ORION IN SITU OIL SANDS

2018 ANNUAL PERFORMANCE REPORT | SUBMITTED MAY 2019

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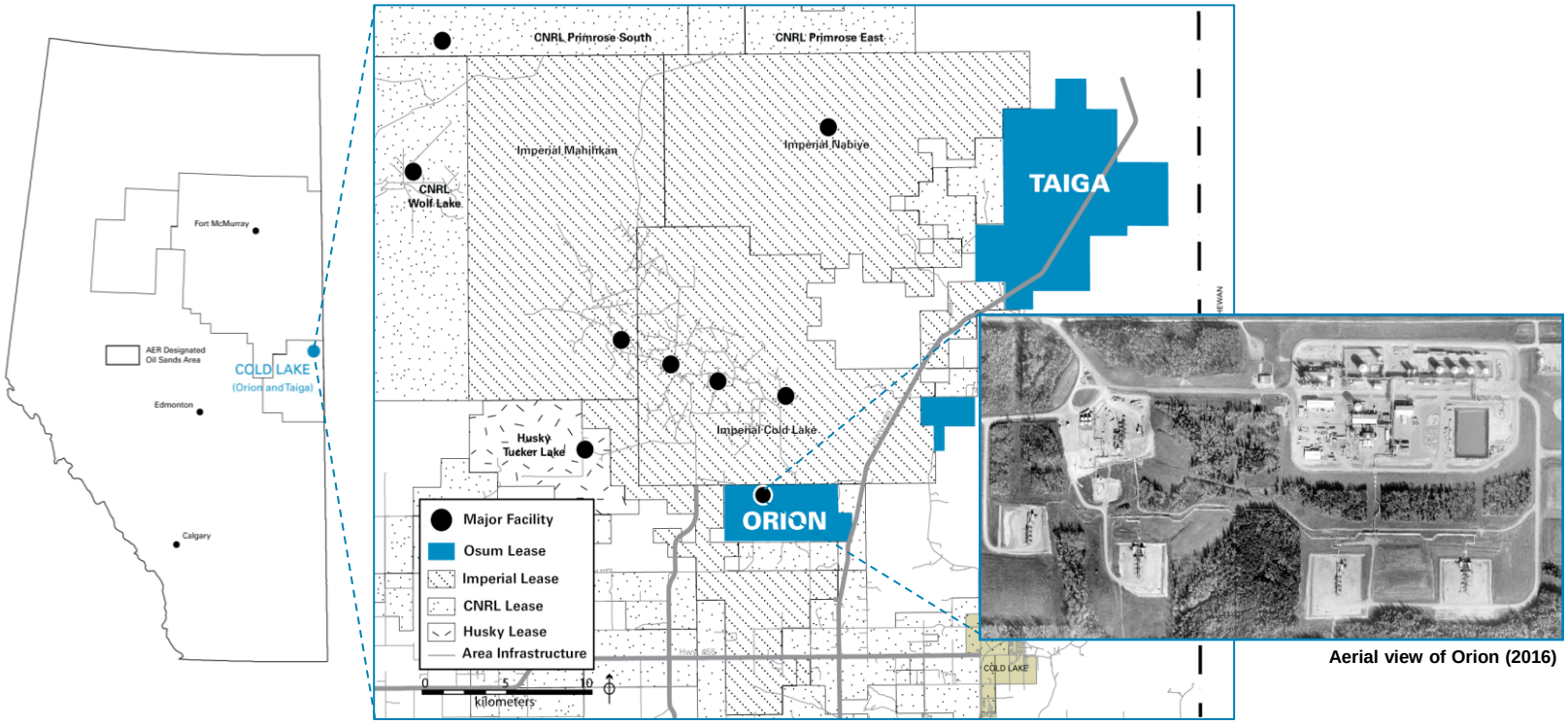
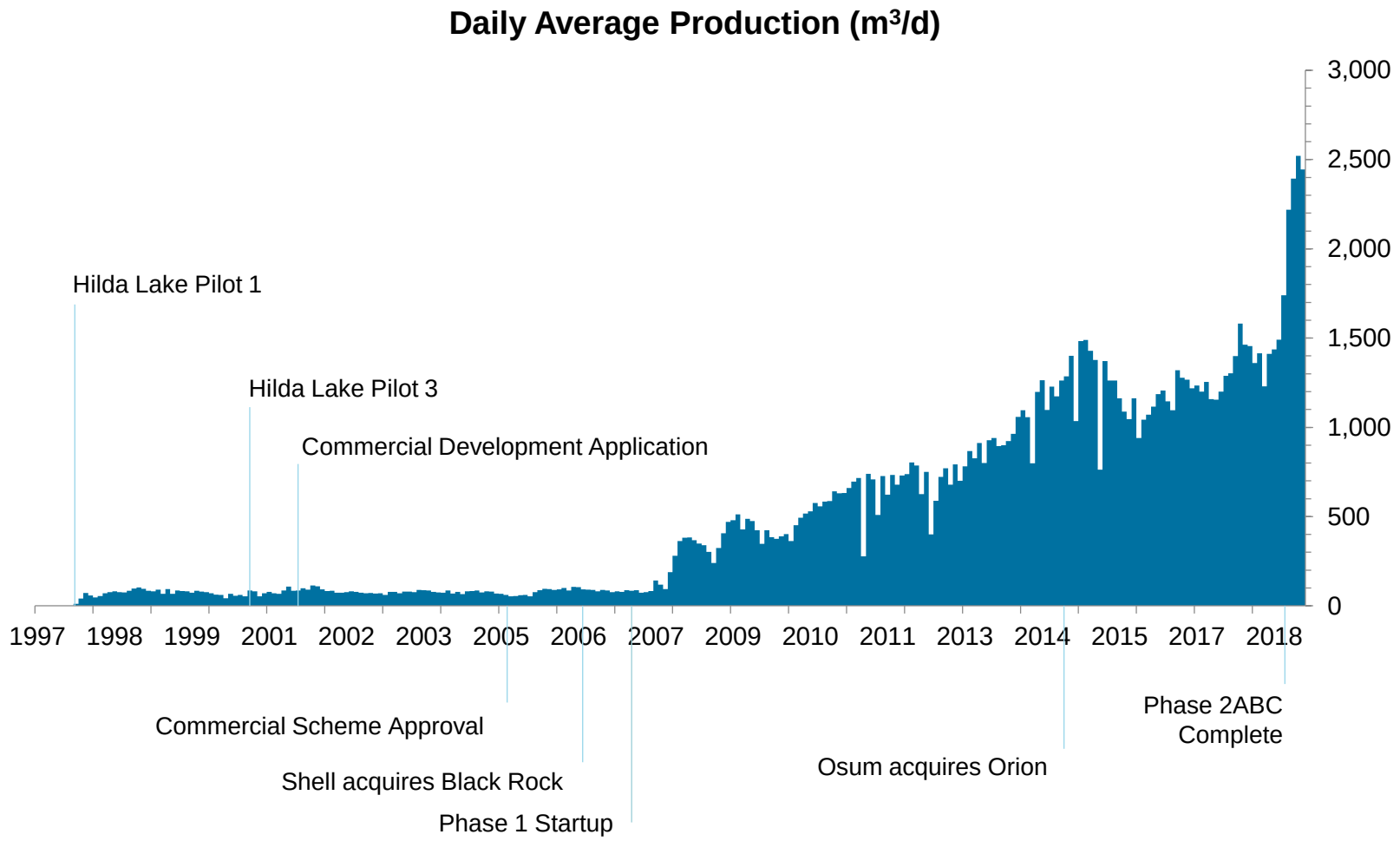
Introduction Project Location



Aerial view of Orion (2016)

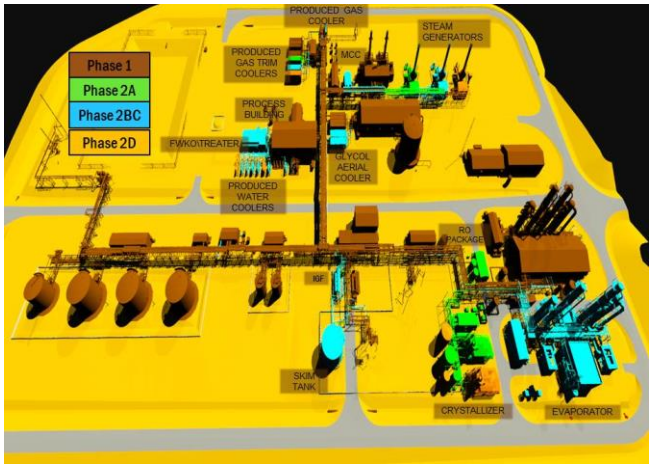
Orion is a Steam-Assisted Gravity Drainage (SAGD) facility consisting of a central processing facility (CPF) and five well pads situated in 13-16-064-03 W4M, approximately 30 km north-west of Cold Lake, Alberta

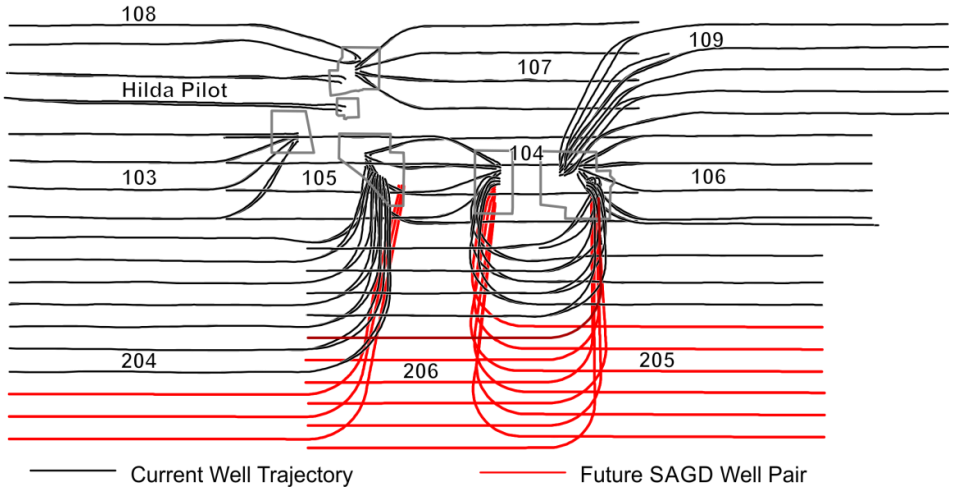
Introduction History



Introduction Phase 2, Small Smart Steps

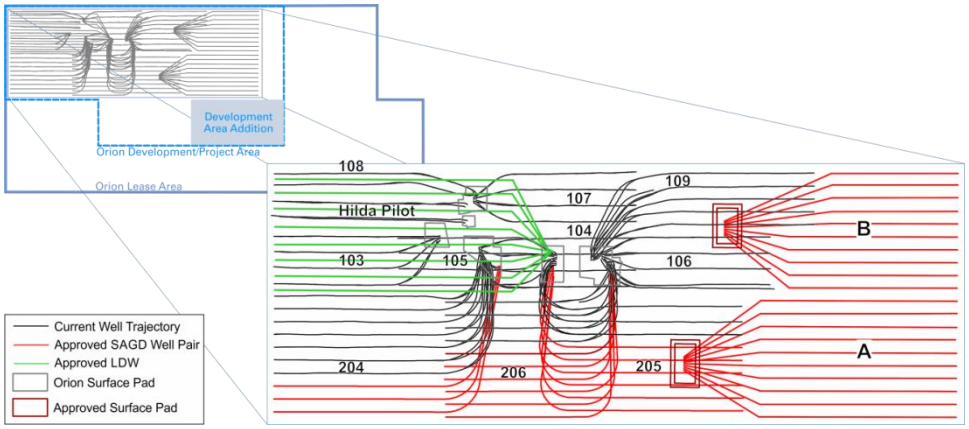
- Successfully executed brownfield project doubling production through:
  - Utilizing existing plant infrastructure whenever possible
  - Reducing development cost and environmental footprint by drilling off existing pads

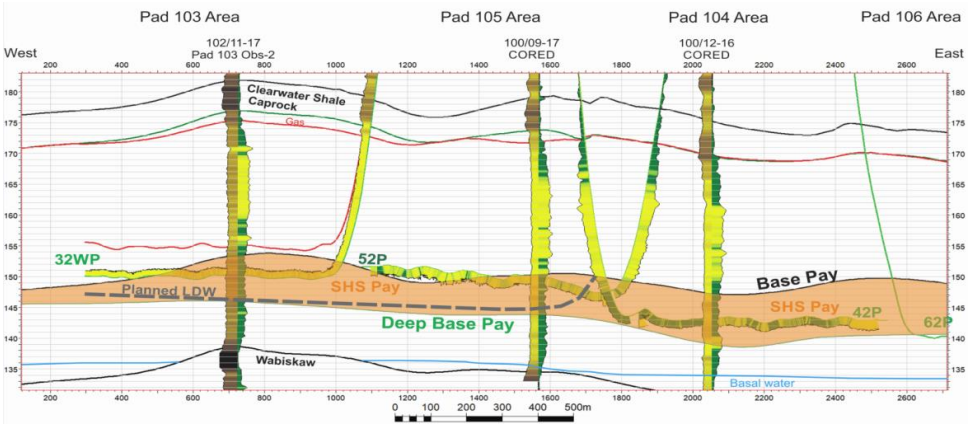




Phase	Well Pairs	Facilities Scope	Steam Capacity (m^3/d)	Oil Capacity (m^3/d)	Expansion Completed
2A	3	3rd Boiler, RO Package, Crystallizer #1	6,040	1,590	Oct 2017
2BC	18	3rd & 4th Evaporators, 4th Boiler, De-oiling, Bitumen Treating and Utilities System	10,350	2,860	Oct 2018
2D	TBD	5th Boiler, additional Oil and Water Treating	12,500	3,815- 3,974	TBD

Introduction 2018 Scheme Amendment Approvals





2018 Amendment Approvals:

Approval No. 8175E (Class II Disposal Well)

Utilize 16-17 well for brackish water source and disposal (produced water storage)

Approval No. 10103T

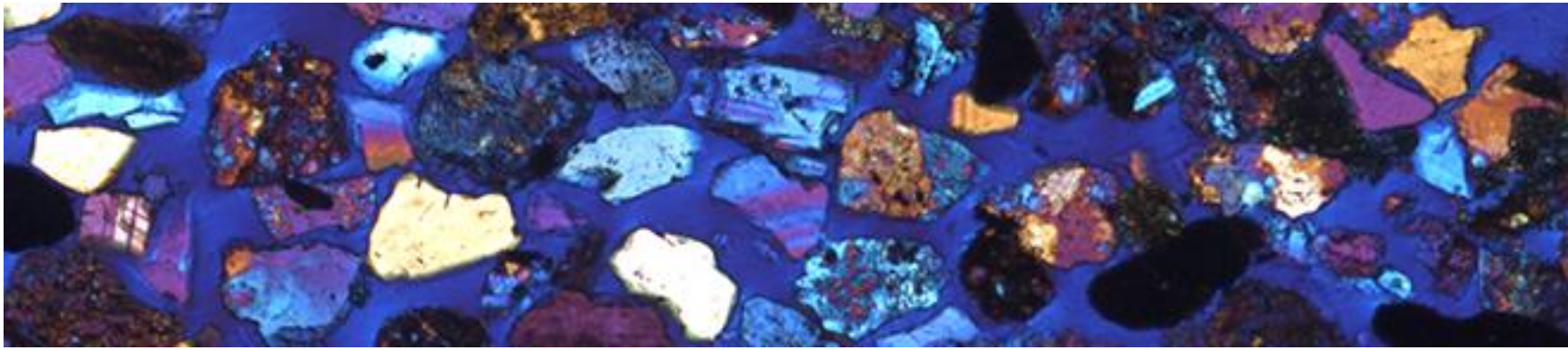
Plant Expansion: Increase Bitumen Capacity to 25,000 bbl/d, additional boiler, second crystallizer, additional water treatment

Approval No. 10103U

Addition of 9 SAGD step out well pairs (Pads 204, 205, 206) and 8 Lower Drainage Wells (LDWs) drilled off Pad 105

Approval No. 10103V

Addition of 20 SAGD well pairs on two new pads (A and B) and addition to Development Area



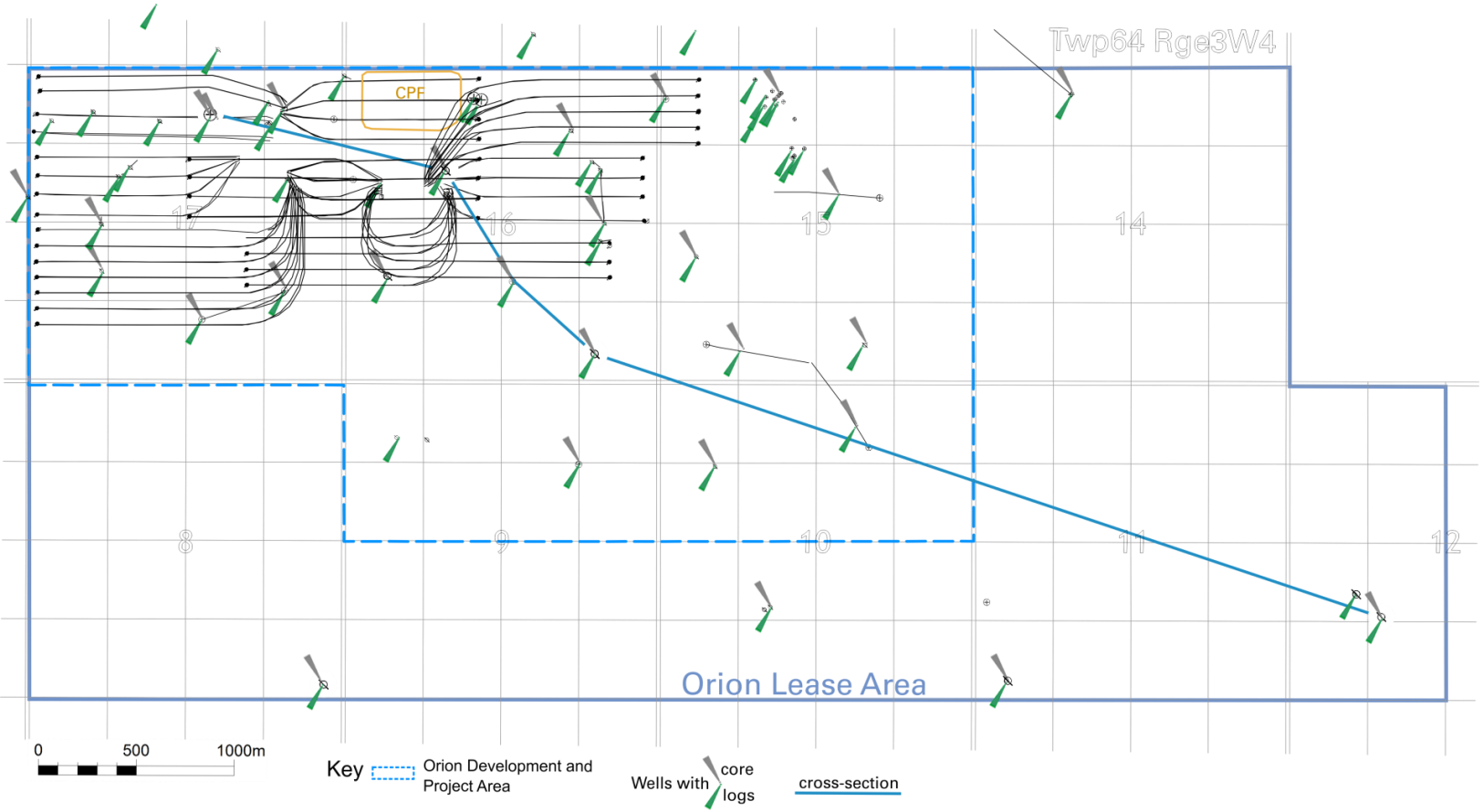
Geoscience

Orion In Situ Oil Sands

2018 Annual Performance Report

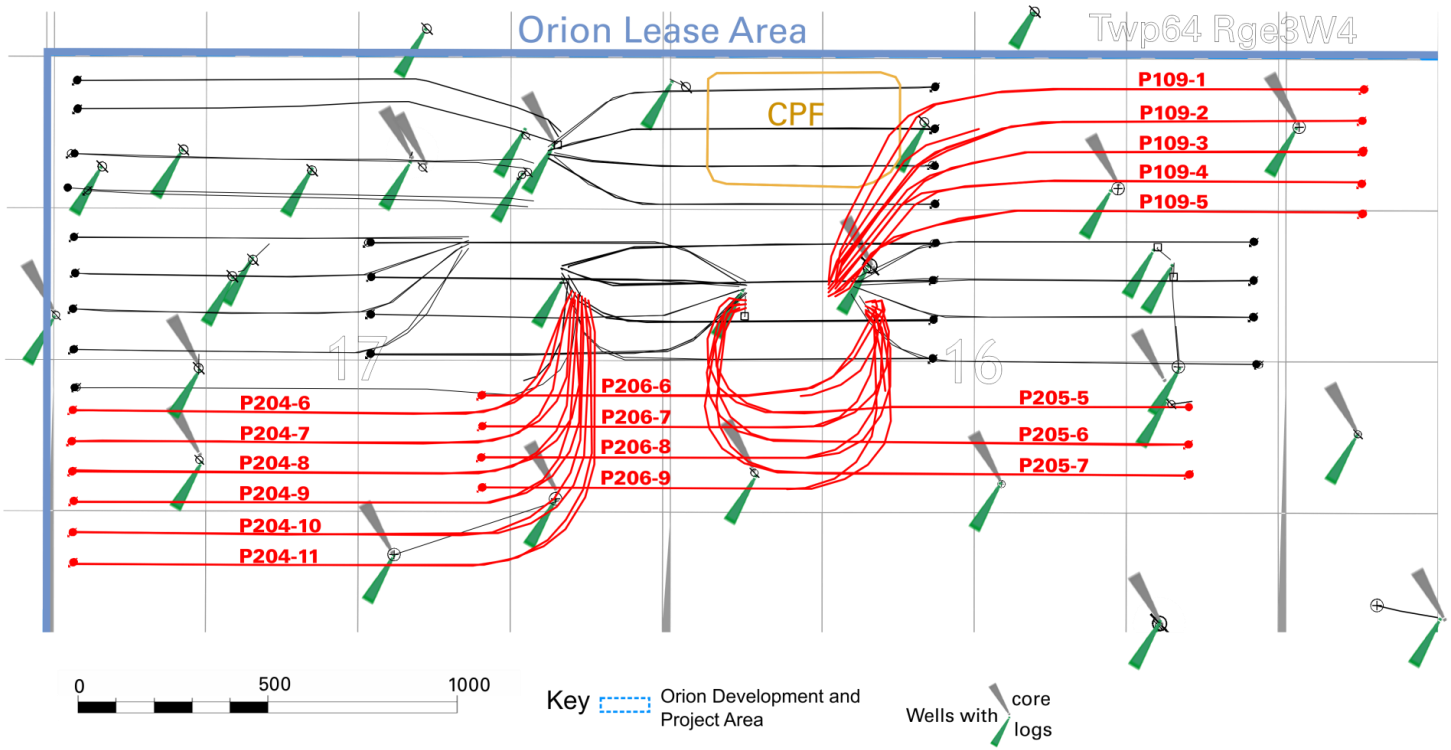
Delineation Well Data

- Fifty-six vertical or deviated wells across lease area; 44 with full suite of logs including 8 with FMI; 28 of the wells were cored

