

Surmont In Situ Oil Sands Project

Directive 054 Submission & Annual OSCA Report

Commercial Scheme Approval No. 9426

EPEA Approval No. 48263-01-00, as amended

Class 1b Disposal Approval No. 10044M

Reporting Period: January 1, 2022 to December 31, 2022

Submission Date: June 30, 2023

SIR Addition Date: January 18, 2024

Scope

This submission is intended to provide information in compliance with:

- ▶ *Directive 054: Performance Reporting and Surveillance of In Situ Oil Sands Schemes* (April 2020) for the operating period from January 1, 2022 to December 31, 2022
- ▶ Condition 22 of Commercial Scheme Approval No. 9426ZZ for the submission of an annual *Oil Sands Conservation Act* Report (OSCA Report)
- ▶ Condition 4 (d) of Class 1b Disposal Approval No. 10044M for the summary of the Basal McMurray disposal monitoring results

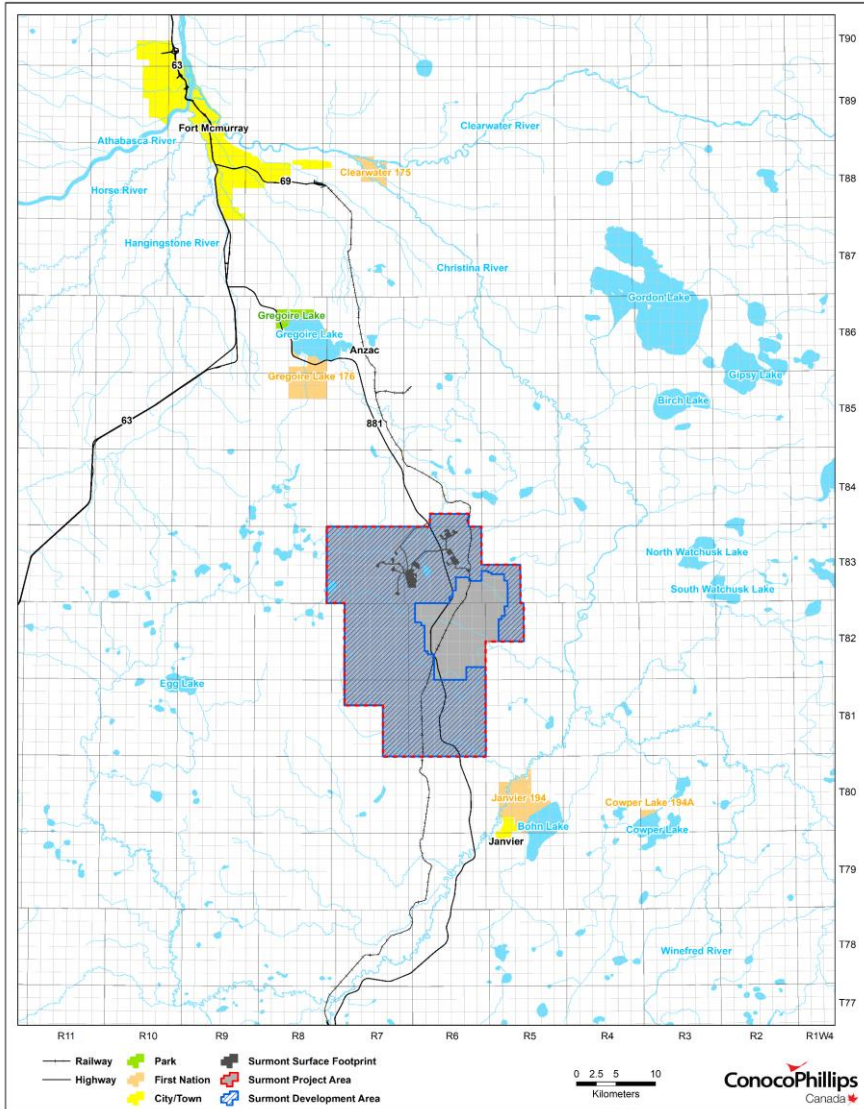


Introduction

Directive 054: Section 4.1



Surmont Overview



OWNERSHIP

Surmont is a steam-assisted gravity drainage (SAGD) bitumen recovery facility in the Athabasca oil sands area that is operated by ConocoPhillips Canada.

LOCATION

The project is approximately 63 km southeast of Fort McMurray, Alberta and covers 219 sections of land in Townships 80, 81, 82, 83, and 84, and Ranges 5, 6, and 7, west of the fourth meridian.

PROJECT HISTORY

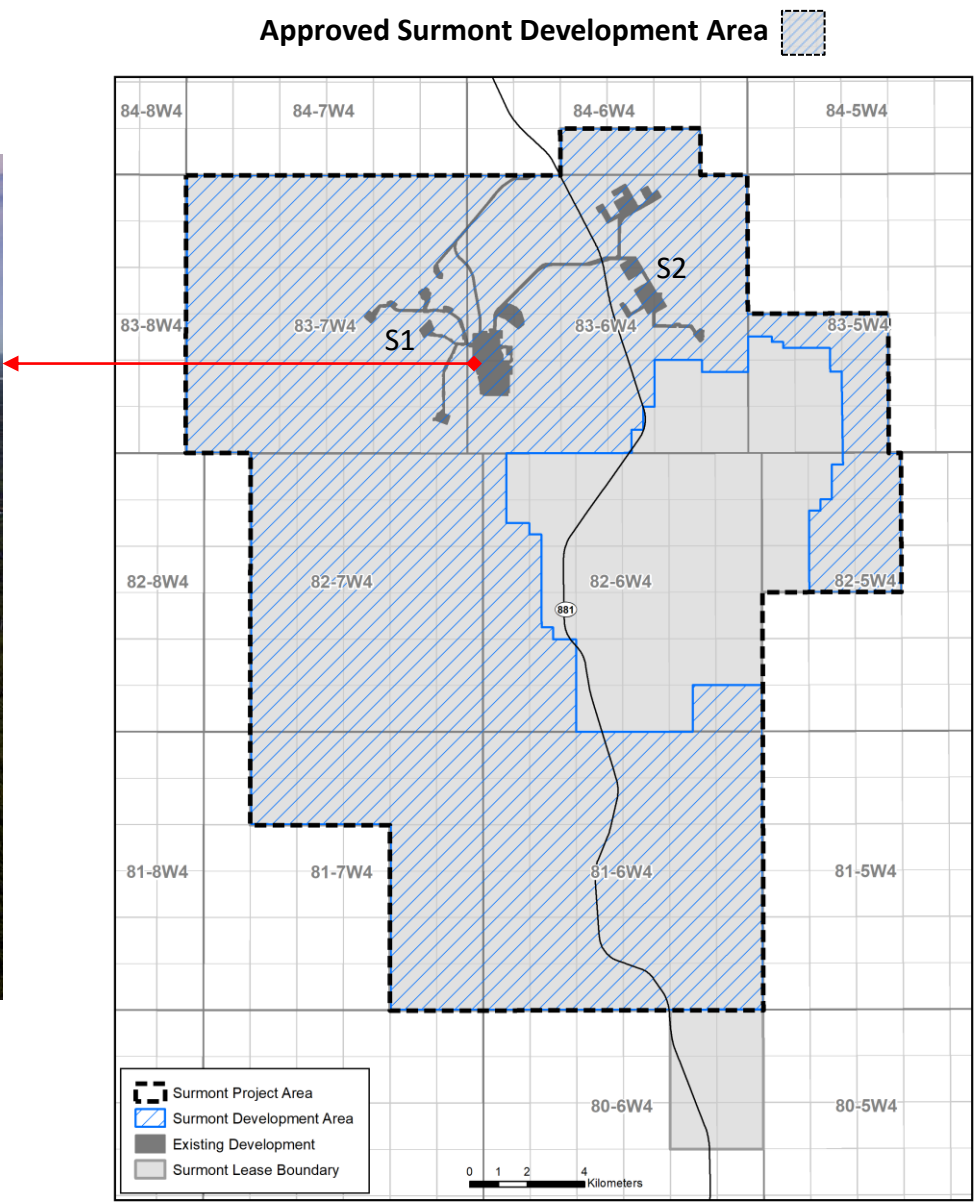
Surmont currently features two phases:

