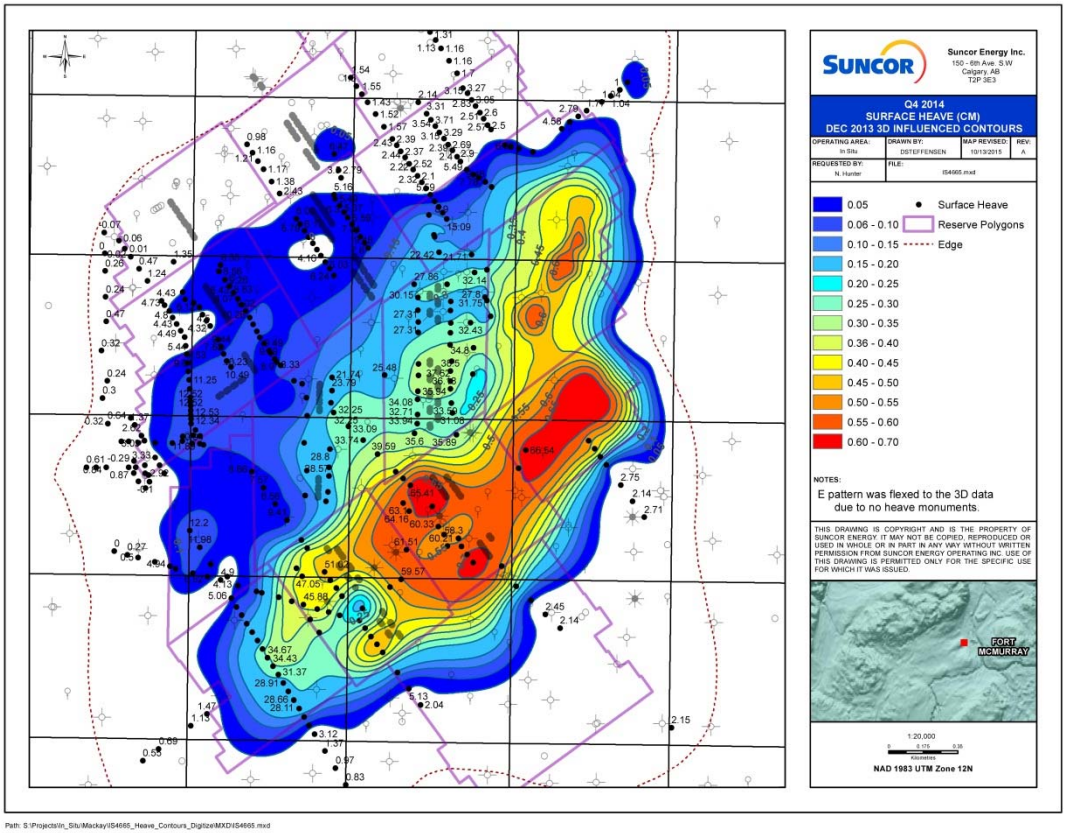
- After 4 years of stunted steam chamber growth, steam has been able to surpass geological layers of resistance
  - OB O1-1 observation well shows that chamber can grow through IHS in certain areas
  - ~15m vertical growth in steam chamber in 4 years
  - ~5m vertical growth in 1 year



Steam Chamber Development: Surface Heave Monitoring

- 431 monuments exist over MacKay River for heave measurement and monitoring
- Installed 59 monuments in 750/751
- Survey History
  - 1st: Fall 2002
  - 2nd: Dec 2006
  - 3rd: Fall/Winter 2007/08
  - 4th: Nov 2008
  - 5th: Jan/Feb 2010
  - 6th: Nov. 2010
  - 7th: Dec. 2011
  - 8th: Dec. 2012
  - 9th: Oct 2013
  - 10th: Oct 2014

2D Surface Heave: Change from Baseline to October 2014



Survey strategy

- Heave surveys are performed at different frequencies depending on well vintage
  - Oct 2014 heave survey for total producing area

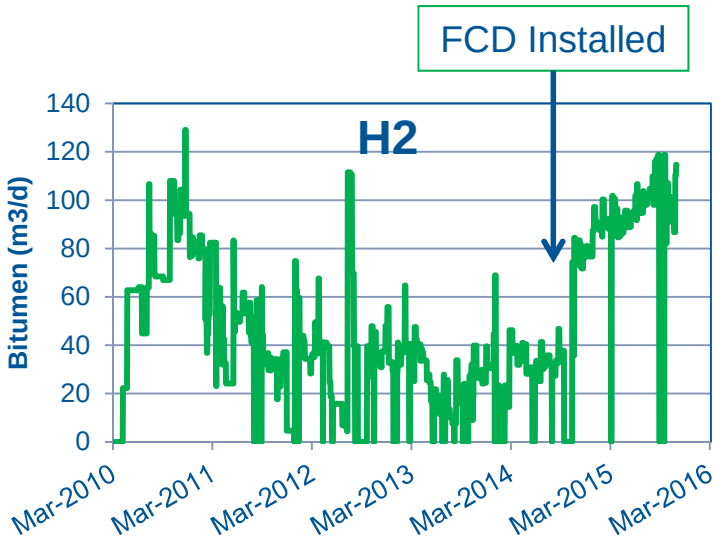
Heave monitoring application:

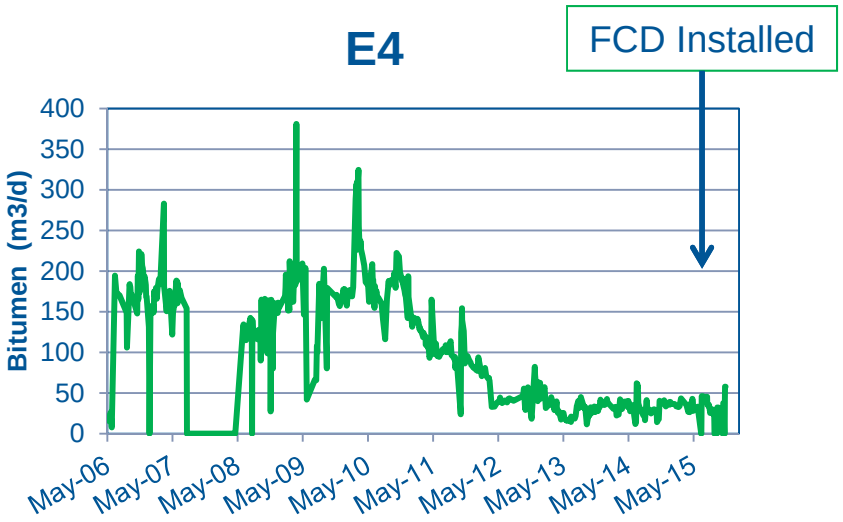
- Field performance monitoring coupled with seismic

Key Learnings: Flow Control Devices at Suncor

- Suncor has installed flow control devices (FCDs) in 16 well pairs at MacKay River:

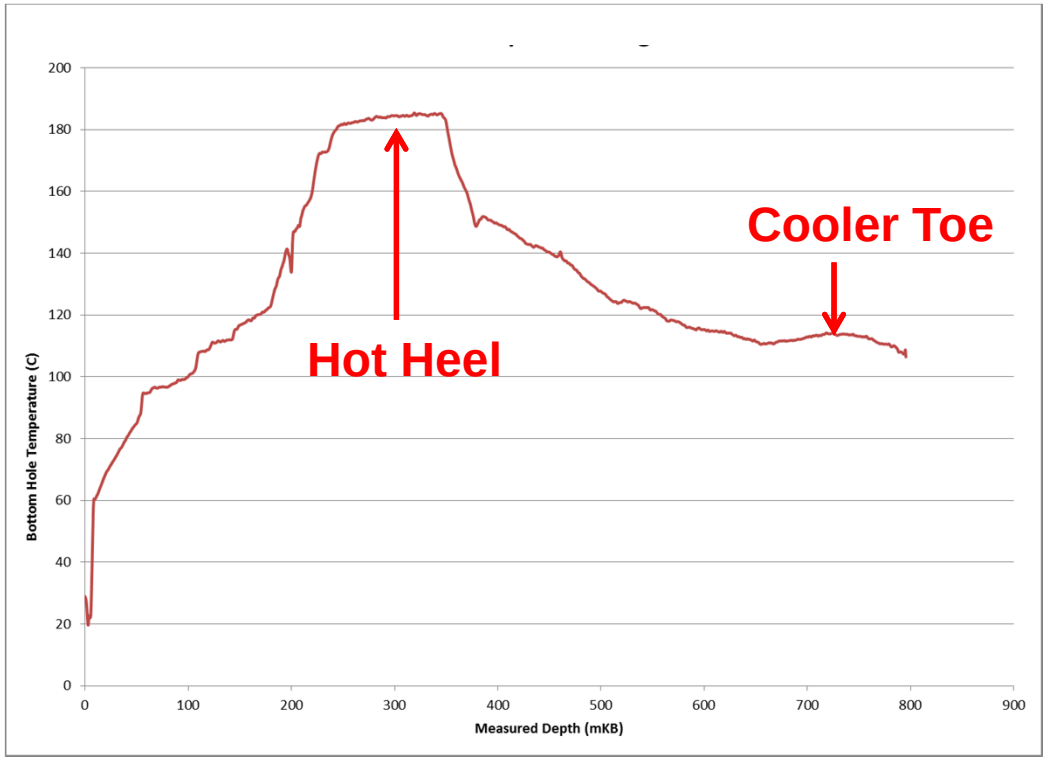
  E4 / F5 / G7 / H2 / NN1 / NN3 / NN11 / NN12 / NN14 / OO4 / OO5 / OO6 / OO10 / OO12 / OO14 / OO15
- FCDs in H2 have demonstrated considerable success. This well had poor conformance resulting in steam coning, which the FCDs have been successful in managing.
- FCDs in E4 have yet to demonstrate success. Cooler sections of the well are now heating up and conformance is improving. This well is expected to demonstrate success given more time.

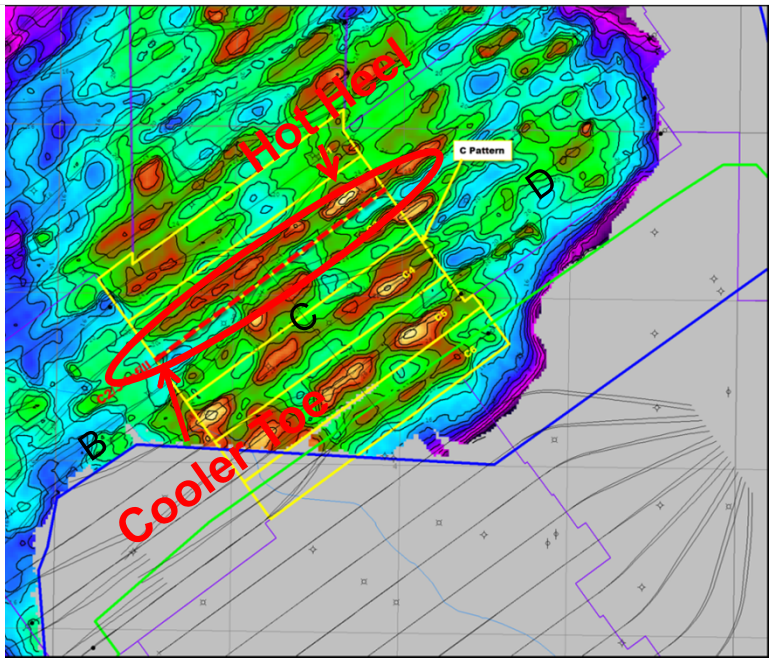




Key Learnings: Validation of Seismic Data

- Infill temperature log validates 2013 seismic data
- Temperature log indicated:
  - ~180°C at heel area of well
  - Cooler temperature in mid well section





Steam Injection Conditions

Pattern	Wells	Maximum Operating Pressure*	
		Surface (kPag)	Bottomhole (kPag)
A	A1-7	1910	1690
B	B1-7	1810	1600
C	C1-6	1570	1390
D	D1-5	1400	1240
E (S)	E1-4	1475	1310
E (N)	E5-7	1430	1270
F	F1-7	1510	1340
G	G1-7	1730	1530
H	H1-4	2010	1780
NN	NN1-5	1890	1680
NN	NN6-10	1970	1750
NN	NN11-16	1920	1700
OO	OO1-3	1680	1490
OO	OO4-9	1710	1520
OO	OO10-15	1690	1500
QQ	QQ2-5	1370	1210
QQ	QQ6-10	1350	1200
QQ	QQ11-16	1350	1200

*Commercial Scheme Approval No. 8668U

- Approved MOPs based on the methodology detailed in Application 1724610
- New approved Bottomhole MOP at 80% of the fracture closure pressure
- MOPs are set by shallowest point in each pattern to allow for intra-pattern communication
- Steam injection pressure limits are enforced at wellhead on tubing and annulus via pressure transmitters. Phase 1 wells are monitored via manual pressure measurement at the wellhead every second day
- Steam injection pressure is reduced as required to maintain estimated bottomhole pressure below MOP for neighbouring patterns in communication

Stewardship to maximum bottomhole operating pressure

Pattern	Wells	Maximum Operating Pressure*	Average pressure Sep 14- Aug 15
		Bottomhole	Bottomhole
		(kPag)	(kPag)
A	A1-7	1690	1251
B	B1-7	1600	1218
C	C1-6	1390	1283
D	D1-5	1240	960
E (S)	E1-4	1310	1076
E (N)	E5-7	1270	1190
F	F1-7	1340	1242
G	G1-7	1530	1084
H	H1-4	1780	1633
NN	NN1-5	1680	1461
NN	NN6-10	1750	1609
NN	NN11-16	1700	1608
OO	OO1-3	1490	1329
OO	OO4-9	1520	1502
OO	OO10-15	1500	1390
QQ	QQ2-5	1210	1093
QQ	QQ6-10	1200	1161
QQ	QQ11-16	1200	927

- All of the Mackay wells in SAGD are currently operating at pressures below the new approved 80% maximum bottomhole operating pressure
- Alarm systems are in place to ensure the approved maximum bottomhole operating pressures are not exceeded.
- Steam injection pressure is reduced as required to maintain estimated bottomhole pressure below maximum bottomhole operating pressure

Impact

- Lower production rates in low MOP areas
- Slower ramp-up post planned outtage's
- Impacts new well conversions in low MOP areas
- Small impact to mature wells performance

Stewardship to maximum bottomhole operating pressure

- For SAGD wells with no downhole instrumentation **Step-down Tests (SDT)** and **Low Rate Tests (LRT)** are performed and used to calculate estimated chamber pressure to ensure that the Maximum Bottomhole Injection Pressure (MBHIP) is not exceeded

- **SDTs** are conducted by lowering the steam injection rate in steps and allowing pressures to stabilize between steps

- **LRTs** are conducted on wells that do not have reliable SDT correlations by reducing the steam injection rates low enough to estimate the chamber pressure

- **SDT** is the preferred method for chamber pressure estimation as it allows for real time chamber pressure monitoring based on changing injection rates

Pad Abandonment Outlook

- The strategy for future well and pad (including surface equipment) abandonments is under development
- Do not anticipate abandonment of operating Pads during the next 5 years
  - Pads 20 and 21 (A/C and B/D patterns) are the most mature and are expected to be under pressure maintenance within 5 years.
  - Individual wells may be suspended or abandoned as required
- Pad 40 expected to be abandoned within the next 5 years
  - Three of four wells on pad abandoned (NP, NI and SP).
  - Considerations for surface equipment are under review.

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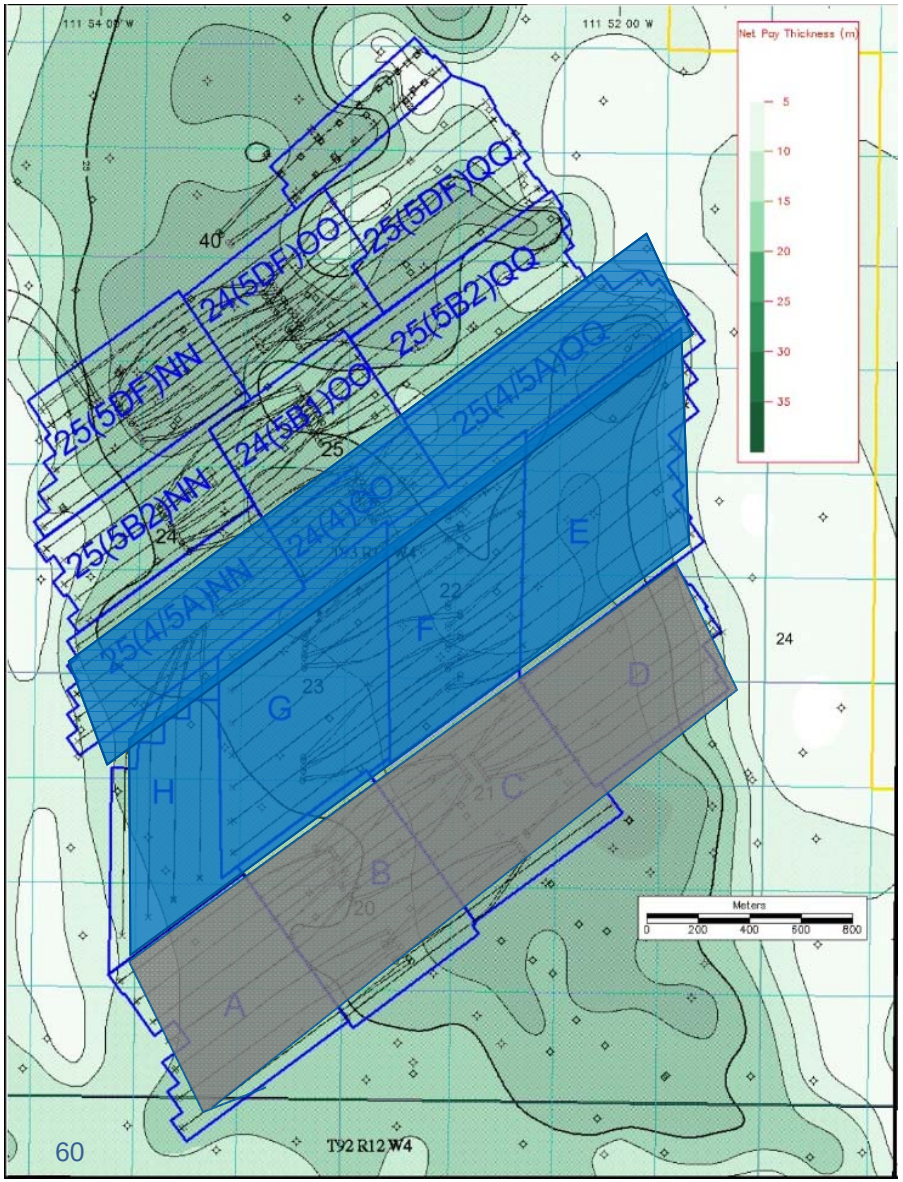
SAGD NCG Co-Injection Strategy



Pilot

- NCG co-injection into B pattern commenced October 2011
- Pilot infrastructure left in place until Stage 1 is operational
- Injection currently based on steam availability

Stage 1

- NCG co-injection to A, B, C, D patterns currently approved
- Expect First NCG Co-Injection Q2 2016

Stage 2

- NCG co-injection into E, F, G, H, NN (4/5A), OO (4/5A), QQ (4/5A) patterns work in progress
- Planning First NCG Co-Injection Q3 2017

New Technology Projects – Near Term

NCG Co-Injection Expansion (A/B/C/D)

- First injection planned for Q2 2016

Surfactant Chemical Pilot (D2/D4/D5)

- First injection February 2015
- Early stages of performance evaluation
- Final injection planned for Q1 2016

Surfactant Co-Injection Pilot Expansion (F)

- First Injection planned for Q2 2016

CO2 Co-Injection Pilot Well (OO8)

- Pilot of DCSG technology
- First injection planned for Q1 2016

MacKay River Performance Presentation

Caprock Integrity

MacKay River Coupled Geo-Mechanics/Reservoir Workflow

1 - Data Gathering
- Well Operations (Rate/Pressure)
- Pressure (Piezometer)
- Temperature (Thermocouple/Fiber)
- Stress (mini-fracs)
- Geo-mechanical (core tests)
- Surface Heave (monuments)
- Dilation (Extensometers)

2 – Data Interpretation

Reservoir Physics
- Well performance
- Vertical Pressure Leak-off
- Lateral Pressure Leak-off
- Vertical heat conduction

Geo-Science
- Initial stress state
- Material behavior
  - shear strength
  - dilation
  - perm enhancement
  - fractures
- Surface Heave
- Reservoir level deformations

3 - Coupled Reservoir Geo-Mechanics
- Update material properties
- Update pressures and stress state
- Recalibrate field history match
- Truth test model
- Forecast/Design for all developments

4 - Learnings
- Sensitize key variables within uncertainty range
- Quantify geo-mechanical risks
- Verify and update MOP
- Recommend further measurements
- Design lab tests

Geo-Mechanical analysis for safe optimal MacKay River operations

Dataset for Characterization of Natural Fractures

2005/06:
- Image logs for 15 wells

2007/09:
- Cores and/or image logs for 17 wells

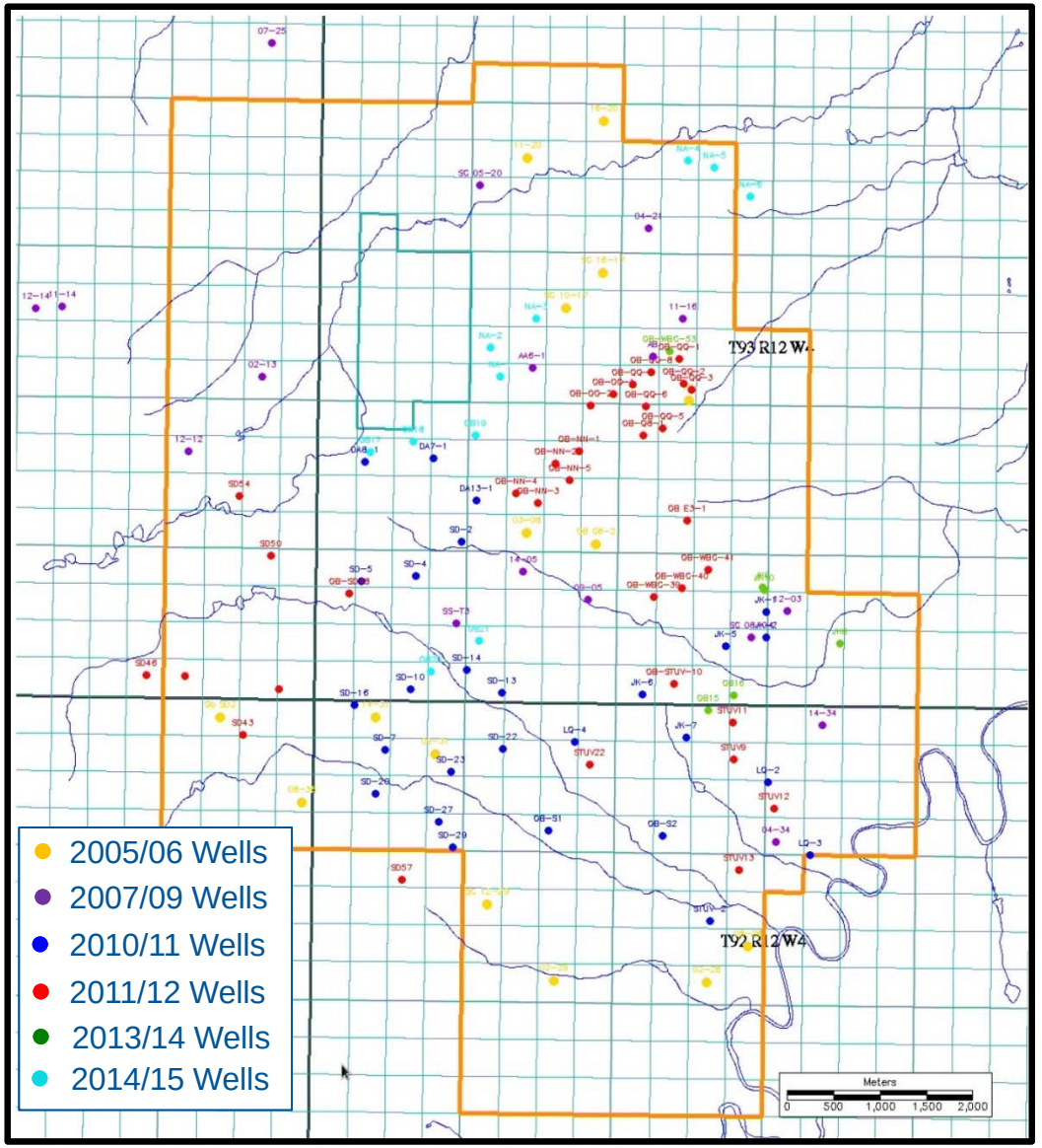
2010/11:
- 17 wells with cores and image logs,
- 10 wells with only image logs

2011/12:
- Cored 6 wells
- FMI logs for 27 wells

2012/13:
- No wells were drilled

2013/14:
- Cored 3 wells
- FMI logs for 3 wells.