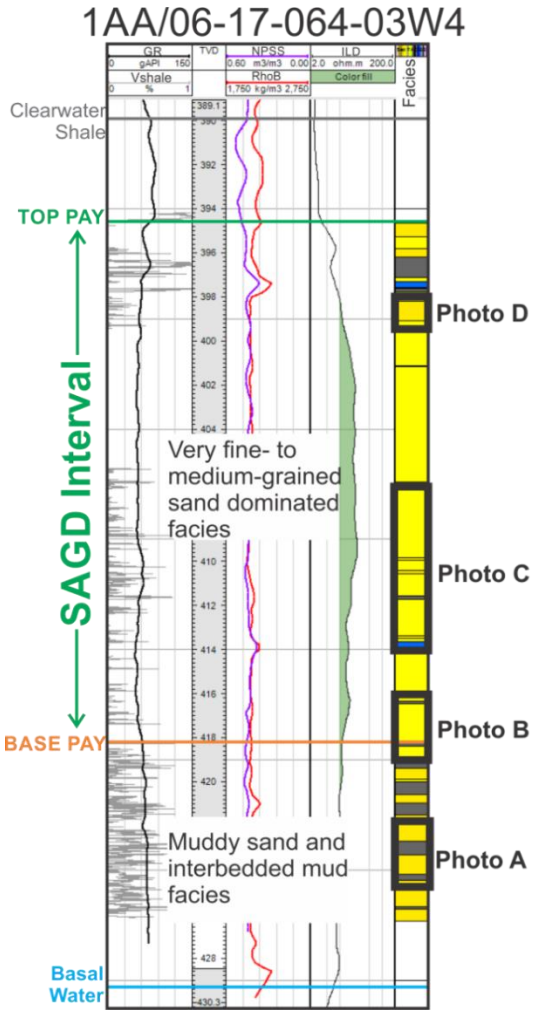


2018 Drilling and Completion Program

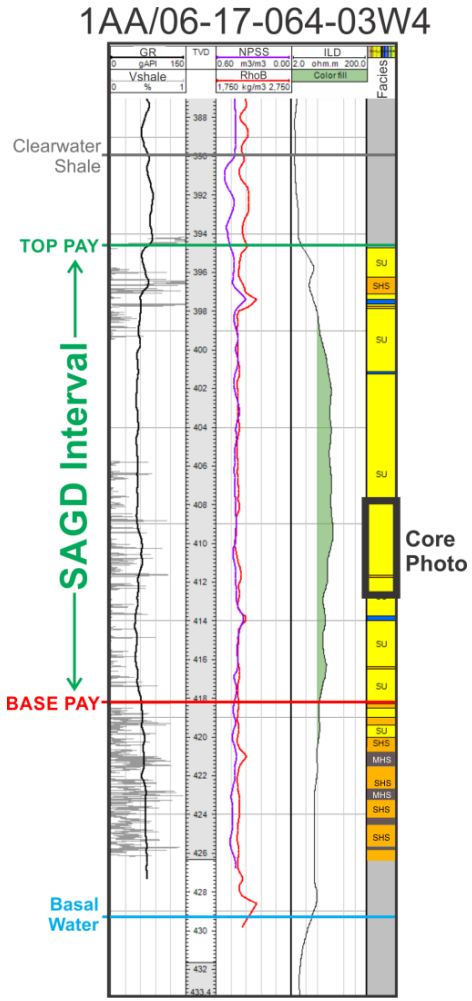
- Phase 2BC; 18 SAGD well pairs; drilling began in late 2017
  - Pad 204, six well pairs
  - Pad 205, three well pairs
  - Pad 206, four well pairs
  - Pad 109, five well pairs

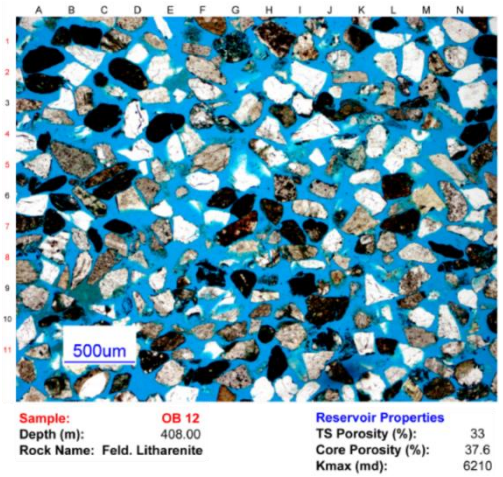


Clearwater Type Log

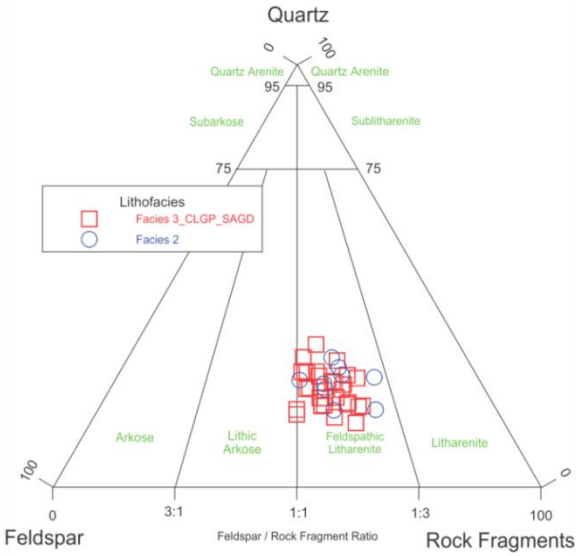


Clearwater Sand Minerology

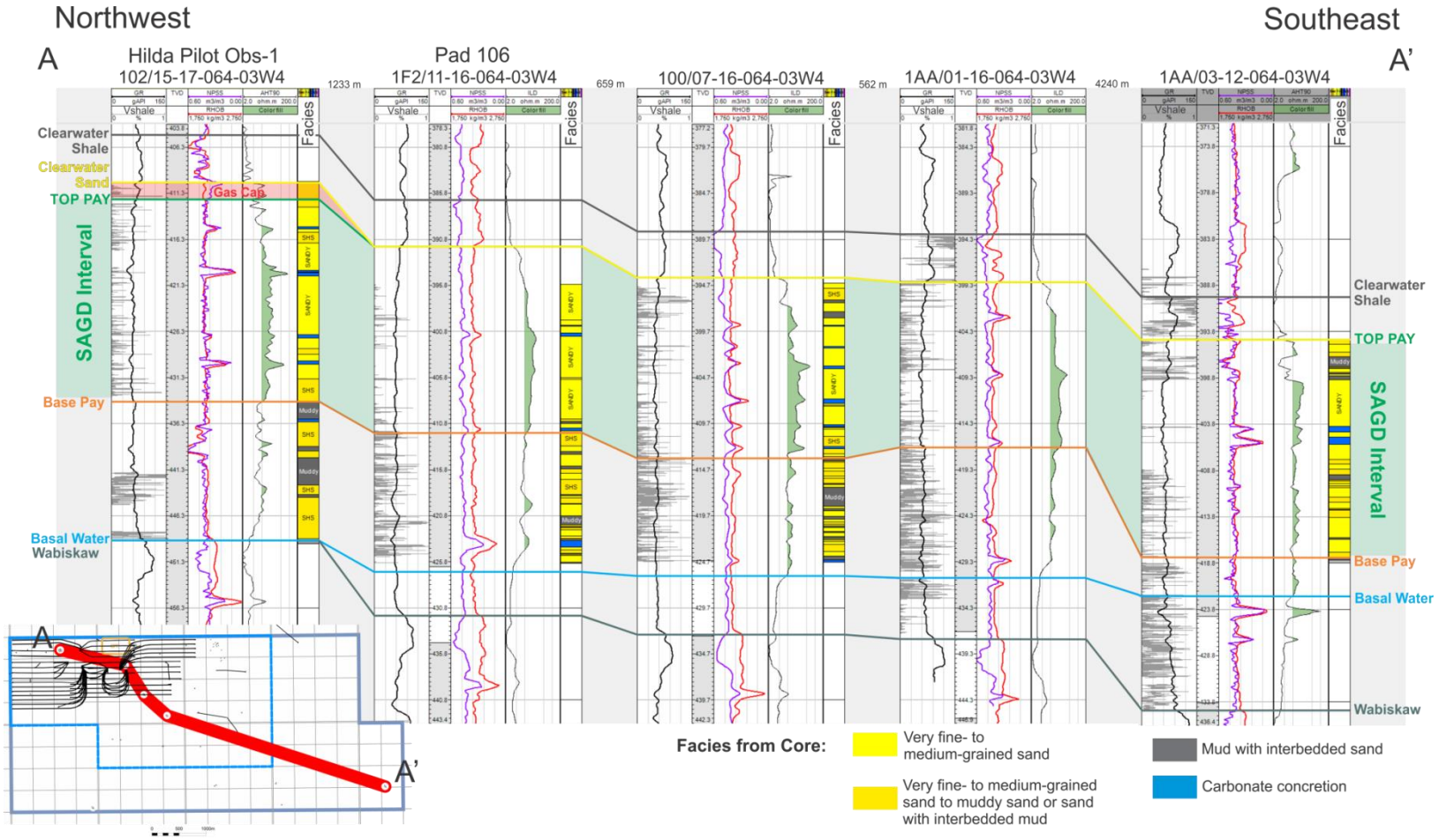




- Sand is angular very fine- to medium-grained feldspathic litharenite
- Clay content is less than 2% of total rock
- Clay composition is kaolinite, illite, chlorite, and smectite

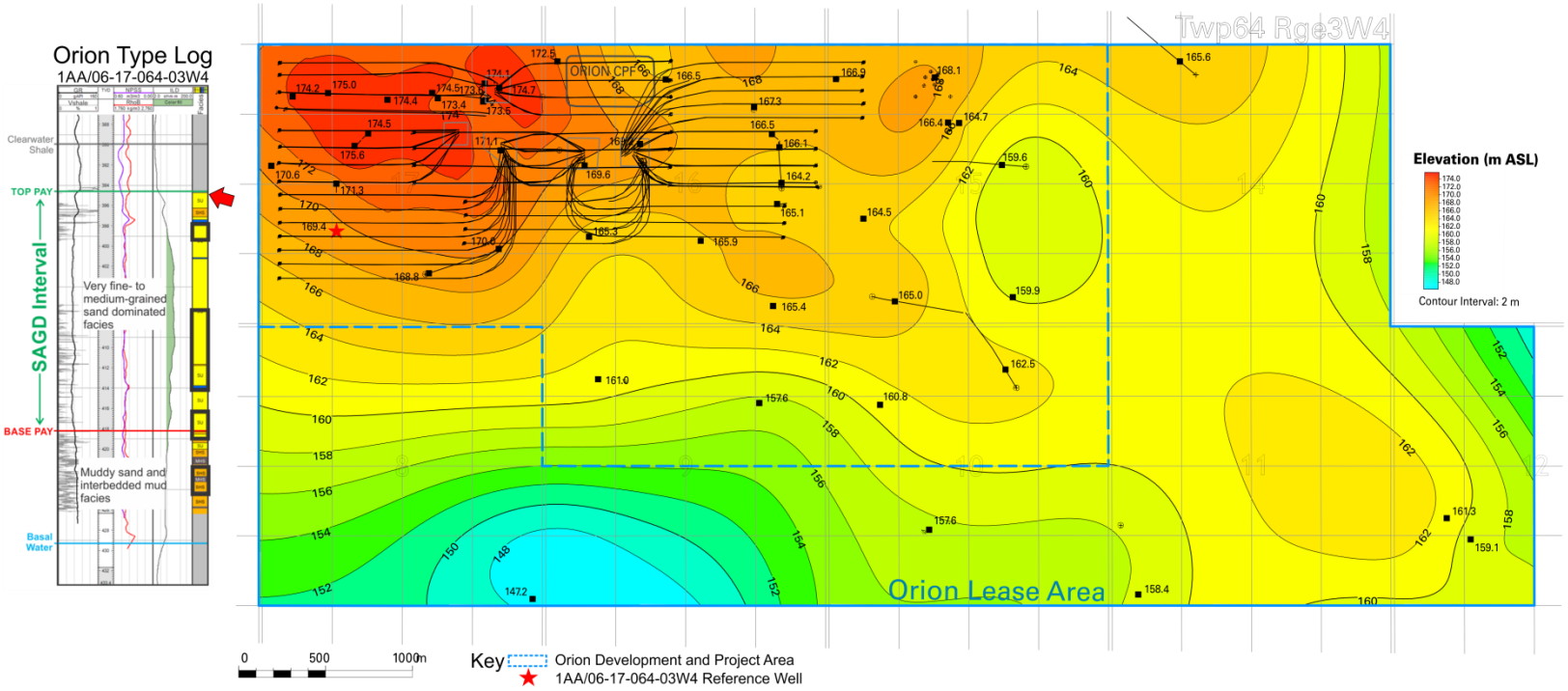


Structural Cross-Section



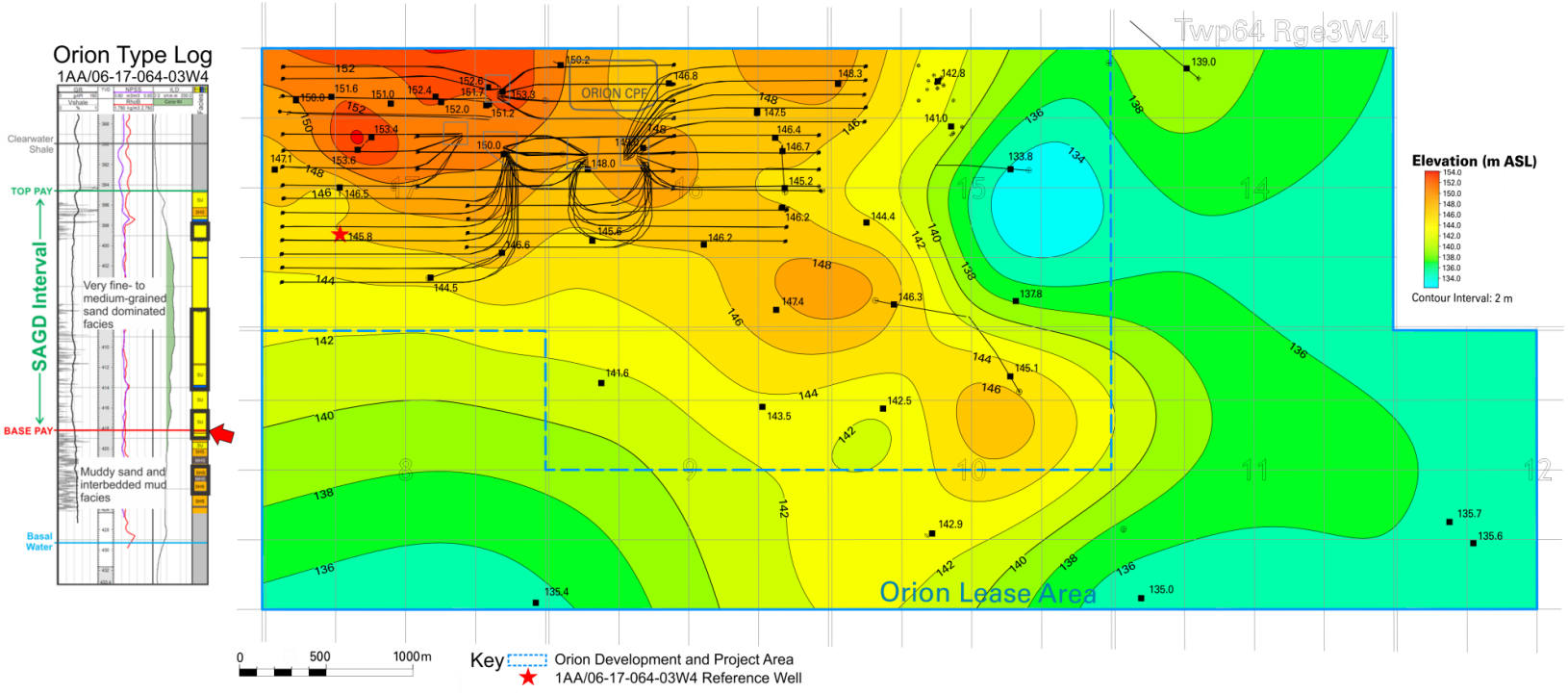
Clearwater SAGD Reservoir

Top Pay Structure



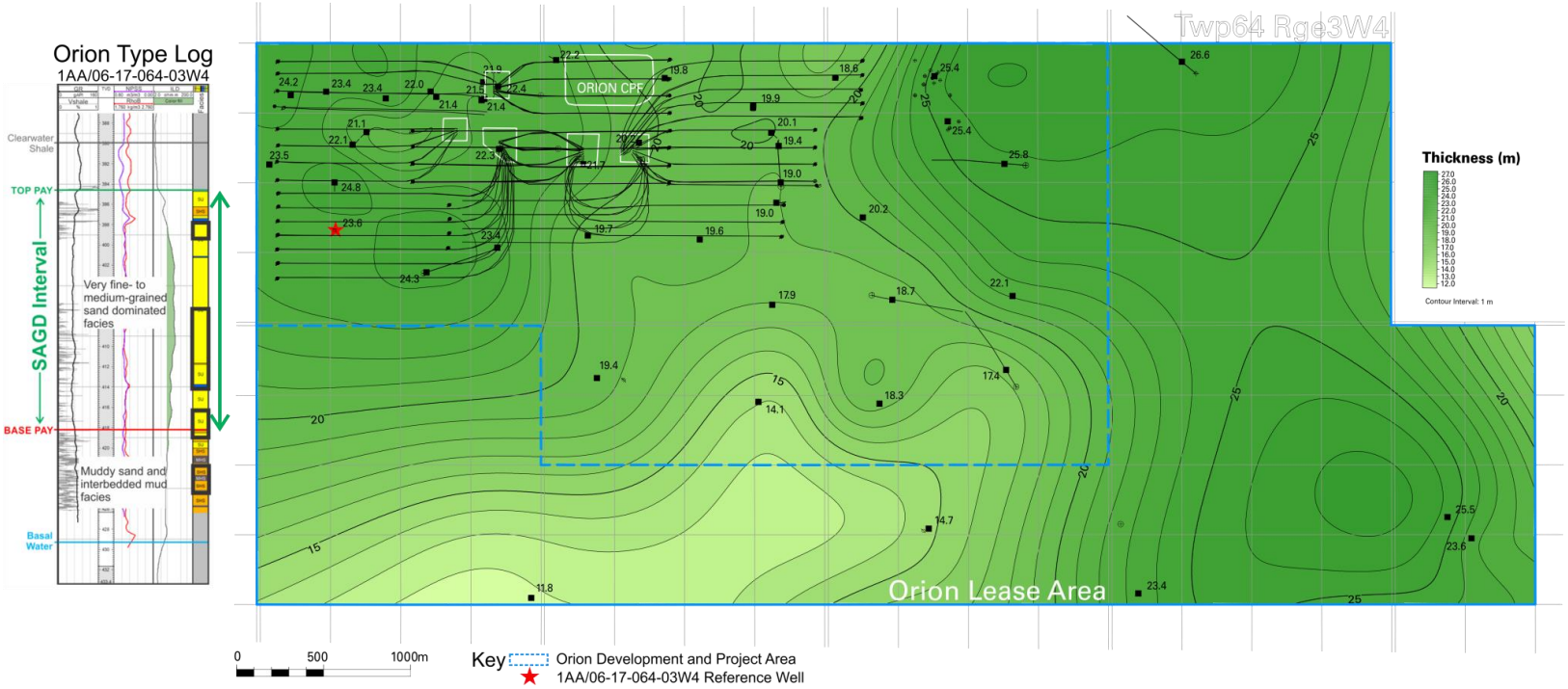
Clearwater SAGD Reservoir

Base Pay Structure

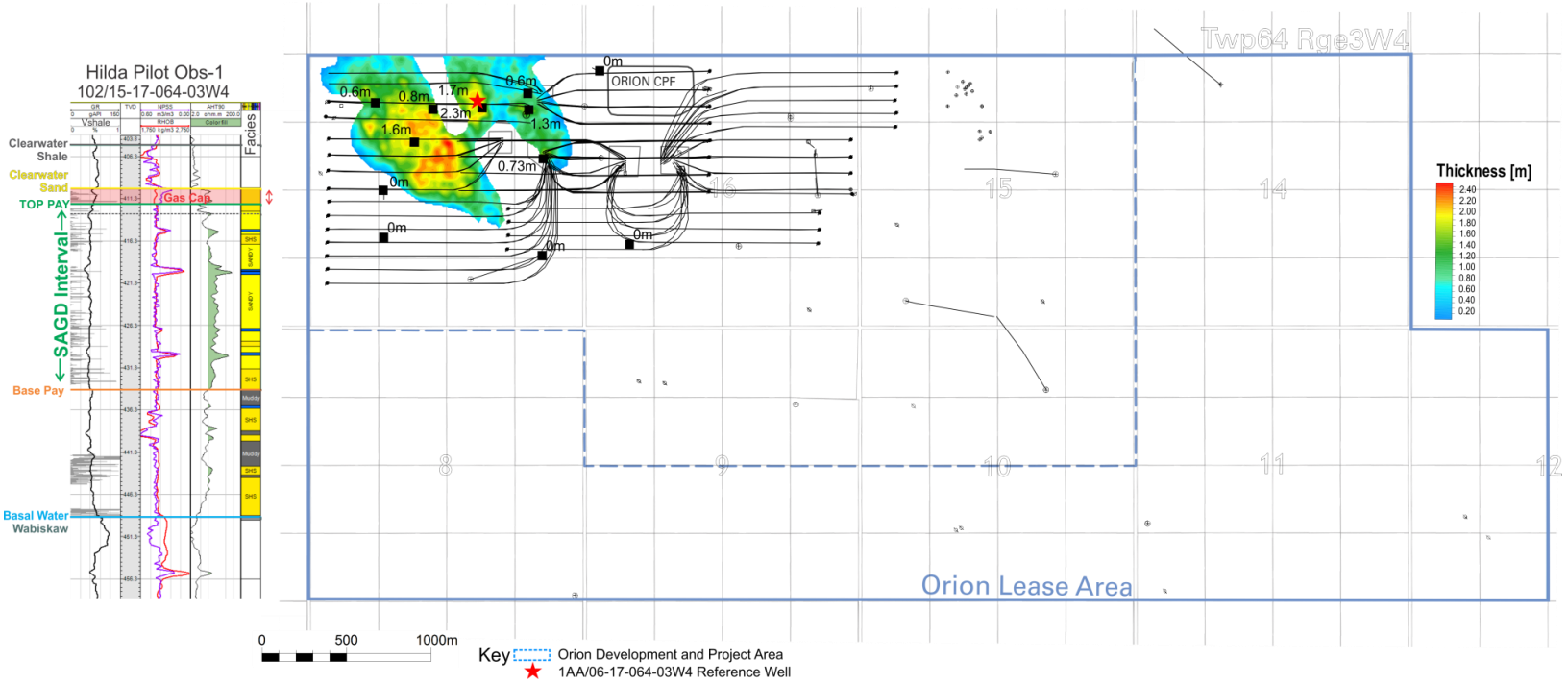


Clearwater SAGD Reservoir

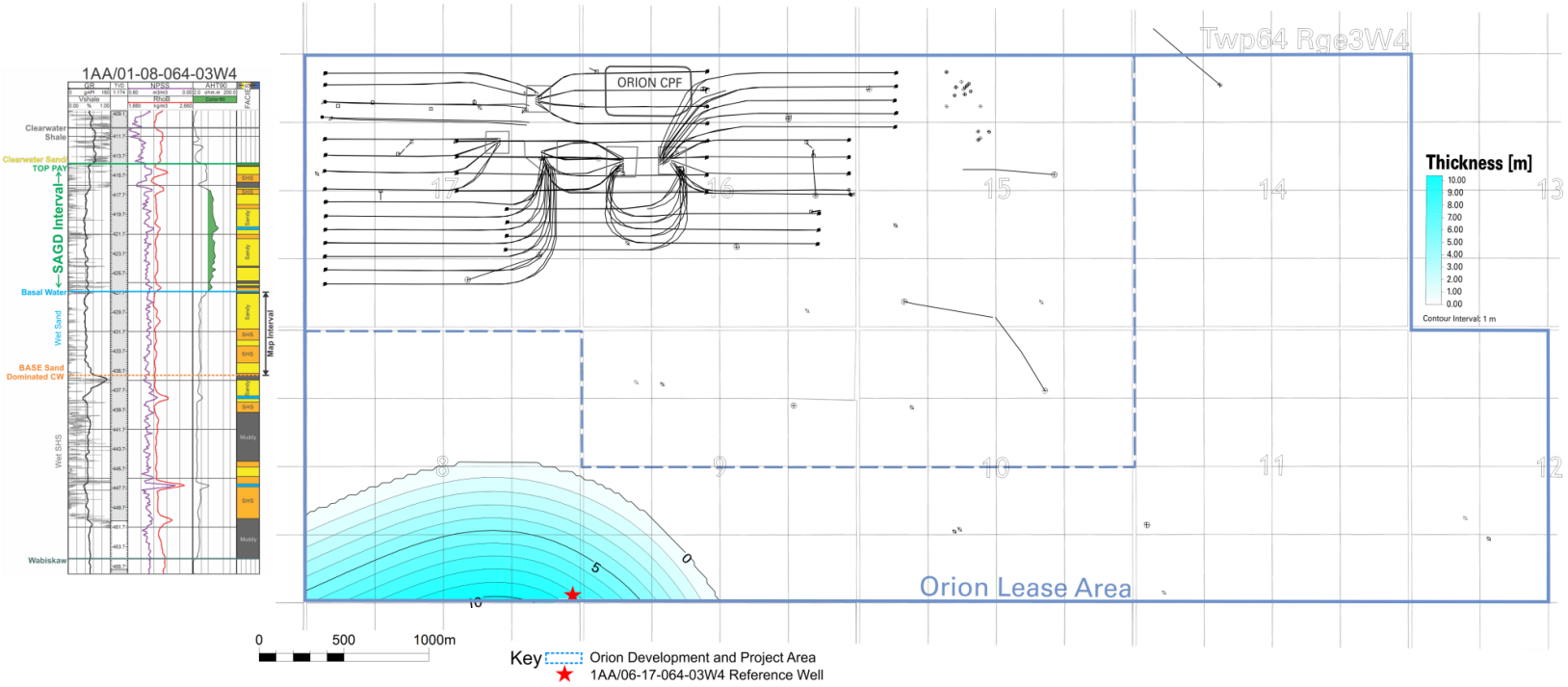
Gross thickness including concretions (<3% of reservoir)