- 2004 - construction start at Surmont Phase 1 ("S1")
- 2007 - commercial production at S1
- 2010 - construction start at Surmont Phase 2 ("S2")
- 2015 - commercial production at S2

APPROVED BITUMEN PRODUCTION LIMIT

29,964 cubic metres per day (m³/d) on an annual average basis or 188 thousand barrels of oil equivalent per day (MBOED)

Surmont Overview: Development Area



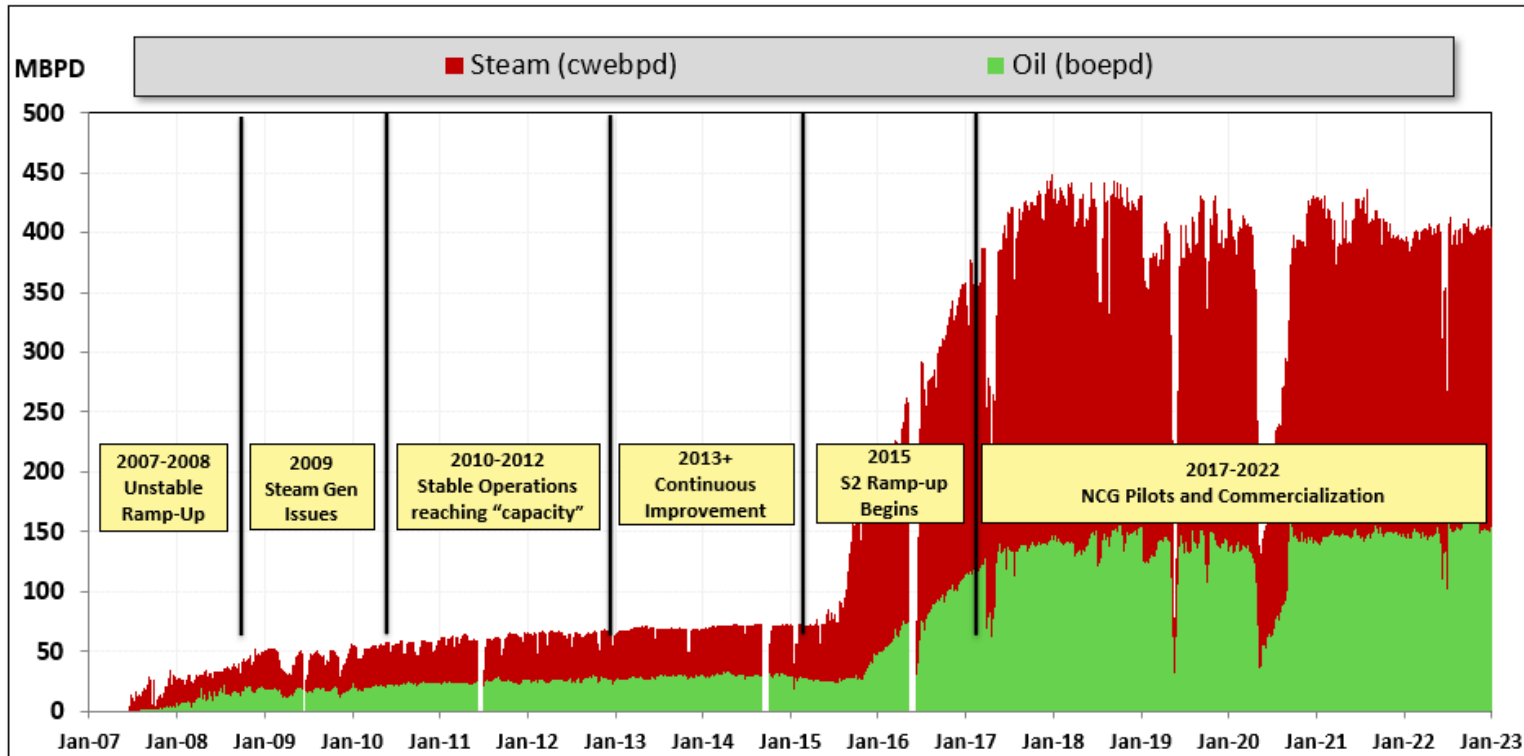
Subsurface

Directive 054: Section 4.2
OSCA Report: Table 1 (1)