2014/15:
- Cored 2 wells
- FMI Logs for 11 wells



Geology - Observations of Natural Fractures

Dataset

- Over 800 individual fracture observations have been assessed, measured, and classified
- Fracture analysis up to 2013/14 cores and FMI data complete.
  - Caprock core logging and fracture identification of high cores
  - Analysis and integration of new image logs into MacKay River caprock dataset

Fracture Frequency

- Fracture frequency higher for the lower part of the Clearwater Shale and the Wabiskaw A Shale than for the Wabiskaw D Mudstone.
- No observed correlation between natural fracture frequency and proximity to SAGD operations

Fracture Orientations

- Orientations continue to be random in azimuth based on image log analysis

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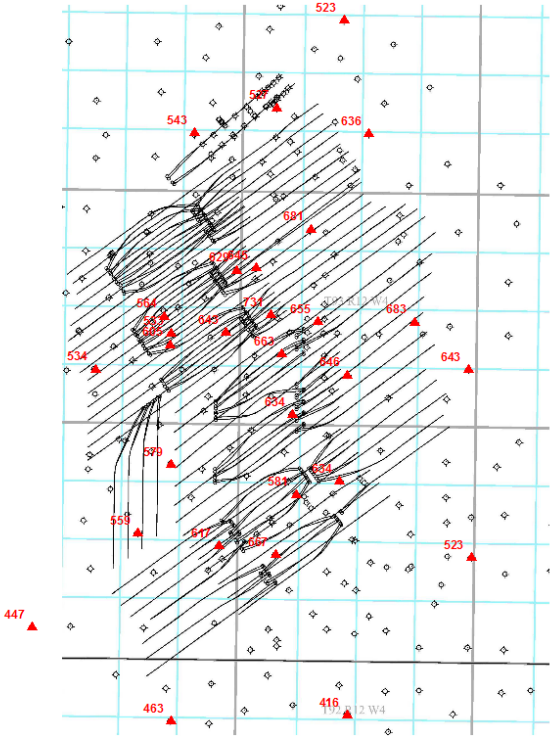
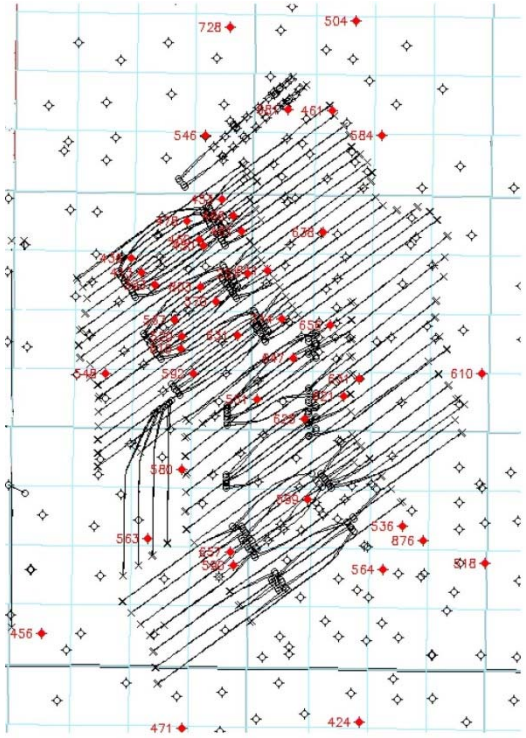
Monitoring: Wab C Pressure & Temperature

Wabiskaw C Pressure (kPag) – August 2014



Datumed to -313.6mSS

Wabiskaw C Pressure (kPag) – August 2015



Average pressure decrease of 7 kPa from August 2014 to August 2015

- Pressures are below hydrostatic and well below fracture pressures

10 Wabiskaw C wells with elevated temperatures directly above mature SAGD operations

- 2 wells between 90°C and 120°C - 8 wells between 30°C and 90°C
- Elevated temperatures are within the expected range as depicted by heat conduction calculations
- Ongoing analysis and simulation efforts are continuing to further understand underlying mechanisms

Monitoring: Wab C Alarms

- Observation well data is reviewed bi-weekly and automated alarms initiate proactive, more detailed daily review of data. The following alarm settings are used for the automated alarms:
  - High pressure – set to alarm at 90% of hydrostatic pressure in the OB well
  - Rising pressure – set to alarm if the pressure increase is >25 kPa/day
  - High temperature – set to alarm if the temperature is above its normal operating temperature range
  - Rising temperature – set to alarm if temperature increase is > 5 ^{o}C/day
  - The set point for the proactive alarms result in daily alarms if set conditions are exceeded; however, review of current alarms has resulted in no safety concerns

Monitoring: Wab C Response

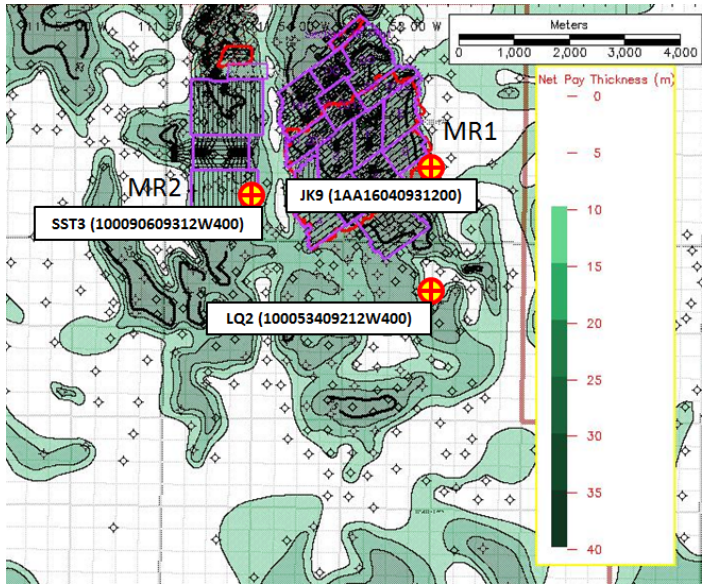
- In the event that pressure or temperatures are nearing levels of concern Suncor will:
  - Confirm the alarm pressure or temperature, and if accurate
  - Decrease injection pressure in the offsetting injection wells as appropriate
  - Monitor the response and adjust operations as required

- WBC-29 had resulted in above actions to be performed
  - Investigation confirmed measurements were inaccurate and not representative of formation pressure

Geo-Mechanics: Mini-frac Test

- No mini-frac tests conducted since last reporting period
- Fracture gradient within operating area still holds at or above 21 kPag/m
  - Fracture gradient measured (kPag/m) from mini-frac test

Formation	JK-9 (2014)	SST3 (2008)	LQ2 (2011)
McM		19.9	21.1
WabD	22.1	24.3	22.6
WabA	21.1		21.2
CW	22.3	24.1	21.3



Geo-Mechanics: Geo-mechanical Simulation Studies

Continued Calibration to Field Data, Pad specific modeling

- Re-calibrated the MacKay River geo-mechanical model
  - Utilizing pressure measurements in the WabC and McMurray
- Performed pad specific coupled geomechanical modeling for subsurface risk reviews
  - Based on current MOP design calculation
  - Verified sufficient factor of safety to tensile and shear failure in the caprock

Results

- Model predictions supported by field measurements; indicates good characterization of geomechanical model
- MOP design calculation continues to provide sufficient factor of safety to tensile and shear failure in the caprock

Geo-mechanical model inputs

- Lab tests to understand Wab A + McM geomechanical properties delayed
  - Performed scanning of various core to screen for lab testing in 2014

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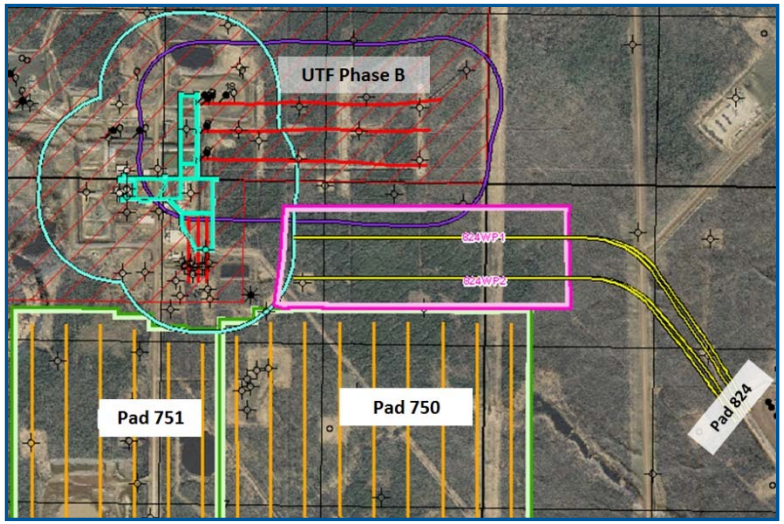
MacKay River Performance Presentation

Future Plans

Pad 824

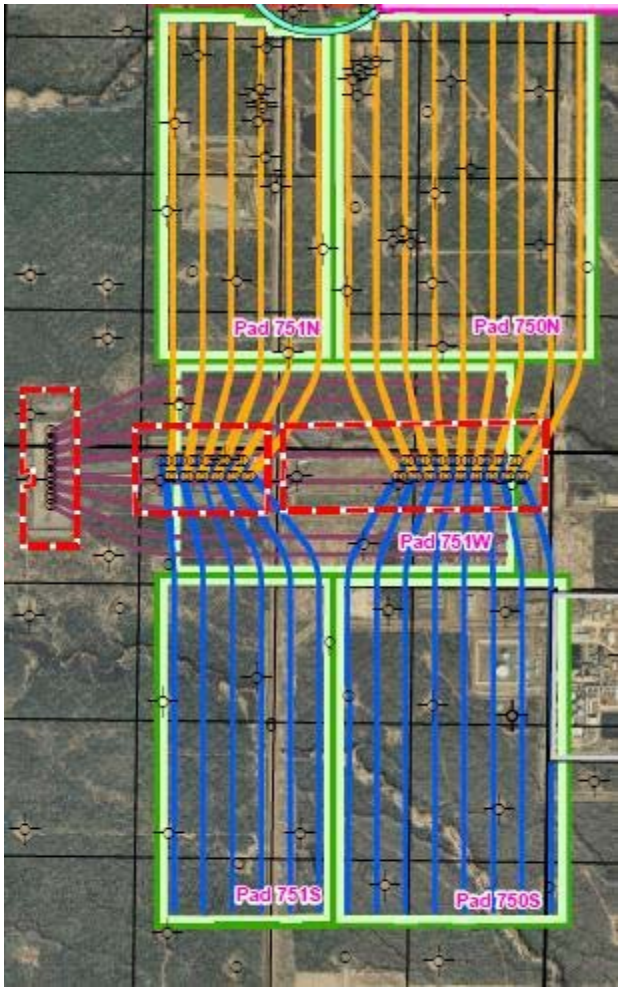
- Required to provide sustaining production for the existing MR1 central processing facility (CPF)
- 2 well pairs located between Pad 750 and the UTF
- Wells drilled from north of Pad 24
  - Drilling completed April 2015
  - Wells tied in to Pad 24 facilities
- Wells completed May 2015
  - ESPs installed in producers
  - Startup will involve steaming past the pump during circulation
- Approval received to use VX meter for well testing
- First steam expected in October 2015



Future Development: Pads 750/751

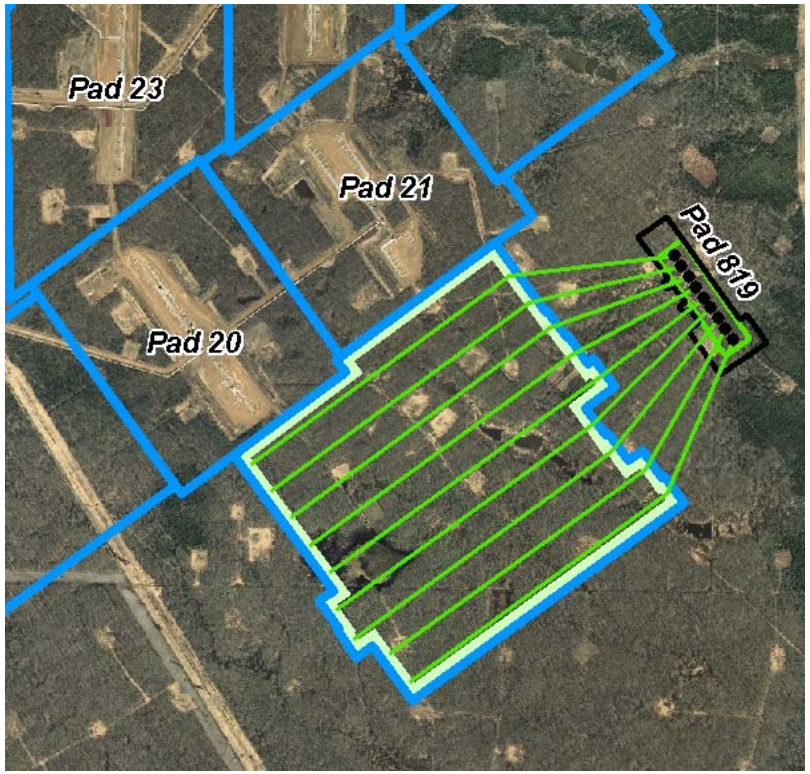
- Pad 750/751 is a future area of development within the MacKay River PA
  - To provide sustaining production for the existing MR1 central processing facility (CPF)
- Approval received August 7, 2012
  - 35 well pairs and 2 single producers
- Drilling completed June 2014
- First Steam for Pad 750 expected in September 2016

- To maintain maximum MR1 CPF capacity:
  - Pad 751 and remaining Pad 750 completions will occur in 2018/2019
  - First Steam for Pad 751 expected in 2020



Future Development: Pad 819

- Pad 819 is a future area of development within the MacKay River PA
  - To provide sustaining production for the existing MR1 central processing facility (CPF)
- Directive 078 amendment approval received in January 2014
  - 9 well pairs located south of existing infrastructure
- Drilling planned to be completed in 2020
- First steam expected in 2022

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MacKay River Performance Presentation

Appendices

Historical Approval Amendments

- **Amendment 8668A**
  - Changed annual average volume to 33,000 bpd (5,250 m^3/d)
- **Amendment 8668B**
  - Increase to project area
- **Amendment 8668C**
  - Additional project area
  - Approval to inject non-condensable gas
- **Amendment 8668D**
  - Additions to project area
  - Increase to annual average volume to 72,964 bpd (11,600 m^3/d)
- **Amendment 8668E**
  - Approval to drill four well pairs
- **Amendment 8668F**
  - Approval to change approval holder from Petro-Canada to Suncor
- **Amendment 8668G**
  - Approval to undertake amendments & modifications to CPF systems
  - Approval tie-in 6 well pairs to well testing facilities
- **Amendment 8668H**
  - Approval to conduct non-condensable gas injection test on Pad 21 wells
- **Amendment 8668I**
  - Approval to conduct non-condensable gas injection at the Section 16 Test Project
- **Amendment 8668J**
  - Approval to transfer portions of the Dover project area into the MacKay River project area
- **Amendment 8668K**
  - Approval to tie-in 16 well pairs to well testing facilities
- **Amendment 8668L**
  - Approval to the remove the limiting factor of a mole percent restriction for the B Pattern non-condensable gas injection test on Pad 21
- **Amendment 8668M**
  - Approval to inject chemical into Pad 22 wells
- **Amendment 8668N**
  - Approval to abandon 3 wells and suspend 1 well on Pad 20
- **Amendment 8668O**
  - Approval to change Phase 5F well trajectories
- **Amendment 8668P**
  - Approval to develop Pads 750/751/28 and add 2 sections to project area
- **Amendment 8668Q**
  - Approval to conduct a pilot of water treatment technologies
- **Amendment 8668R**
  - Approval to abandon well G1I
- **Amendment 8668S**
  - Approval to conduct chemical injection test on Pad 21 (D-Pattern Injectors)

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Historical Approval Amendments

- **Amendment 8668T**
  - Pad 819 Approval
- **Amendment 8668U**
  - Maximum Operating Pressure Approval
- **Amendment 8668V**
  - NCG Expansion Project and Phase 5D/F Chemical Injection Approval
- **Amendment 8668W**
  - MR CPF Expansion Project and Directive 081 Waiver Approval
- **Amendment 8668X**
  - Administrative reissue approval
- **Amendment 8668Y**
  - WHIP for Phases 5B2, 5D and 5F Patterns approval

MacKay River Project Overview

Pad	Pattern	Phase	# Well Pairs	Well Pairs	Spacing	First Steam
20	A	1	7	A1 - 7	100	Sep-02
	C		6	C1 - 6	100	
21	B		7	B1 - 7	100	
	D		5	D1 - 5	100	
22	E	2	7	E1 - 7	100	Jan-06
	G		7	G1- 7	100	
23	F	3	7	F1 - 7	100	Sep-07
24	OO	4	3	OO1-3	75	Oct 2008 - Apr 2009
		5B-1	6	OO4-9	75	Feb-12
		5DF	6	OO10-15	75	May-14
	H	4	4	H1 - 4	100	Feb 2009 - Jun 2010
25	QQ	4	2	QQ2-3	75	Nov-08
		5A	2	QQ4-5	75	Jul-11
		5B-2	5	QQ6-10	75	Jan - May 2013
		5DF	6	QQ11-16	75	Jun-14
	NN	4	1	NN1	75	Dec-08
		5A	4	NN2-5	75	Jun - Jul 2011
		5B-2	5	NN6-10	75	Jan - Feb 2013
		5DF	6	NN11-16	75	Jun-14
40	Section 16		2	S16 1-2	120	Oct-05

- Optimal well spacing is evaluated for each new development
- Currently evaluating feasibility / safety for infill wells

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Suncor MacKay River Project
2015 AER Performance Presentation: Surface Commercial Scheme Approval No. 8668

December 17, 2015
Reporting Period September 1, 2014 – August 31, 2015

AER Directive 054
2015 Performance Presentation

Section 3.1.2 – Surface Operations, Compliance, and Issues not related to Resource Evaluation and Recovery

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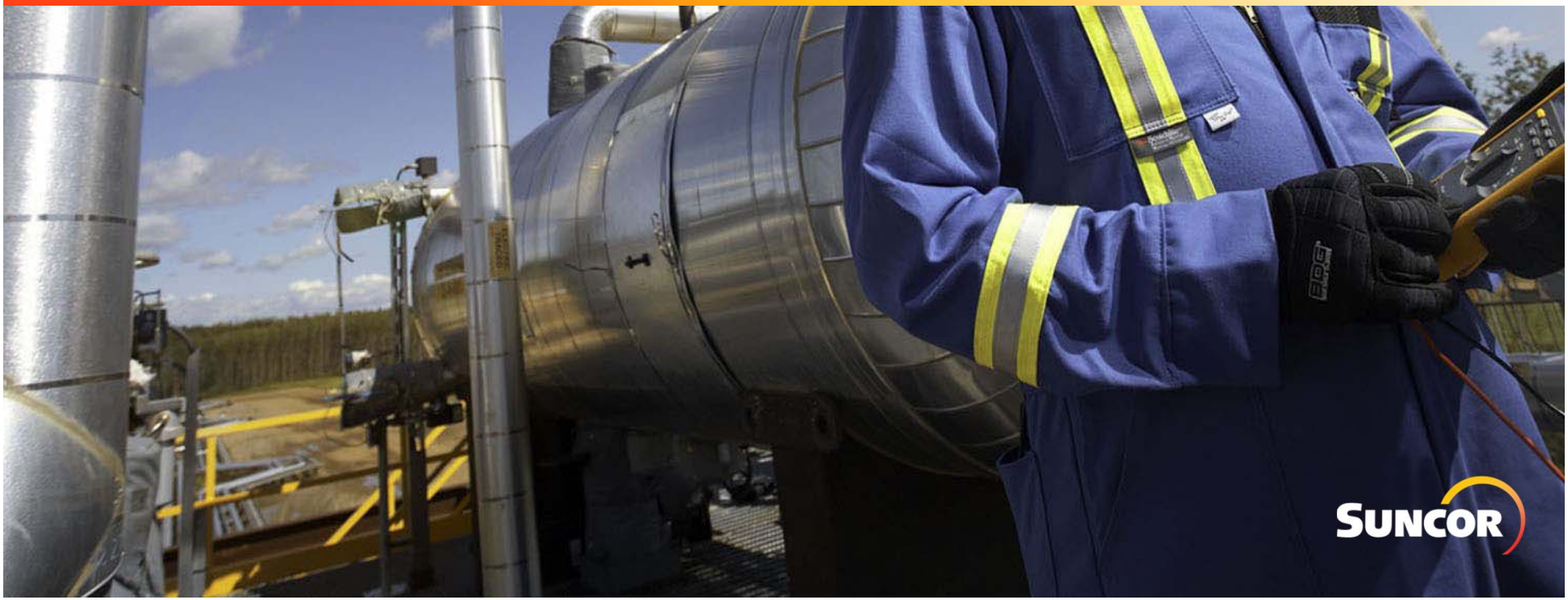
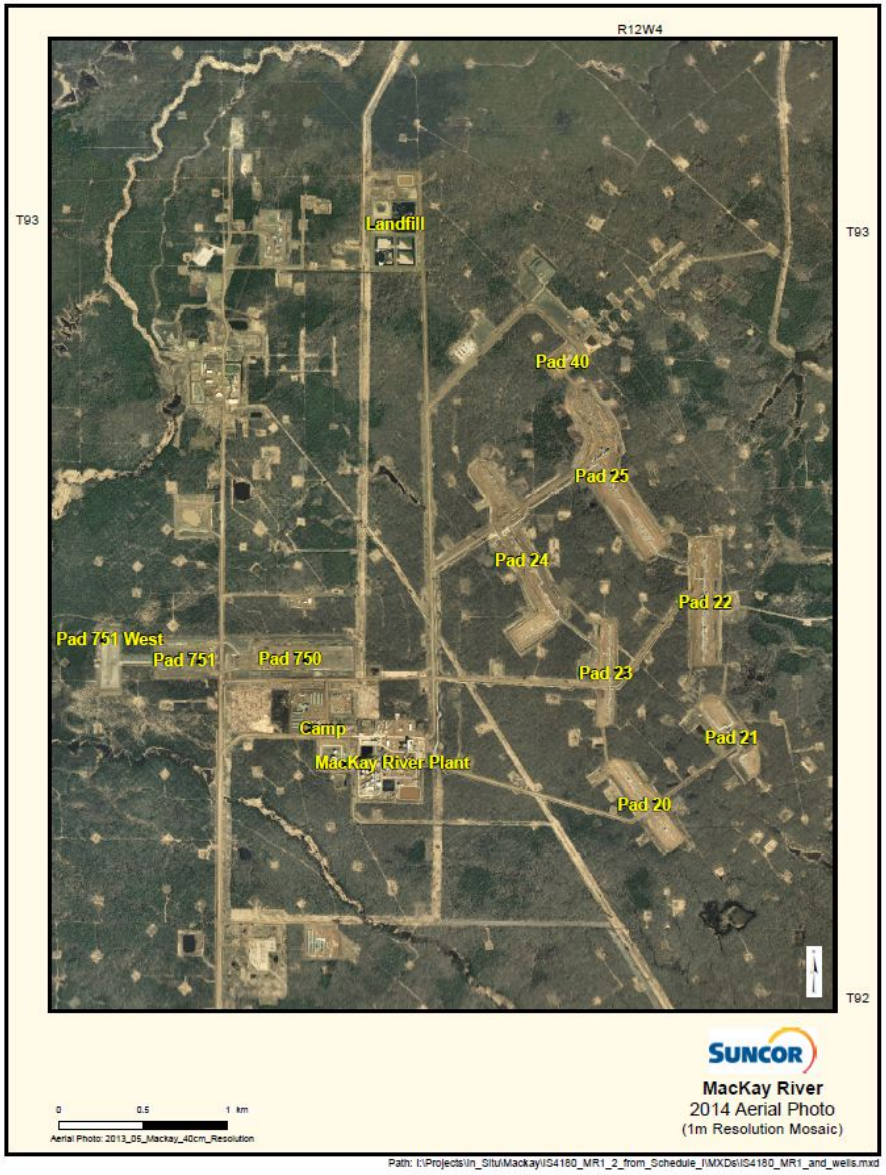
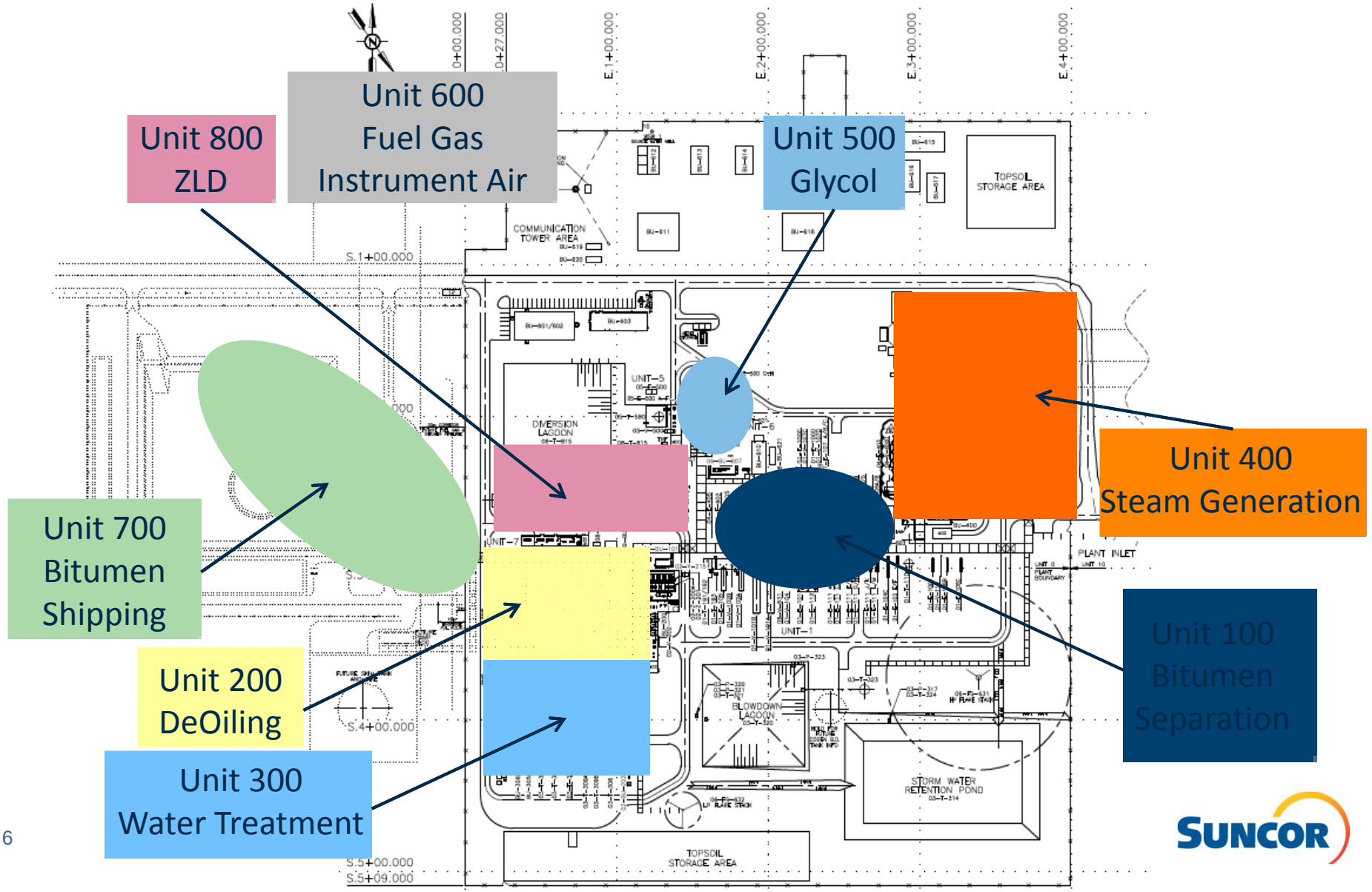
Facilities