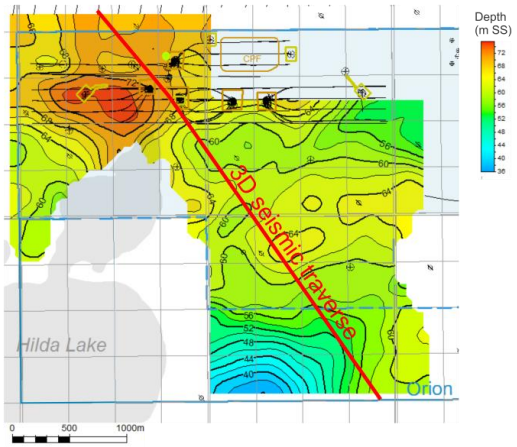
Clearwater Gas Cap Isopach



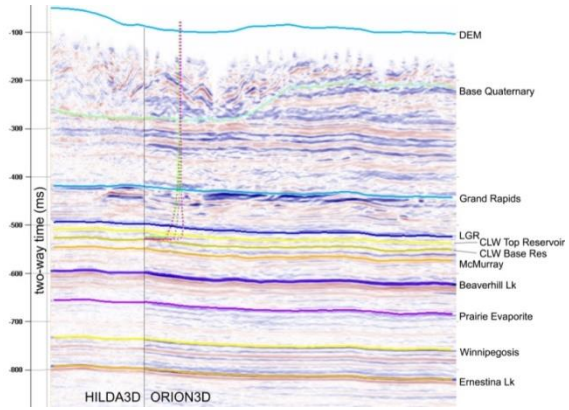
Clearwater Reservoir Basal Water Isopach



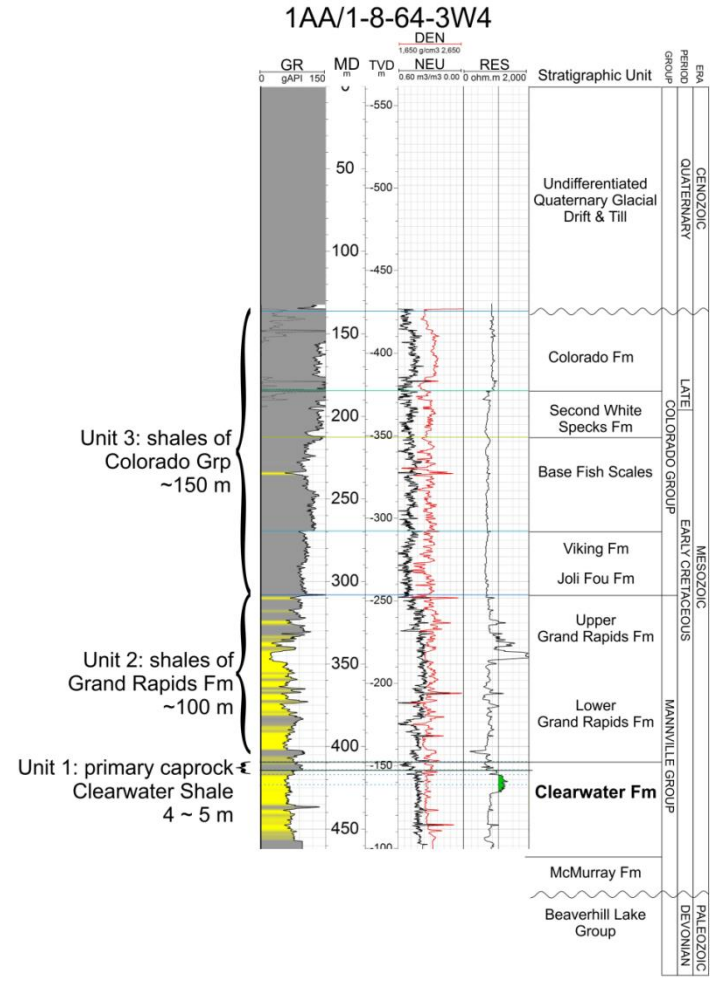
Clearwater Reservoir Caprock



Depth Structure of Beaverhill Lake based on 3D seismic



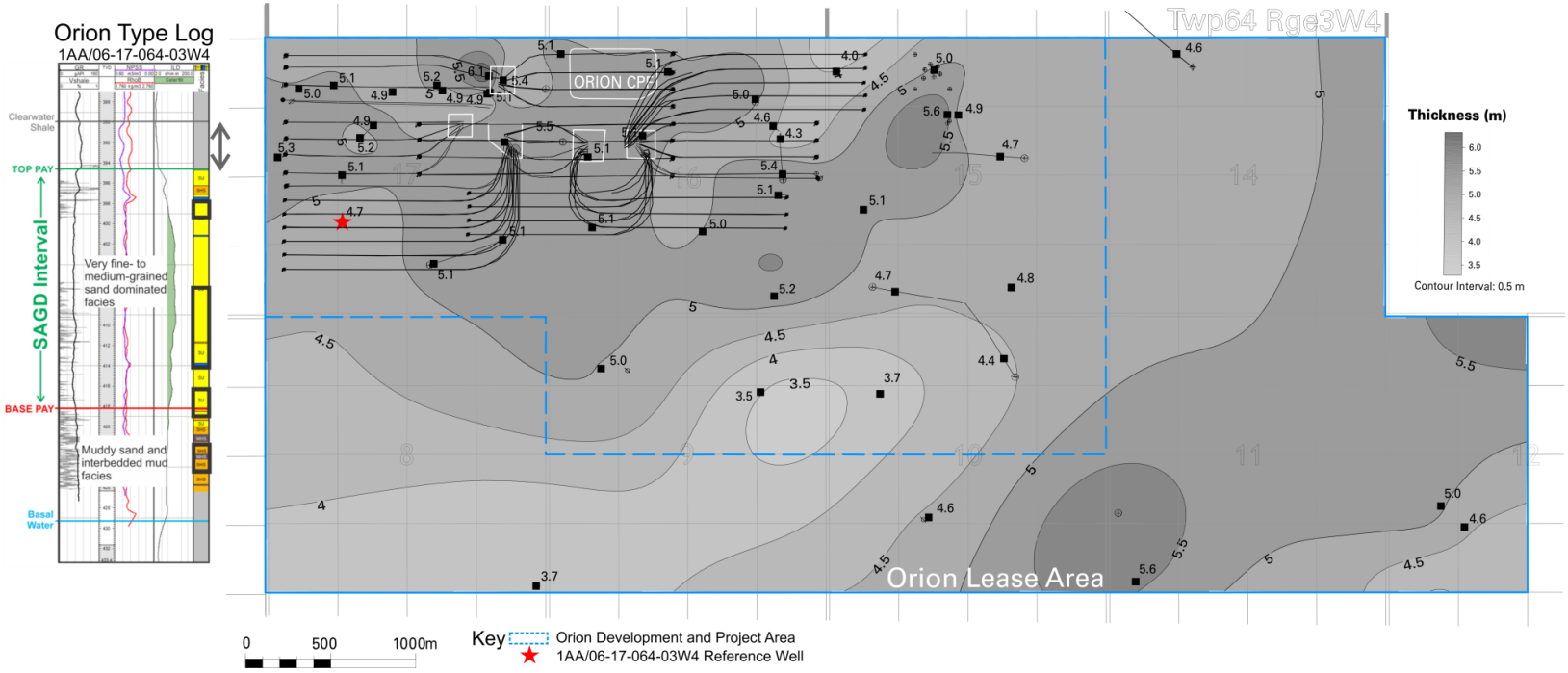
Seismic traverse



- 3 units of capping shales of significant thickness
- Undisturbed basement mapped on 3D seismic
- Vertical in-situ stress gradients at the top of the Clearwater Formation for seven wells in the Orion lease range from 20.3 to 20.8 kPa/m
- Maximum Operating Pressure is 6 Mpa

Clearwater Caprock

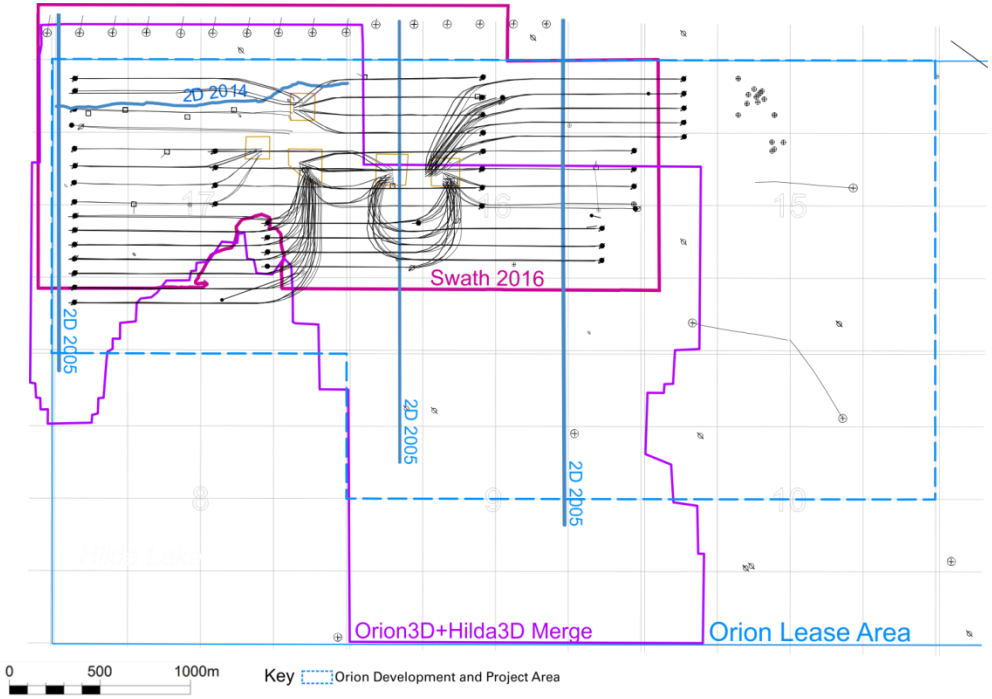
Clearwater Shale Isopach



Seismic Data

3D, 2D & Swath Datasets:

- Hilda 3D – 2005, 1.8 km^2
- 2D – 2005, 3 lines
- Swath – 2007, 1522 records
- Orion 3D – 2009, 6.6 km^2
- Swath – 2009, 1705 records
- Swath – 2011, 1074 records
- Swath – 2014, 1708 records
- 2D – 2014, 1 lines
- Orion 3D & Hilda 3D Merged - 2015
- Swath – 2016, 1688 records



No Seismic Data Gathered Since 2016

Reservoir Properties and Producible Bitumen in Place (PBIP)

PBIP and Recovery to Date[1]							
Pad	Start Date	Operating Well Pairs	Well Length	Well Pair Spacing[2]	Total PBIP[3]	Current Recovery [4]	Estimated Ultimate Recovery
Name	Date	#	m	m	10^6m^3	%	%
Pilot	Sep 1997	2	950	100	1.14	62	>62
Pad 103	Oct 2009	4	670	100	1.53	50	50-60
Pad 104	Oct 2007	4	695	100	1.79	22	50-60
Pad 105	May 2008	4	675	100	1.46	55	55-60
Pad 106	Sep 2007	4	730	100	1.76	24	50-60
Pad 107	Sep 2007	4	700	100	1.67	40	50-60
Pad 108	Jun 2017	2	1,000	70	0.88	9	50-60
Pad 109	Sep 2018	5	1,000	80	1.74	<1	50-60
Pad 204	Jun 2017	7	1,000	80	2.76	4	50-60
Pad 205	Jul 2018	3	1,000	80	1.00	2	50-60
Pad 206	Sep 2018	4	800	80	1.21	<1	50-60

SAGD Reservoir Properties		
Depth	metres	425
Pay Thickness	metres	16-25
Average Porosity	%	35
Average Oil Saturation	%	66
Average Bitumen Weight	%	10
Horizontal Permeability	Darcies	2 to 6
Kv:Kh	X	0.8-0.9
Temperature	°C	15
Pressure	MPa	3.2
Oil Gravity	°API	10 to 11
Viscosity	cP	100,000

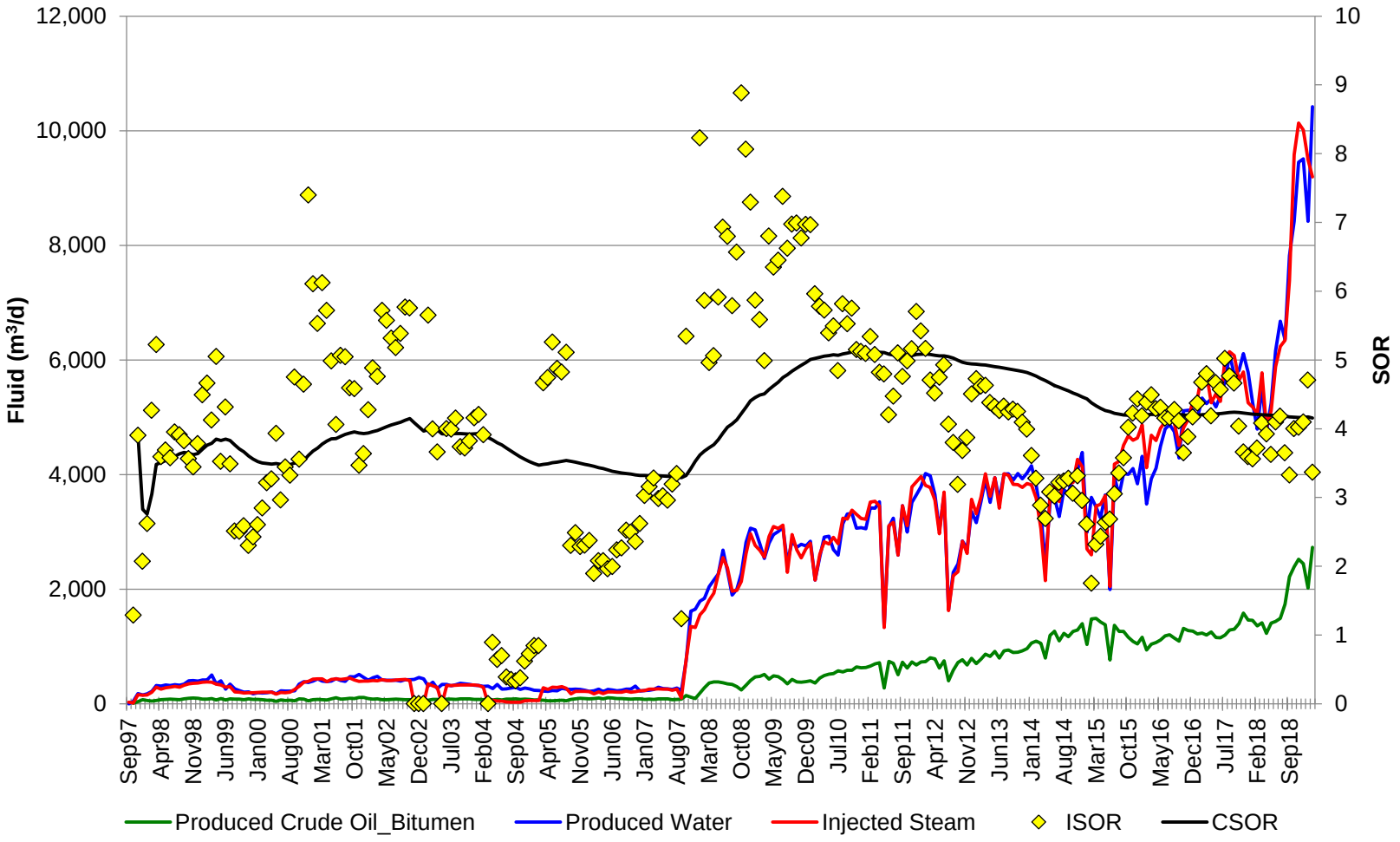
(1) As of December 2018
(2) Approximate Well Pair Spacing, m
(3) PBIP=Area x Thickness Above Producer x Porosity x Oil Saturation
(4) Recovery as of December 2018, on PBIP basis

Scheme Performance

Orion In Situ Oil Sands

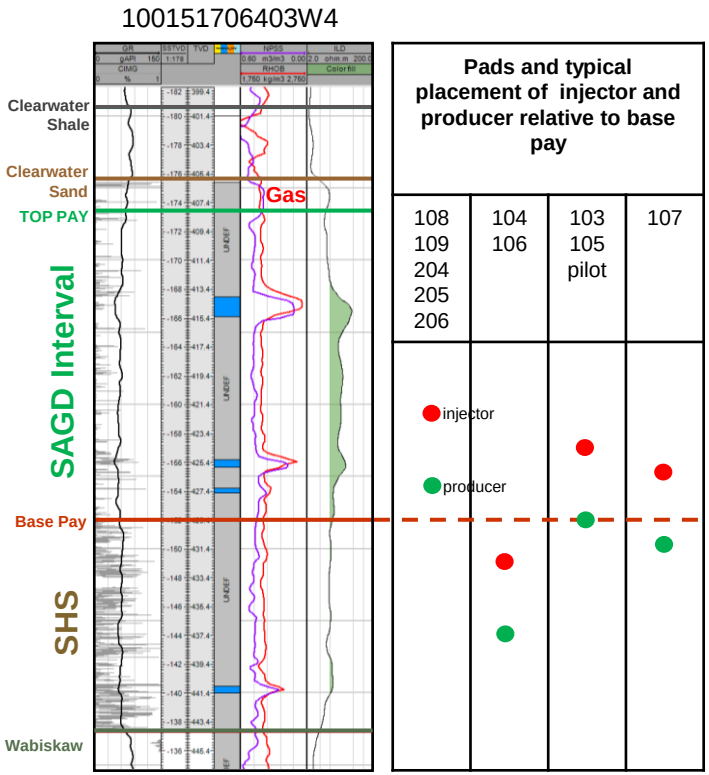
2018 Annual Performance Report

Orion Field Production Since Inception

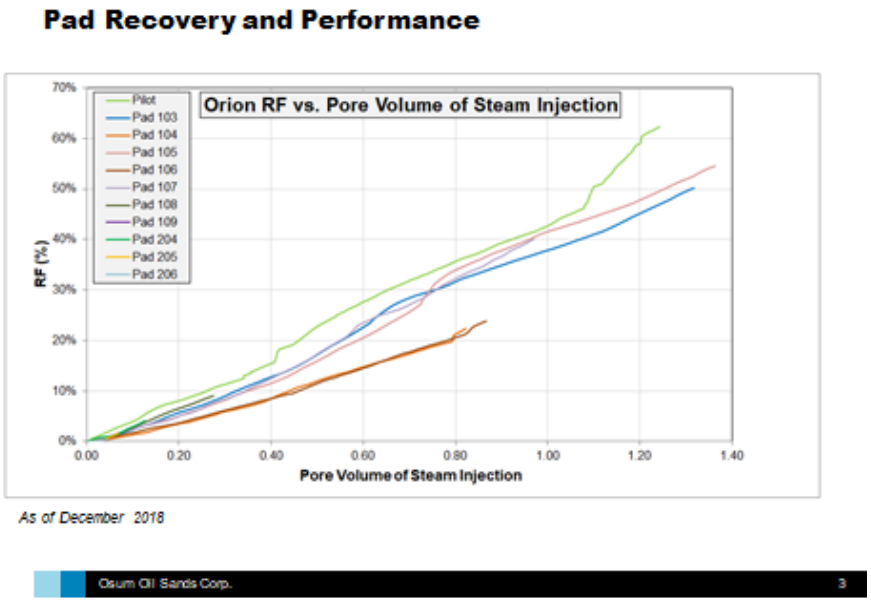


Lessons Learned Well Placement

Placement of Phase 2BC well pairs were positioned at the same stratigraphic level as Phase 2A well pairs. This was based on lessons learned from the placement of wells, relative to Base Pay in Phase 1.



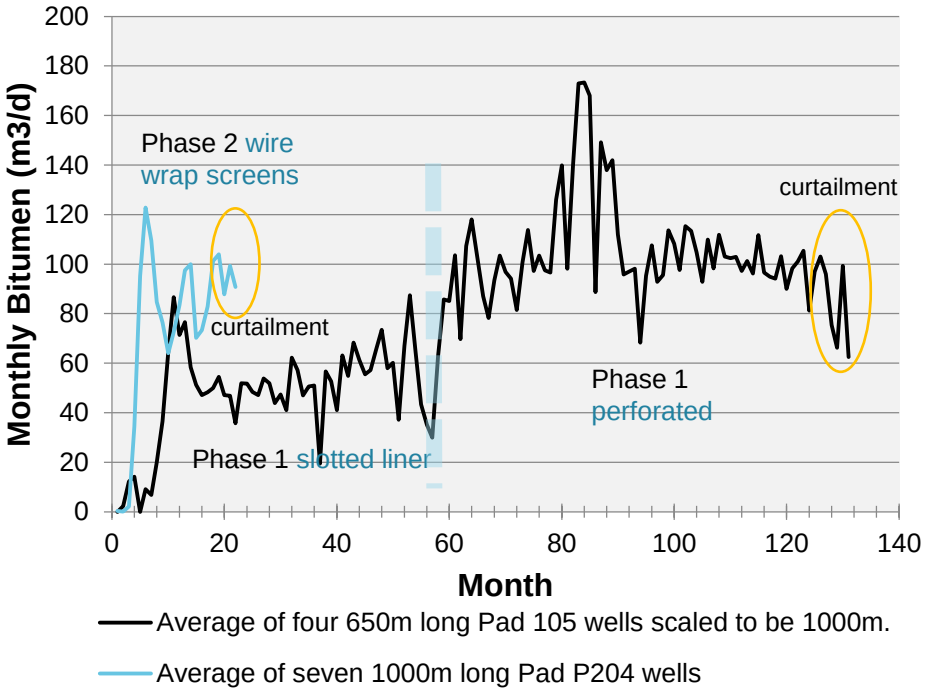
Log V_{shale} (CMG curve on log display) measured from core photo image; high V_{shale} (>35%) interpreted to represent low *in situ* $K_{v.}$

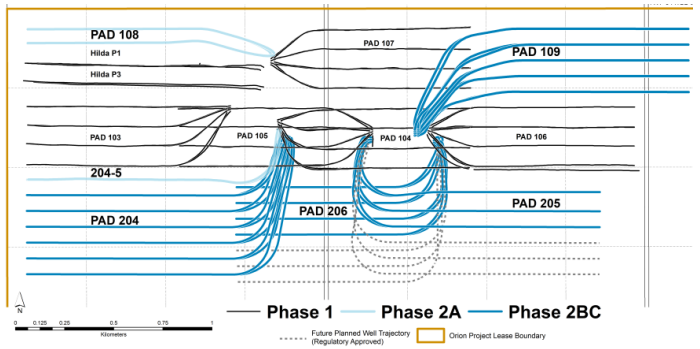


Well pairs from Pads 104 and 106 have less recovery per pore volume steam injected than other well pairs. Lower Kv impacts SAGD performance.