One Surmont Lifespan Production

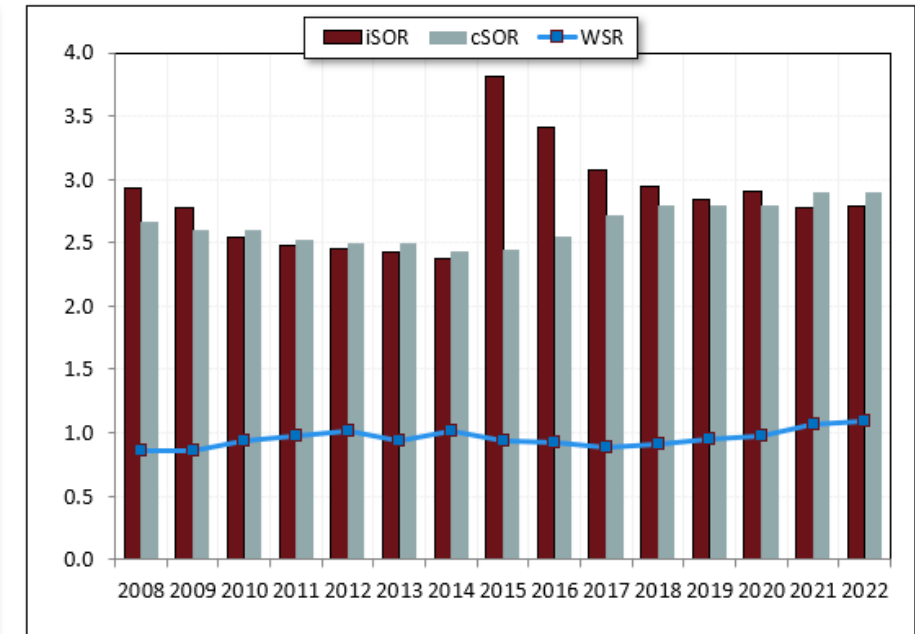
Historical Steam Injection and Bitumen Production



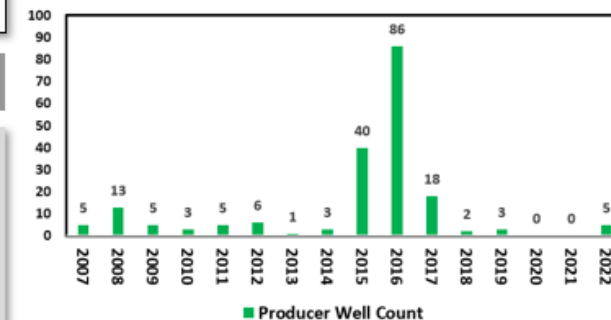
2022 Highlights

- Expanded NCG co-injection capabilities to more wells in Surmont for thief zone management and to optimize SOR
- 2022 redrill campaign executed to replace failed producer wells and optimize well placement
- Set Surmont production record with over 156,000 bbl/d oil in Q3 2022
- Steam additive pilot continued
- Late life steam optimization at S1
- Successful chelant stimulation program executed in Q2/3 2022