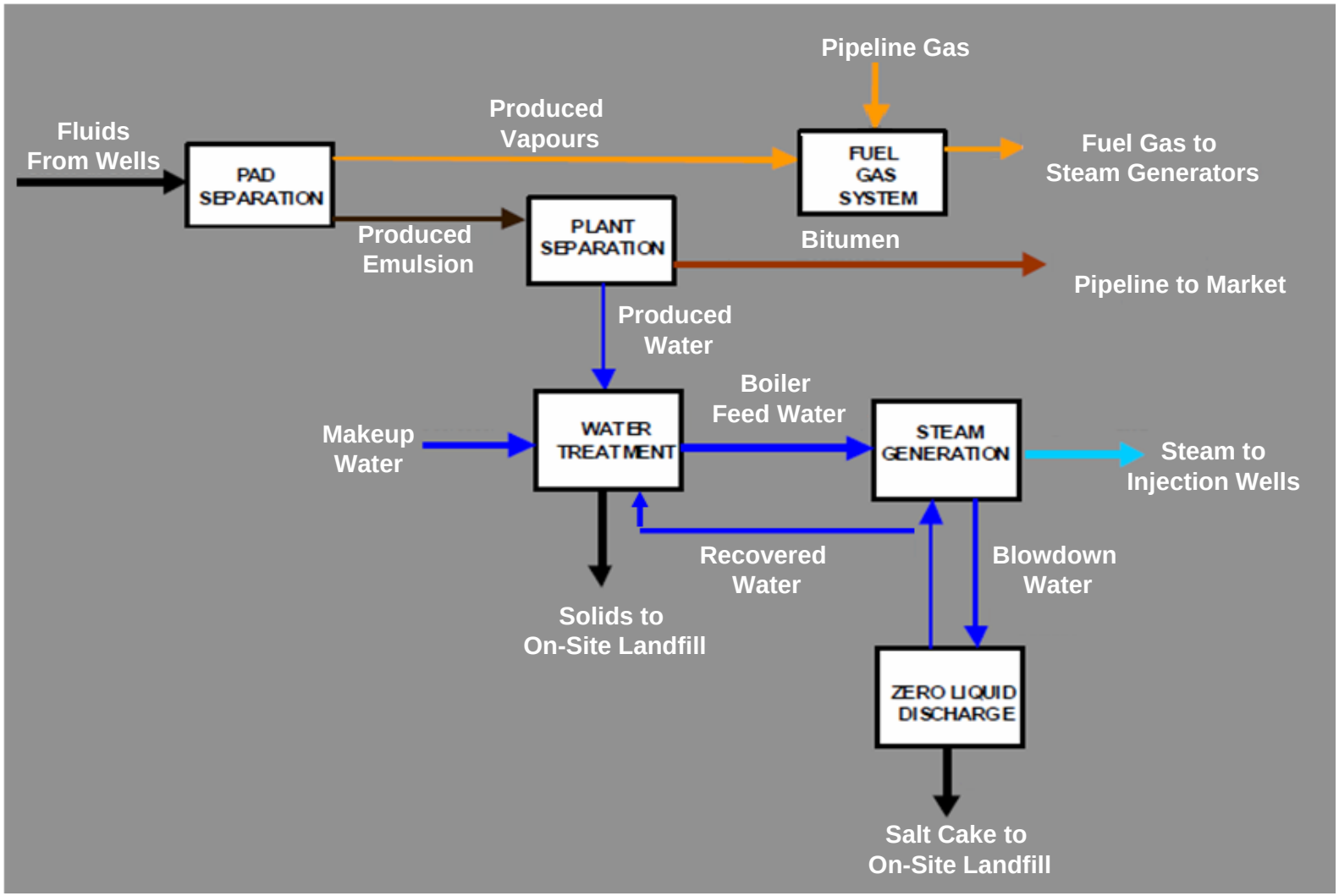
MacKay River Project Site



CPF Plot Plan

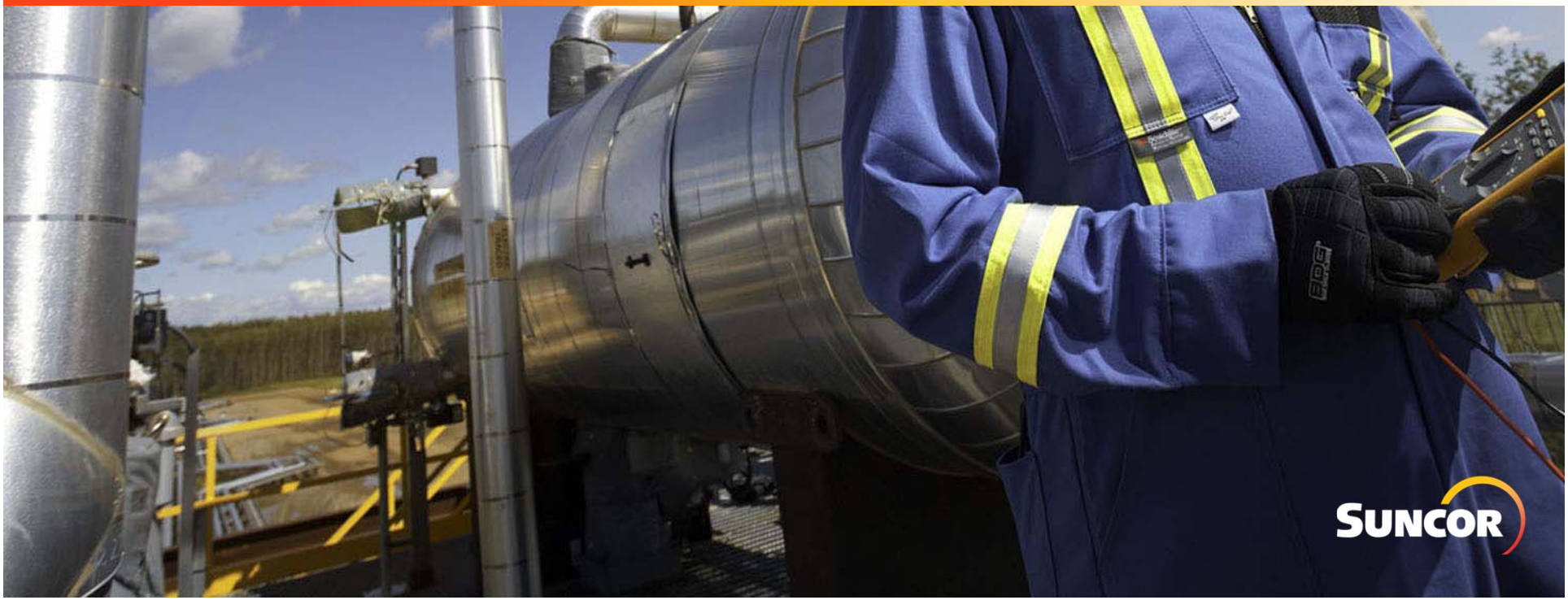


Simplified CPF Process Block Diagram



MacKay River Performance Presentation

Central Processing Facility Performance



CPF Performance (September 2014 - 2015 YTD)

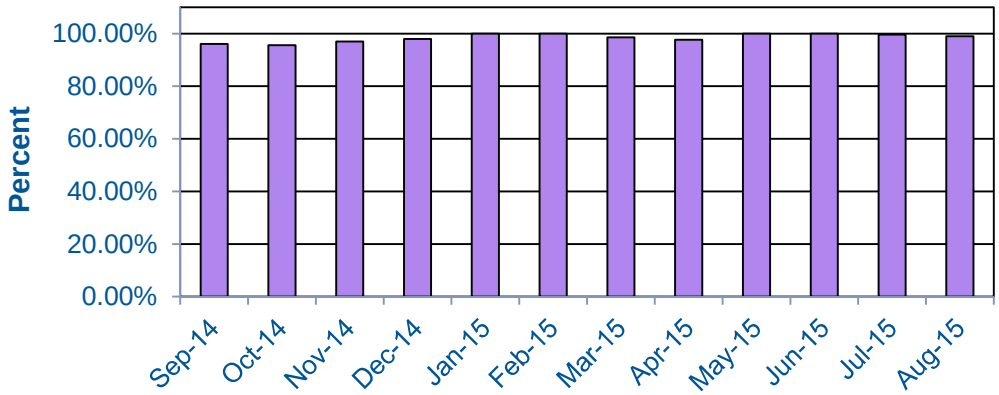
MR CPF has been remained very reliable:

- Strong performance in water treatment plant operation
- Implemented initiatives to enhance OTSG/HRSG online time

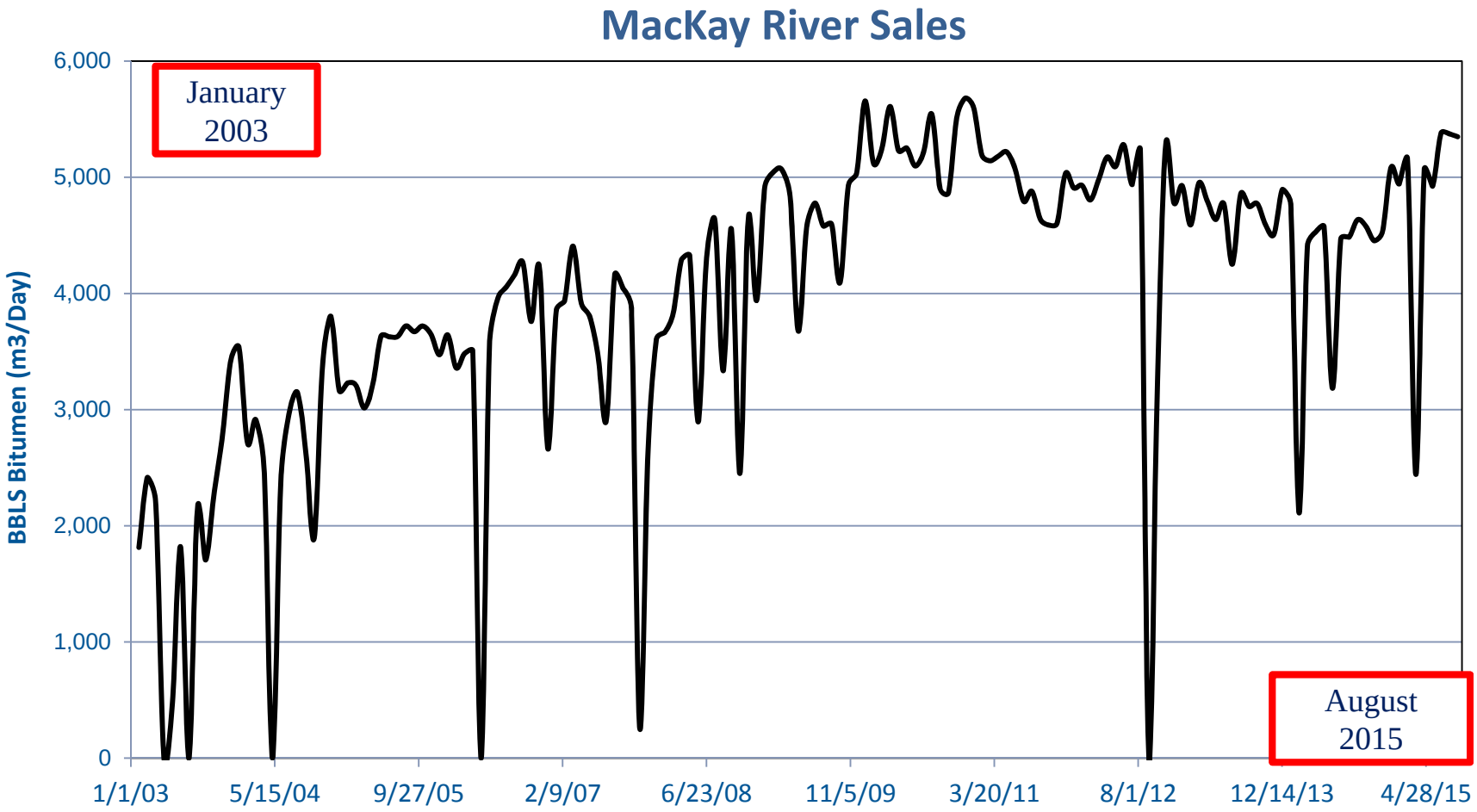
Major challenges:

- Minor plant upset in water treatment plant during March.

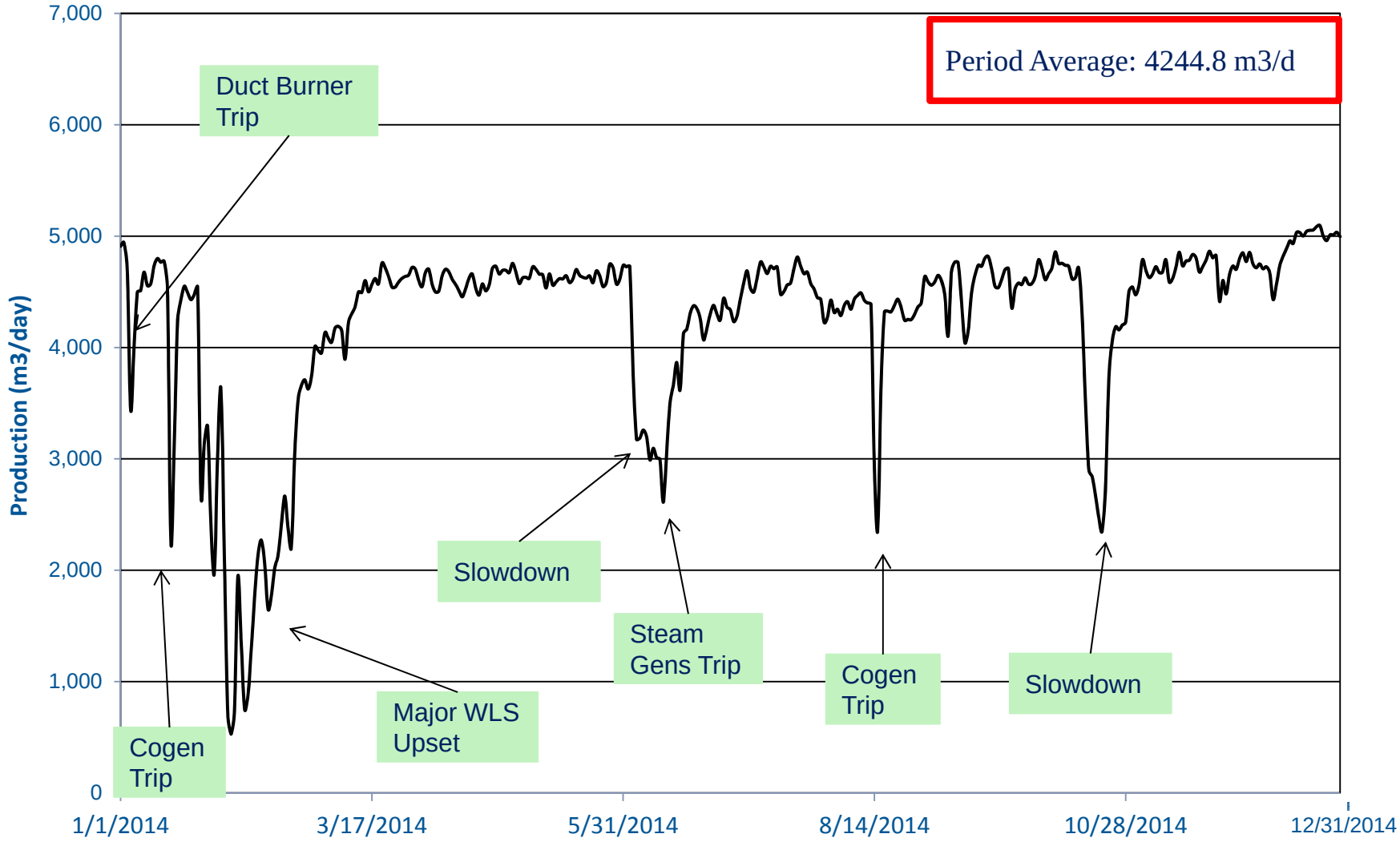
Average 98.5%
(September 2014 to August 2015)



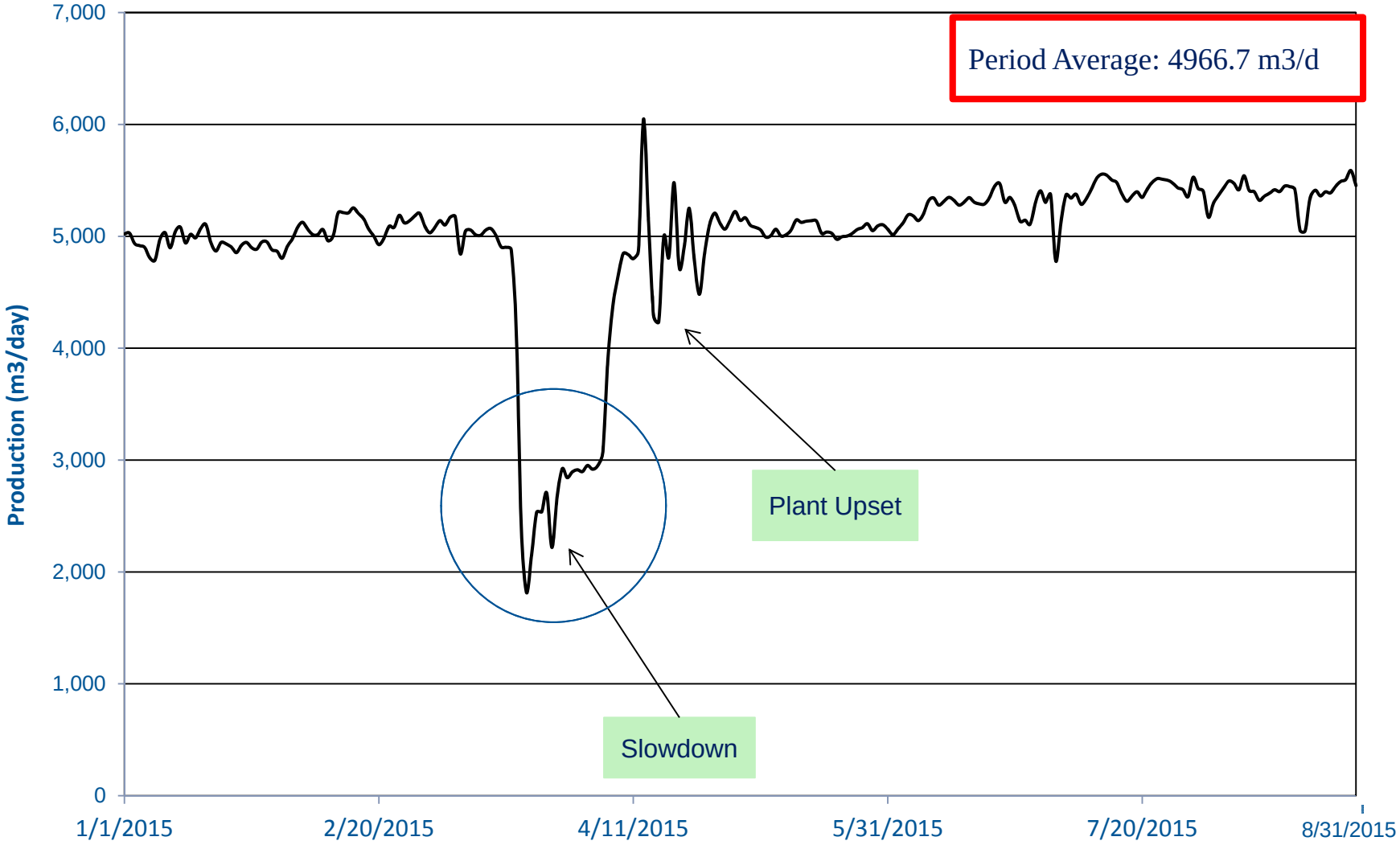
Historical Production (January 2003 – 2015 YTD)



Production (2014)



Production (January 2015 to August 2015)



Water Treatment Technology

Warm Lime Softening (WLS) and Weak Acid Cation (WAC) softening for produced water

Zero Liquid Discharge (ZLD) System on blowdown slip stream:

- Evaporators: one steam and one mechanical driven
- Crystallizer: Steam driven
- Dryer: gas fired
- Filter press (2): back up for dryer

Boiler Feed Water (BFW) Quality

Parameter	Avg. Value (Sept 2014 – Aug 2015)	Max Value During Period	BFW Specifications
Temperature, ºC	151.14	169.76	140 – 170
Hardness (Dissolved), mg/L	0.23	0.93	< 1.0
Total Dissolved Solids, mg/L	6115.3	7682.9	< 8000
Silica, as SiO2, mg/L	23.53	67.43	< 50.0

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Water Treatment Successes and Challenges

The WLS performance has been steady for 2015:

- Reliability is 98.6%
  - Consecutive days within spec: 148 days Parameters: temperature, hardness, total dissolved solids, pH, silica, oil, free oxygen, total dissolved iron
  - Reliability of water treatment system significantly enhanced due to a renewed focus on operational targets

Challenges:

- Lower Warm Lime Softener performance entering Q3 2015
  - Water quality was within operational targets
  - Problem within WLS rectified during turnaround activities