Lessons Learned Liner Design

Clearwater sands are reactive under thermal conditions. Phase 1 performance was impaired by scale in the producer slotted liners. This was mitigated with liner perforations resulting in enhanced production and no sand production issues due to reservoir consolidation.





Phase 2 was completed with wire wrapped screen (WWS) liners which has resulted in:

- Increased open flow area
- Less scaling tendencies
- Lower SAGD Injector-Producer differential pressures
- no sand production issues.

Lessons Learned Orion SAGD Pressure Strategy

Pressure Strategy:

- Circulate at high pressure (~4.5 MPa) to maximize conduction
- Operate early-life SAGD at high pressure (4 - 4.5 MPa)
  - Enhanced chamber growth, lower viscosity
  - Wells utilize natural lift without needing downhole pumps
- Reduced pressure in mature wells to reduce SOR

2018 Year-end Status:

- Phase 1
  - 21 of 22 well pairs operating on artificial lift facilitating operation at lower pressures (2.4 – 2.8 MPa)
- Phase 2
  - 9 well pairs circulating at 4 – 4.5 MPa
  - 11 well pairs operating on natural lift at 4 - 4.5 MPa
  - Well pair 204-5 in communication with Phase 1, initially requiring additional steam prior to artificial lift. Currently operating at 2.8 MPa

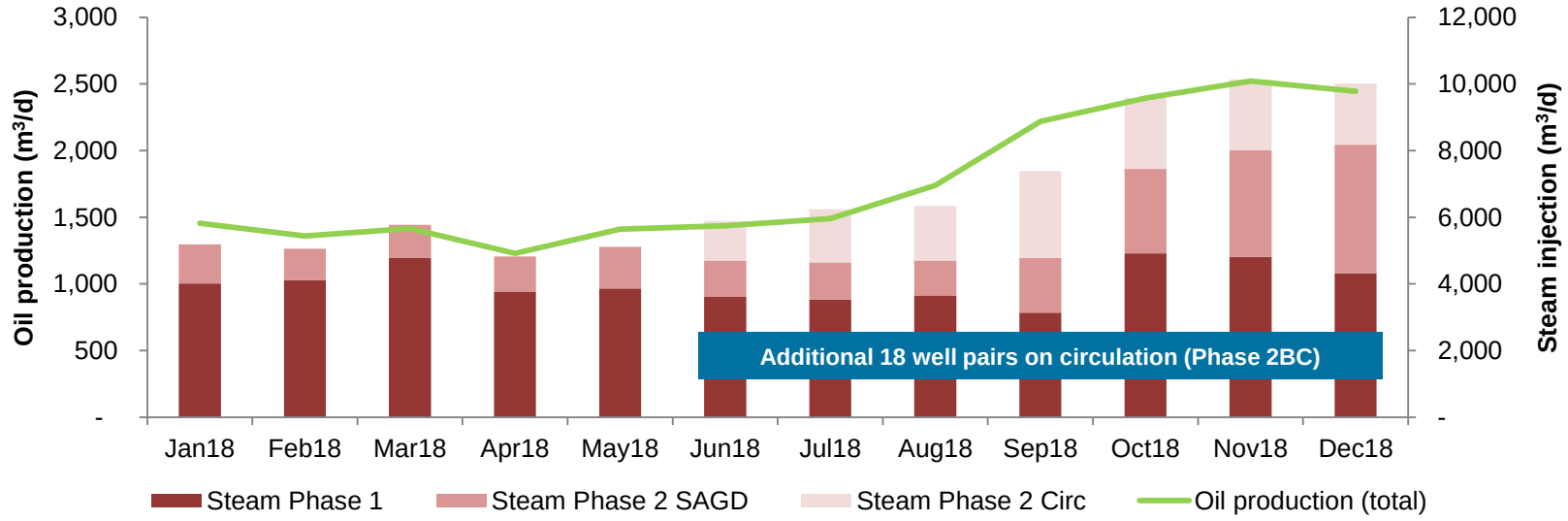
Lessons Learned SAGD Startup Strategy

- Circulation is utilized to startup all SAGD well pairs
  - Circulation time frame 3 - 4 months
  - Both injectors and producers are tested and monitored
    - Downhole temperature measurement in producers to ensure consistent temperature along full liner length
  - Initially well pairs operated with balanced pressure between injector and producer
  - Moderate differential pressure applied after 60 days
  - Transition to Semi-SAGD prior to SAGD operation
- Circulation Lessons from Phase 2
  - Good oil ramp up
  - Low SAGD differential pressures
  - No scale indications
  - Adequate circulation heating
  - Successful liner design

Orion Field Production 2018

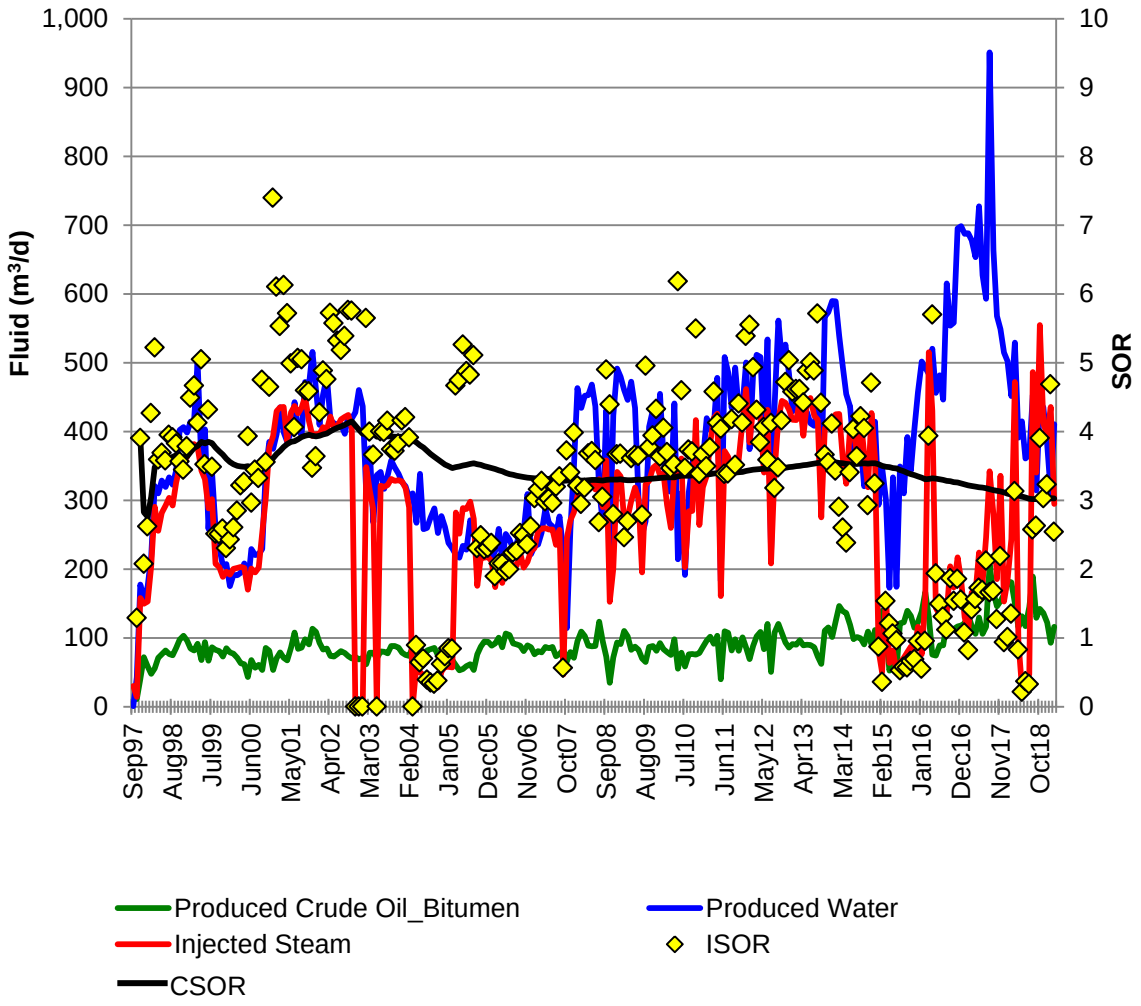
Year Highlights:

- 70% increase in production through the year despite challenging Q4 market environment
- Reliable plant operation post expansion
- Phase 1 - Low oil decline at improved SOR (3.2 avg.)
- Phase 2 - 18 Phase 2BC well pairs initiated circulation in 2018
    - 2018 Q4 - 9 well pairs converted to SAGD
    - 2019 Q1 - 9 remaining well pairs converted to SAGD



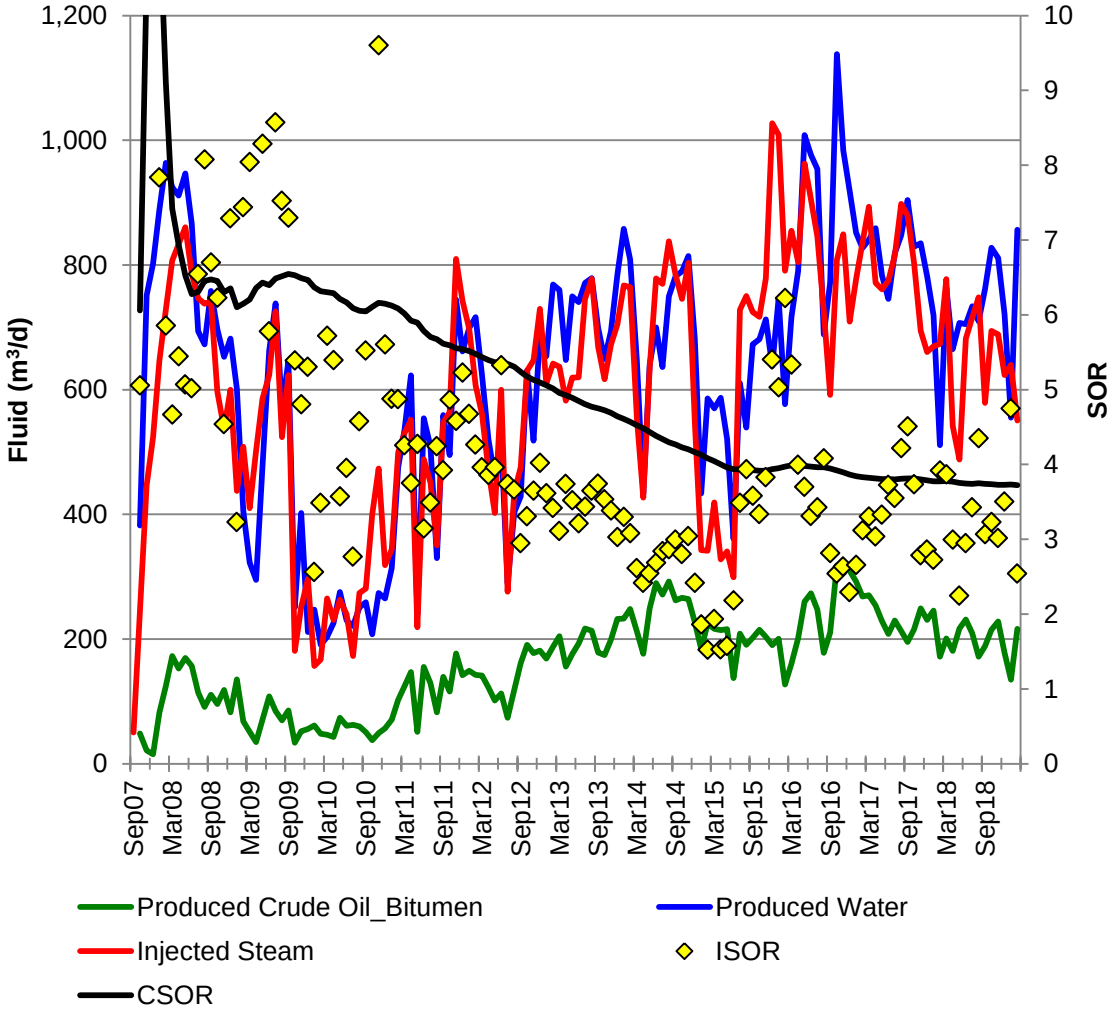
High Recovery Hilda Lake Pilot (2 well pairs)

- 62% recovery with no decline
- High recovery potential, CSOR improving
- Placed near base pay
- Completed with wire wrap liners
- Startup sub-optimal
- Frequent steam shortages early in life



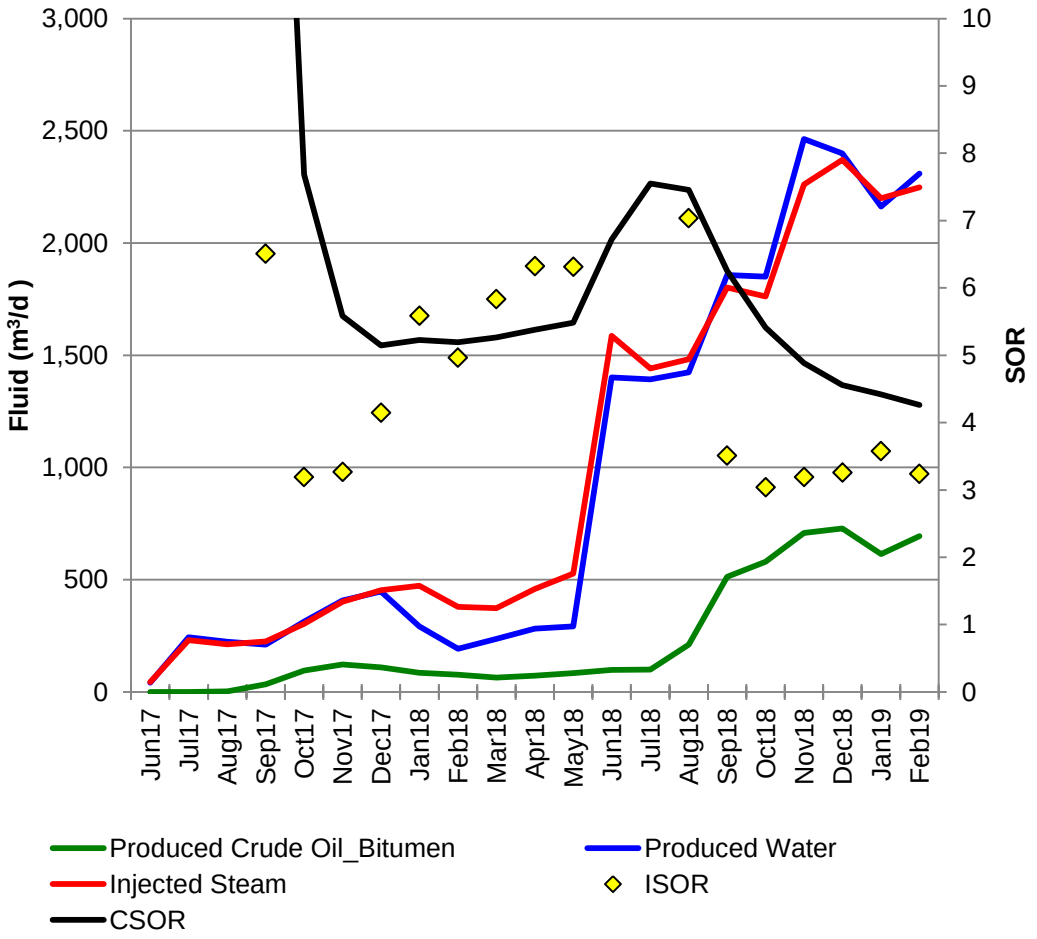
Medium Recovery Pad 107 (4 well pairs)

- 40% recovery with no decline
- High recovery potential, CSOR improving
- Placed 2m below base pay
- Completed with slotted liners
- Performance significantly improved post perforations (2013 and 2016)

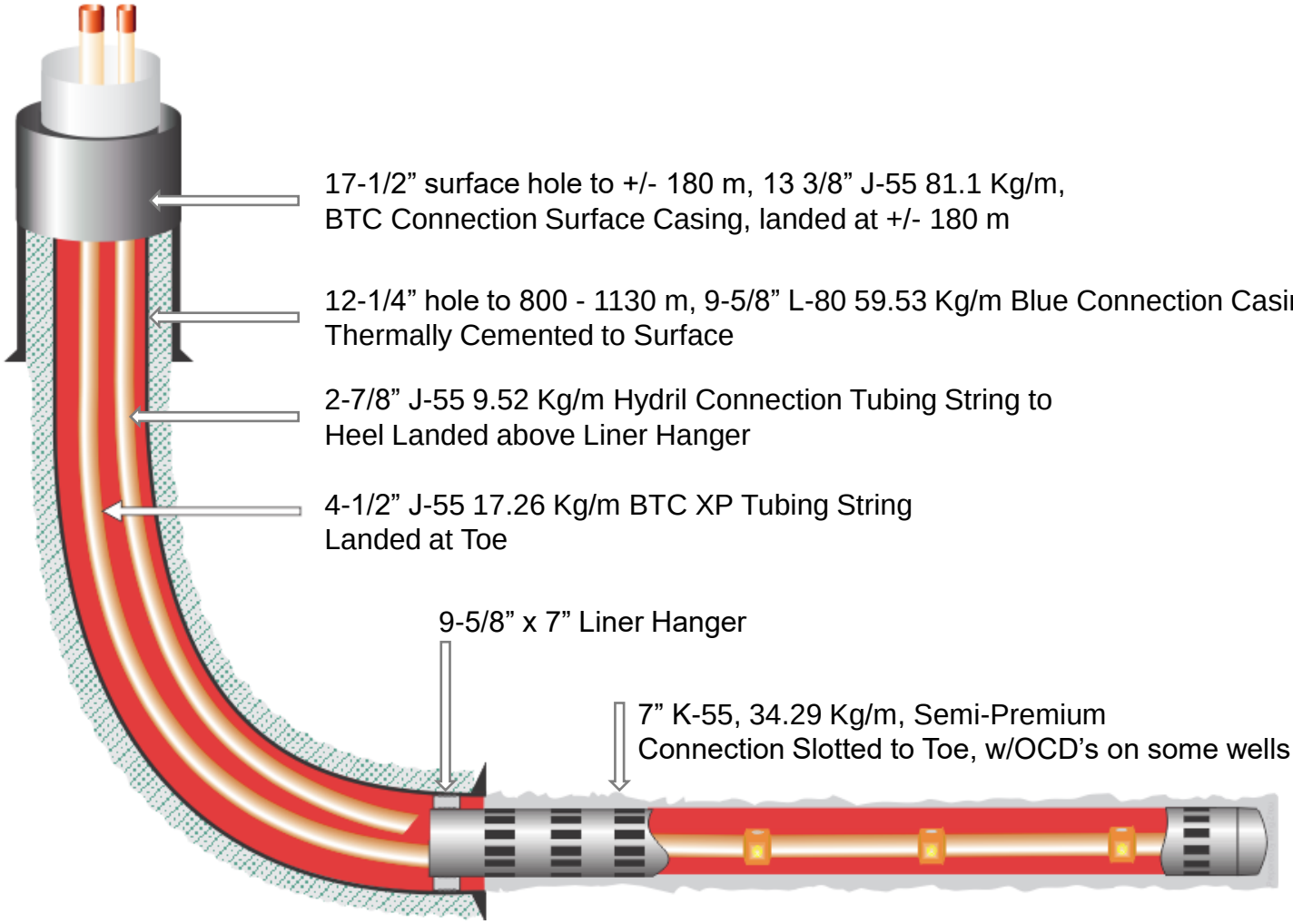


Low Recovery Pad 204 (7 well pairs)

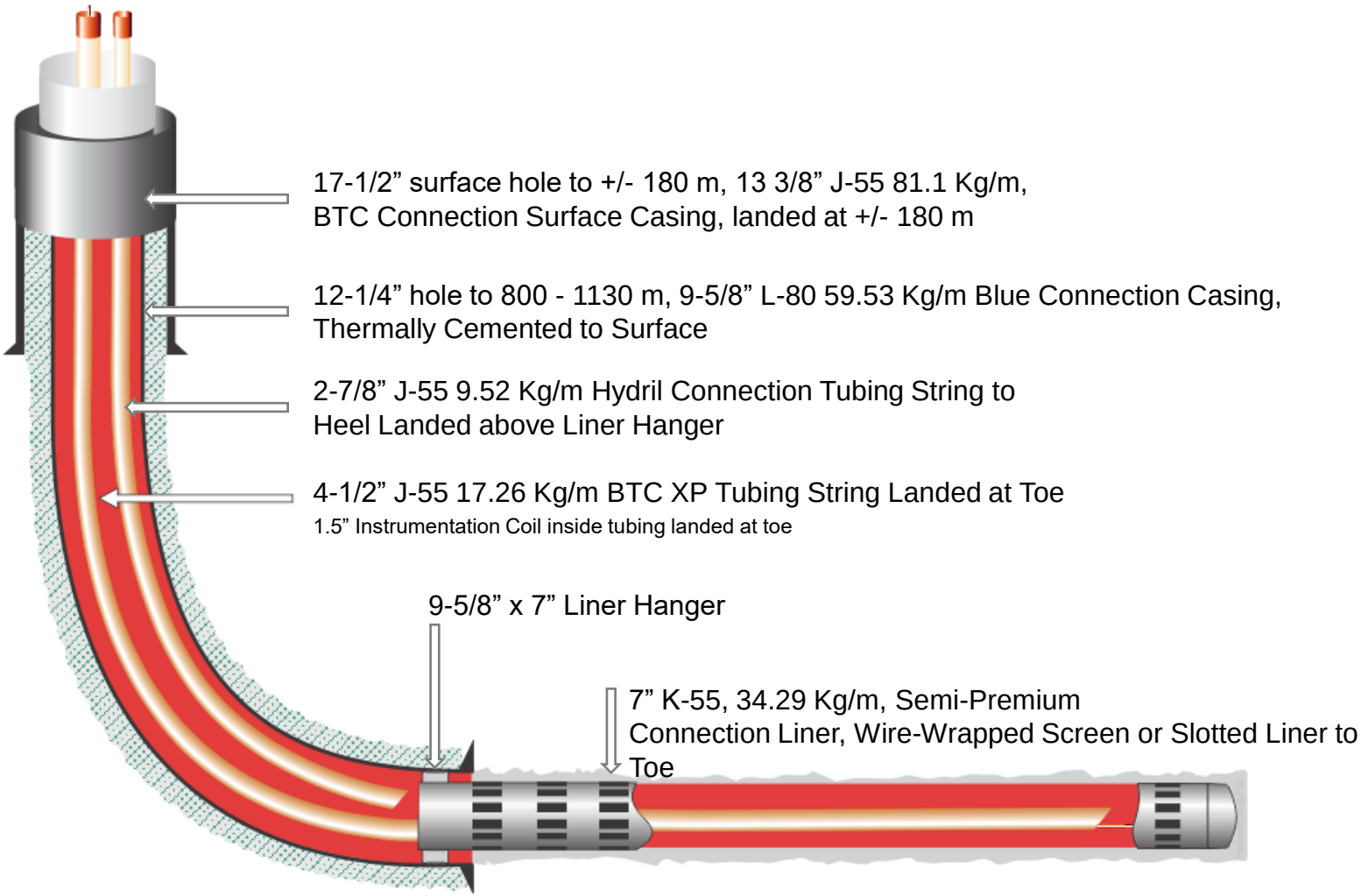
- Single well pair (204-5) startup in 2017 as part of Phase 2A
- Early communication between 204-5 and Phase 1
  - Initially required higher steam rates
  - ESP installed August 2018
  - Water/Steam back in balance
- Six additional Phase 2BC well pairs began circulation June 2018
- Placed 1-2m above base pay
- Completed with wire wrap liners
- No issues completing, circulating, or operating >2,000m MD wells
- Rate and SOR (~3) meeting performance expectations