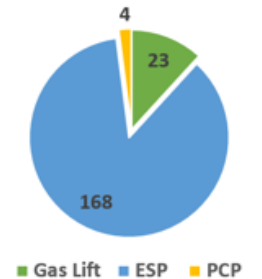
Historical iSOR, cSOR and WSR



Historical SAGD Starts

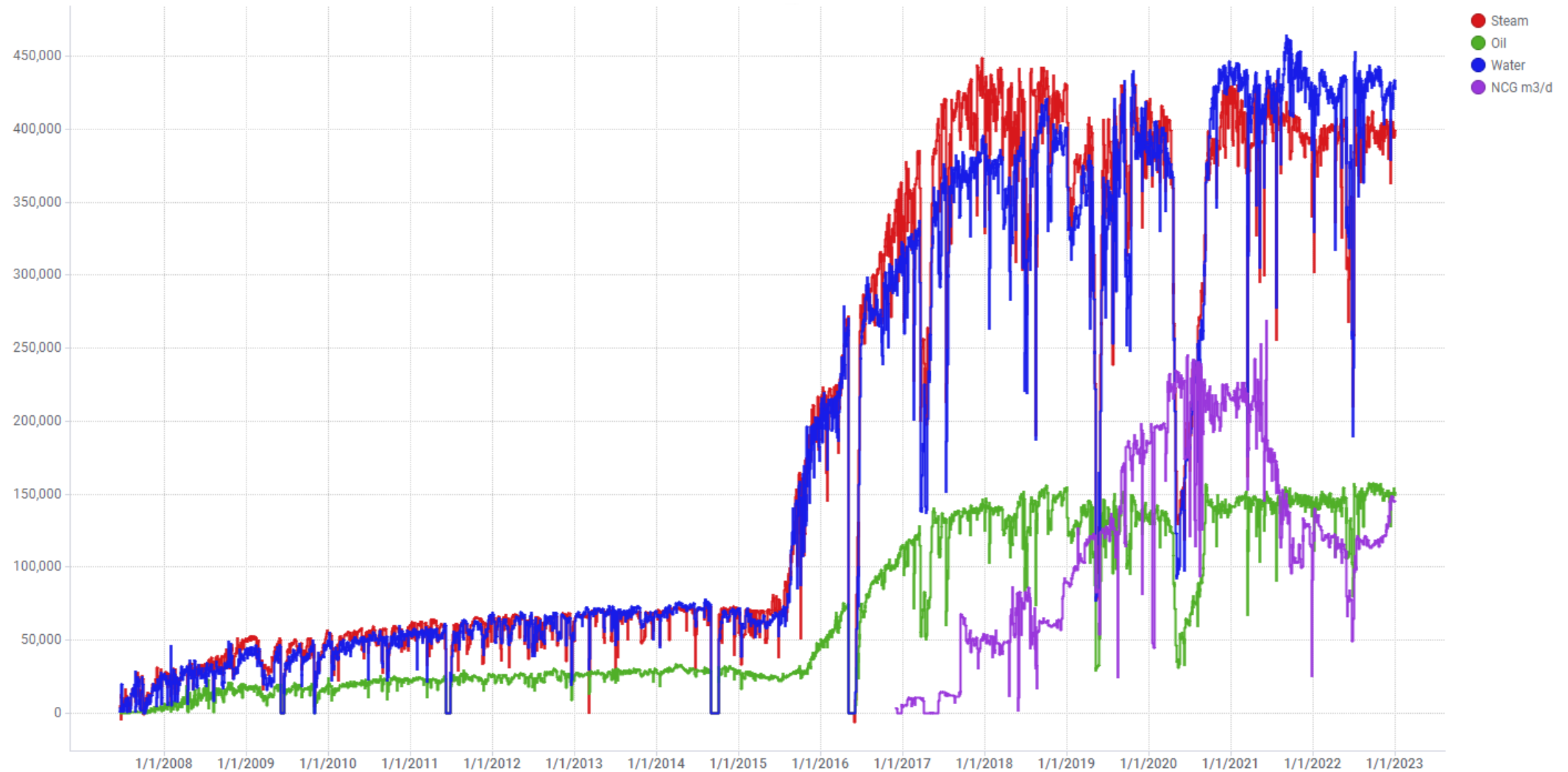


OneSurmont well count As of December 31, 2022

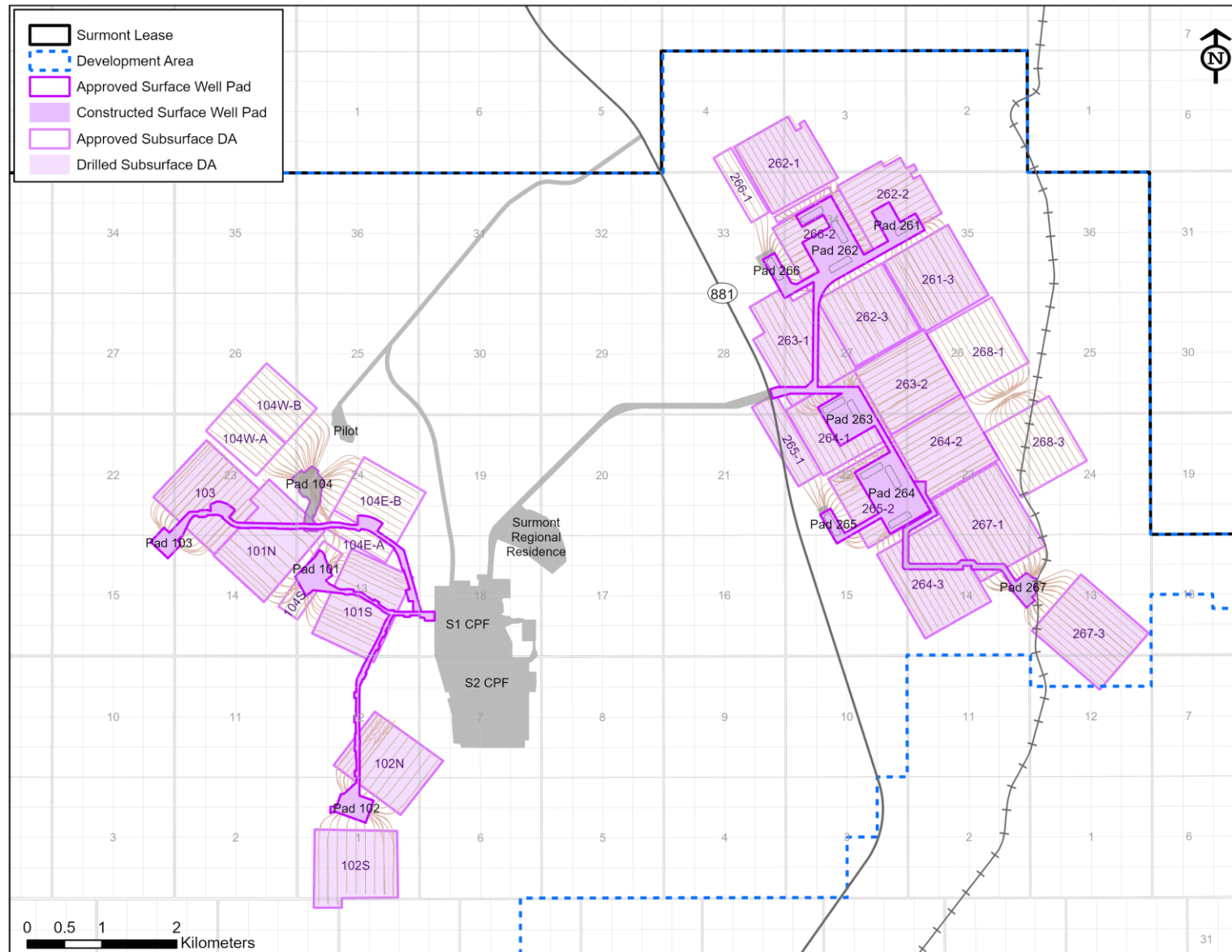


One Surtmont Lifespan Production

Rates (BPD, NCG in m3/d)



Development Area Maps: Drilled and Approved Drainage Areas



DRILLED DRAINAGE AREAS

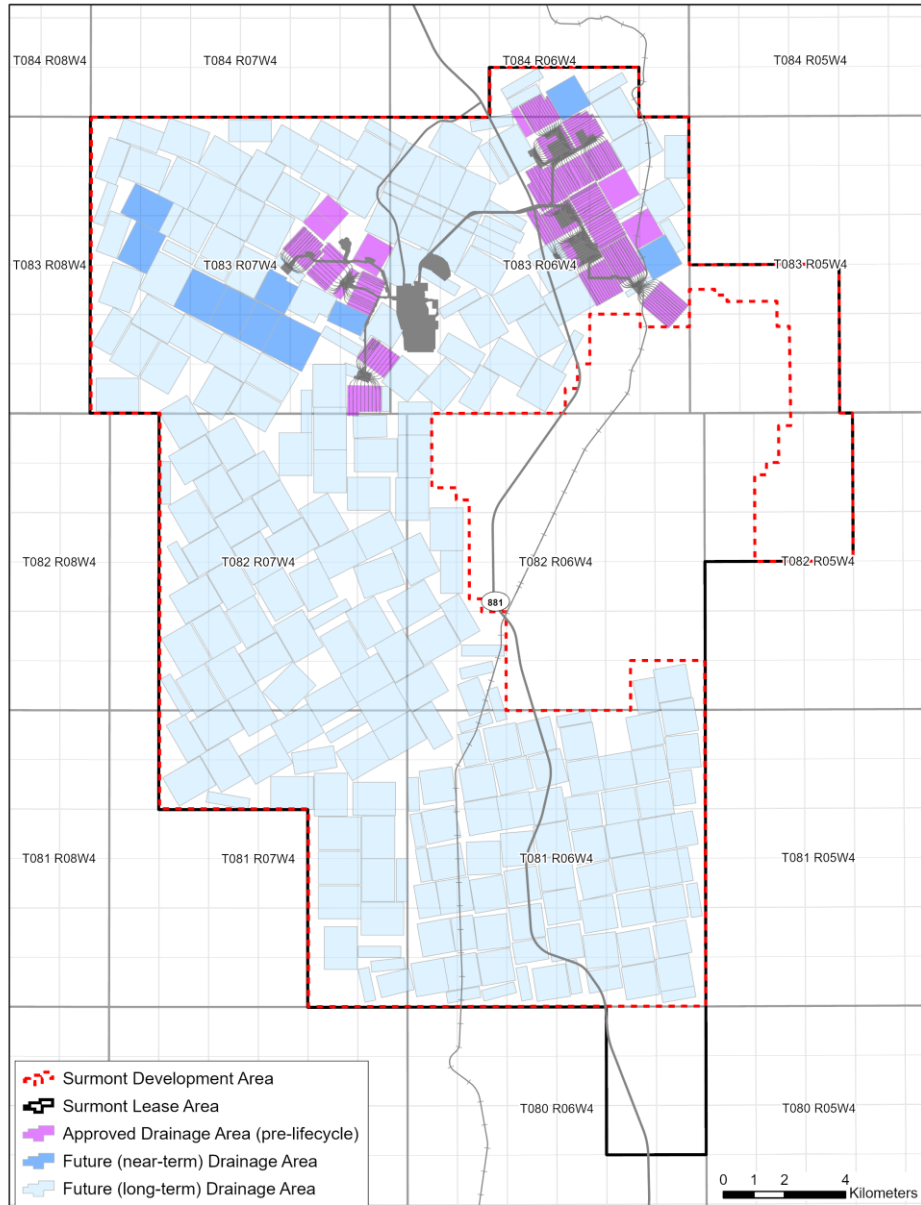
- 101N
- 101S
- 102N
- 102S
- 103
- 261-3
- 262-1
- 262-2
- 262-3
- 263-1
- 263-2
- 264-1
- 264-2
- 264-3
- 265-1
- 265-2
- 266-2
- 267-1
- 267-3