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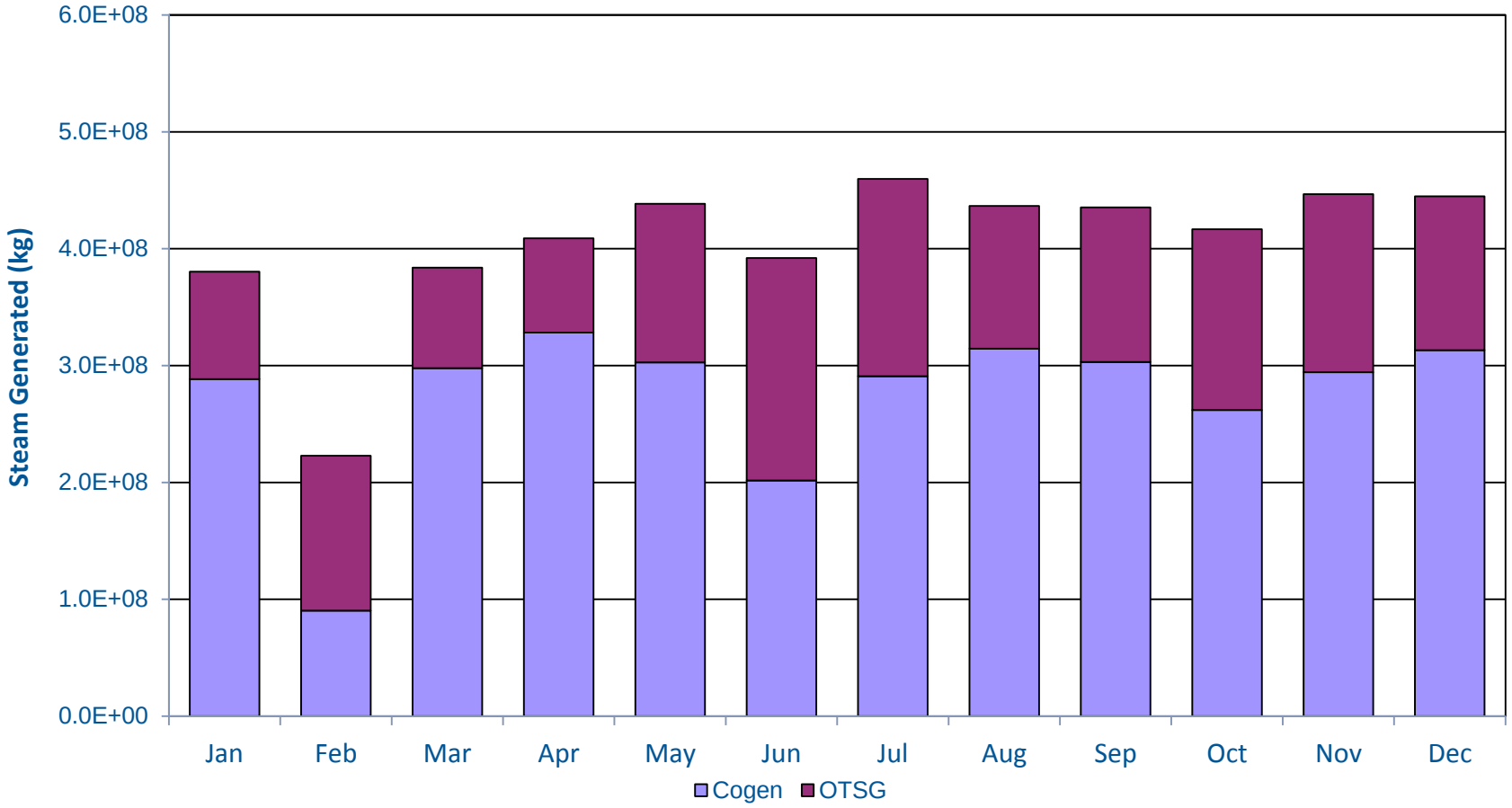
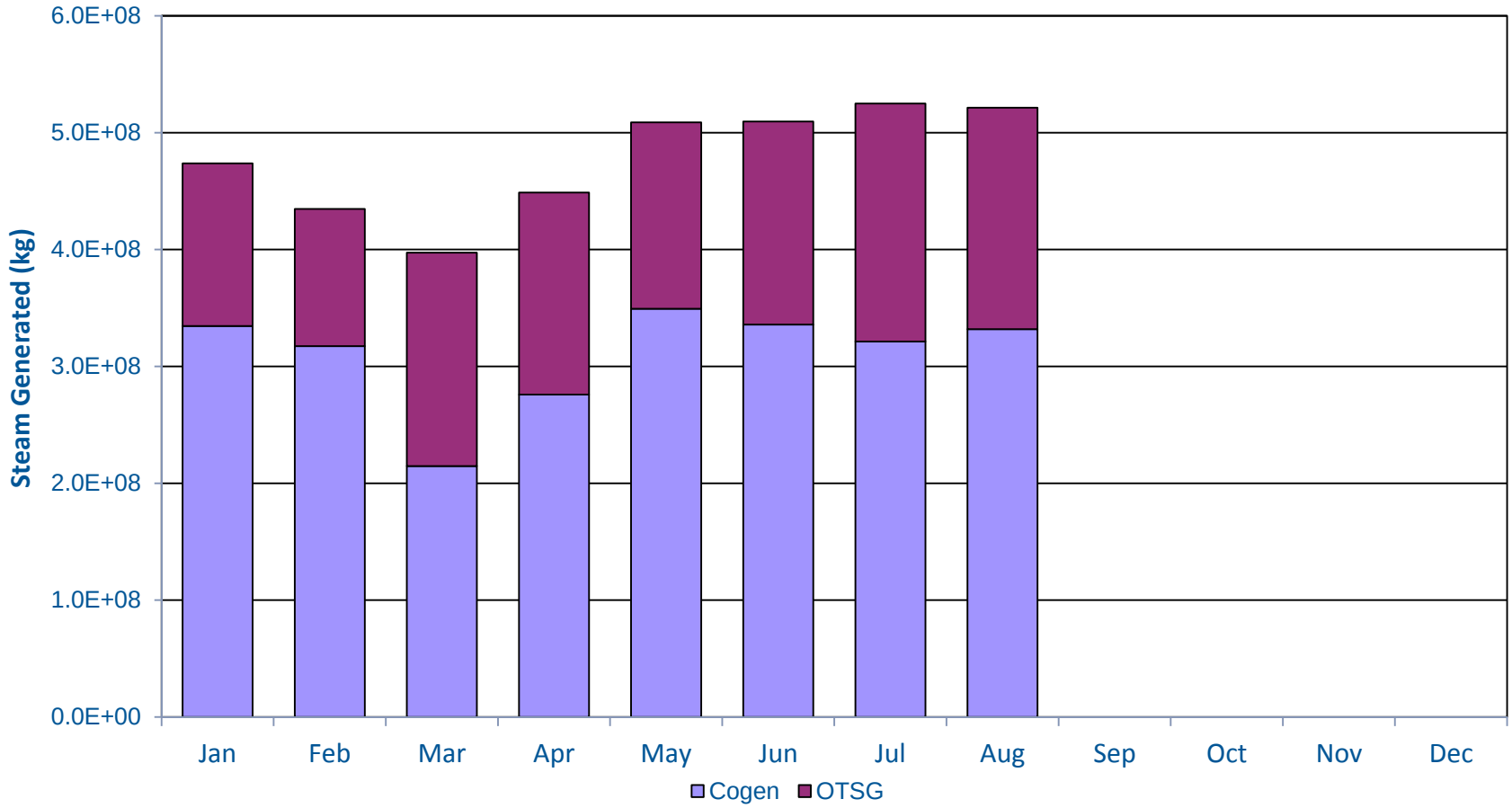
Steam Generation (2014)



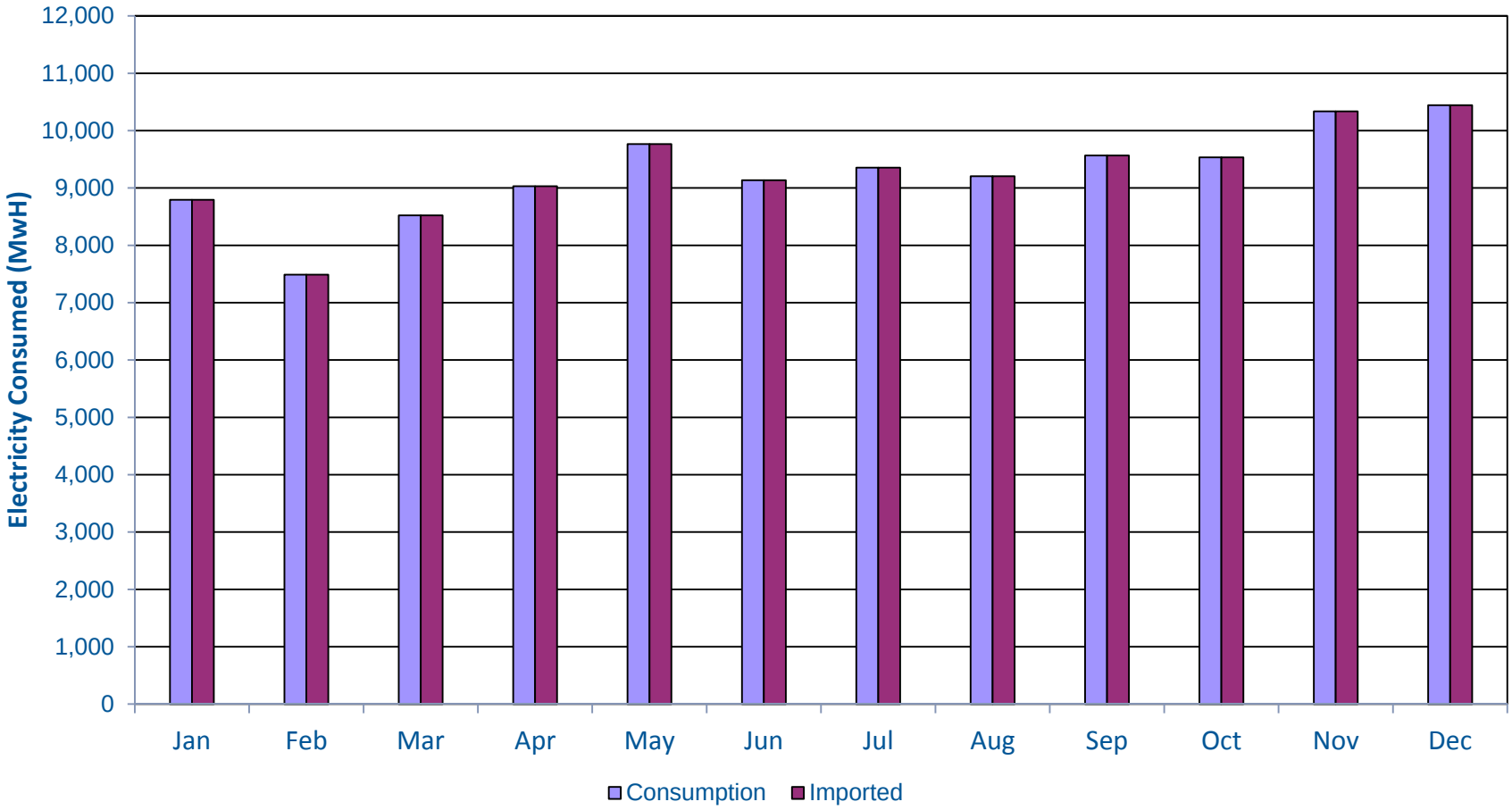
Steam Quality from Co-gen is maintained approximately 77% and OTSG is approximately 80%

Steam Generation (2015 YTD)

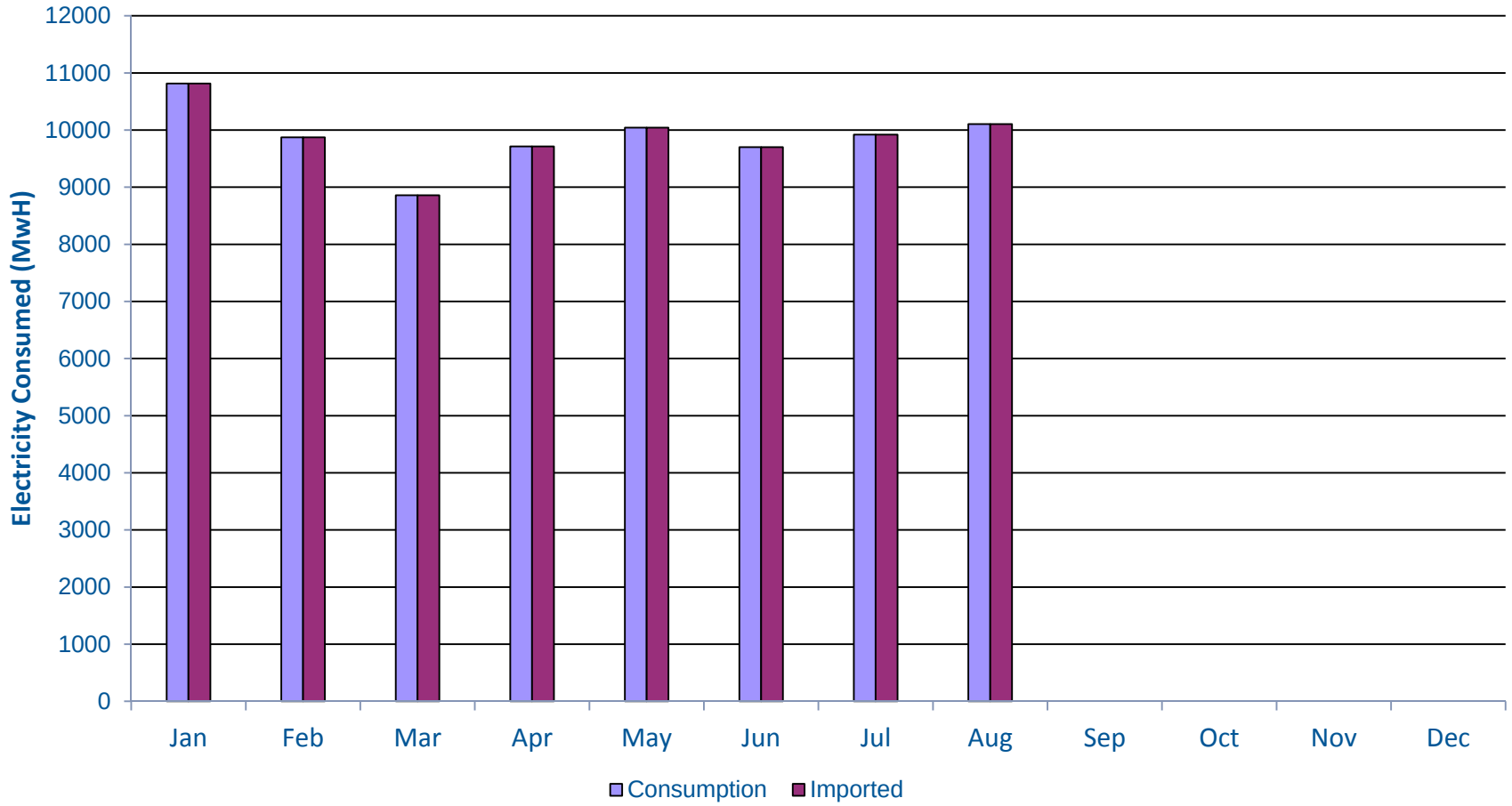


Steam Quality from Co-gen is maintained approximately 77% and OTSG is approximately 80%

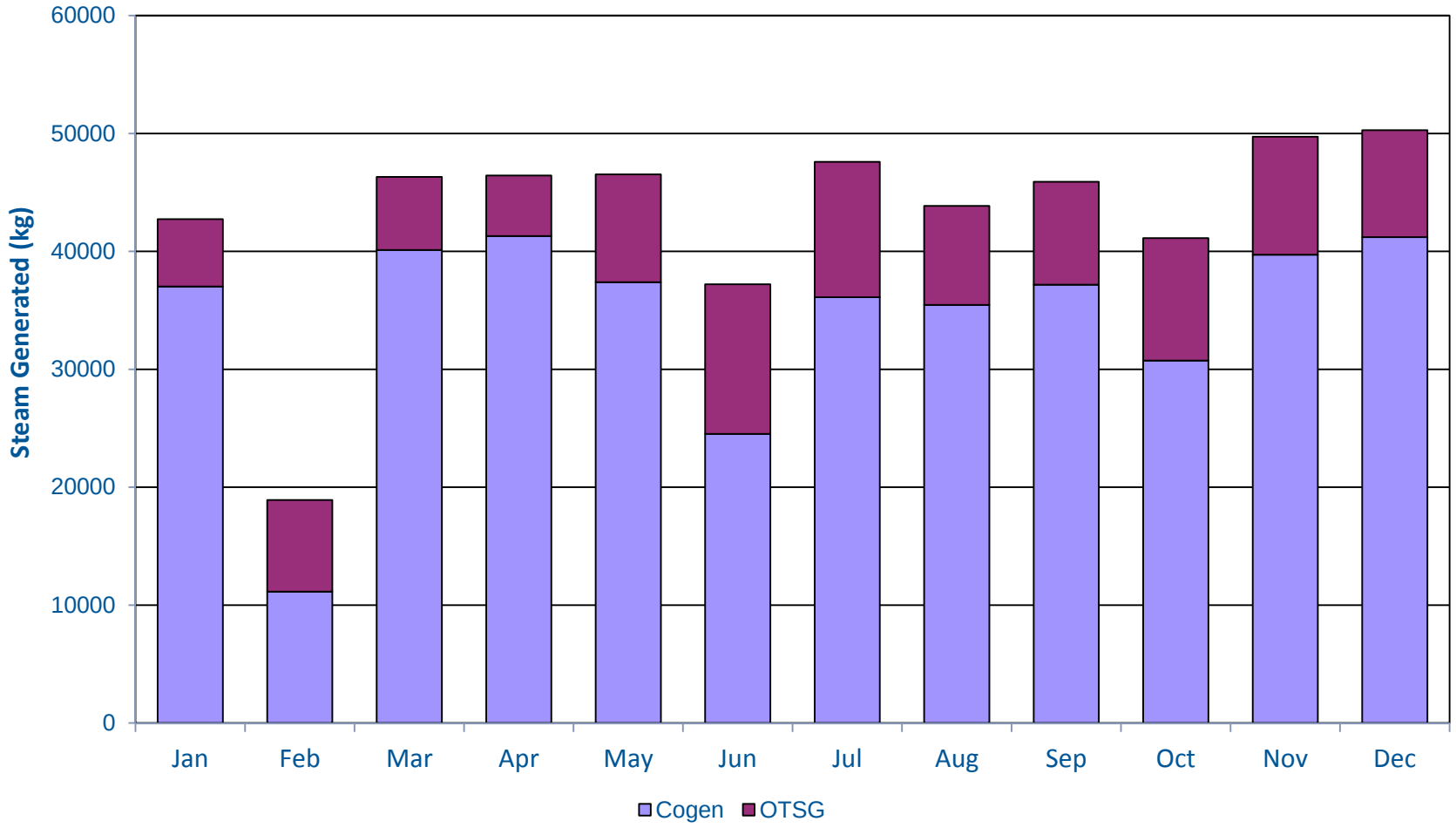
Power Generation (2014)



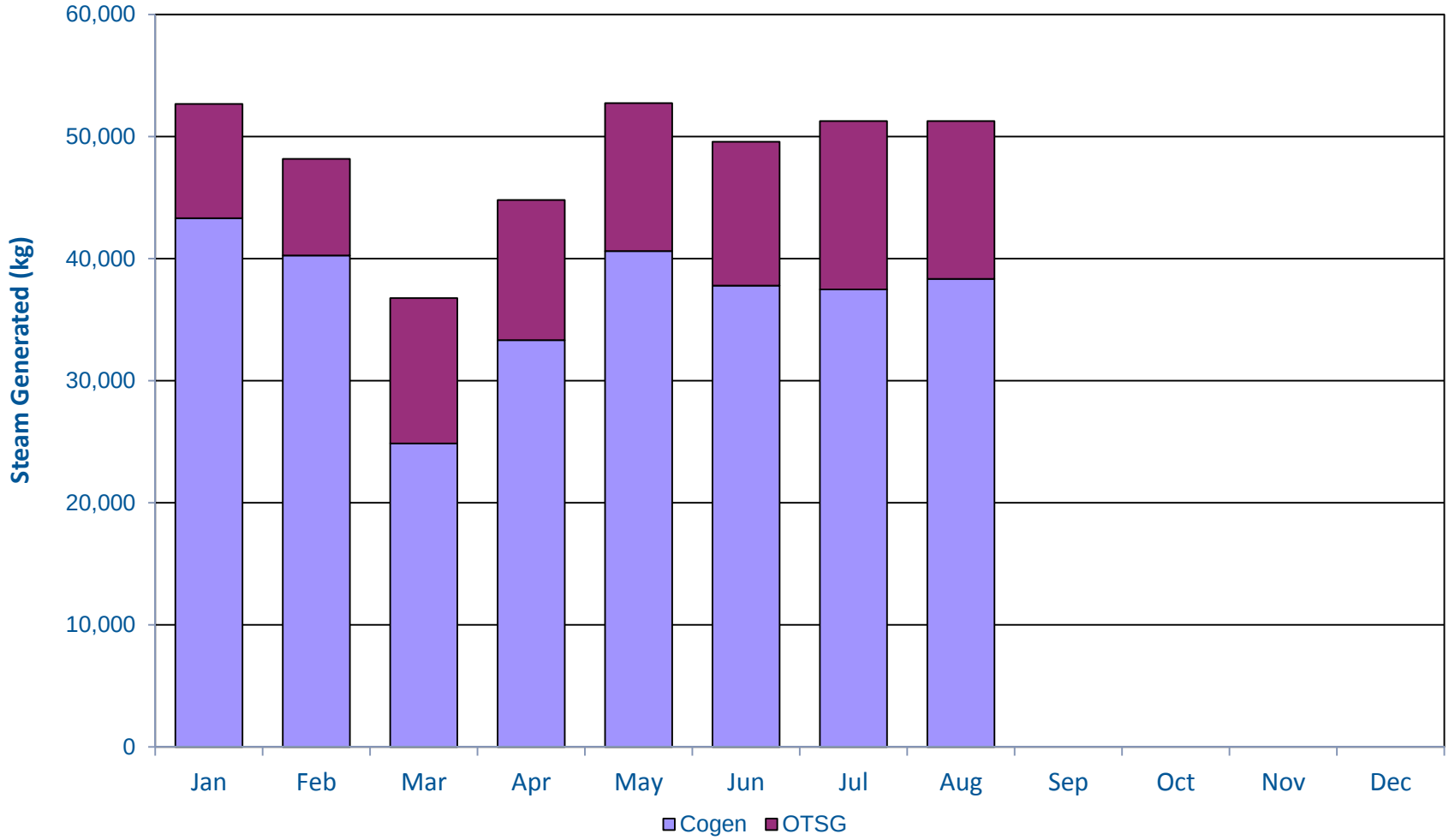
Power Generation (2015 YTD)



Gas Consumption (2014)



Gas Consumption (2015 YTD)



Energy Intensity

Energy Intensity Formula

- Energy Intensity (GJ/m^3) = Total energy consumed by site / Sales bitumen volume

- Total energy consumed by site (GJ) = Energy used to make steam in Cogen + Natural Gas imported to site + Solution gas to Cogen + Electricity consumed by site – Mixed gas to Cogen duct firing
  - Note that the term “site” does not include Cogeneration

- Energy used to make steam in Cogen (GJ) = BFW Mass Flow Rate to Cogen x Hourly average difference in enthalpy between steam and BFW

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Cogeneration Agreement with TransCanada Energy

Energy exchange: TransCanada Energy (TCE) provides steam and electricity to Suncor in exchange for BFW and a "fee"

- Fee calculated as GJ of fuel gas equivalent in compensation for steam and electricity (energy equivalent value based on contractual formula)
- Suncor provides on-spec BFW and fuel gas, maintains MacKay River facility within specified outage hours and takes a minimum steam requirement
- Mixed gas supplied by Suncor to TCE credited against total gas "fee" requirement
- TCE required to provide all other excess gas for the operation of the cogeneration facility
- TCE sells excess electric energy generated by the cogeneration facility to the market

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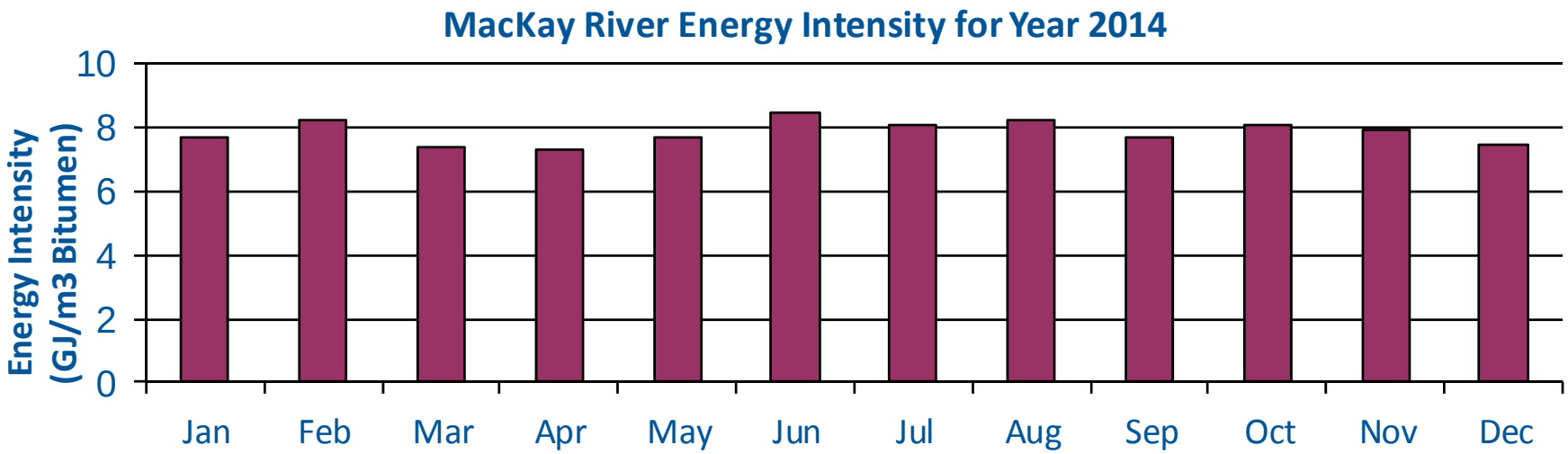
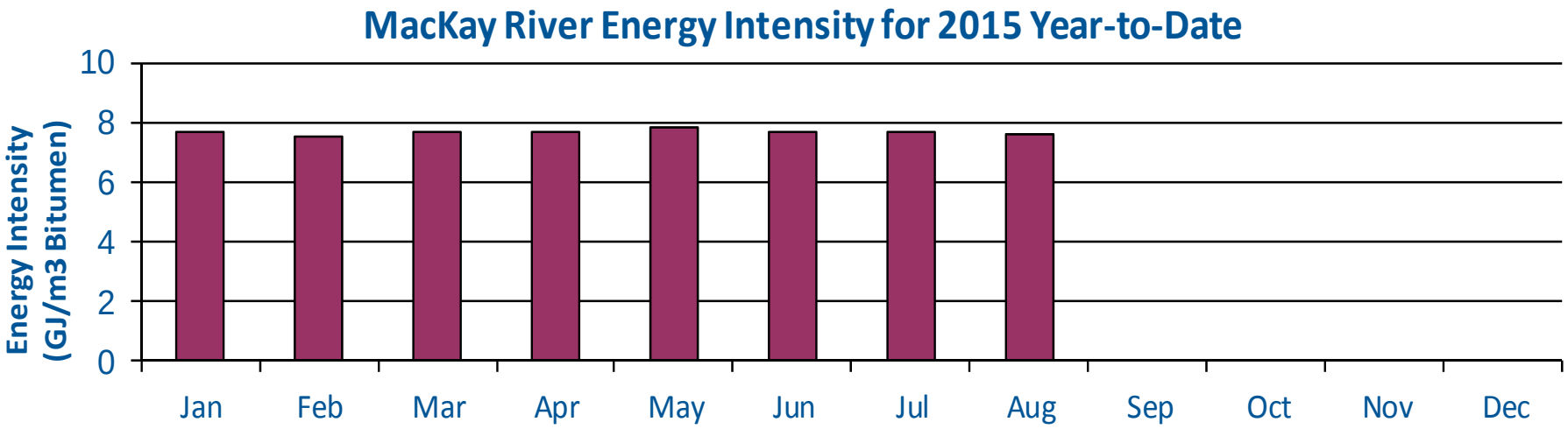
Energy Intensity (2014)