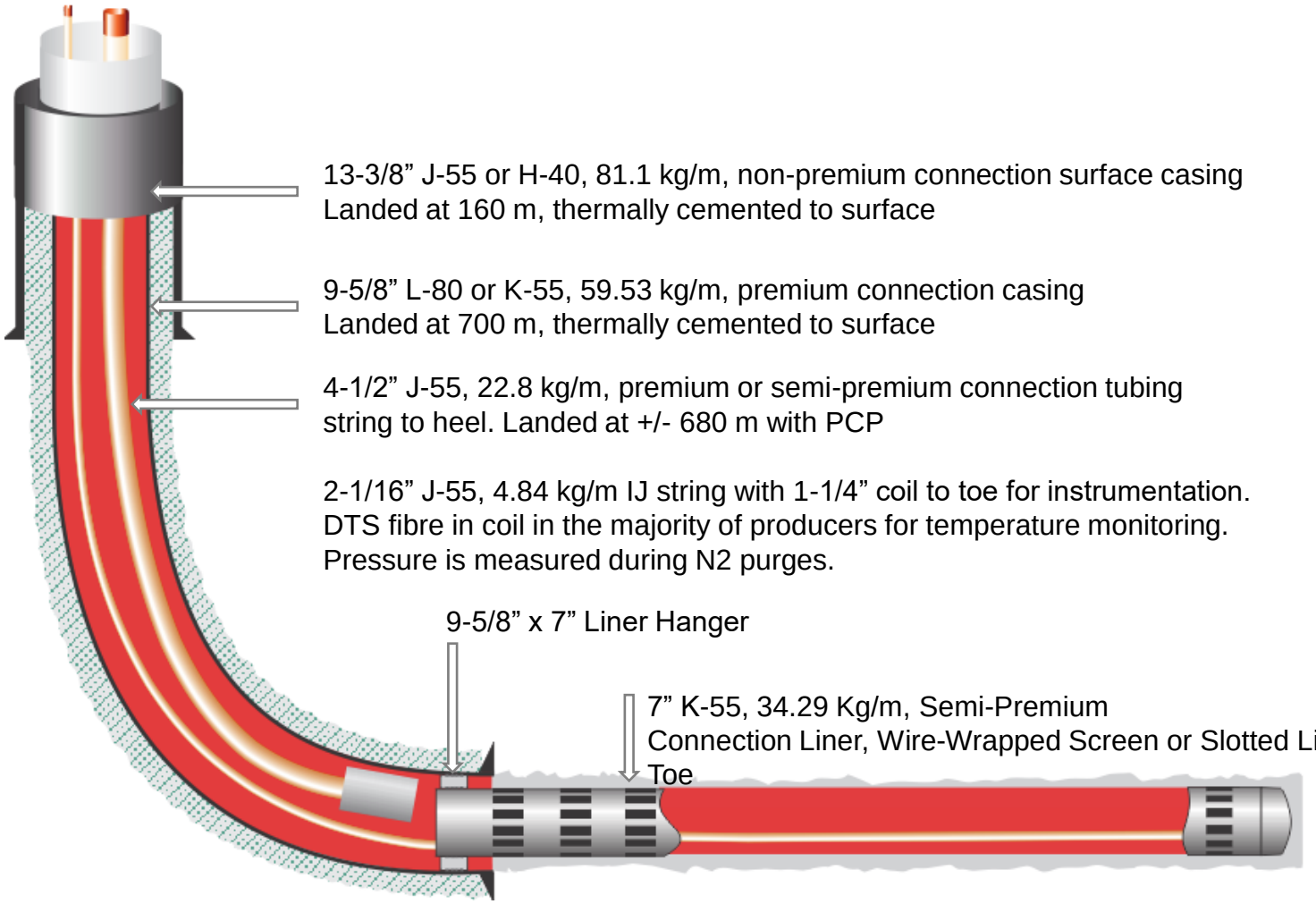
Typical Orion Injector Completion



Typical Orion Producer Completion Steam Lift



Typical Orion Producer Completion PCP

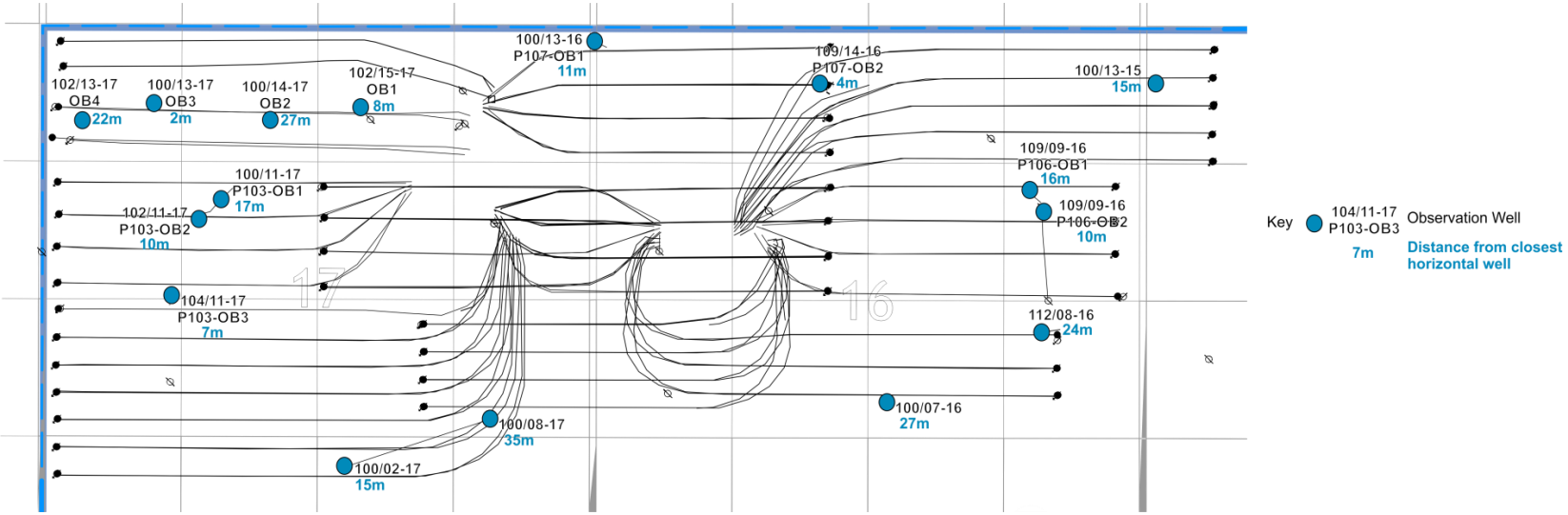


Artificial Lift

- **Phase 1**
  - 21 of 22 well pairs utilize artificial lift, installed to enable lower pressure operation
  - Majority of wells utilize metal-to-metal progressive cavity pumps (PCP)
    - Good performance and reduced cost over operating range
- **Phase 2**
  - Higher bottom hole pressure should allow lift to be achieved without any pumps in most cases for the first 3-5 years of production
  - As wells reach mid/late life (or communicate with Phase 1) artificial lift will be installed
    - Electrical submersible pumps (ESP) will be utilized on higher rate potential wells
- Osum continues to work collaboratively with PCP and ESP vendors to improve performance and run time.

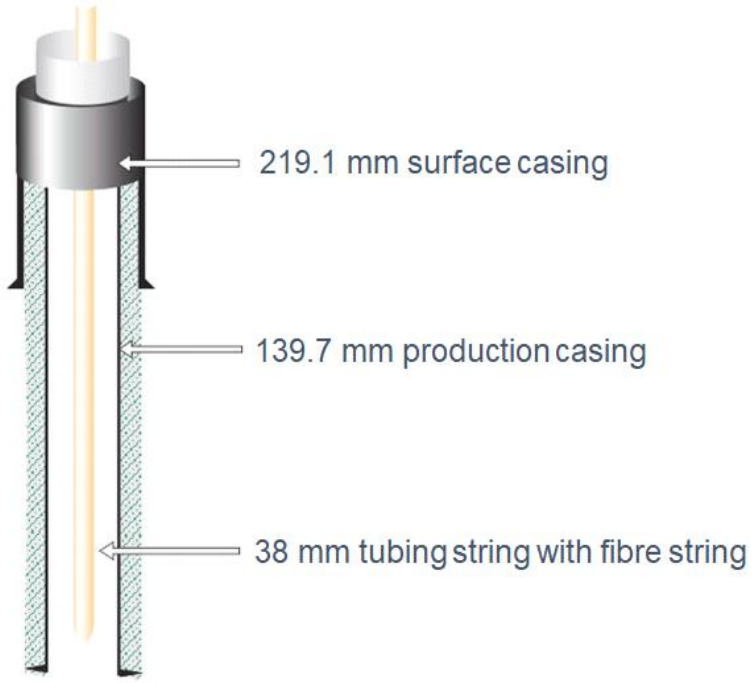
Orion Observation Wells Location Map

- Phase 1 Observation (OBS) wells
  - Installed repaired OBS well DTS interrogator February 2018
  - Temperatures began to drift shortly after installation, and interrogator sent for repair.
  - Currently no representative OBS well data for 2018
- Phase 2 Observation (OBS) wells
  - Will begin gathering data in 2019.

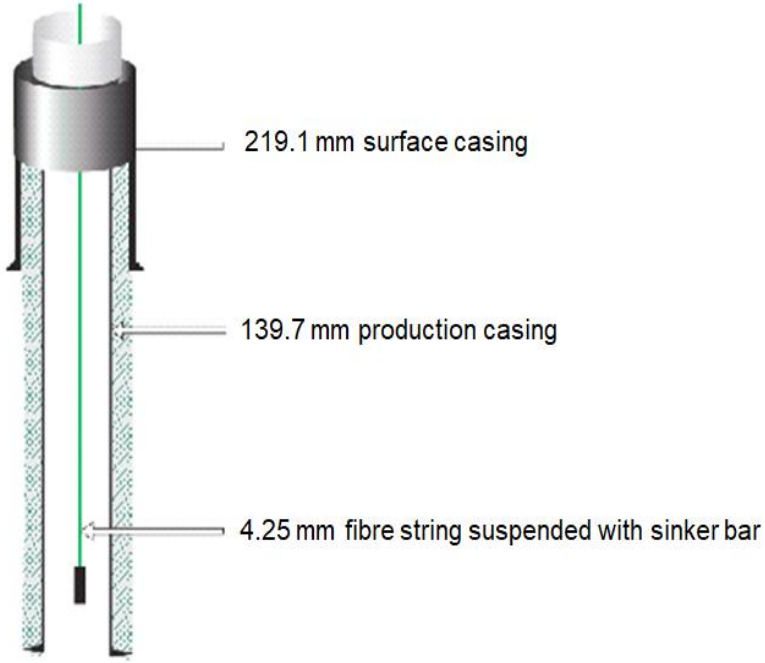


Hilda Lake and Phase 1 Observation Wells

Hilda Lake Observation Well



Phase 1 and 2 Observation Well



Wellbore Integrity

- All newly drilled eighteen SAGD well pairs had cement to surface, and surface casing vents installed.
- Osum has not experienced liner failures on existing wells.
- Osum is currently updating the Well Integrity Management Plan which addresses design, integrity risks, corrosion mitigation, along with monitoring and detection.
- Osum has both an Emergency Response Program and a Well Intervention Plan in place to mitigate the environmental impact of a near surface casing failure.

Future Plans

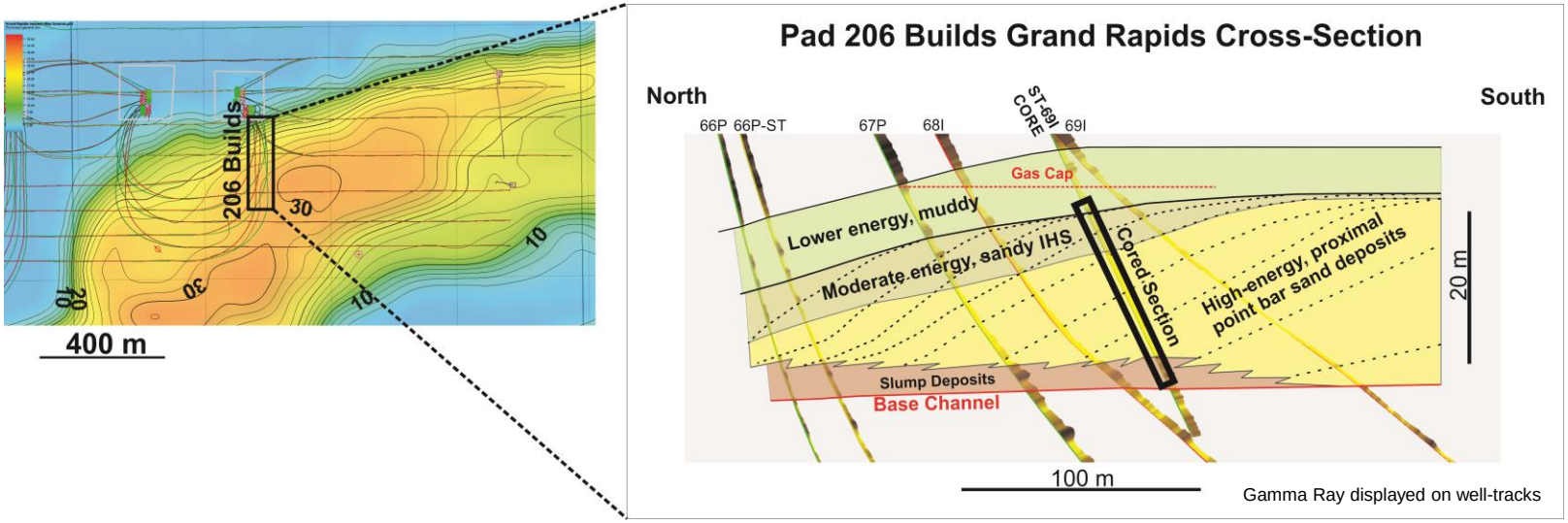
Orion In Situ Oil Sands

2018 Annual Performance Report

Future Amendments Upper Grand Rapids Channel

- Program planned to further delineate Upper Grand Rapids Channel for AER amendment.
  - Delineated northern edge of a southwest to northeast trending channel in the Upper Grand Rapids with build sections of Pad 206 horizontal wells. This included core and wireline logs from a sidetrack of 206-9 injector (103/06-16).
  - Quartzose sub-arenite with excellent reservoir quality (34% porosity, 6000 mD Kh, 70% oil saturation with 60,000 cp viscosity @ 16ºC) and pay thickness (18.75 m TVD in cored well).

Upper GR Channel Isopach Map (Seismic)



Surface Operations

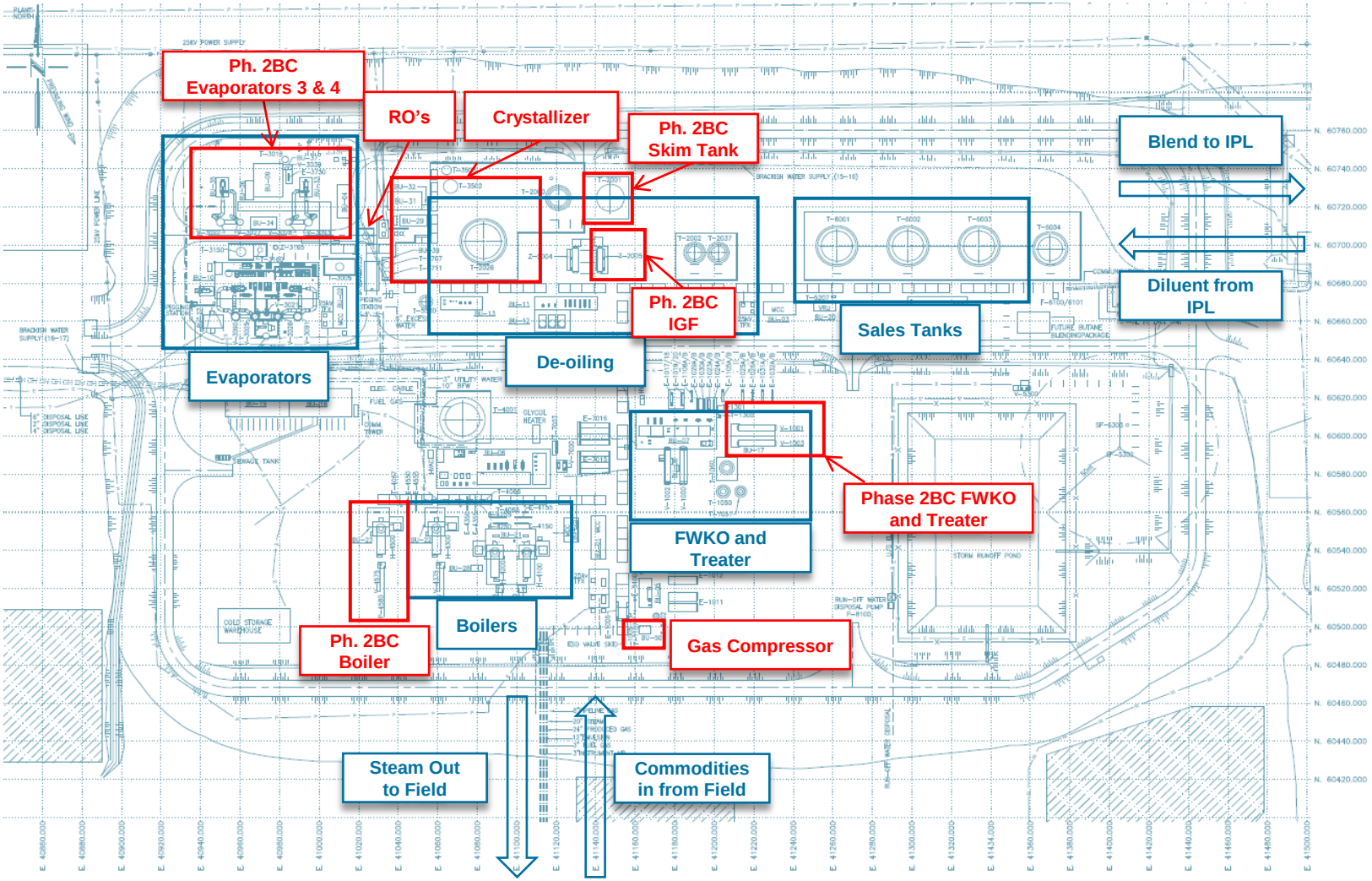
Orion In Situ Oil Sands

2018 Annual Performance Report

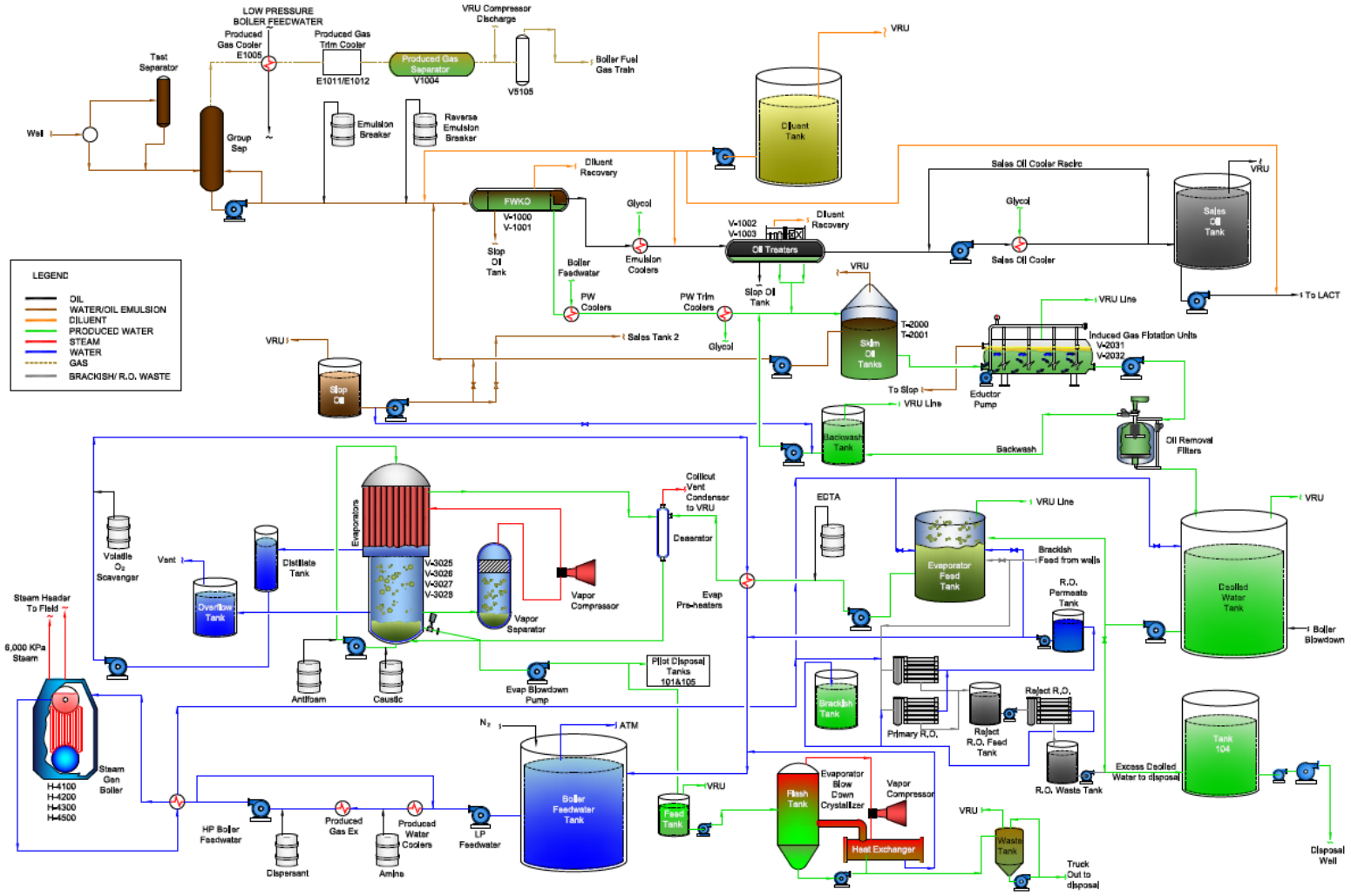
Facility Highlights

- **Improved steam generation capacity and boiler reliability:**
  - H-4500 was installed as part of 2BC expansion
  - Maintained consistent boiler reliability (minimal downtime)
  - Boilers were tuned and internal inspections were completed
- **Produced Gas & VRU:**
  - Additional Produced Gas Cooler & Produced Gas Trim Cooler were installed as part of 2BC
  - VRU compressors were repaired
- **Water treatment and delivery:**
  - Free Water Knock Out (FWKO), Treater, Skim Tank, Induced Gas Flotation (IGF), Oil Removal Filter (ORF), Evaporators 3 and 4 were added during 2BC expansion
  - Crystallizer unit helps process additional distillate to boiler feed and decreases evaporator blowdown waste disposal (200 m^3/d reduction)
  - 16-17 brackish well has been completed enabling utilization as a produced water disposal well or as a source water well depending on water balance needs.