APPROVED DRAINAGE AREAS*

- 104E
- 104W
- 104S
- 266-1
- 268-1
- 268-3

* Additional approved drainage areas described in Lifecycle Application No. 1922683 are illustrated on the next slide.

Development Area Maps: Drilled and Approved Drainage Areas



LIFECYCLE APPROACH (APPLICATION NO. 1922683)

The conceptual locations of future subsurface drainage pattern areas are identified based on current sequencing scenarios as follows:

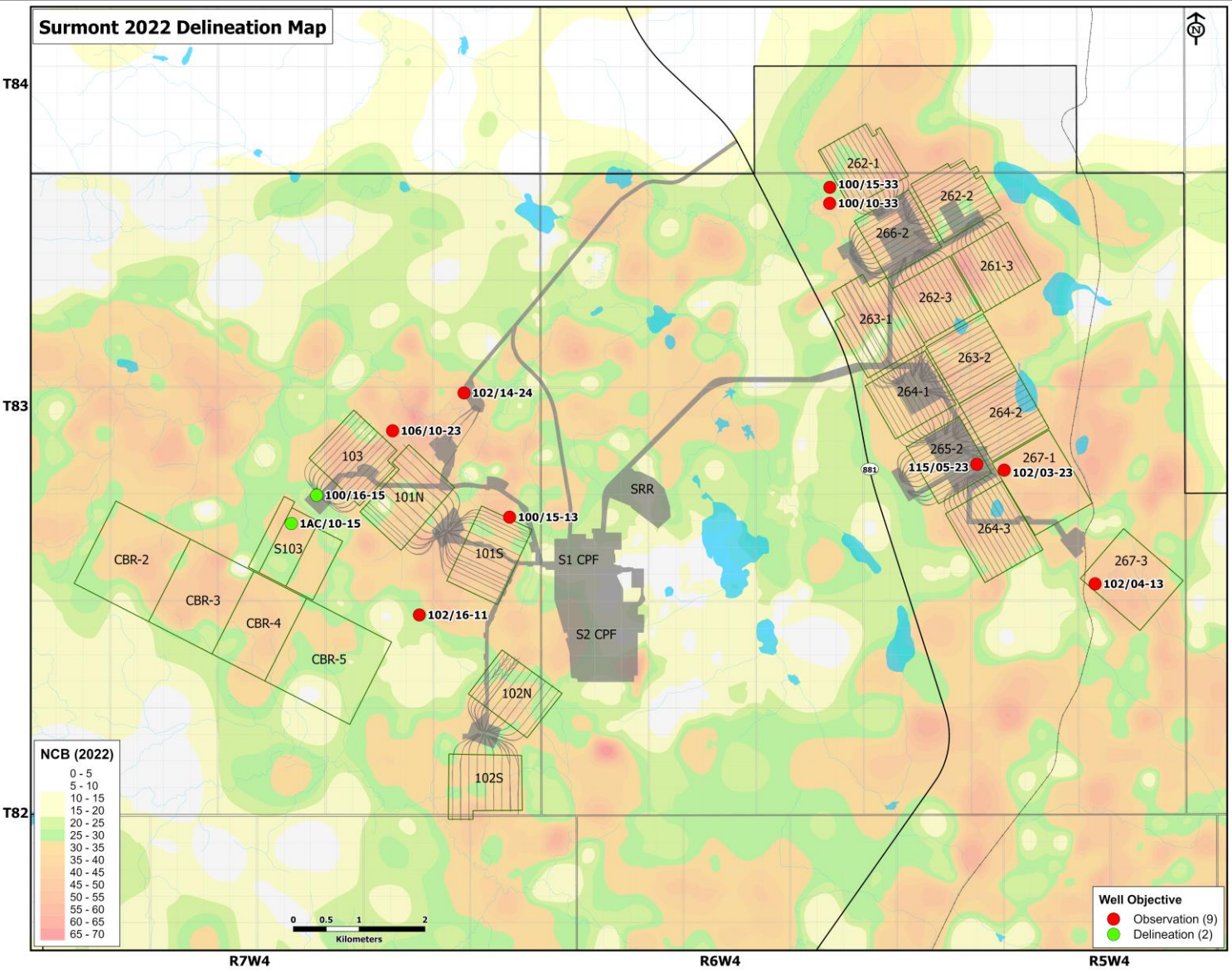
- future near-term drainage areas: next 10 years
- future long-term drainage areas: beyond 10 years



SUBSURFACE INFORMATION

No new subsurface information is available related to approved lifecycle activities, i.e., drainage area evaluation, design, or development