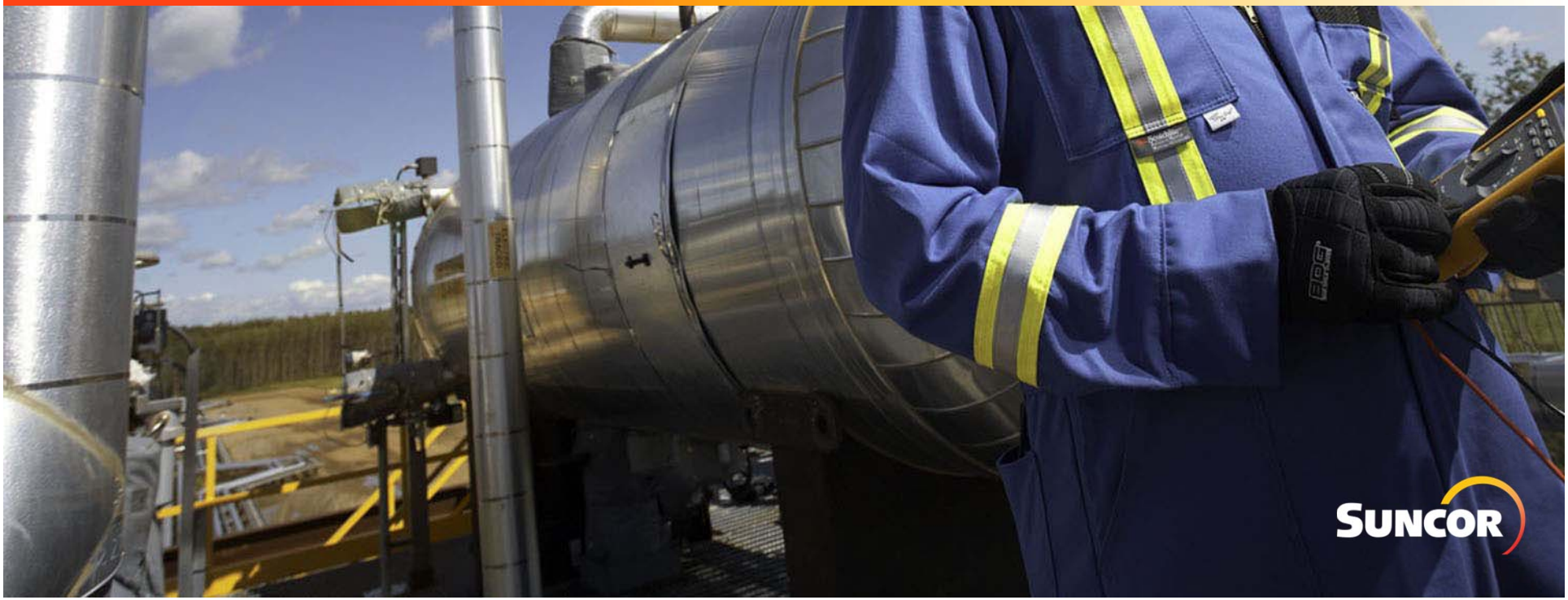


Energy Intensity (2015 YTD)



MacKay River Performance Presentation

Measurement and Reporting



Measurement Accounting & Reporting Plan (MARP)

- MARP approved in April 2010
- MARP was updated on February 28, 2015
- MARP details all the required data in Directive 42
- MacKay River Report Codes:
  - Battery – AB BT 0067097
  - Injection Facility – AB IF 0009498
  - Meter Station – AB MS 0084090

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Well Testing Strategy

Test Separators are used to test all wells for production allocation
Fully compliant with Directive 017

Pad 20 and Pad 21 Well Testing Strategy

- 12 active SAGD producers per pad, 4 hour tests (+ purge time)

Pads 22 Well Testing Strategy

- 23 active SAGD producers, 5.5 hour tests (+ purge time)
- No long grandfathered as a result of the Directive 017 update
- Phase 5A (NN2-5, QQ4-5) are tested via Pad 22 Test Separator

Pads 23/24 Well Testing Strategy

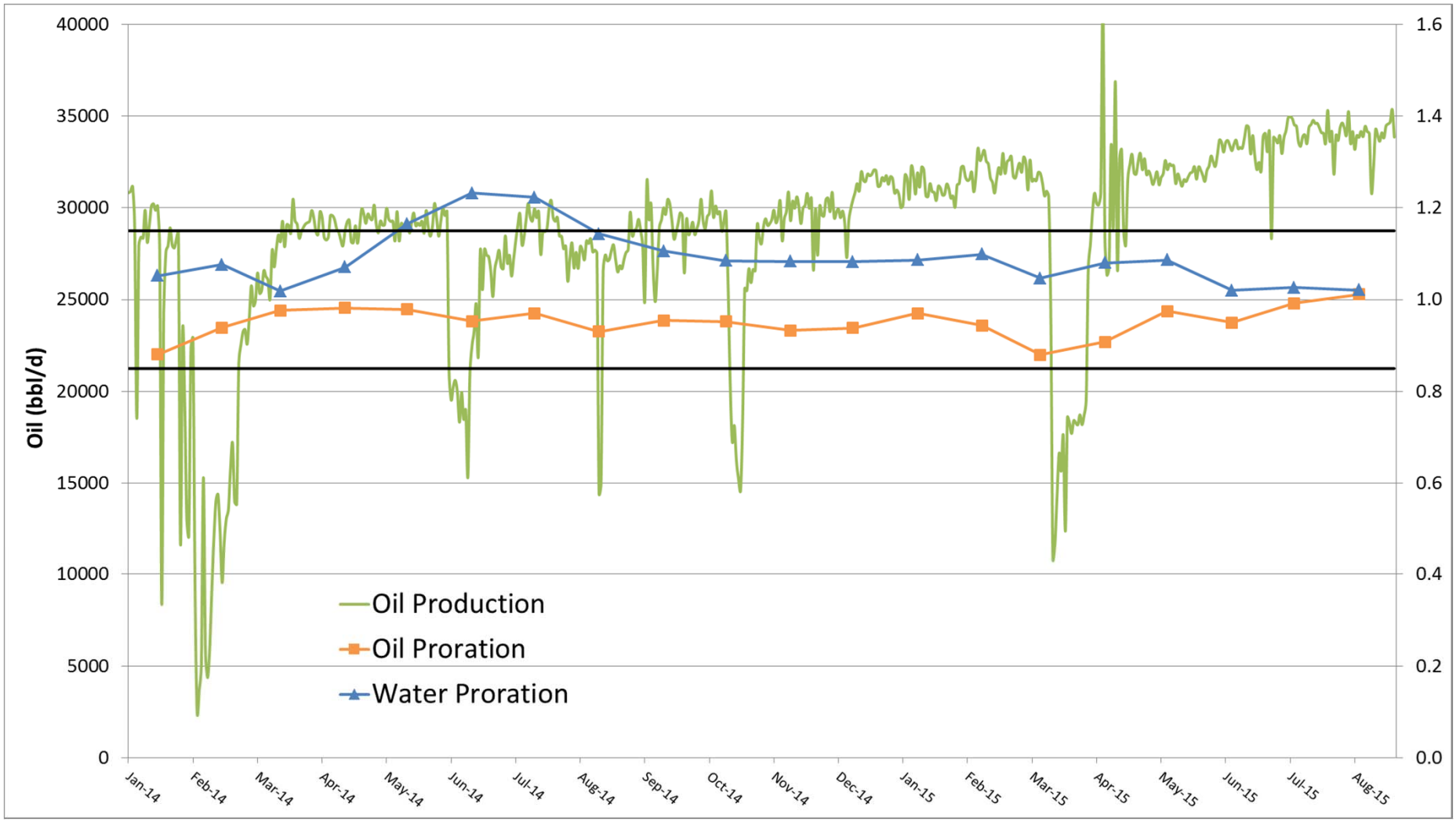
- 14 active SAGD producers, 7 hour tests (+ purge time)

Pad 25 Well Testing Strategy

- V-100 Test Separator
  - 10 active SAGD producers, 5 hour tests (+ purge time)
- V-1100 Test Separator – *Recalibrated May 2015 once substantial steady production achieved*
  - *12 active SAGD producers,* 5 hour tests (+ purge time)
- V-1150 Test Separator - *Recalibrated May 2015 once substantial steady production achieved*
  - *12 active SAGD producers*, 6 hours test (+ purge time)

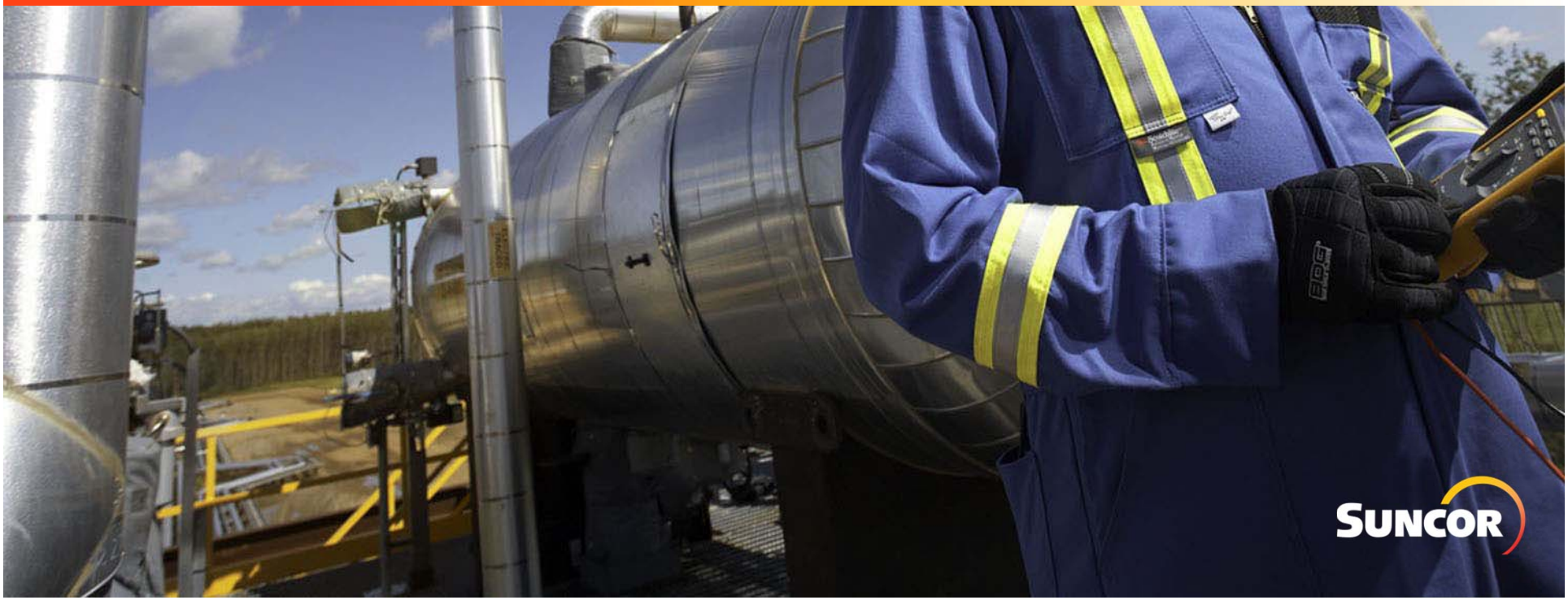
Proration of Oil and Water

- Average for 2014: Oil Factor = 0.95 Water Factor = 1.1
- Average for 2015 YTD: Oil Factor = 0.95 Water Factor = 1.06

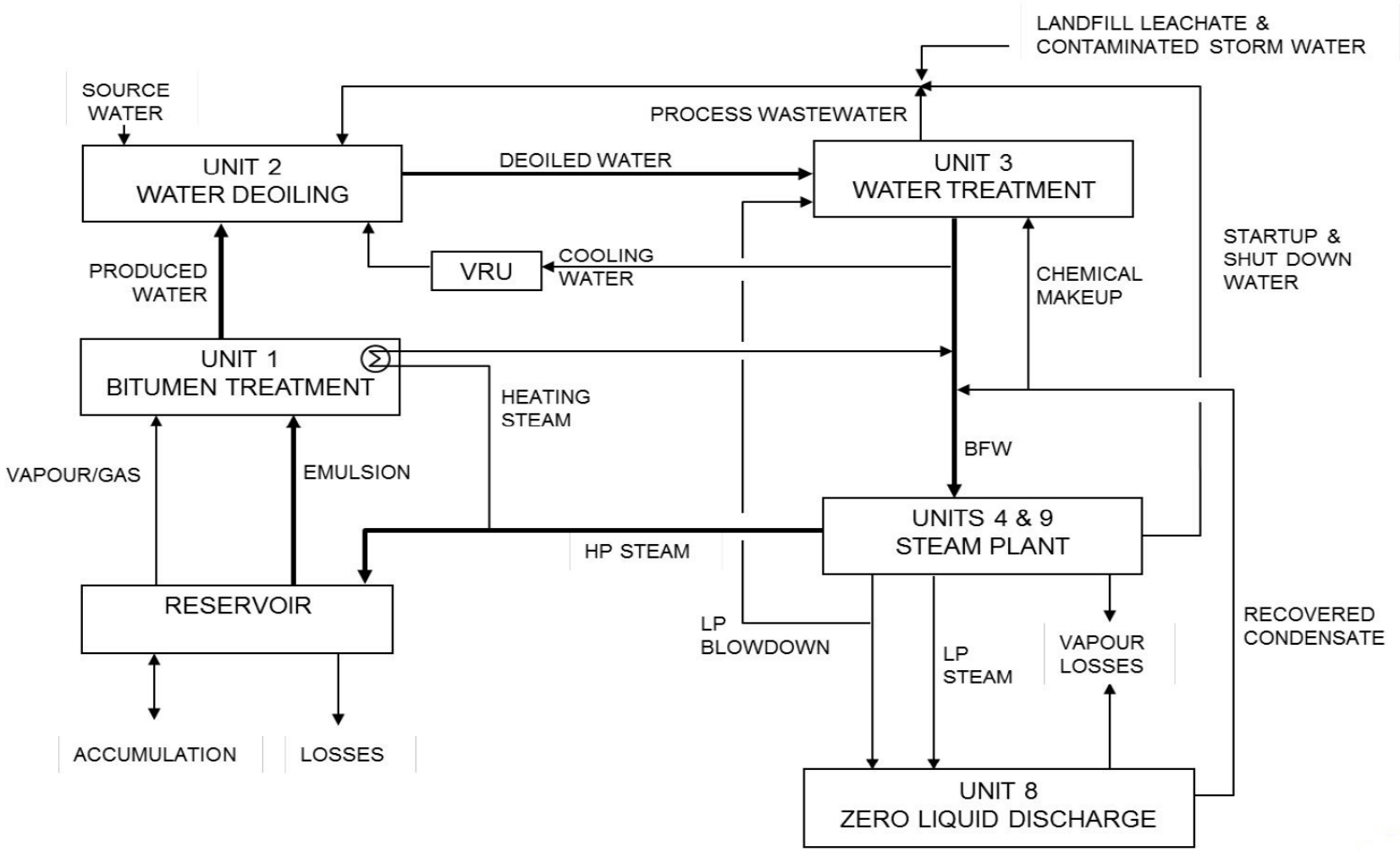


MacKay River Performance Presentation

Water Production, Injection and Use



CPF Water Traffic



Fresh Water

Source Water Wells

- *Water Act* Licence No. 00188229-02-00 (511,000 m3/y) Birch Channel Aquifer (Renewal issued September 2012)

1. 13-05-093-12W4 (GD-SW-212-53; formerly WSW-1), max. rate 450 m3/day
2. 04-08-093-12W4 (GD-SW-213-86; formerly WSW-2), max. rate 1368 m3/day
3. 04-08-093-12W4 (GD-SW-215-91; formerly WSW-3), max. rate 1411 m3/day

Domestic Water Well

- *Water Act* Licence No. 00249470-01-00 (25,550 m3/y) Birch Channel Aquifer

4. 12-05-093-12W4 (CWSW-SW-218-55), max. rate 123 m3/day

- Monthly reporting done through Water Use Reporting System (WURS)

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Raw Water Source Wells

test		water analysis
physical	EC (uS/cm)	864
	pH (units)	8.21
	Tot Hard as CaCO2 (mg/L)	416
	Tot Alk as CaCO3 (mg/L)	402
inidicators	Chloride:D (mg/L)	0.53
	Sulphate:D (mg/L)	108
	Iron:D (mg/L)	<0.030
	Manganese:D (mg/L)	0.277
	TDS-calculated (mg/L)	535
cations, anions & ion balance	Calcium:D (mg/L)	110
	Magnesium:D (mg/L)	34.2
	Potassium:D (mg/L)	5.18
	Sodium:D (mg/L)	35.6
	Bicarbonate:D (mg/L)	490
	Carbonate:D (mg/L)	<5.0
	Hydroxide:D (mg/L)	<5.0
	Fluoride:D (mg/L)	0.23
	Ion balance % (%)	--
nitrogen parameters	NO2 as N (mg/L)	<0.050
	NO3 as N (mg/L)	<0.050
	NO2 + NO3 as N (mg/L)	<0.071
	DKN (mg/L)	---
	TKN (mg/L)	---
	Tot Amm N (mg/L)	---
phenols	phenols (mg/L)	---
PAH	Naphthenic Acids (mg/L)	---

Typical water quality assessment parameters

Monitoring station GD-SW-212-53 (formerly WSW-1)

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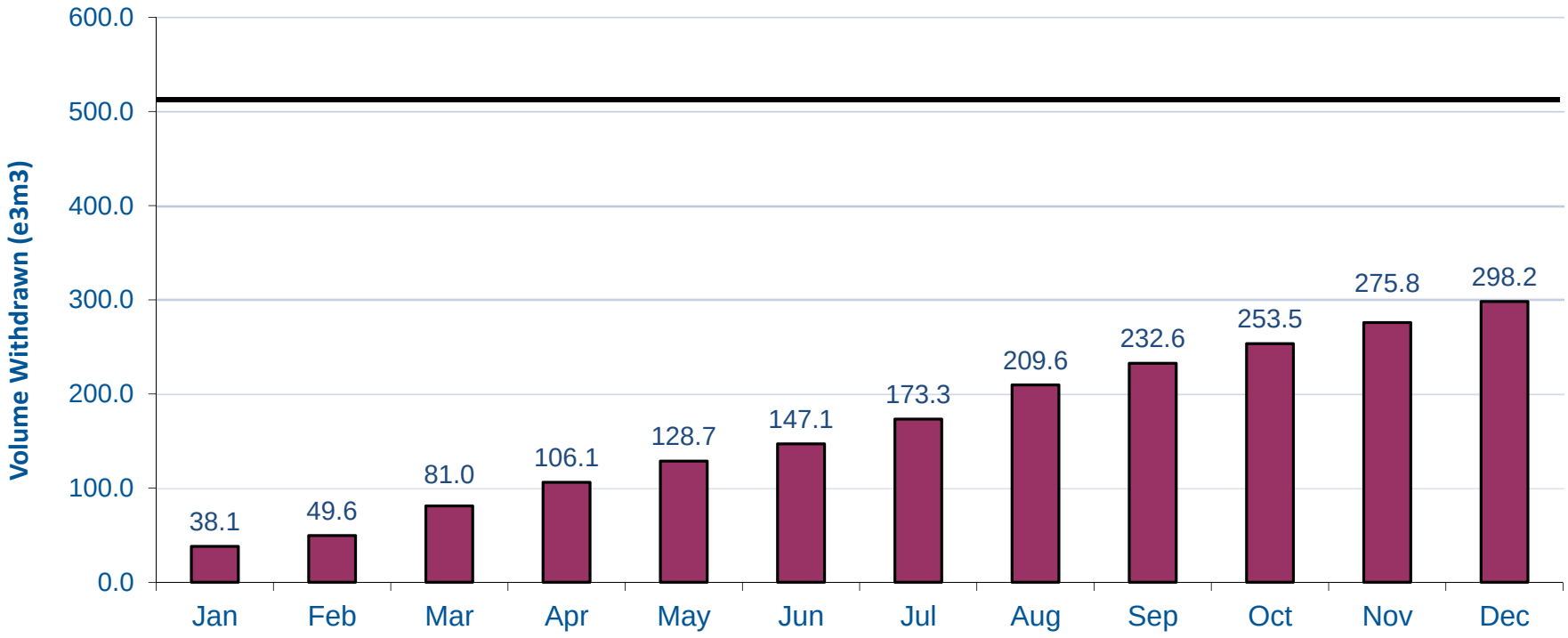
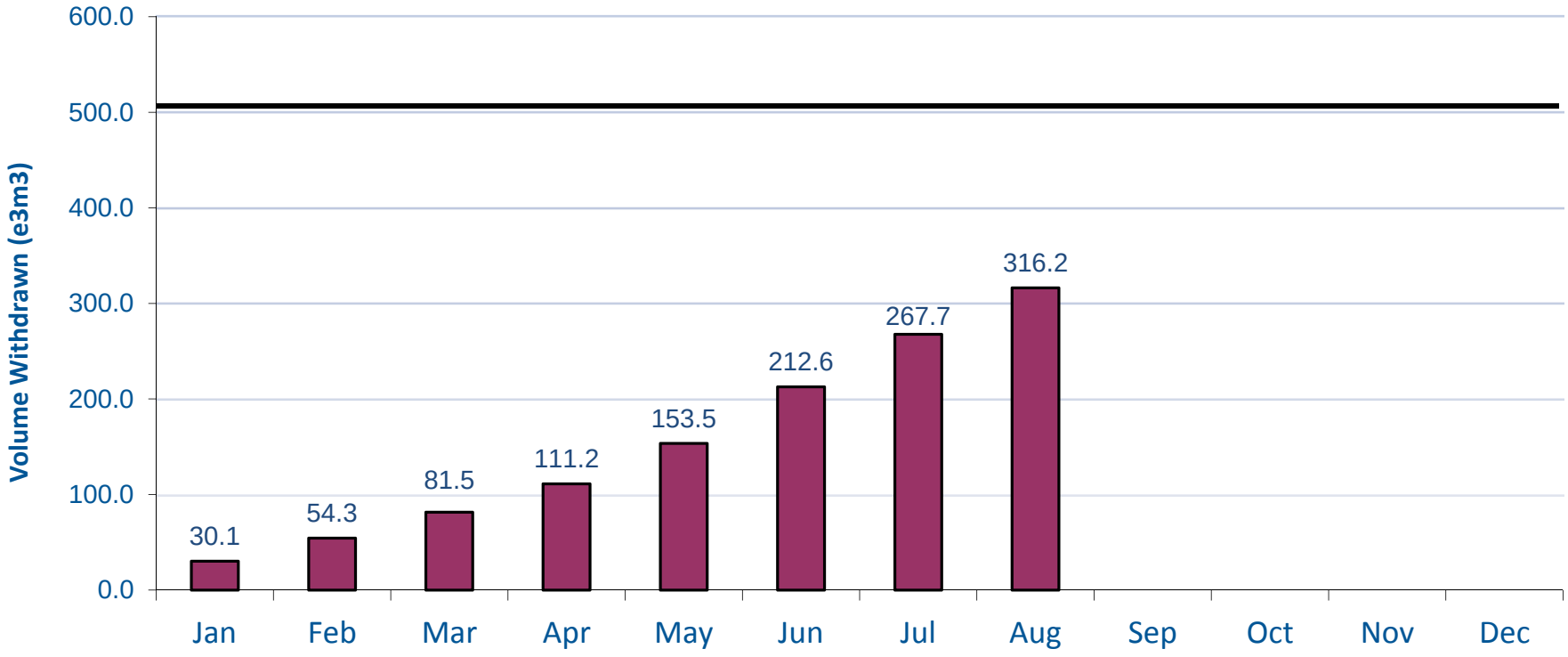
Cumulative Raw Water – Source Wells (2014)



- Regulatory allowable limit from *Water Act* Licence No. 188229 is 1.4e^{3}m^3/day (511e^{3}m^3 per year - black line shown on chart)