Orion Central Processing Facility Plot Plan



Orion Water Usage and Treatment



Orion Central Processing Facilities (CPF)

General process description:

- Four conventional drum boilers are used to generate steam, which is sent via steam pipelines to the field for injection into the reservoir
- Emulsion returns to the CPF by pipeline, produced gas is separated at the well pad and separately piped to the CPF where it is mixed with purchased natural gas for boiler fuel
- Oil separation occurs in the free-water knockout and treater vessels, produced water is cooled and sent to de-oiling while oil is transferred to product storage
- The water treatment facilities treat produced water in order to be re-used to generate steam. The process results in reuse of over 90% of the produced water
- Brackish water is drawn from two McMurray formation source wells to supply required make-up water. Brackish water is processed through RO units prior to feeding the boilers. In 2018, 80% of produced brackish water was used to generate steam (RO reject water is injected into on-site water disposal well)
- The waste produced in the evaporative water treatment process is fed to the Crystallizer unit which recovers distillate water to feed the boilers
- Waste produced in the Crystallizer unit is sent offsite to an AER approved waste disposal facility

Water Treatment De-Oiling

Produced water is recovered from emulsion utilizing:

1. Skim tank – designed to maximize retention time for adequate separation
2. Induced gas flotation vessel – micro-bubbles of fuel gas are introduced into the produced water to remove residual hydrocarbon content to <10ppm oil/water
3. Oil removal filters – walnut shell deep bed filtration

Water Treatment Evaporators

- Evaporator technology is utilized to produce boiler feed water (BFW)
  - Evaporators 3 and 4 were added – 2BC
  - Produce BFW that meets or exceeds water treatment criteria
- Orion evaporators generate a brine waste stream that is further concentrated in the Crystallizer, residual waste brine is disposed of at an AER approved facility
- 95% design conversion rate of feed to distillate for BFW

Water Treatment Crystallizer

- In October 2017 Osum commissioned a Forced Circulation Crystallizer Unit which converts approximately 69% of evaporator blowdown waste to boiler feed water quality distillate.
- The unit has significantly reduced the volume of off-site waste disposal and increased the water recycle ratio of the facility.

Steam Generation

Description

Conventional drum boilers generate 100% quality steam at 6,000 kPag for injection at the well pads

A concentrated blowdown of 3-5% of the inlet mass flow to the boilers is sent to the de-oiled tank and can also be routed to the reverse osmosis units

2018 Focus

Boiler reliability from existing equipment and the safe and successful commissioning of a fourth boiler installed in September 2018 were key steam generation related focus points in 2018.

1. Minimal downtime in 2018 – consistent steam generation averaging 6,820 m^3/d
2. Internal inspection and tuning was completed on four boilers (H-4100/4200/4300/4500)

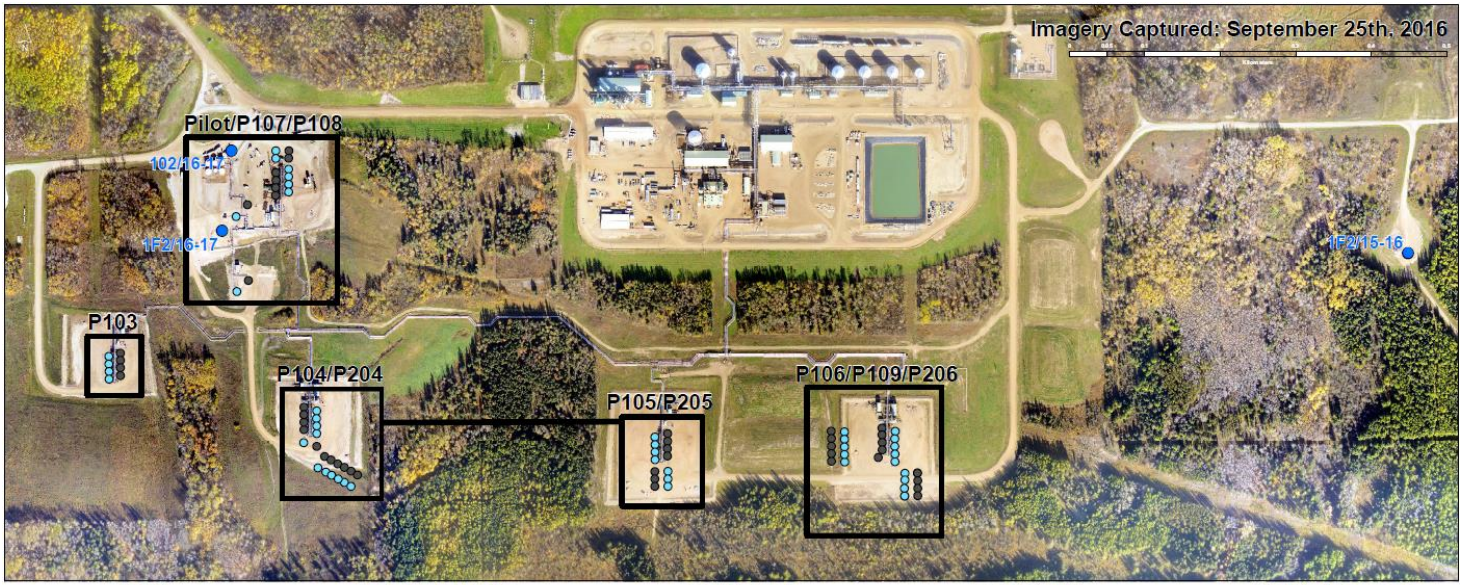
Orion Vapor Recovery System

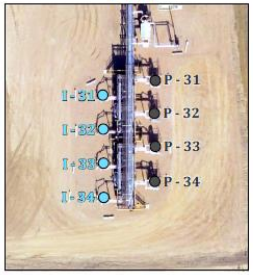
General process description:

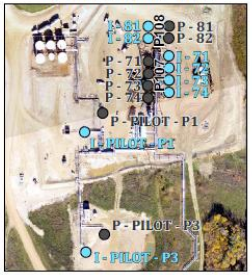
- The vapour recovery (VRU) system collects and compresses produced gas vapours from:
  - Evaporator vent recovery
  - Ten storage tanks
  - Diluent recovery system
  - Induced gas flotation system
- All recovered gas vapours are utilized in the steam generation fuel gas system
- VRU system is 2 times 100% redundant compressors
- The vapour recovery system is routed to the low pressure (LP) flare system during upset conditions

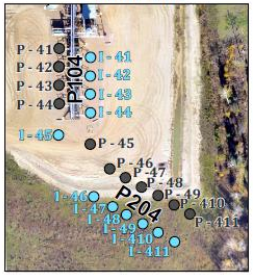
Orion Well Pad Facilities

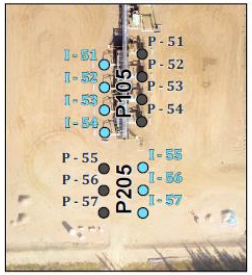
- Five surface well pads with a total of 43 SAGD well pairs.
- Eighteen Phase 2BC well pairs were drilled from existing Phase 1 surface pads in 2018.

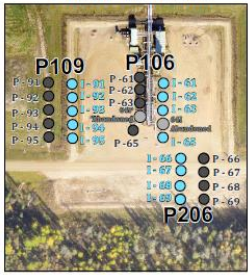




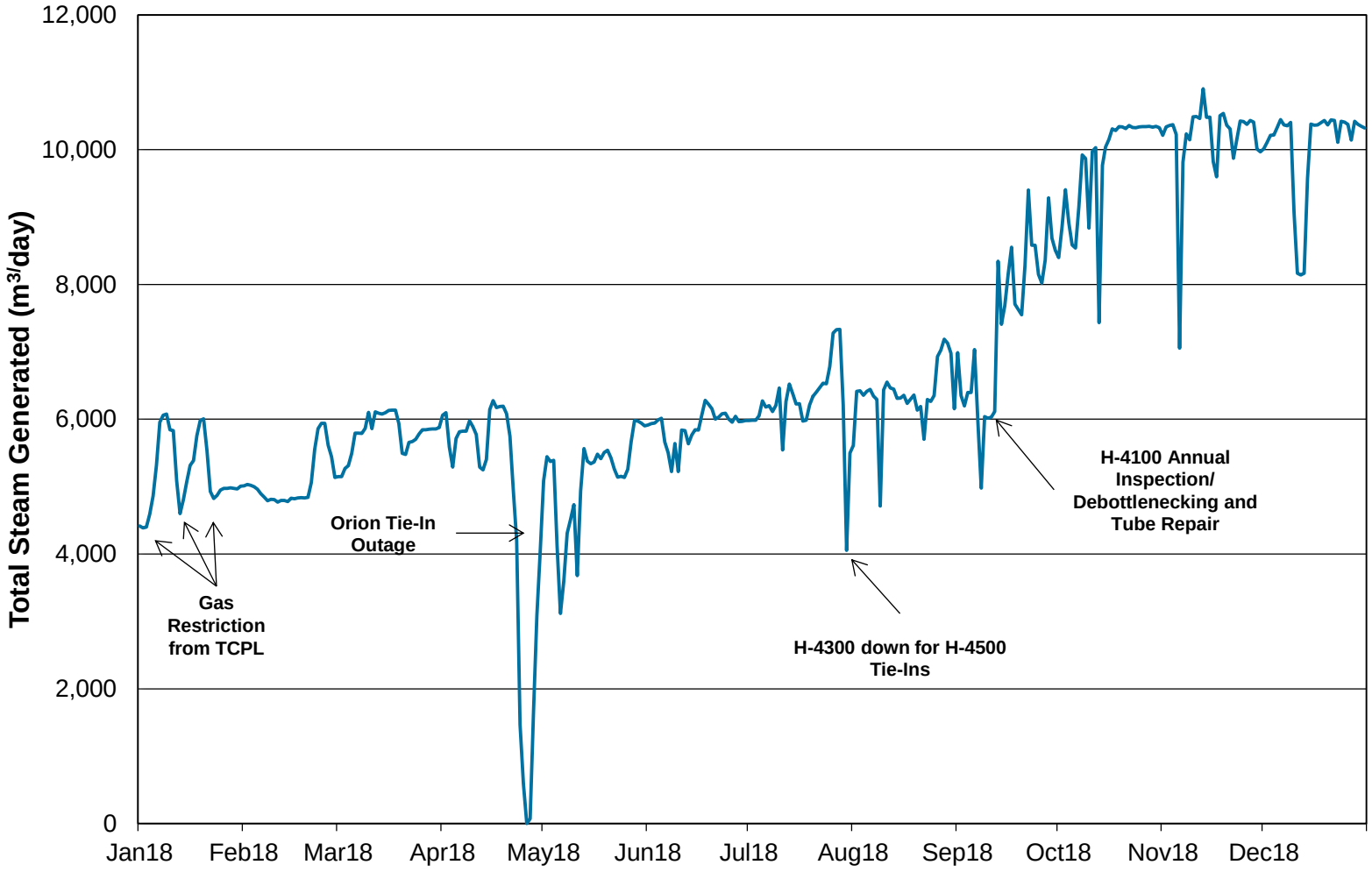






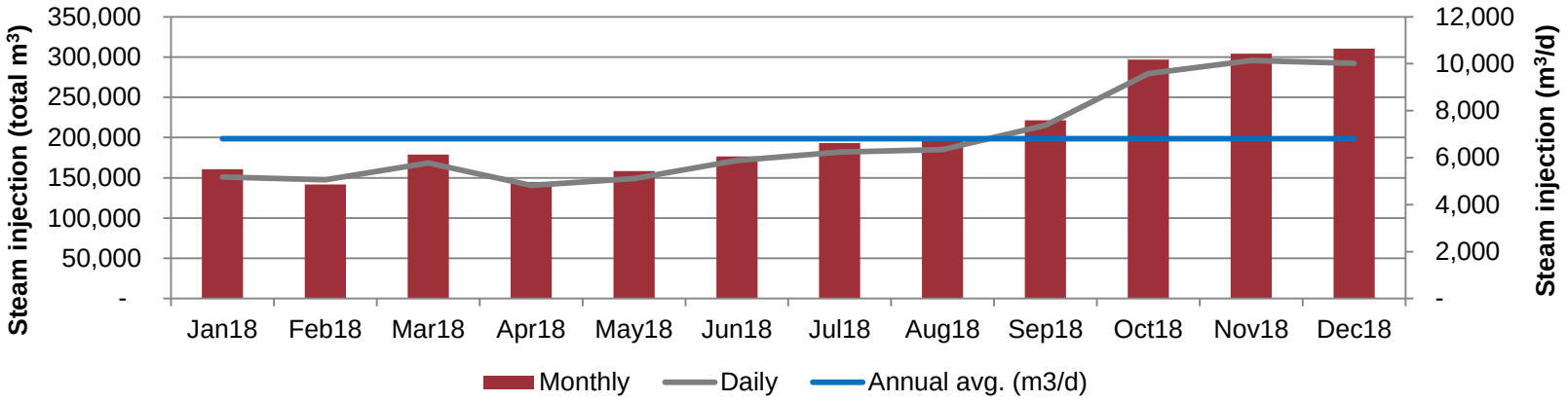


Plant Reliability 98%

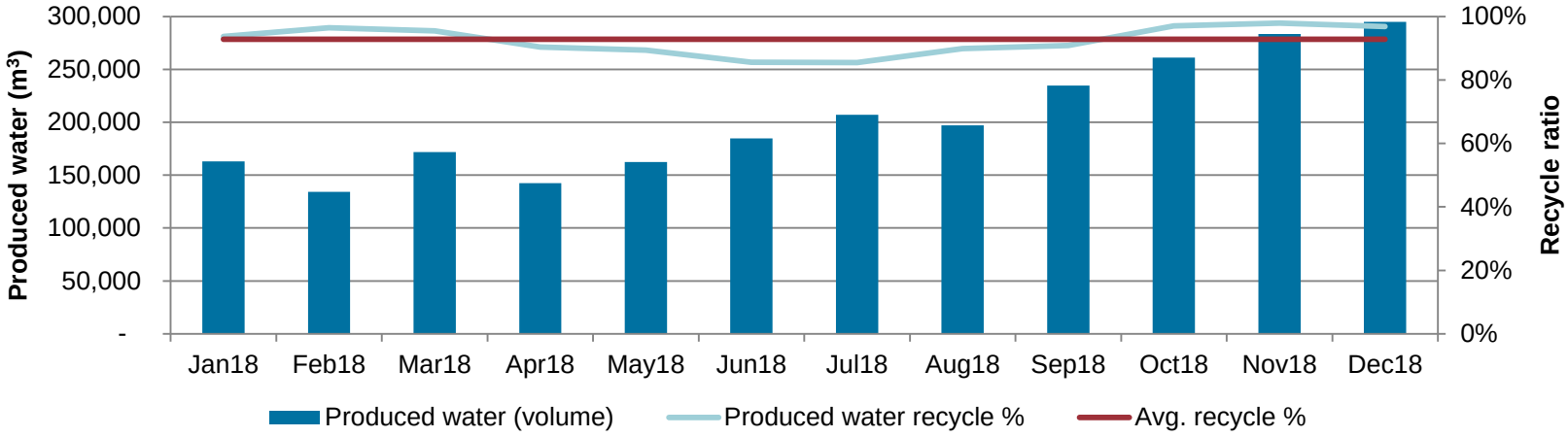


Orion Steam/Produced Water Performance

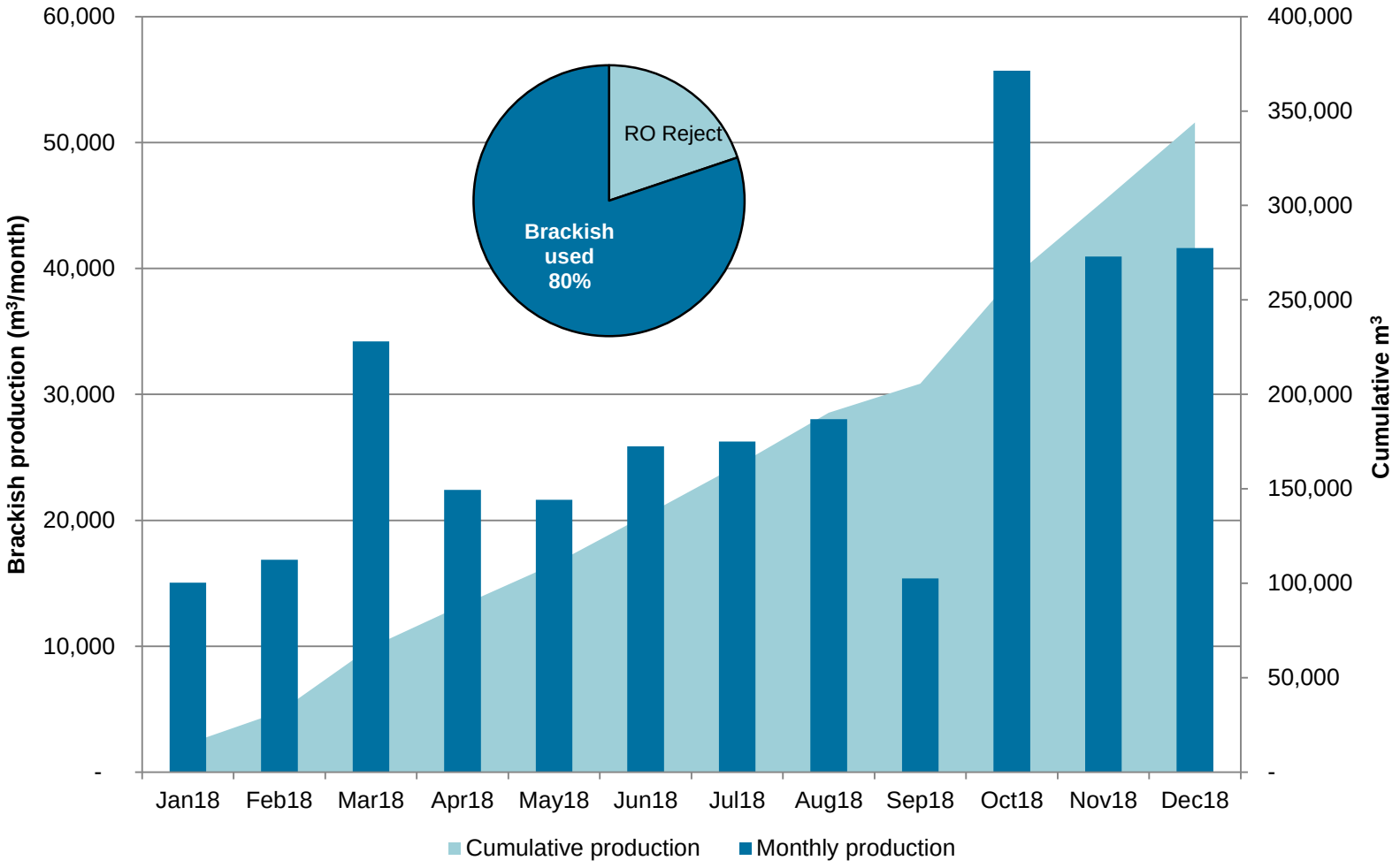
Monthly Steam Production



Produced Water

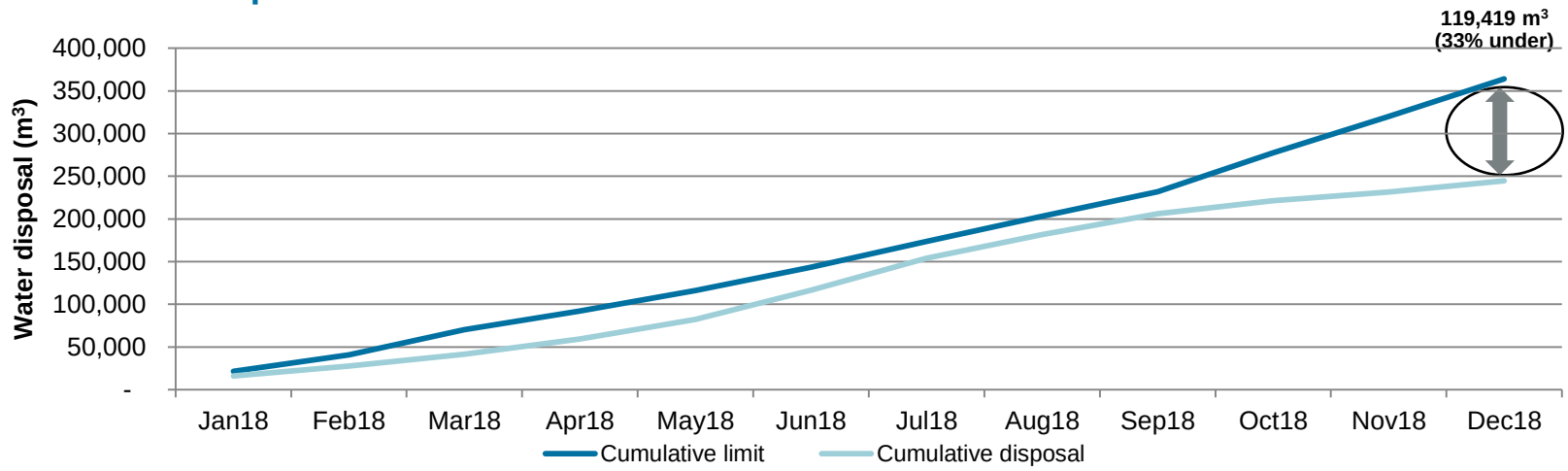


Brackish Water Usage (80% of production)

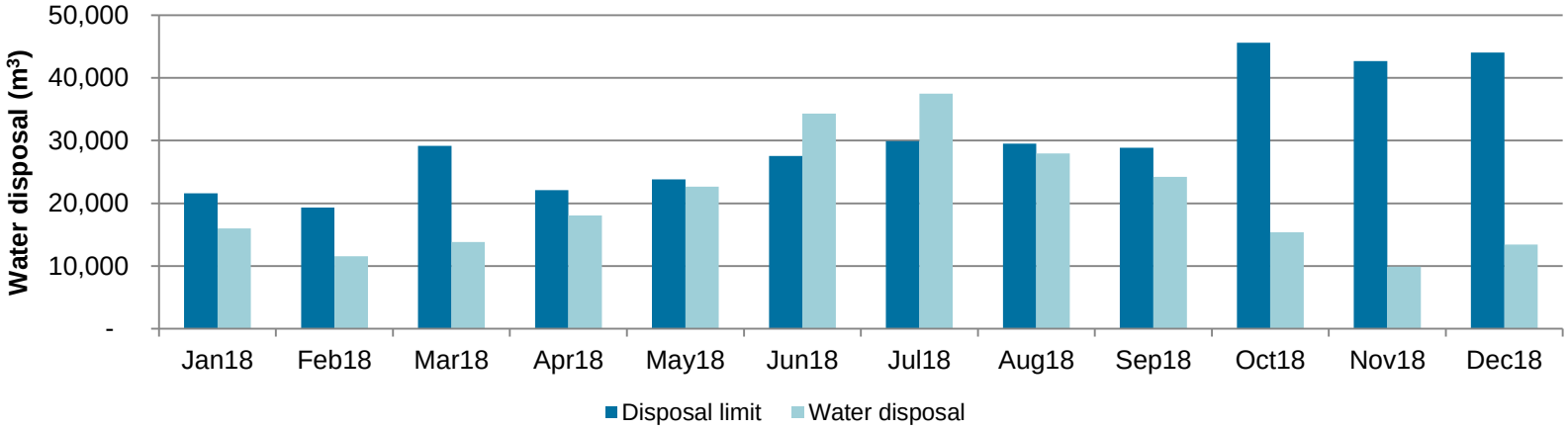


Water Disposal vs. Limits (33% under limit)

Cumulative Disposal Volumes

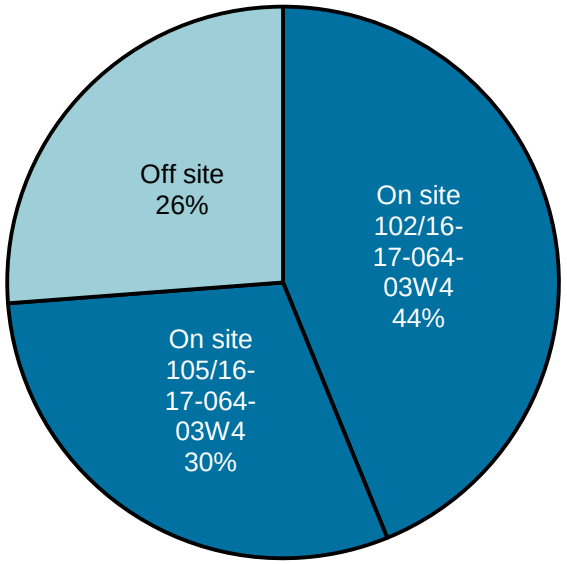


Monthly Disposal Volumes



On-site Water Disposal (Approval #8175E)