New Geological, Geomechanical & Reservoir Data



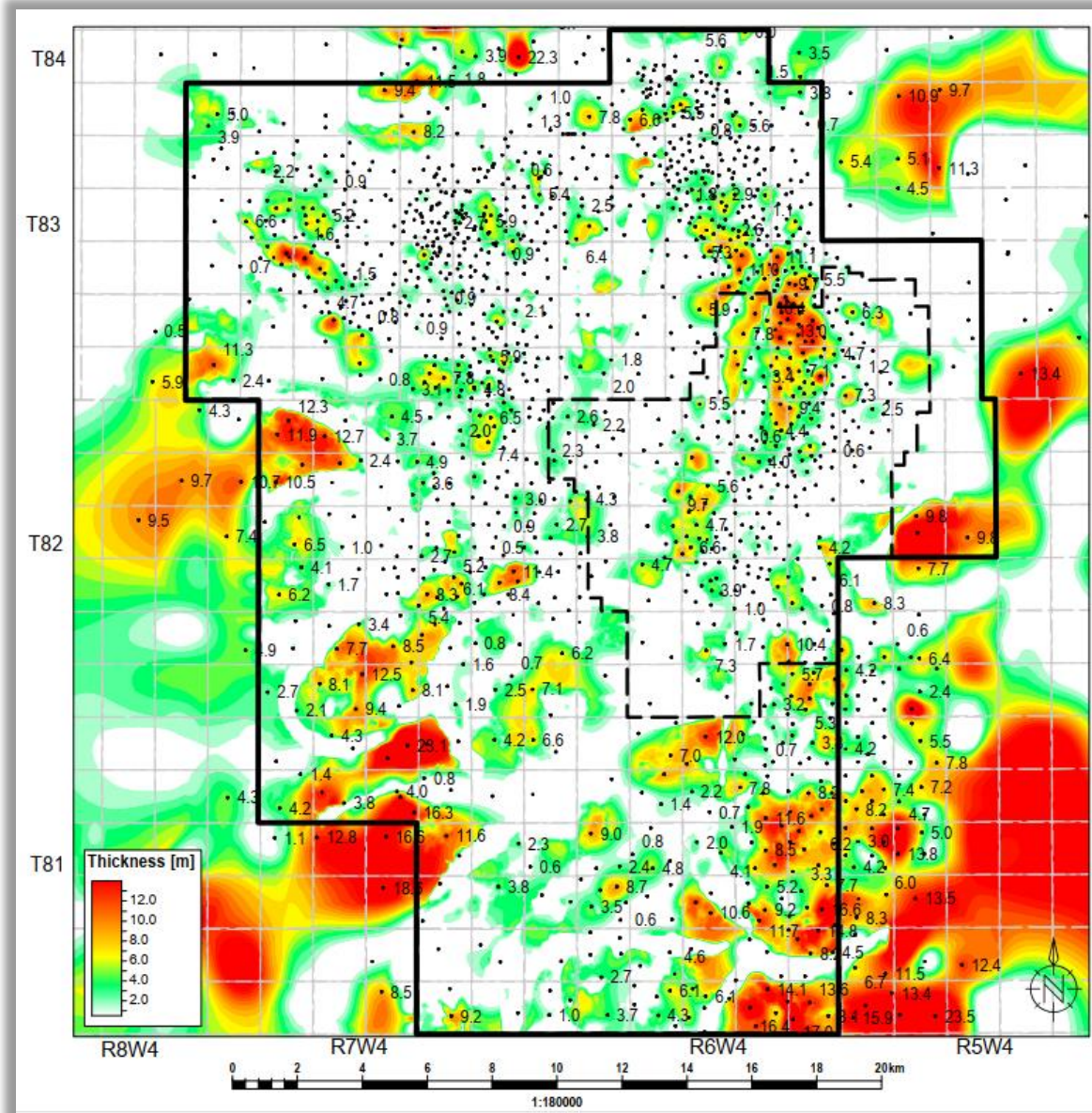
Net Continuous Bitumen (m)

Wells Drilled in 2022	Drainage Area	Type
1AC101508307W400	S103	OSE
100103308306W400	266-1-OB	OBS
100151308307W400	104E-A	OBS
100153308306W400	266-1-OB	OBS
100161508307W400	103-BZ	OSE
102032308306W400	267-1	OBS
102041308306W400	267-3	OBS
102142408307W400	FPA-4	OBS
102161108307W400	S101S	OBS
106102308307W400	104W-A	OBS
115052308306W400	265-2	OBS

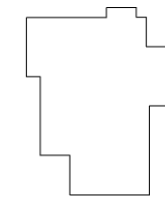
2022 Data Acquisition Table

Data Types Acquired	Quantity
Basic Logs	Each well (11)
Shear Sonic	7
Micro Image Logs	11
Wireline Pressure	7 samples
Core (McMurray Formation)	3
Dean Stark Analysis	471 Samples
PSA	17 Samples
Grain Density	471 Samples
Viscosity	10 Samples
Gas Chromatography	14 Samples
Petrography	3 Samples

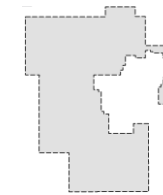
Development Area Maps: Net Top Gas Interval