Cumulative Raw Water – Source Wells (2015 YTD)



- Regulatory allowable limit from *Water Act* Licence No. 188229 is 1.4e^{3}m^3/day (511e^{3}m^3 per year – black line shown on chart)

Cumulative Raw Water – Domestic Well (2015)

- Water well casing failure September 9, 2011; well was abandoned and a replacement well drilled July 2013. No water has been withdrawn (2015 YTD)

Water Balance

- **Steam**:
  - MARP approved methods:

(1) HP steam ultrasonic meter pending resolution on foaming issue:

- A new longer wave guide was installed in the ultrasonic meter during the 2012 September turnaround
- A new annubar meter was installed off the new steam separator at the end of 2014
- An additional new annubar steam meter (on the common steam header to the pads) was installed during the 2015 September turnaround

(2) Steam Injected = Σ All Meters to injection wells

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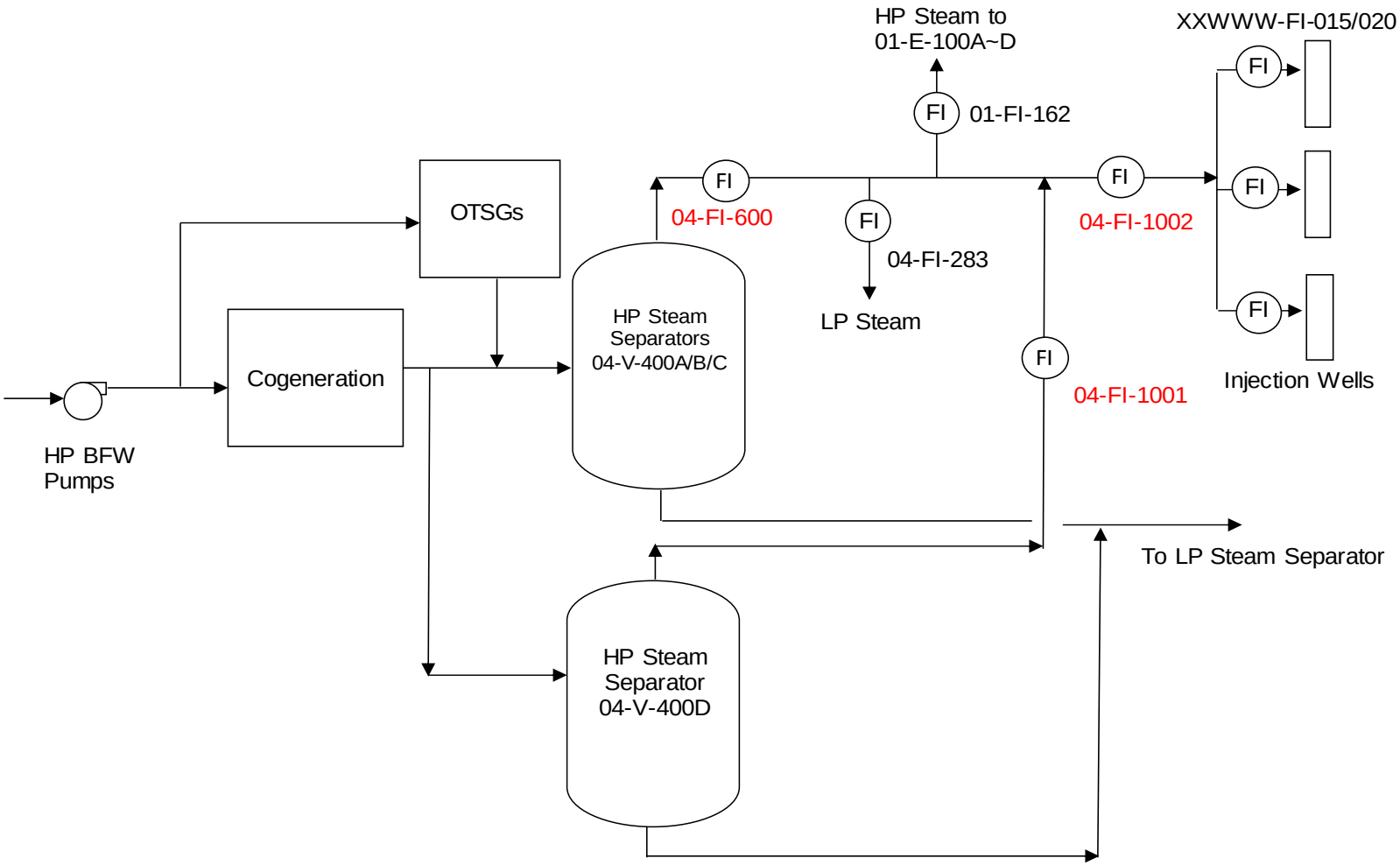
Water Balance Continued



Water Balance Continued

- **Raw Water** = Σ Water Source wells (3 water source wells)
- **Produced Water:**
  - MARP approved method
- **Vapour losses are estimated:**
  - LP Steam vent losses
  - ZLD has vapour loss to atmosphere
- Details of measurement and reporting procedures may be found in the MARP
- Water from the crystallizer is metered at the crystallizer outlet before it goes to the dryer
  - Truck tickets capture the volume of water trucked off-site
  - Volumes reported in Petrinex

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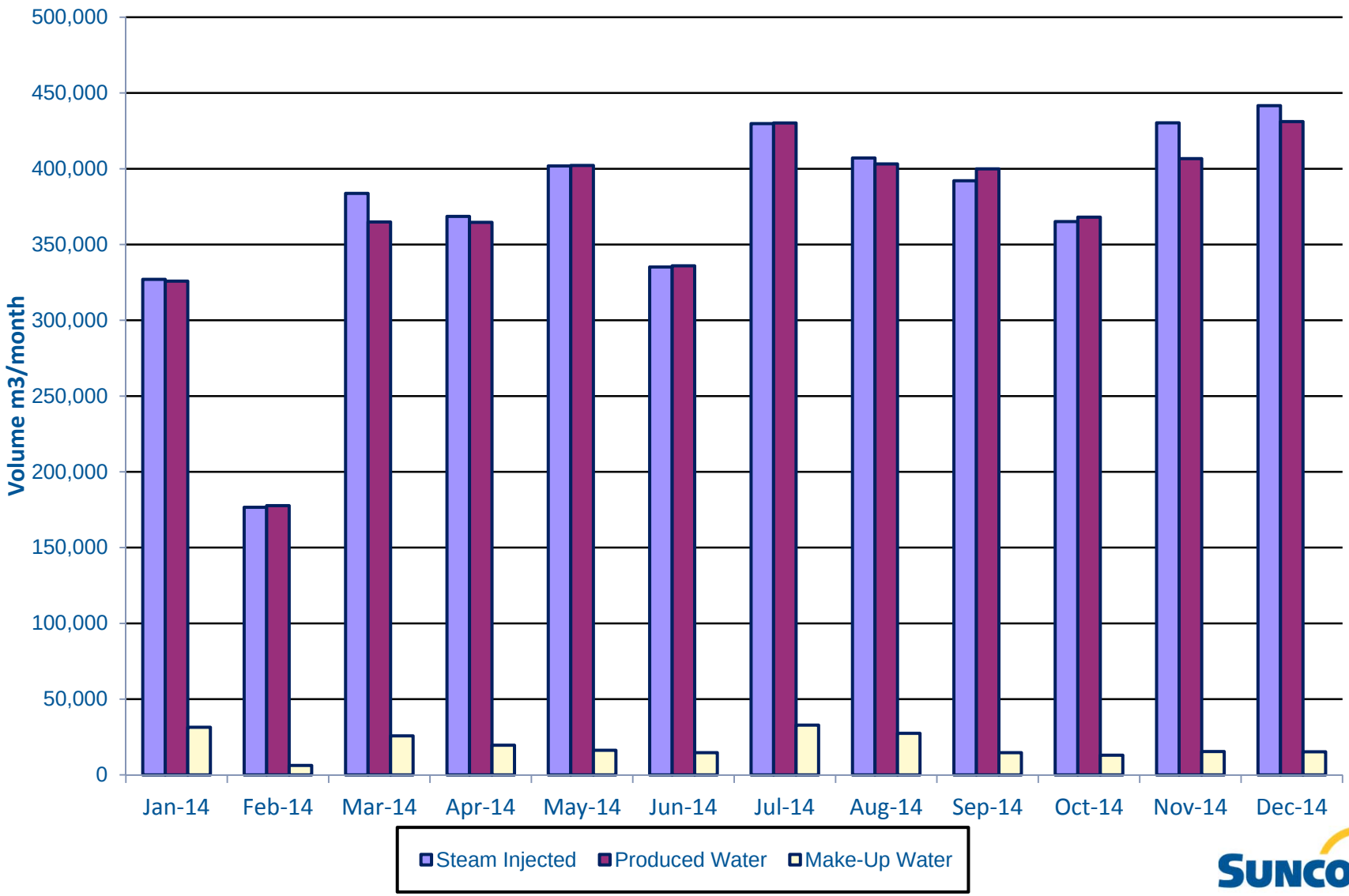
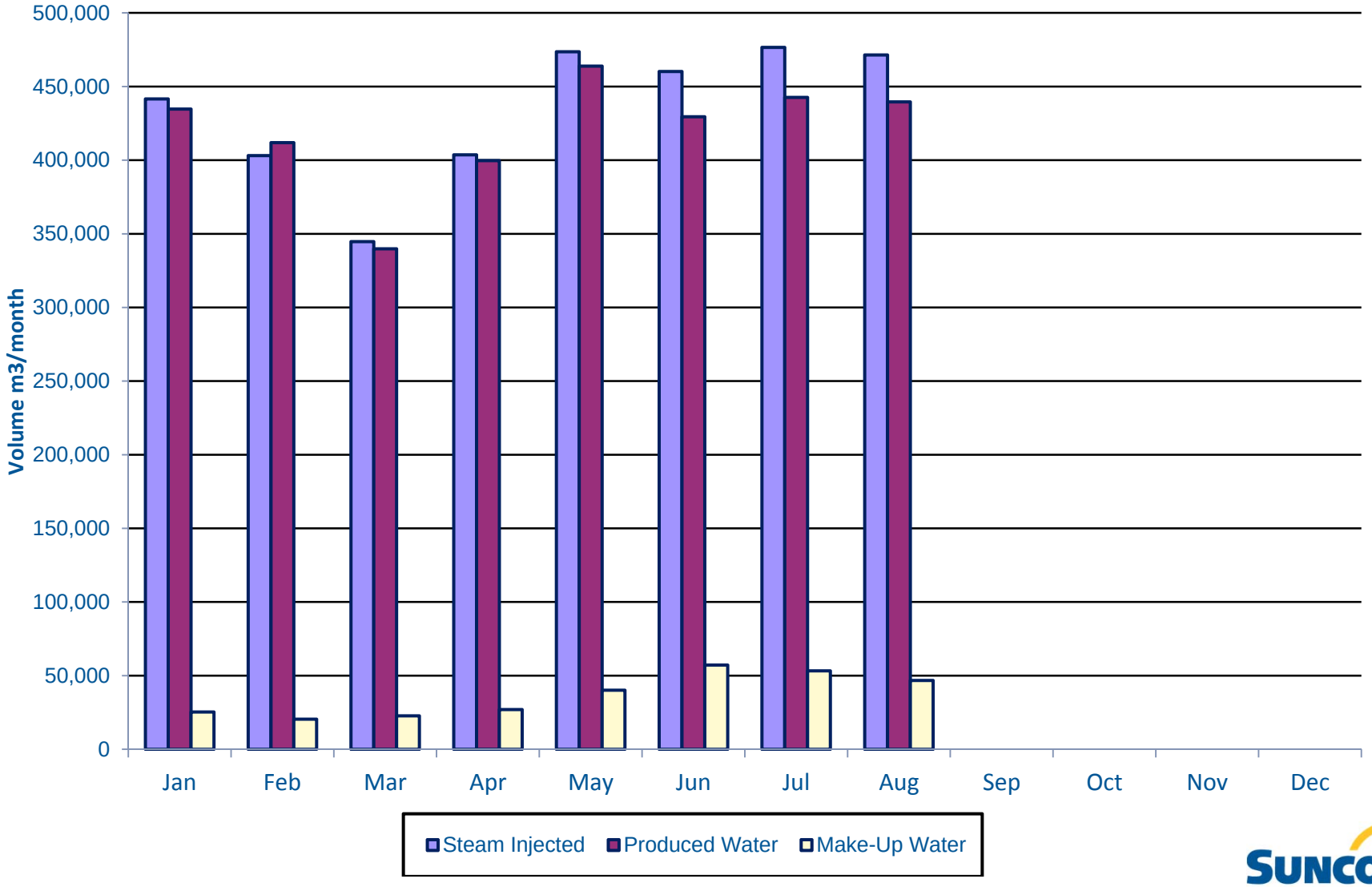
Water Balance (2014)

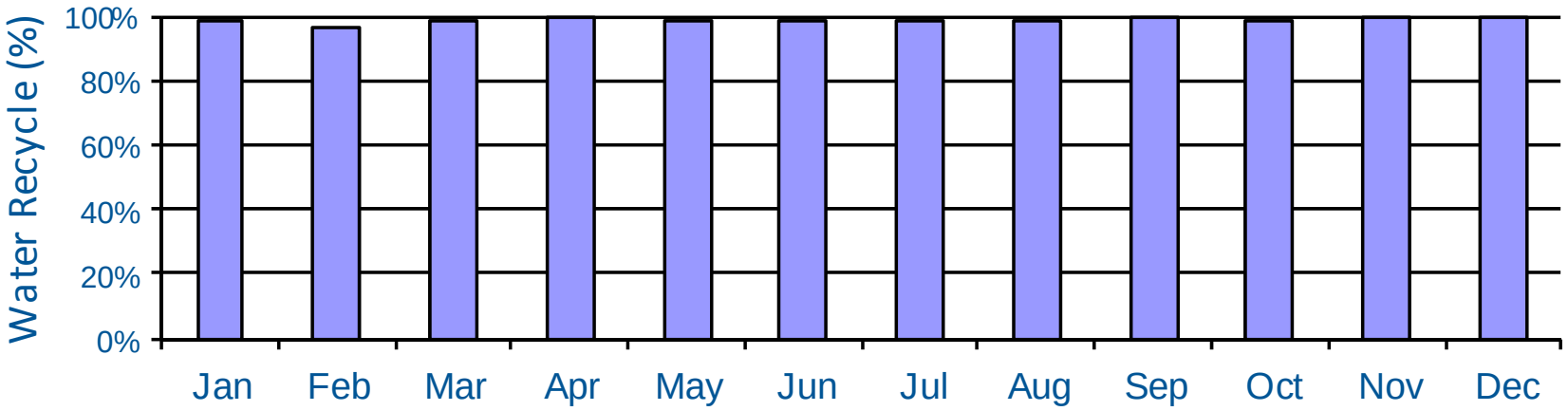


Water Balance (2015 YTD)



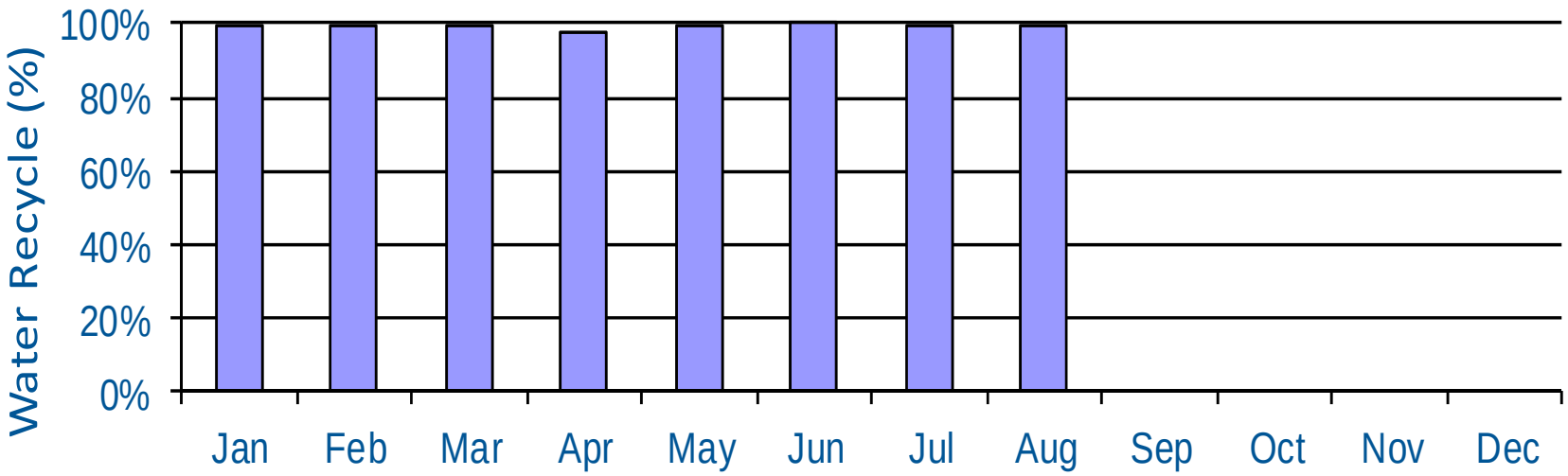
Water Recycle (2014)

Produced Water Recycle* = (Produced Water – Disposal Water)*100/Produced Water



*New calculation based on Appendix H of Directive 081

Water Recycle (2015 YTD)



Low Pressure Blowdown Recycle (2014 & 2015 YTD)

Blowdown Recycle = 100%

- Blowdown treated in the Water Plant
  - YTD (August 2015): 54,710 m^3/month
    2014: 49,322 m^3/month
- Blowdown treated in the Zero Liquid Discharge (ZLD) Plant
  - YTD (August 2015): 42,371 m^3/month
    2014: 41,865 m^3/month

Trucked volumes from Diversion Lagoon:

- 55,816 m^3 (January 1, 2014 – December 31, 2014)
- 22,433 m^3 (January 1,2015 – August 31, 2015)

Note: The diversion lagoon is filled by crystallizer concentrate during purges and by landfill leachate after periods of rain

MacKay River Landfill / Waste Management

AER Approval WM-072 Class II Oilfield Landfill

- Volumes of solids (salt/lime) to landfill
  - 2014: 23,808 m^3
  - 2015 YTD : 20,011 m^3 *
- Total volume of landfill fluids to facility
  - 2014: 20,753 m^3
  - 2015 YTD: 14,472 m^3 *
- Waste Surveys completed on October 8/9th, 2014 (Phase II), and February 6/8th, 2015 (Phase III)
  - Phase III: 27,447 m^3
  - Phase II Cell (A&B): 74,270 m^3 (approved for 86,000m^3)
  - Phase I of the MacKay River Landfill is closed and is in post-closure monitoring period
- Waste services contract in place
  - Addresses hazardous, scrap metal, domestic waste
- Waste Tracker software used to track and submit manifests to AER

*Volumes estimated in August 2015

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Off-Site Brine Water Disposal

Location of disposal site:

- Tervita Lindbergh (WPF, SFC)
- 05-26-056-05 W4M
- Application No: 1652609
- Approval No: WM061 (Amendment I)

- Brine water is disposed of off-site when the diversion tank and diversion lagoon reach capacity and the ZLD system cannot process the boiler blowdown from Unit 400.

- Water sources in the diversion lagoon include: precipitation, leachate from the MacKay River Landfill and excess boiler blowdown water during upset conditions.

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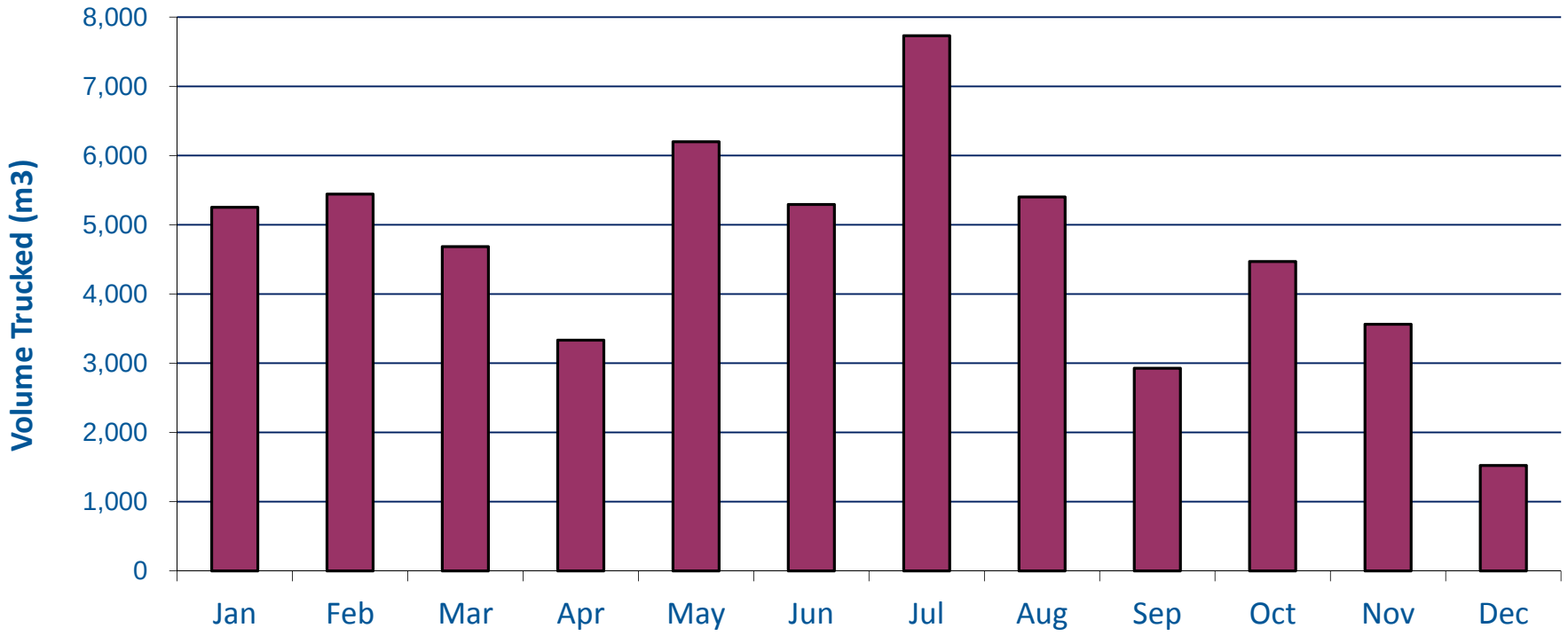
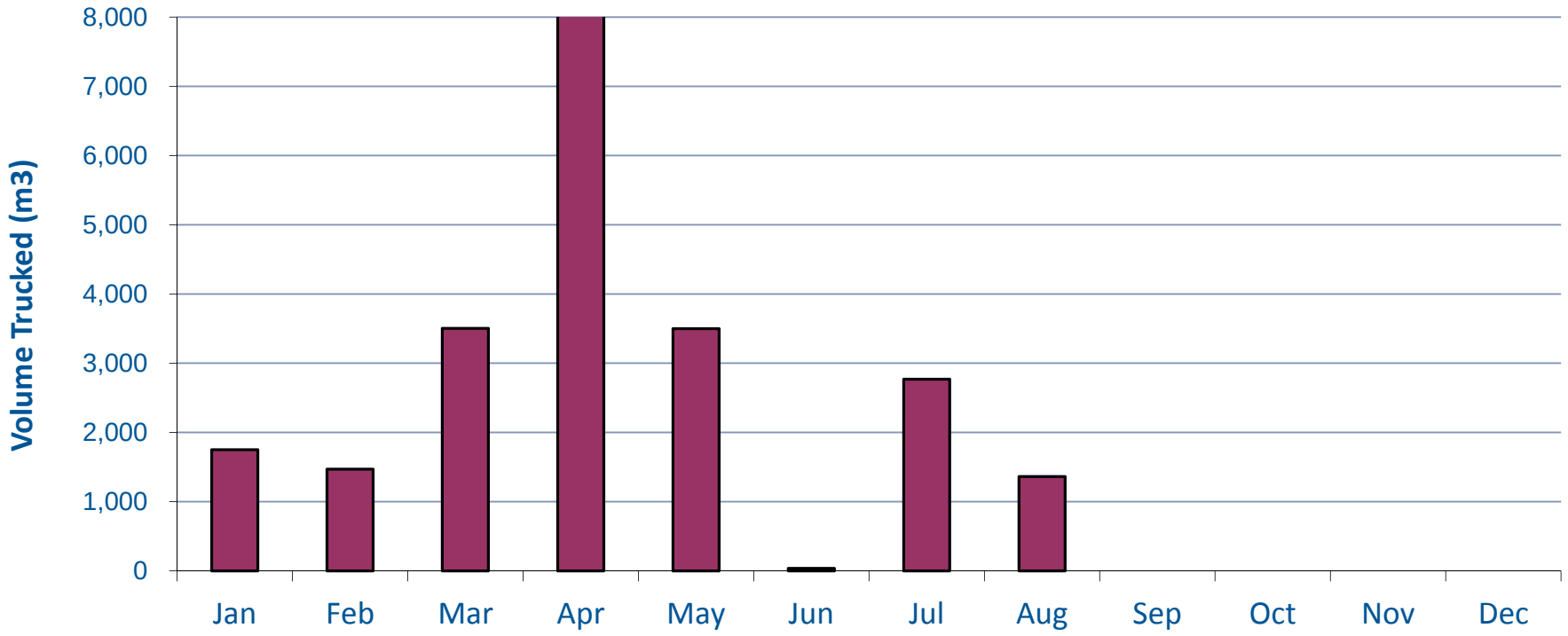
Off-Site Brine Water Disposal (2014)