- License permits produced water and recovered steam condensate to be disposed into the Granite Wash formation. Granite Wash water disposal well 102/16-17-064-03W4M (Well License #192346)
  - Normal operating pressure range: 11100 - 12500 KPa (surface pressure)
  - Protected by a high pressure shutdown limit of 12600 KPa
  - Normal disposal temperature range: 60 - 80 deg C
- McMurray water disposal well 105/16-17-064-03W4M (Well License # 0487069)
  - 105/16-17-064-03W4M was approved for use as disposal or brackish water supply in May 2018.
  - As a result **73,439** m^3 produced water was disposed in this well and will subsequently be produced as source water when needed
  - Maximum wellhead injection pressure: 3200 Kpa
- Total disposal volumes were reduced by 40% in 2018 with the addition of Phase 2BC

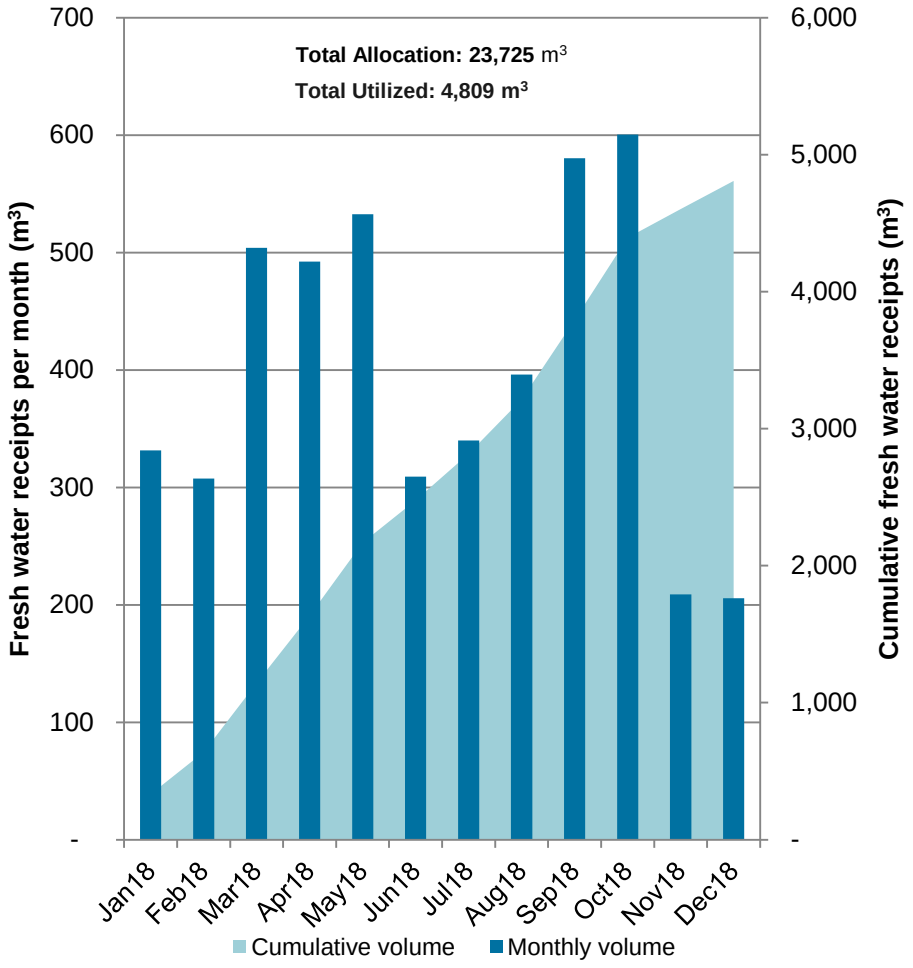


Total disposal
244,798 m^3

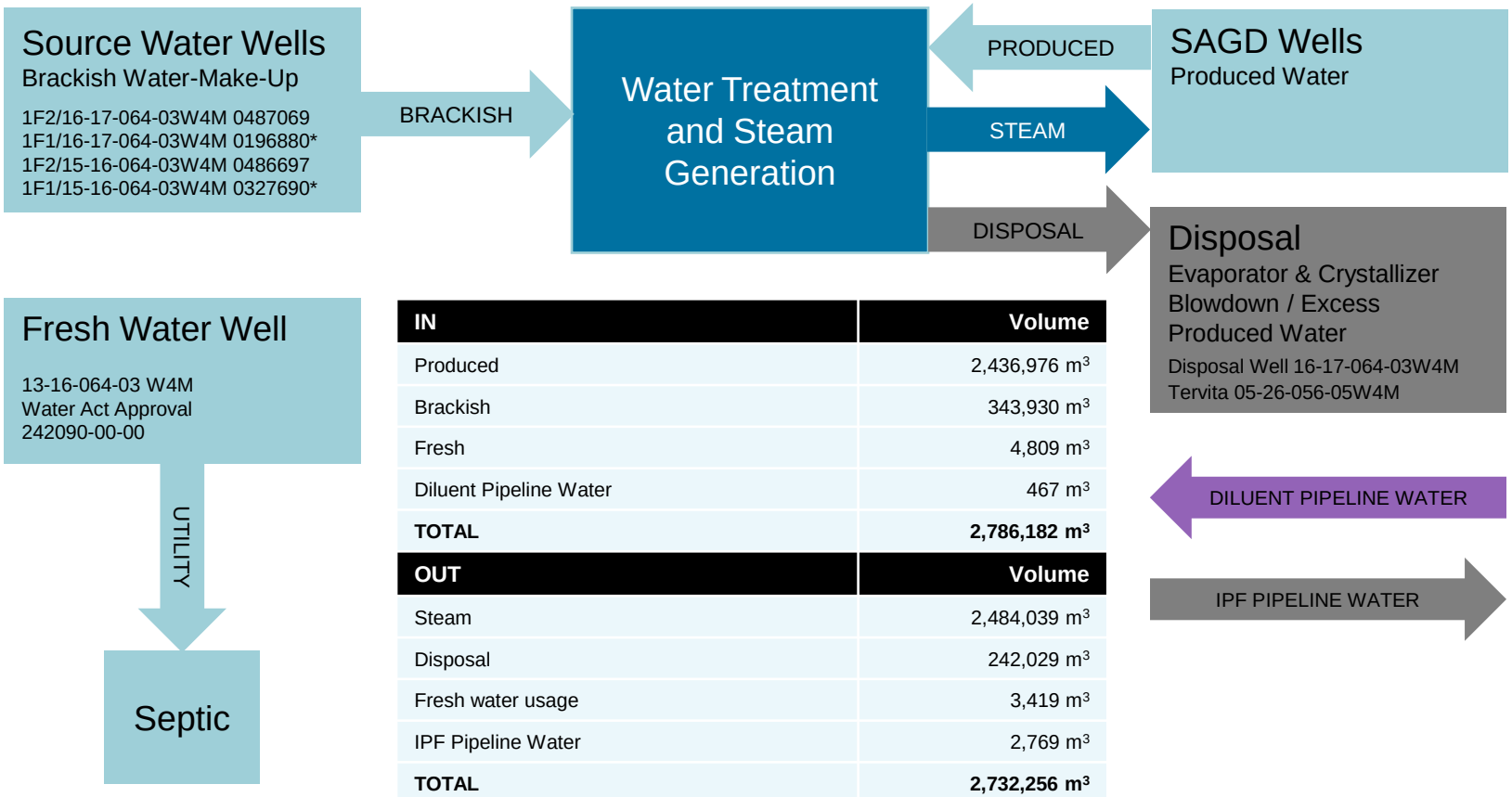
Fresh (Non-Potable) Water Usage (Well ID 1420481)

Water drawn from water source well situated at 13-16-064-03W4M under Water Act Approval 242090-00-00

- Water is used for domestic needs/utility water
- Water levels have steadily increased since monitoring began in 2006 even though water production increased from 2013 – 2018
- Water quality does not meet drinking water criteria:
  - TDS concentration is 760 mg/l
  - Dissolved iron concentration is 2.2 mg/l



Cumulative Water Balance

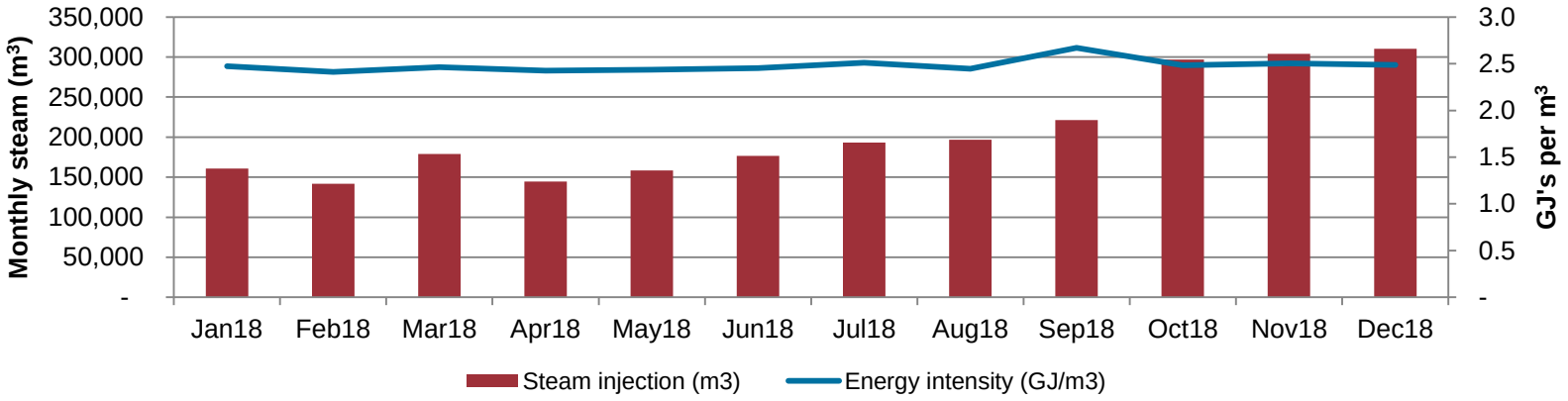


IN	Volume
Produced	2,436,976 m^3
Brackish	343,930 m^3
Fresh	4,809 m^3
Diluent Pipeline Water	467 m^3
TOTAL	**2,786,182 m^3**
OUT	**Volume**
Steam	2,484,039 m^3
Disposal	242,029 m^3
Fresh water usage	3,419 m^3
IPF Pipeline Water	2,769 m^3
TOTAL	**2,732,256 m^3**
Difference (as a percentage of total in's)	53,926 m^3 (1.9%)
Disposal Limit	**15%**
Actual Disposal	**10%**

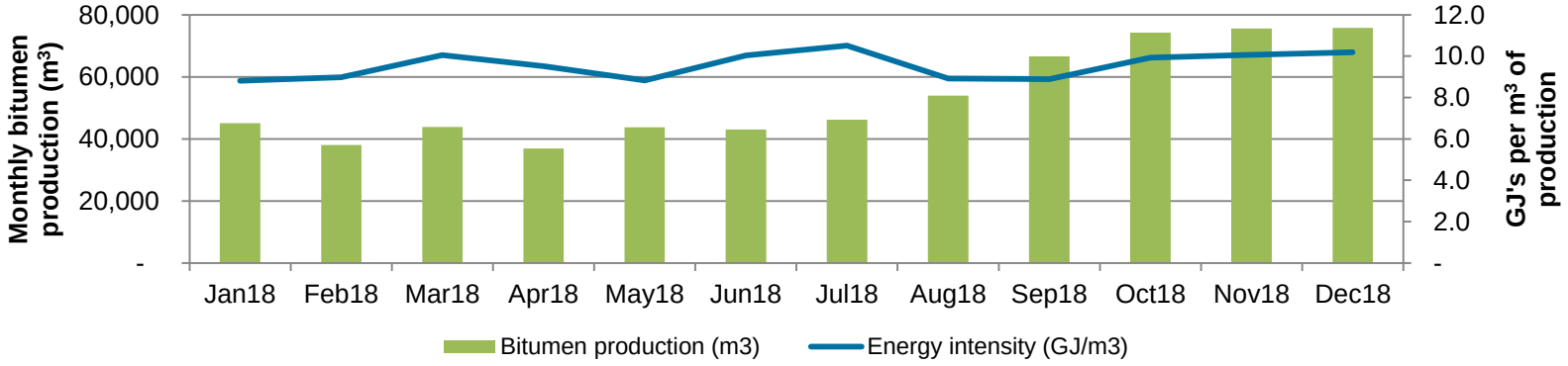
* Abandoned Wells

Monthly Natural Gas Intensity

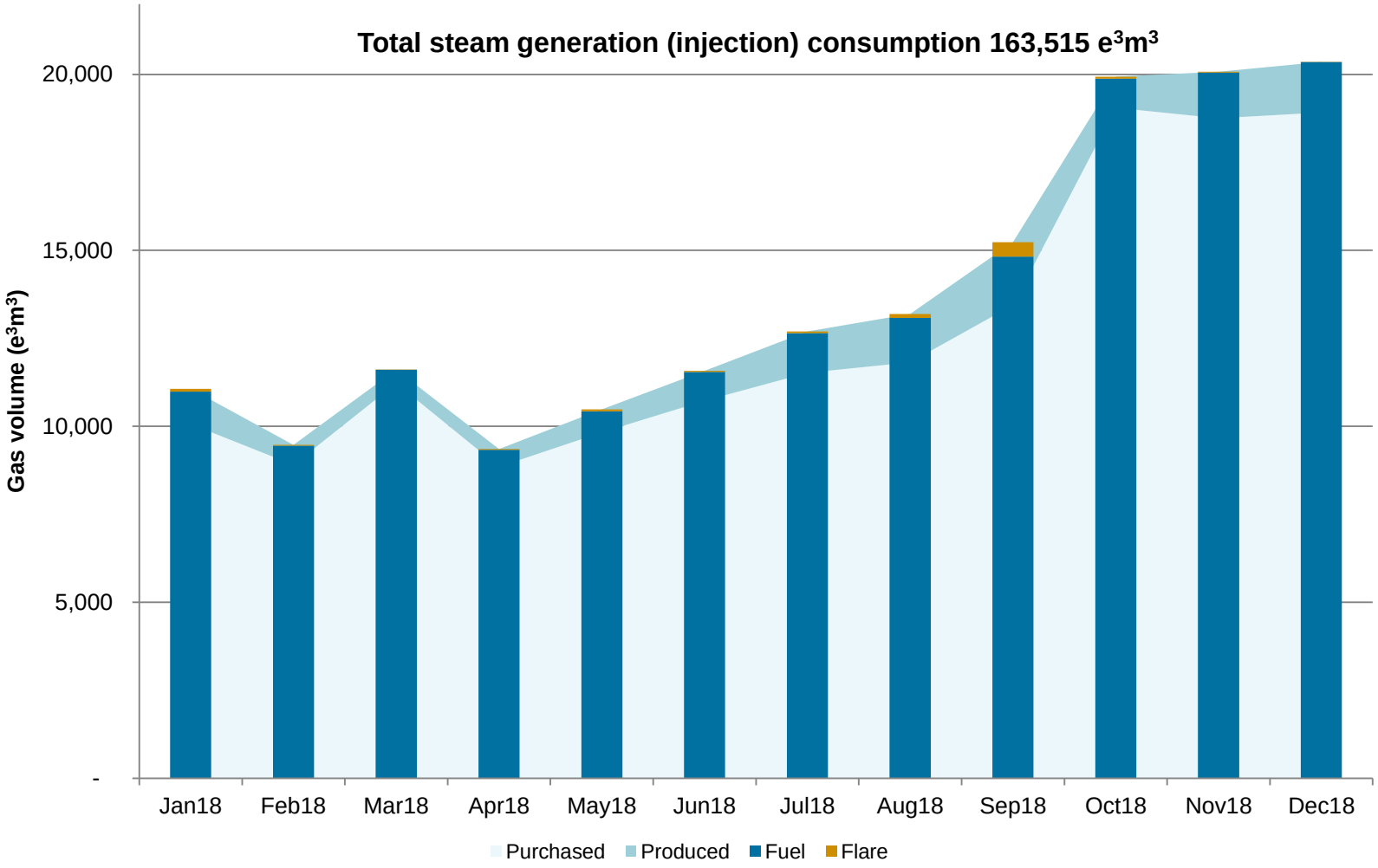
Purchased fuel per m^3 of steam injection



Purchased fuel per m^3 of bitumen production

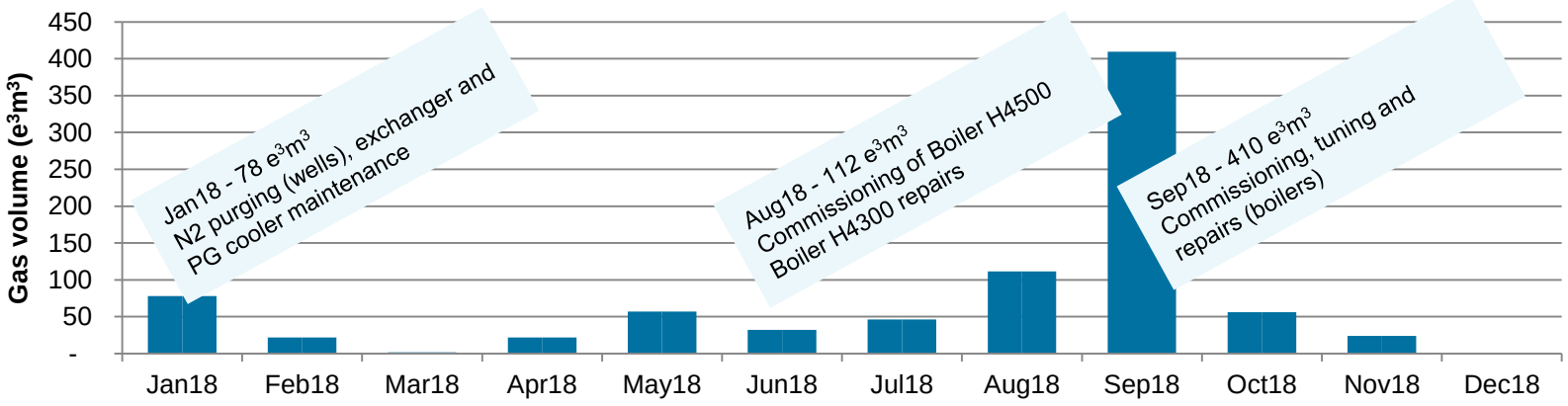


Monthly Gas Usage



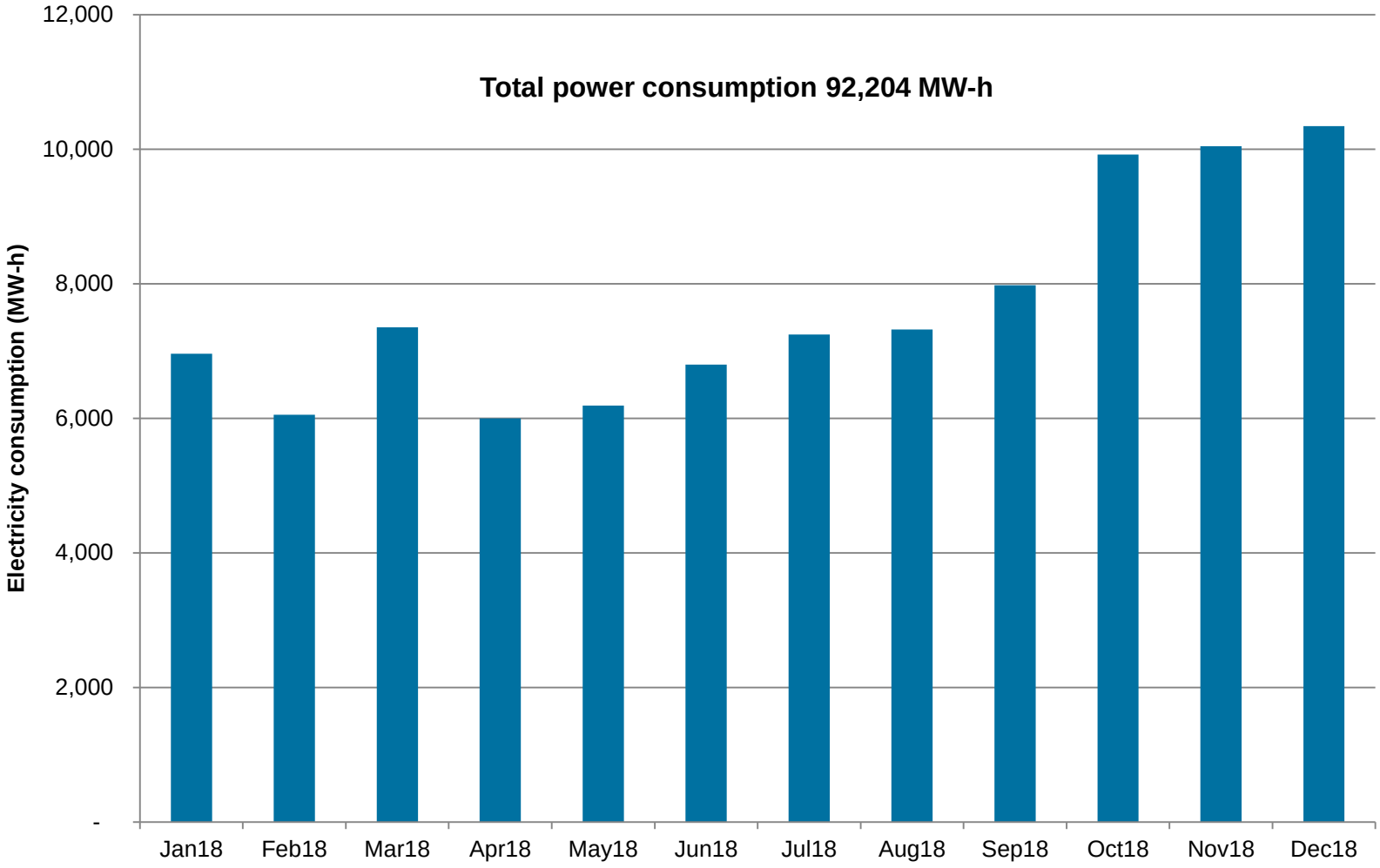
Monthly Flaring and Venting

Flaring



Venting

Monthly Power Consumption



Measurement & Reporting

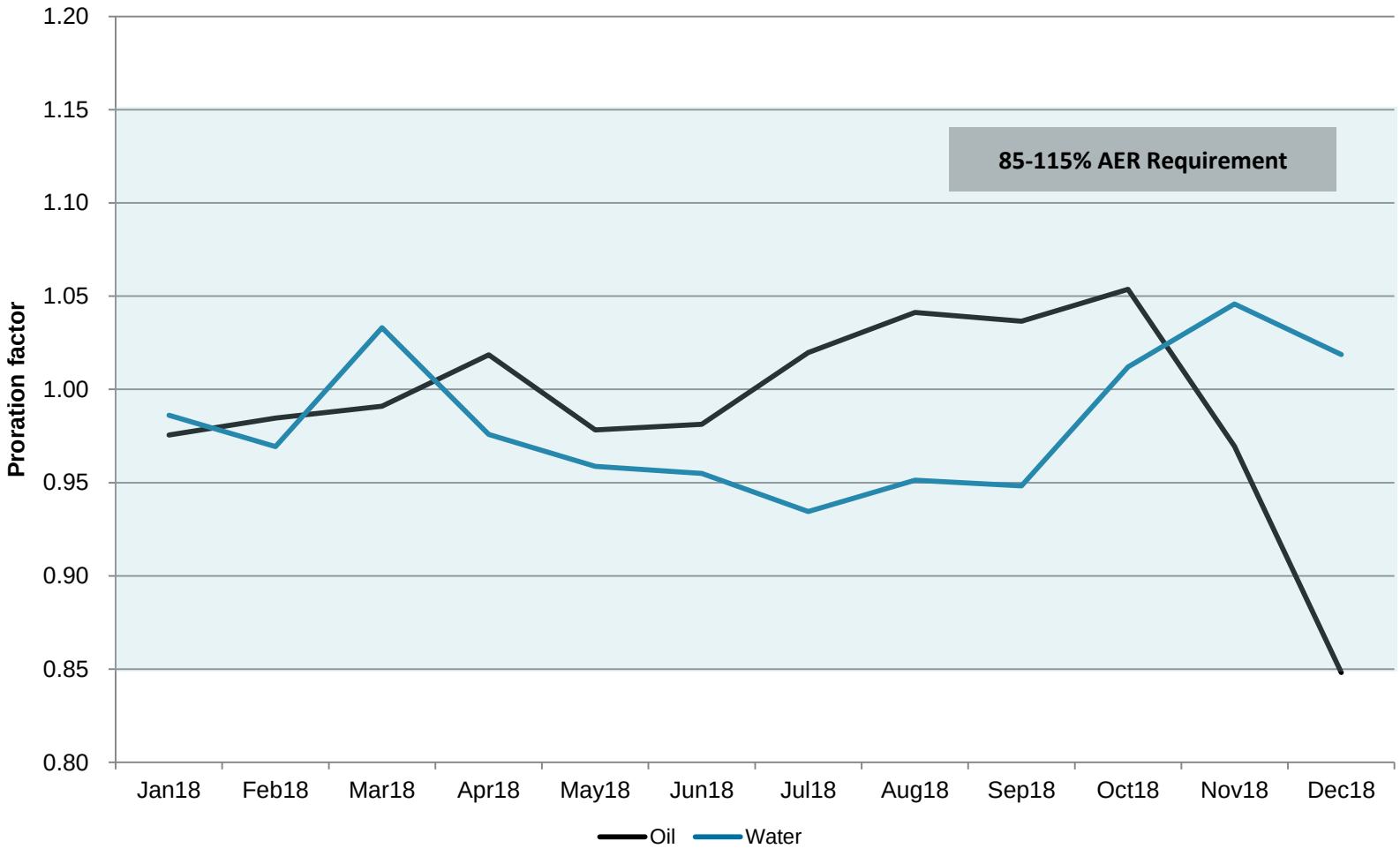
MARP

- April 2018; AER approval to convert Brackish source well 1F2/16-17-064-03W4/0 to disposal well
- August 2018; AER site visit/audit ORION MARP – minor findings have been addressed via response to AER
- November 2018; reported deviation from MARP related to trucking in condensate (Inter-Pipeline- pipeline lateral maintenance outage)
- November 2018; reported deviation from MARP related to produced water calculation due to a hydraulic restriction
- Annual MARP revision prepared December 2018
    - Changes included the addition of metering associated with the 18 new SAGD well pairs and metering associated with the central plant facility additions; H4500 boiler
- Accounting meters calibrated / verified on an annual basis

EPAP

- Declaration deadline May 31, 2019 for 2018 reporting period
- Controls documentation, evaluation and testing completed by third party
- Continued focus on the quality, accuracy and internal visibility of measurement data

Oil & Water Proration Factors



Compliance

Orion In Situ Oil Sands

2018 Annual Performance Report

2018 Compliance Status

Osum Production Corp. believes existing Orion operations are in compliance with all approval conditions and regulatory requirements.