Net Top Gas Isopach



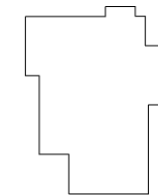
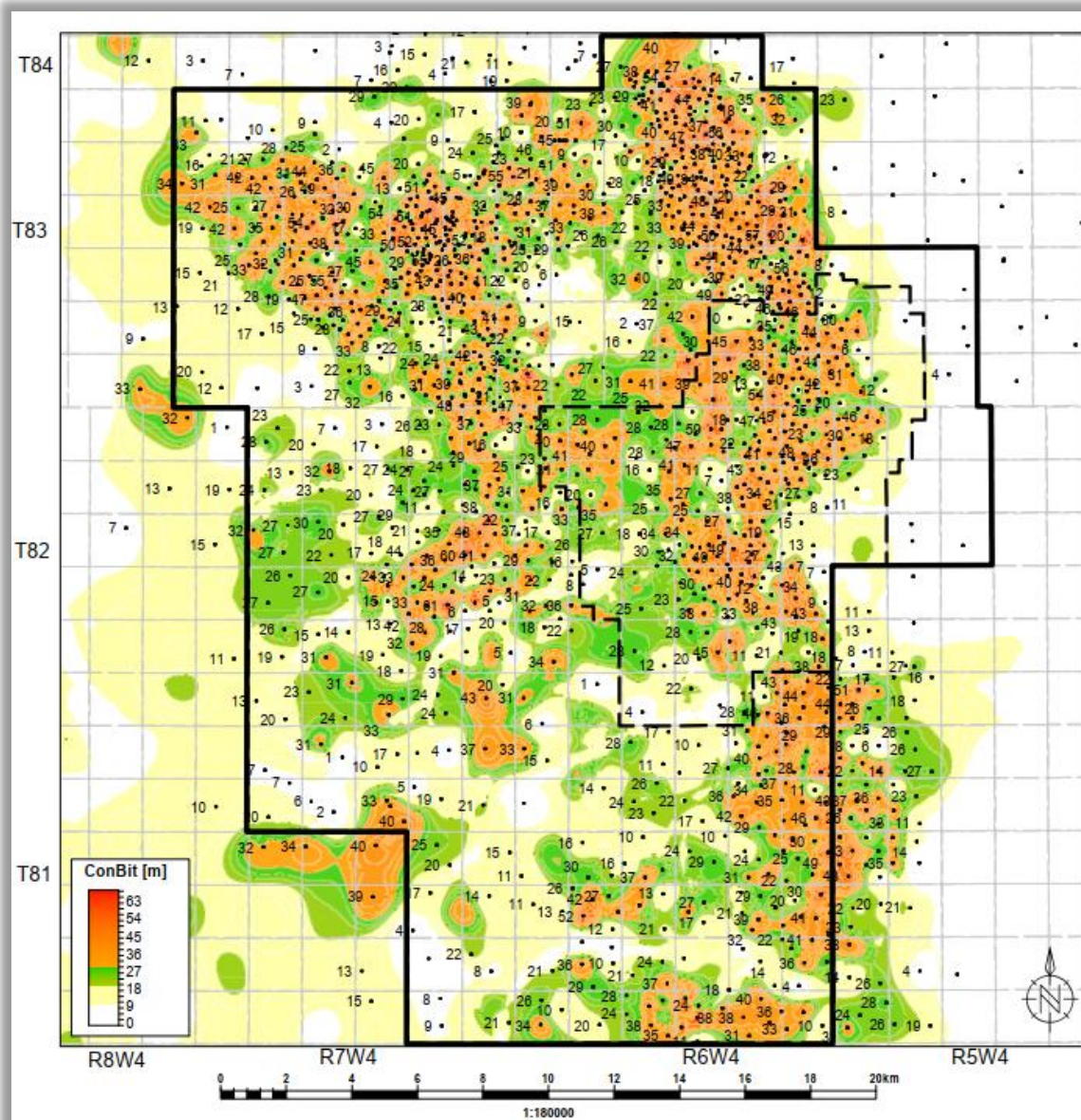
Surmont Project Area



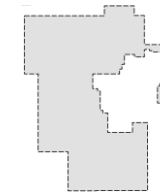
Surmont Development Area

Net Top Gas Thickness =
Sands have Deep Resistivity ≥ 10 Ohm-m and
Vsh $< 65\%$

Development Area Maps: Net Pay Isopach



Surmont Project Area



Surmont Development Area

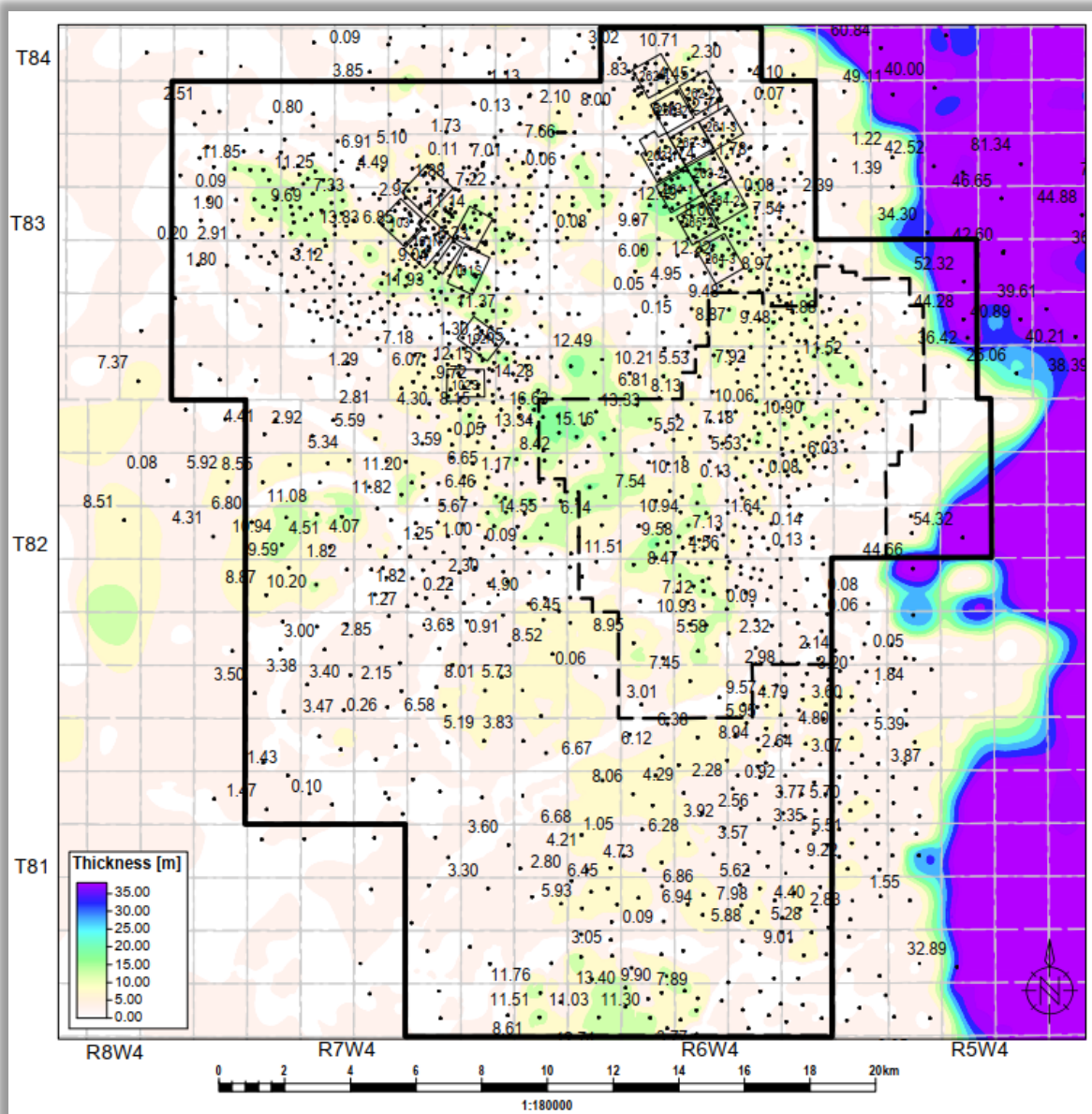
Net Continuous Bitumen Thickness (NCB) =
Sands have Deep Resistivity ≥ 10 Ohm-m and Vsh $< 33\%$