- Volumes reported via Petrinex

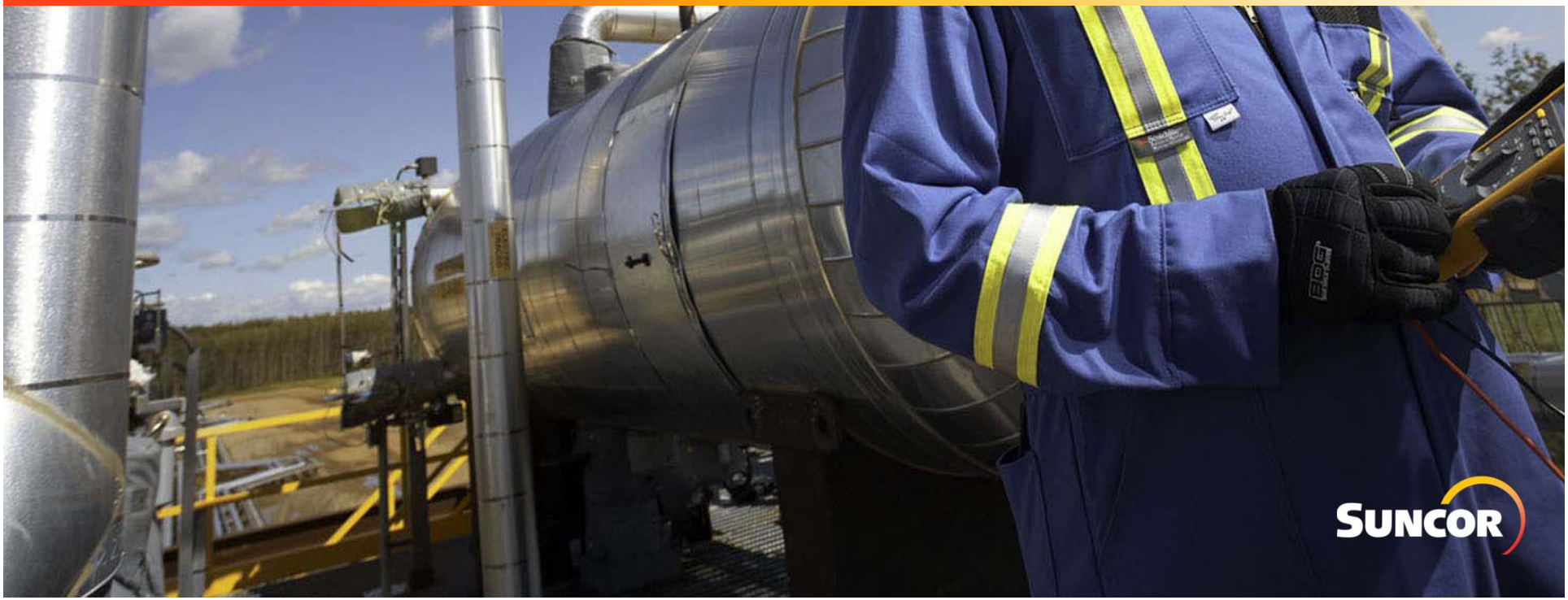
Off-Site Brine Water Disposal (2015 YTD)



- Volumes reported via Petrinex

MacKay River Performance Presentation

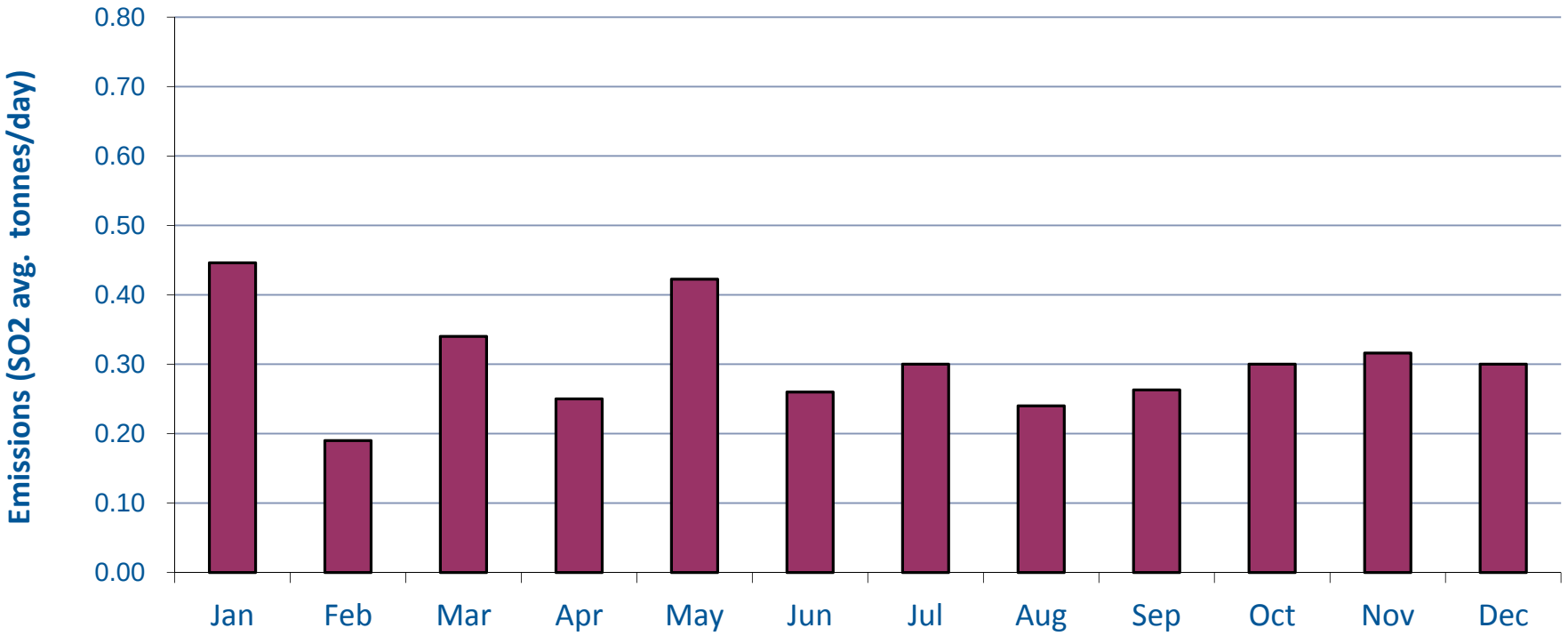
Sulphur Production



Sulphur Production

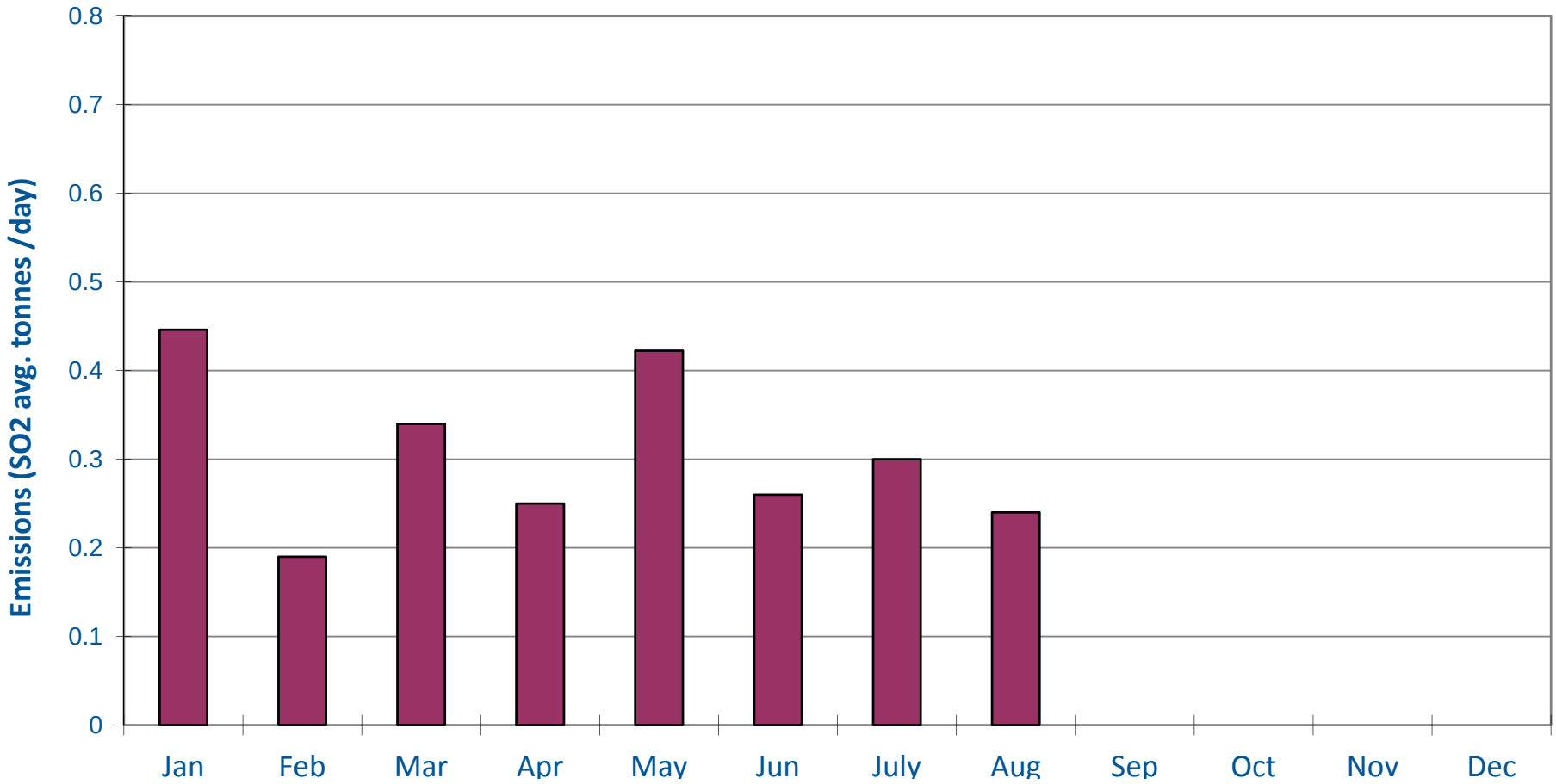
- Currently there are no sulphur recovery facilities at the MacKay River Project

Sulphur Dioxide Emissions (2014)



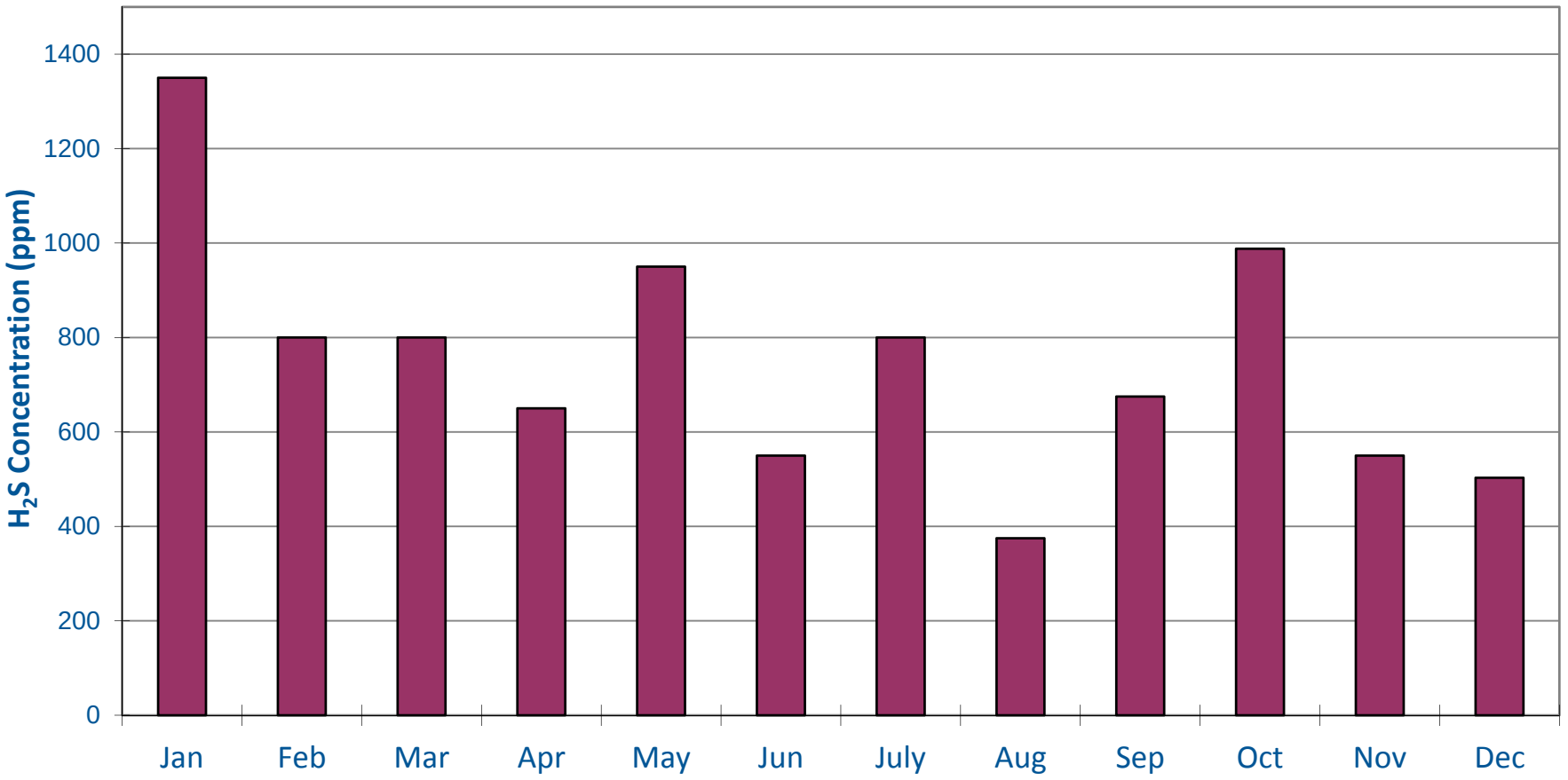
- SO_2 emissions are calculated from monthly produced gas samples

Sulphur Dioxide Emissions (2015 YTD)



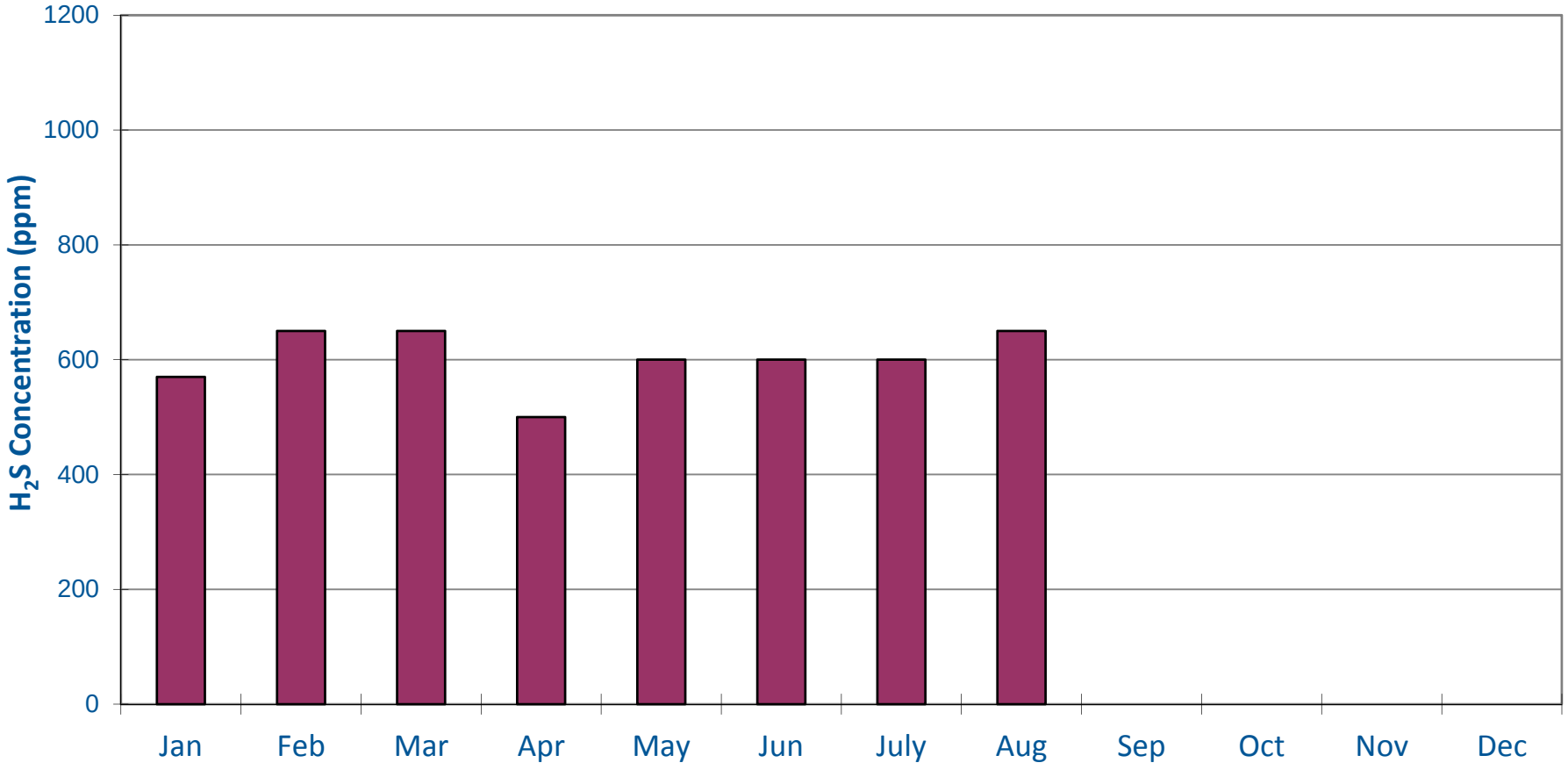
- SO_2 emissions are calculated from monthly produced gas samples

H_2S Concentration (2014)



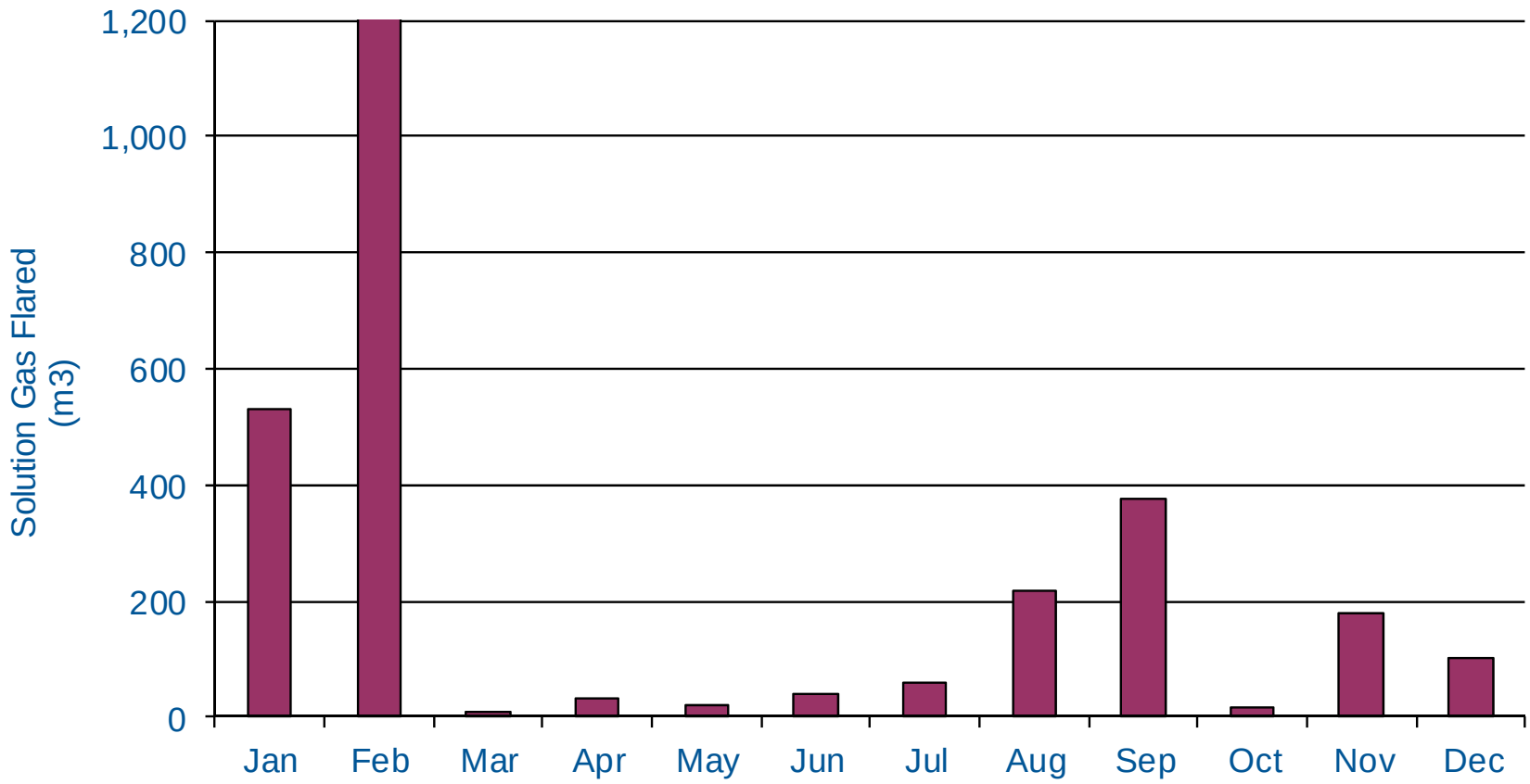
- H_2S concentrations are measured in semi-monthly produced gas samples.

H_2S Concentration (2015 YTD)

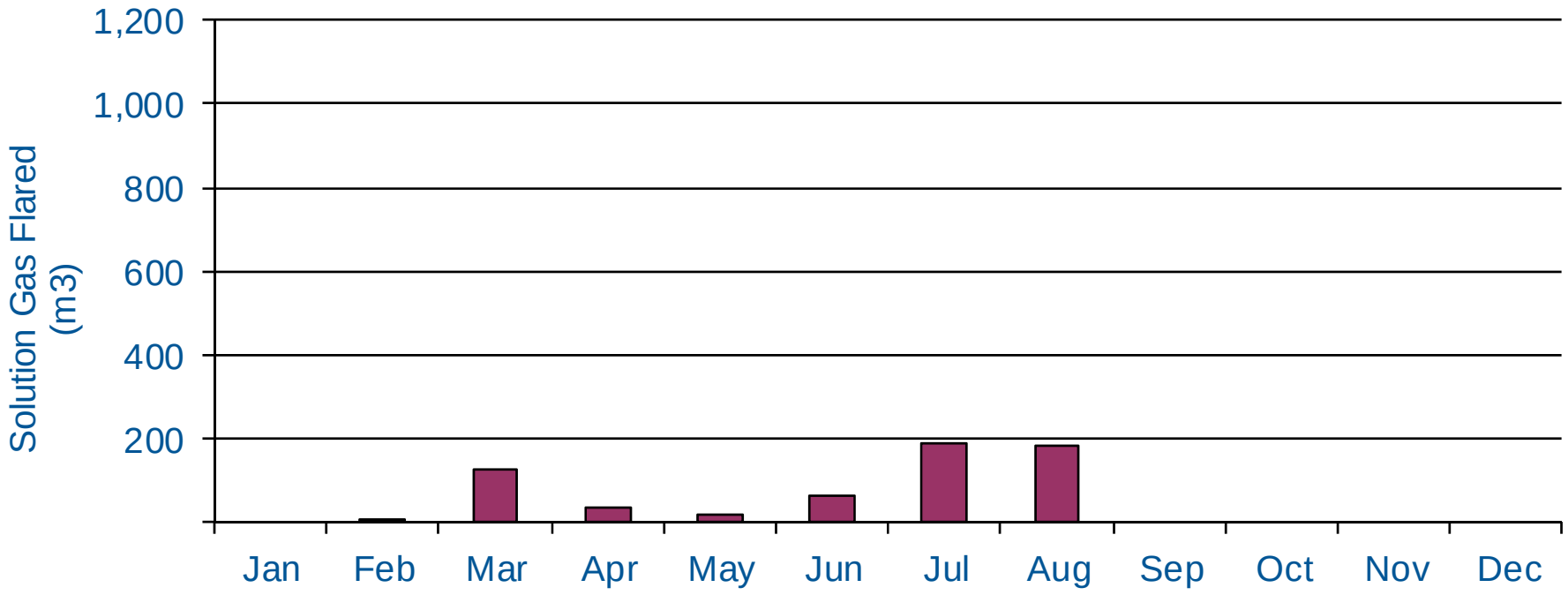


- H_2S concentrations are measured in monthly produced gas samples.