- Compliance is maintained through:
    - Incident Management System
    - Velocity EHS database for compliance commitments and approval condition management
    - Dedicated on-site professionally accredited environmental personnel
    - Embedded assurance (routine inspections, audits and preventative maintenance)

2018 Compliance Summary

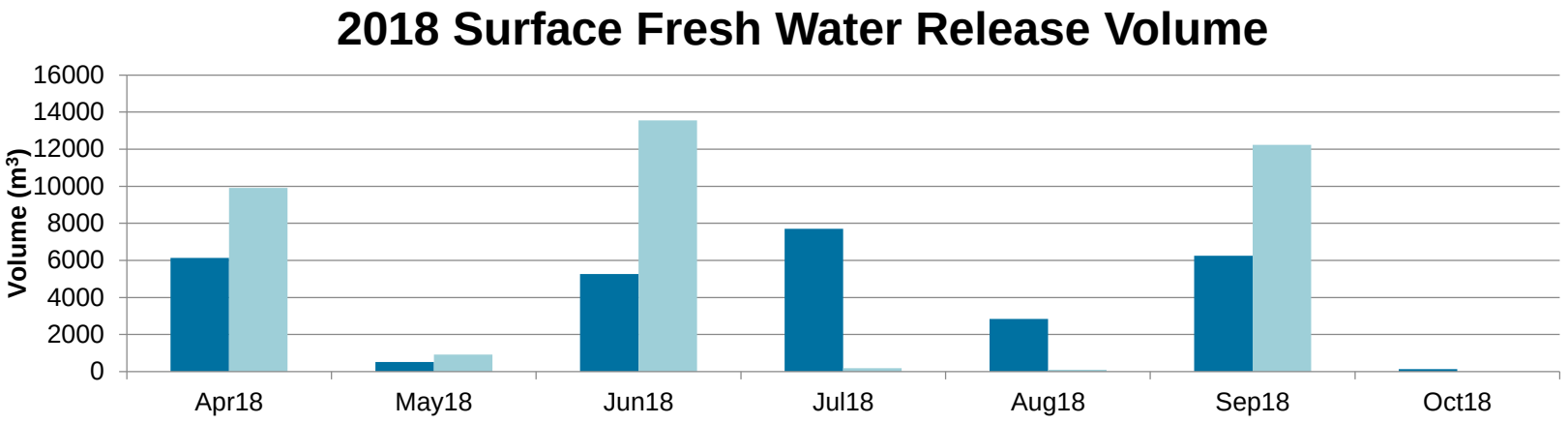
Approval Number	Amendments	Compliance Reporting	Corrective Actions
EPEA 01141258	141258-01-03 Modification of NOx emission limit to 12.1 kg/hr for all boiler units from 10.5 kg/hr on H4300/H4500 and 11.6 kg/hr on H4100/4200	CIC 339147-NOx limit exceedance 0.08kg/hr	• Optimized boilers to enable amendment of EPEA conditions. • Amend EPEA • Installed alarms based off of CEMS performance for non-CEMS boilers.
		CIC 343366-NOx limit exceedance 0.3kg/hr	
		CIC 346983-NOx limit exceedance 0.02kg/hr	
		CIC 347180-NOx limit exceedance 0.02 kg/hr	
		CIC 347717-NOx limit exceedance 0.2kg/hr	
		CIC 348048-NOx limit exceedances max 0.28kg/hr	
Water Act License 00242090	-	Compliant with all conditions of approval	-
Reportable Release	-	CIC 339373-De-oiled bellows rupture within containment	Replace bellows and implement program to replace all within facility.
Directive 13/IWCP Program	-	Year 4 compliant	Completed all required suspensions and abandonments

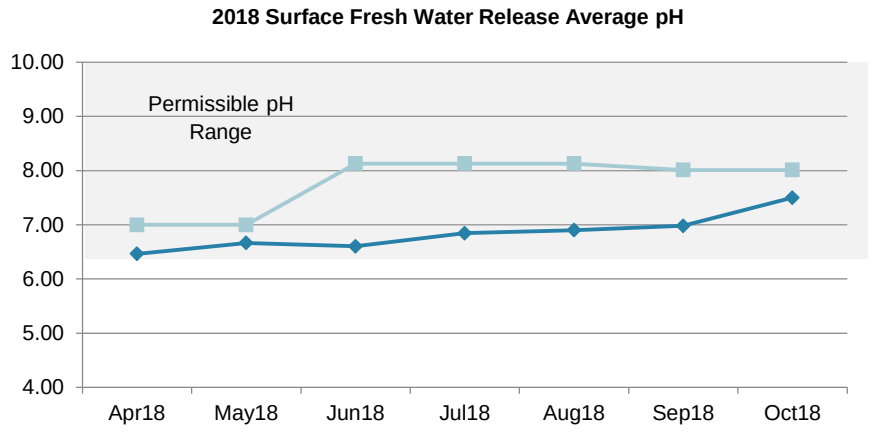
Monitoring Programs

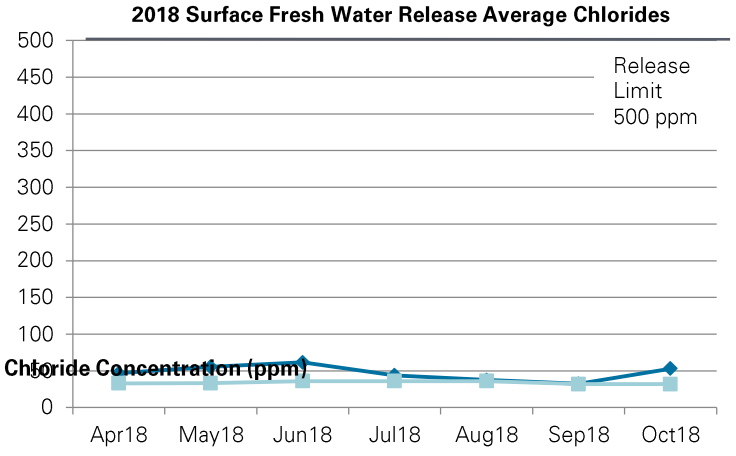
Monitoring Aspect	Monitoring Programs	Progress and Results
Air Quality	• Continuous monitoring on boiler emissions • Ambient air quality is monitored through the LICA Airshed • Fugitive emissions survey conducted annually	• 98.6% compliant NOx, 100% compliant SOx • Exceedances associated with H2S from Jessie Lake and particulate matter from BC fires • Deficiencies addressed
Groundwater Monitoring	• Monitoring of potential contaminants, thermally liberated minerals, physical and chemical parameters	• 9 new wells installed associated with expansion. • 3 wells abandoned due to lack of effectiveness or casing issues. • Results reflective of historical trends
Soils management and monitoring program	• Soil investigation of fluid transfer areas, spill locations and historical impacts for residual contaminants	• Monitoring program conducted Q3 2018 • Zero surficial soil impacts due to diligent fluid handling practices • Historical impacts remain unchanged
Wetland and Water Bodies Monitoring Program	• Investigation of wetlands in proximity to facility roads and infrastructure	• Proximity to roads does not have an impact on vegetative community or environmental condition • Dewatering events have an observable and short-lived influence on wetland hydrology
Wildlife Monitoring and Mitigation Program	• Passive monitoring of wildlife in and around facility for species diversity and richness	• Comprehensive report submitted 2018 • A total of 11 mammal, 72 bird, 3 amphibian and 5 bat species were observed; 22 of which are listed as sensitive
Reclamation Monitoring	• Assessment of reclaimed areas for soil replacement and vegetation establishment and planted species health	• Increase in tree density required, all other factors are representative of pre-disturbance conditions. • Supplemental planting will occur in 2019
Project Level Conservation and Closure Plan	• Conservation plan for the next ten years of development activity.	• Submitted October 31st, authorized February 7th 2019

Annual Surface Water Release

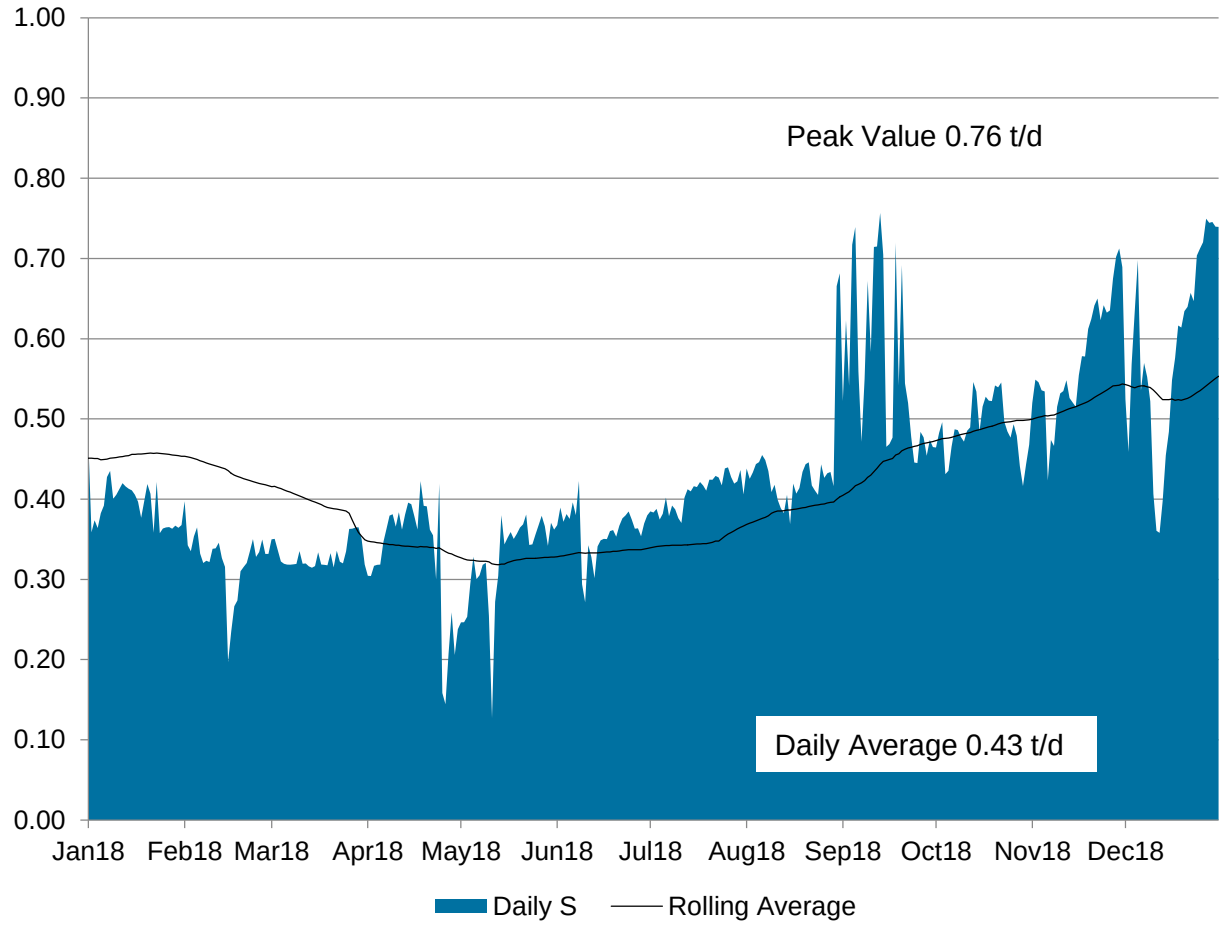
All water associated with annual precipitation (65,721 m^3) was released back into the environment.





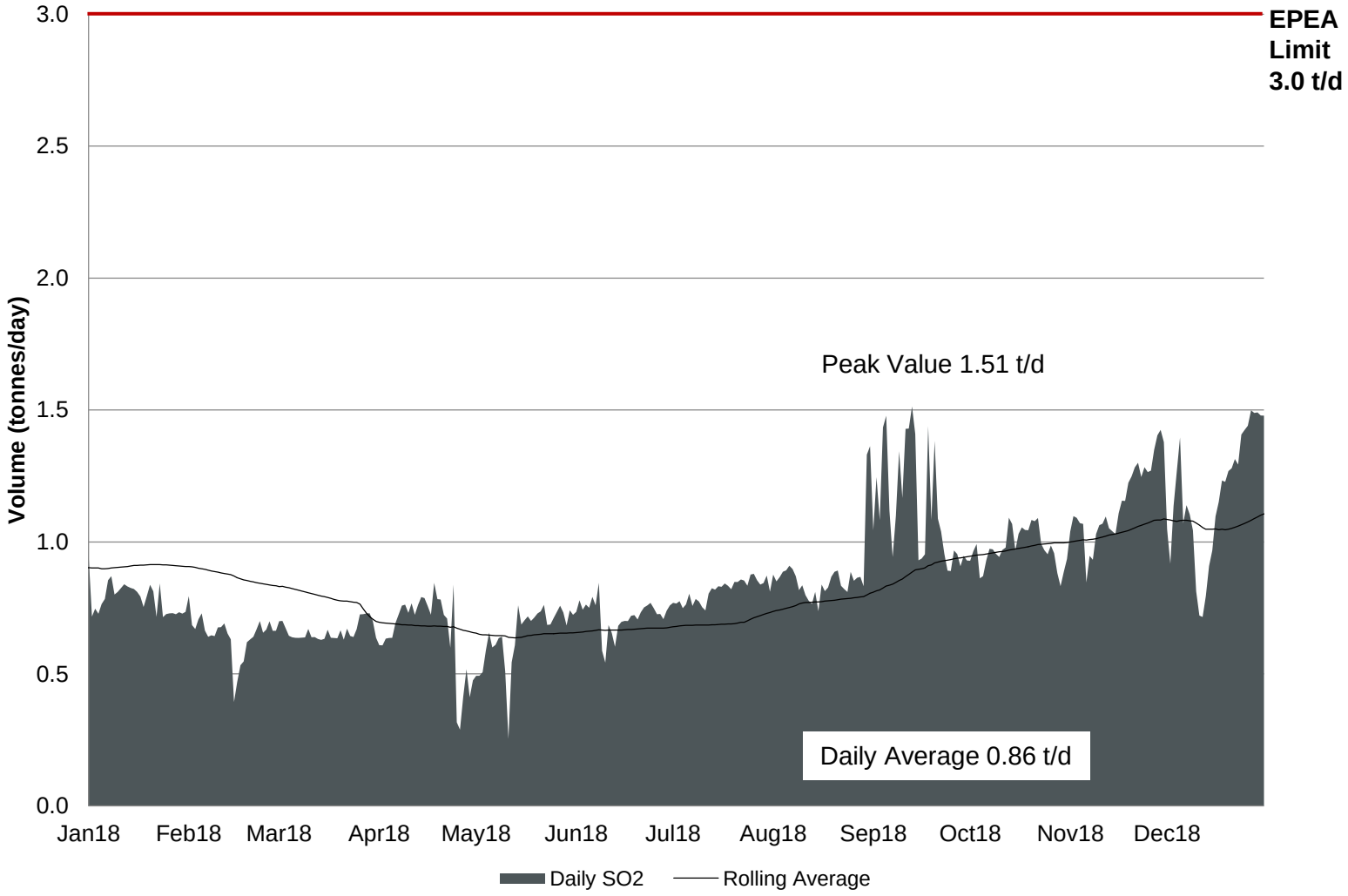


Daily Sulphur (Tonnes)

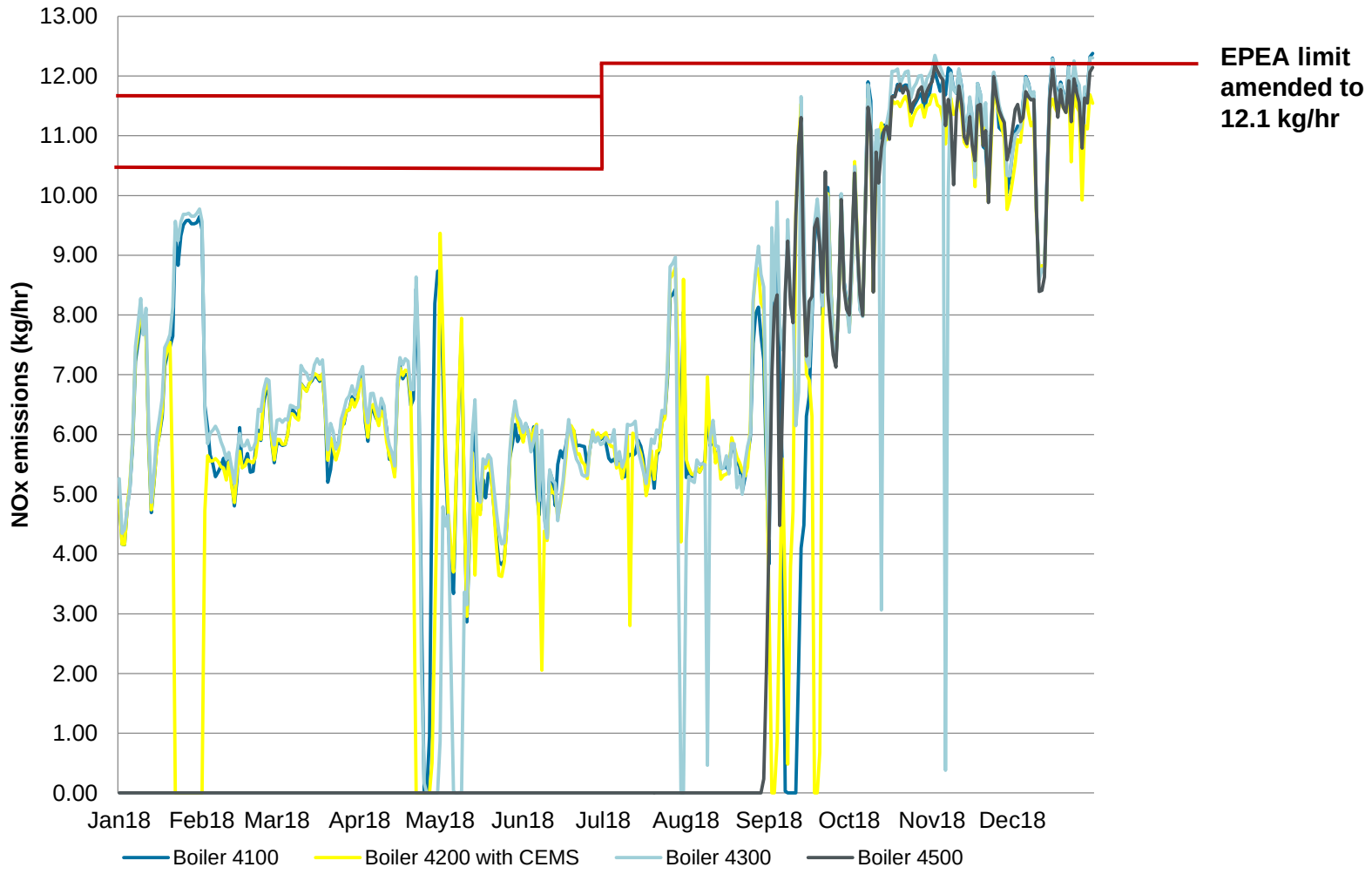


Quarterly Sulphur Balance (tonnes/qtr)	
Q1	31.46
Q2	30.76
Q3	43.24
Q4	50.75

Daily SO_2 Volumes (Tonnes)



Daily NOx Emissions Per Boiler



Offsite Waste Disposal and Recycling Program

- Tervita-Lindbergh – Class 1b – 05-26-056-05W4M
  - Evaporator waste water – 61,476 m^3 – 40% reduction over previous year
- RBW Waste Management
  - Contaminated soil from housekeeping and hydro-vac activities 46 m^3
  - Well drilling and completion fluids 28,203 m^3
  - Recycle-Glycol, lube oil, filters, oily rags, aerosols, methanol 345 m^3
- Domestic waste water from the administrative offices washrooms and kitchens is collected in holding tanks and disposed of weekly by a commercial septic service. Total volume disposed of at a Town of Bonnyville Waste Facility was 1282 m^3
- Domestic waste is hauled to municipal landfills in either Cold Lake or Bonnyville, 675 m^3
- Paper, cardboard and steel recycling program processed 267 m^3
- Wood recycling 632 m^3
- Metal recycling 225 m^3

Regional Initiatives

Environmental:

- Membership with Lakeland Industry and Community Association (LICA)
- Specifically, representation on:
    - LICA Governance Committee
    - LICA Education and Information Committee
    - LICA Oil Sands Industry Members Committee

Community:

- Annual Lakeland Town Hall – November 28, 2018
- Well-established community investment program that annually supports initiatives targeting education, promoting student interest in science and innovation and sport.
- Annual Osum Spark Award – three recipients from the Cold Lake area in 2018
- Annual Osum Leader of Tomorrow Award – six recipients from the Cold Lake area in 2018.

Osum Production Corp.

Subsidiary of Osum Oil Sands Corp.

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