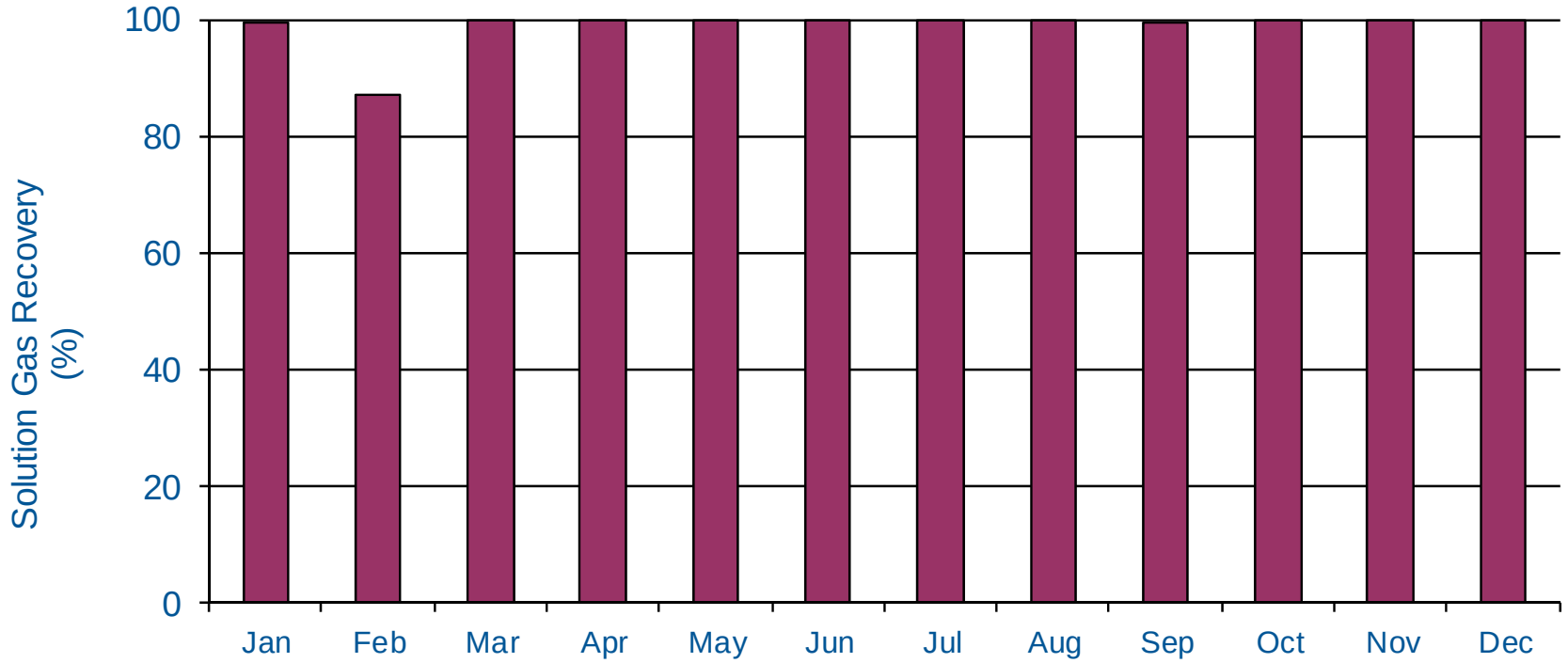
Solution Gas Flared (2014)



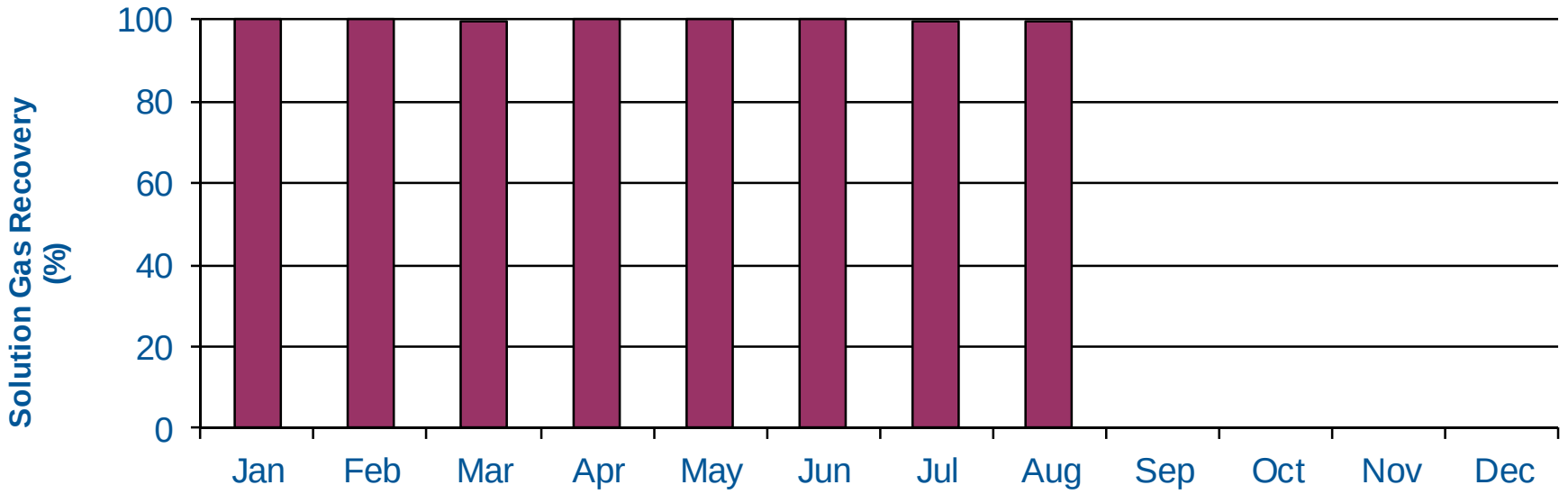
Solution Gas Flared (2015 YTD)



Solution Gas Recovery (2014)

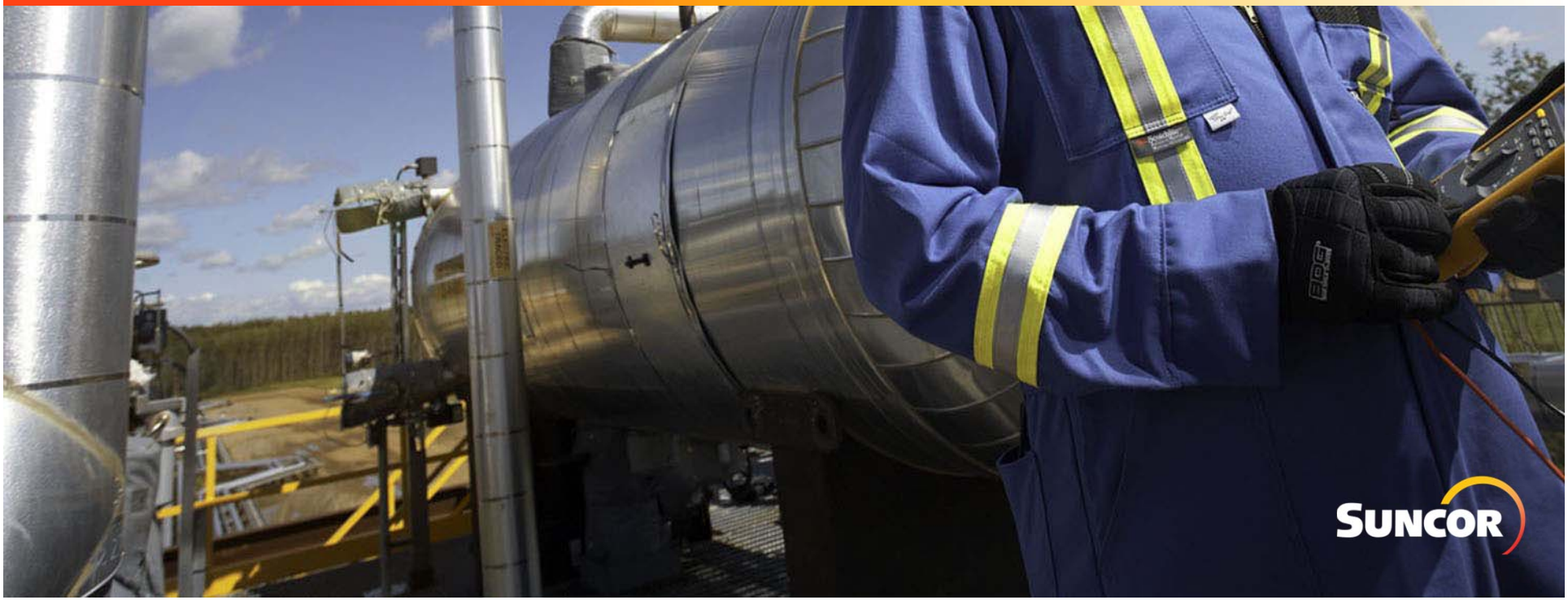


Solution Gas Recovery (2015 YTD)



MacKay River Performance Presentation

Environmental Performance



Greenhouse Gas Emissions (GHG)

Submitted the annual SGER report to Alberta Environment and Parks and NPRI GHG report to Environment Canada

- GHG calculation methodology developed to improve transparency

Total direct emissions for 2014:

- 228,984 tonnes of CO_2equiv
- Total emissions have been reported to ESRD

Total direct emissions for 2015 (5+7 Forecast):

- 313,057 tonnes of CO_2equiv*
- Total emissions will be reported to ESRD

Approved baseline emissions intensity:

- 0.1174 tCO_2e/m^3 (Global Warming Potential Updated)

* 2015 5+7 forecast estimated. Numbers to be verified in 2016.

Ambient Air Monitoring

- 4 passive air monitoring stations at MacKay River
- Monthly ambient air quality monitoring performed by a site representative and sample analysis reports submitted to AER by Suncor site personnel for H_2S and SO_2
- Ambient air quality data available for viewing on WBEA website
- No air quality exceedances at MacKay River
- In 2014 average H_2S concentration was 0.09 ppb and SO_2 concentration was 0.6 ppb collected from the passive stations
- In 2015 (as of August 31) average H_2S concentration was 0.09 ppb and SO_2 was 0.5 ppb collected from the passive stations

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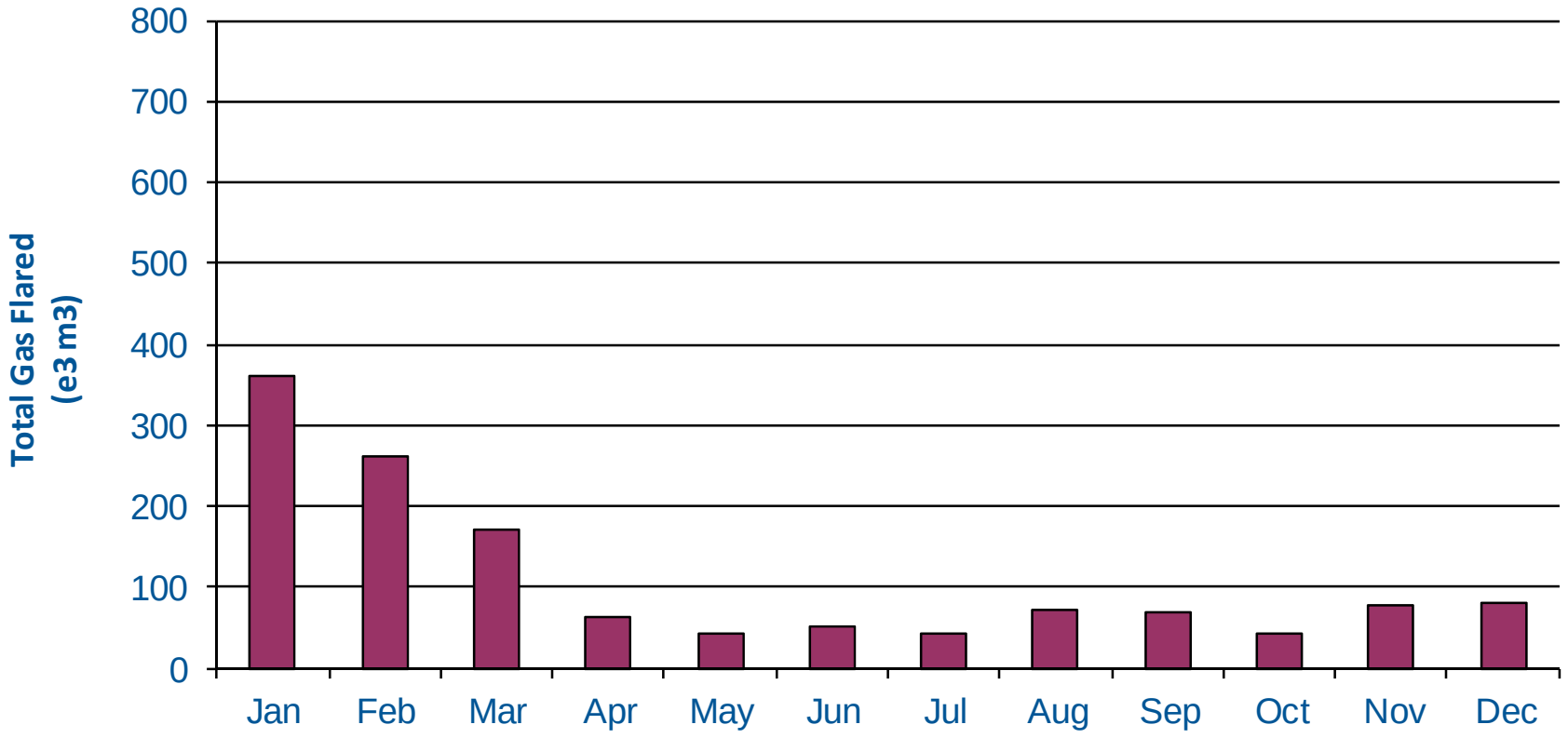
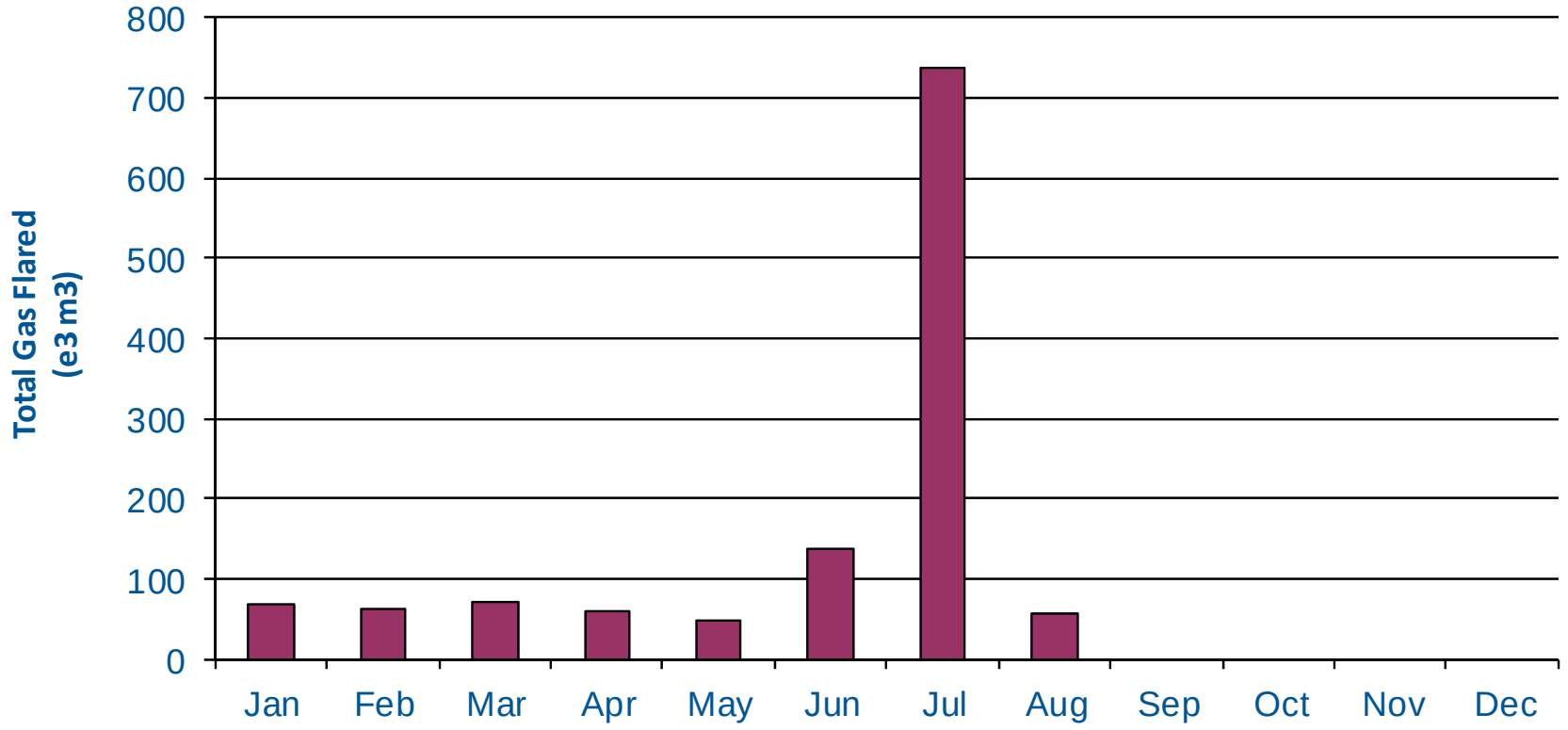
Total Flared Gas (2014)



Total Flared Gas (2015 YTD)



Regulatory Compliance (2014 and 2015 YTD)

Environment Canada Site Visit

- May 14, 2014
  - Audit of bird deterrent systems on ponds

AER Site Visit

- May 13, 2015
  - Introduction of new inspector and discussion on transition of reporting from Bonnyville to the Fort McMurray Office.

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Release Management – Reportable Releases

AER Reportable Releases for 2014

- Twelve AER reportable releases

AER Reportable Releases for 2015 (YTD)

- Five AER reportable releases

Environmental Awareness Training

- Core training requirement
- Highlights Spill Awareness, Waste Management, Flaring etc.

Current Approval Amendments

AER Approval No. 8668

- **Amendment 8668Z**
  - Pad 828 change from 3 well pairs to 2 wells pairs and correction of well UWIs on Pad 21 Chemical Injection Test (D-Pattern Injectors) approval issued December 10, 2014
- **Amendment 8668AA**
  - Phase 1 NCG design amendment approval issued December 19, 2014
- **Amendment 8668BB**
  - Phase 2 and Phase 3 Chemical Co-Injection (E, F and G Patterns) approval issued January 1, 2015
- **Amendment 8668CC**
  - Approval for E1P Sidetrack well issued January 27, 2015
- **Amendment 8668DD**
  - Approval for NN6P Sidetrack well issued February 3, 2015
- **Amendment 8668EE**
  - Approval for VX™ multiphase meter on Pad 824 issued February 19, 2015
- **Amendment 8668FF**
  - Approval for NCG Test at OO5I well on pad 24 issued March 17, 2015

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Current Amendments Continued

- **Amendment 8668GG**
  - Approval to conduct CO_2 Co-Injection at the OO9 well pair on Pad 24 issued April 13, 2015
- **Amendment 8668HH**
  - CO_2 Co-Injection amendment to change to OO8 well pair on Pad 24 issued
- **Amendment 8668II**
  - Pad 824 Thermal Compatibility Assessment approval issued July 14, 2015
- **Amendment 8668JJ**
  - Approval for NCG Test at OO7I issued July 29, 2015

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Current Amendments / Applications

AER Approval 8668

- Application No. 1835073: MOP Strategy Trial at QQ5 – QQ16 submitted July 24, 2015 and approved October 9, 2015 (8668KK)
- Application No. 1838202: C2IPB Sidetrack and well conversion application submitted September 2, 2015 and approved October 13, 2015 (8668LL)

AER *Water Act* Licences

- Licence No. 00289164-01-00 for MR2 diversion of water renewed June 26, 2015; expiry June 25, 2020;
- New Licence No. 00367341-00-00 for dust suppression on AOSTRA road issued July 20, 2015; expiry July 19, 2025

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Current Amendments / Applications

EPEA Approval – no amendments within this reporting period

AEP

- New Wildlife Research Permit (56728) and Collection License (56219) issued on April 27, 2015

Environmental Initiatives

Suncor is an active member of:

- Cumulative Environmental Management Association (CEMA)
- Regional Aquatics Monitoring Program (RAMP)
- Wood Buffalo Environmental Association (WBEA)
- Alberta Biodiversity Monitoring Institute (ABMI)
- Alberta Water Council (Watershed Planning Advisory Council)
- Oil Sands Developers Group (OSDG)
- Canada's Oil Sands Innovation Alliance (COSIA)
- Industrial Footprint Reduction Options Group (iFrog)
- Oil Sands Spill Coop Area Y

Suncor is in ongoing consultation with:

- Regional stakeholders
- Aboriginal Communities and the local Municipality

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Reclamation

2014 Conservation & Reclamation report was submitted to AER in March 2015.
No reclamation activities are underway at MacKay River.

- **Total area of land cleared in 2014 was 16.9 ha:**
  - MR2 Central Processing Facility – 2.4 ha
  - Soil Stockpile Area – 6.3 ha
  - Observation Wells – 8.2 ha
- **Estimated total area of land to be cleared in 2015 is 5.8 ha:**
  - Pad 824 – 2.5 ha
  - Borrow Pit – 3.3 ha

Note: Estimated numbers do not include exploration programs

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Regulatory Compliance

- Suncor Energy Inc. is in compliance with all regulatory approvals, decisions, regulations and conditions as described in Decision Report 2000-50; specifically pertaining to:

  - Plant and waste management facility location,
  - Ground level ozone and VOC monitoring,
  - Groundwater monitoring wells,
  - Surface water quality monitoring, and
  - Participation in Regional Initiatives

Summary of Key Learnings (Operations)

- Implementation of Suncor Safety Task force initiatives driving and reinforcing correct behaviours
  - Primary focus on operational discipline and leadership
  - Secondary deployment of processes and tools

- Visual management of process variables delivers step change in CPF reliability
  - Record consecutive days without unplanned steam outage
  - Record consecutive days of on-spec boiler feed water

- Group transfer pump reliability gains from previous years have been maintained. Project to right size pumps funded late 2014 with fabrication underway.

- Focus on brine dryer operation has significantly reduced offsite disposal

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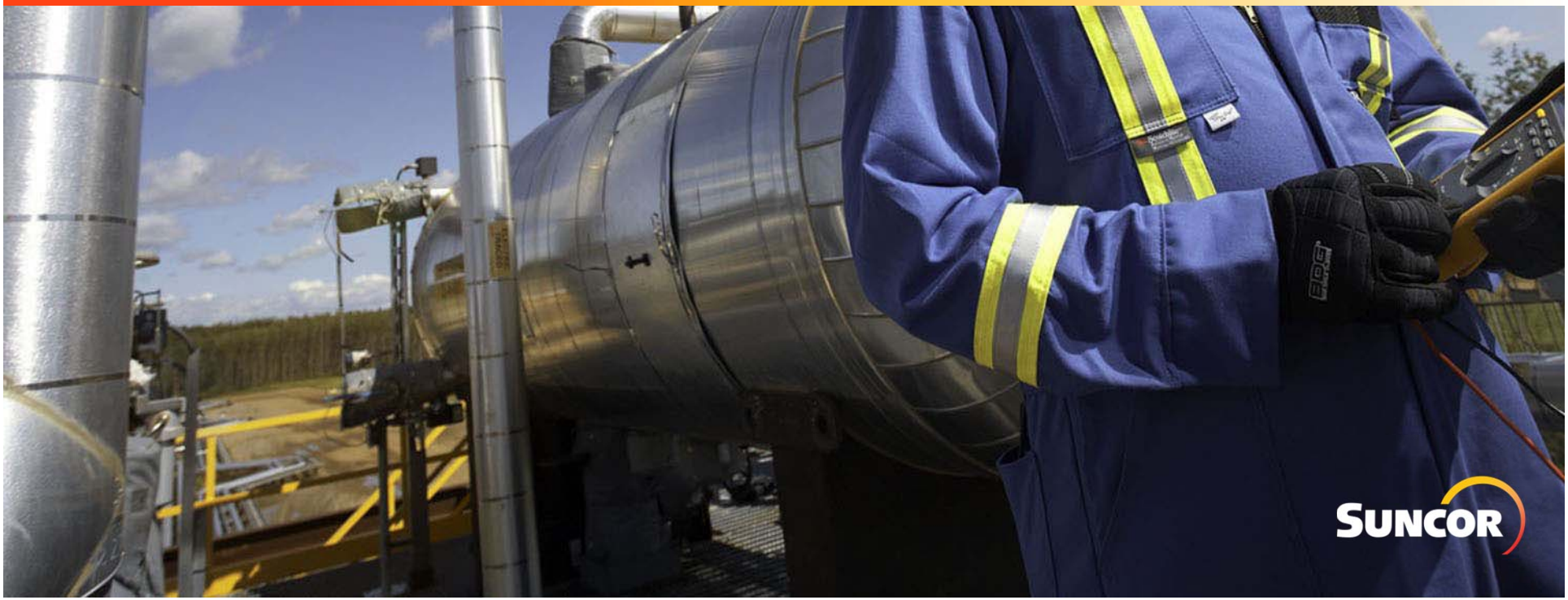
MacKay River Performance Presentation

Future Plans



Future Plans

Project Description	Comments	Status
MR1 Debottlenecking/Optimization	Series of equipment modifications/improvements building towards an increase in MR1 production capacity	Series of submissions over the next few years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