OBIP = Thickness x Phie x So x Area

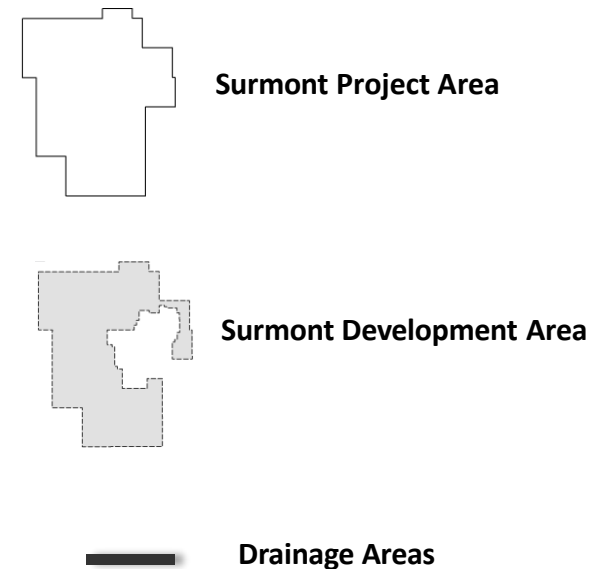
Properties	Development Area
NCB Thickness Range	0 to Greater than 30 m
NCB Thickness	13.59%
Phie in NCB	31.83%
So in NCB	76.59%
OBIP in NCB > 18 m	13732.33 MMbbls Deterministic

Net Pay Isopach

Development Area Maps: Major Water Intervals (Net Top Water)



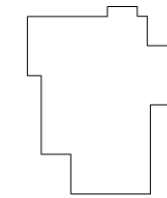
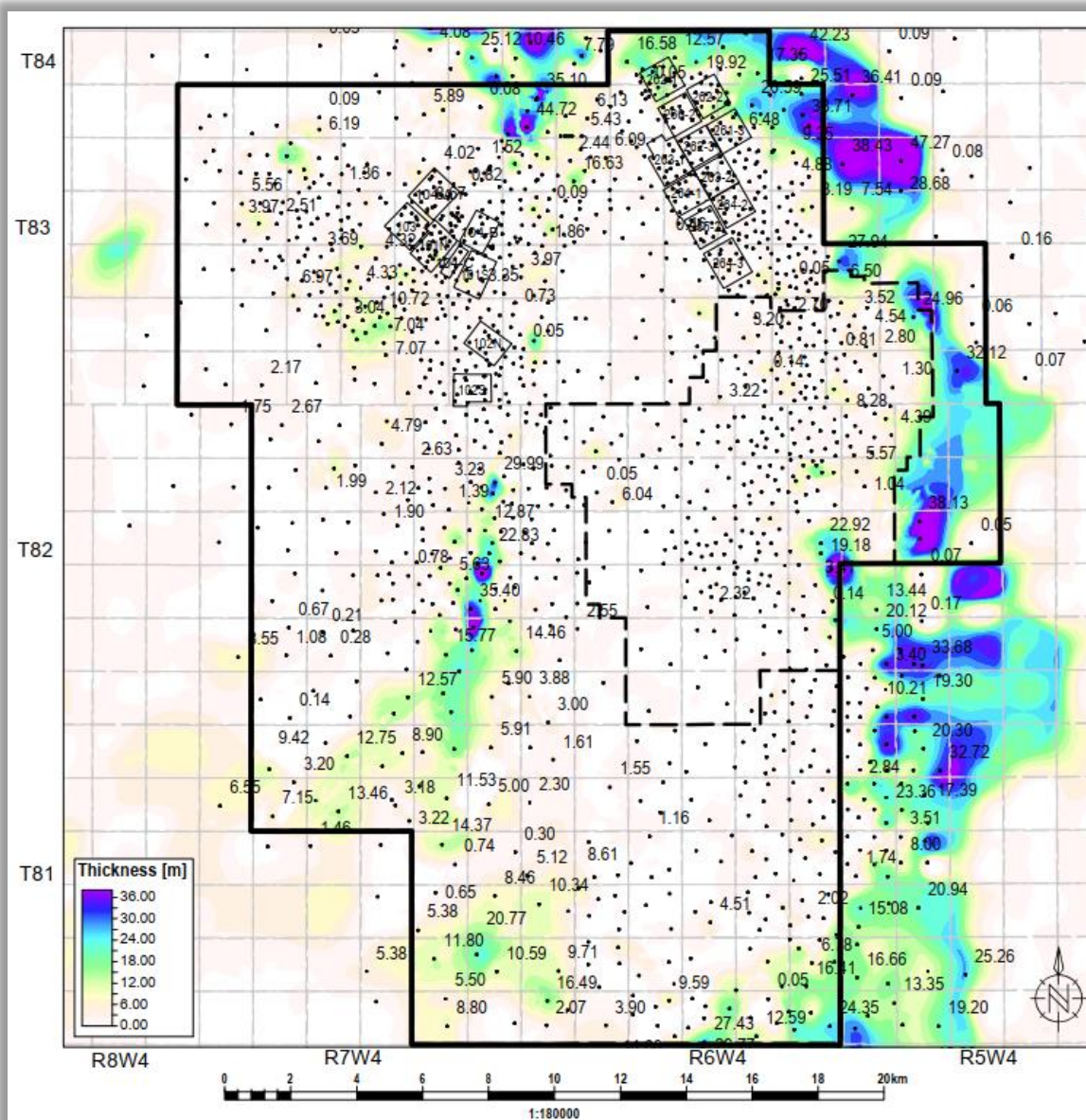
Net Top Water Isopach



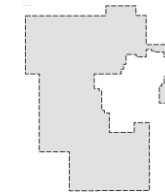
Net Top Water thickness = sands having

- Deep Resistivity $< 10 \Omega\text{-m}$, and
- Vsh $< 45\%$

Development Area Maps: Major Water Intervals (Net Bottom Water)



Surmont Project Area



Surmont Development Area

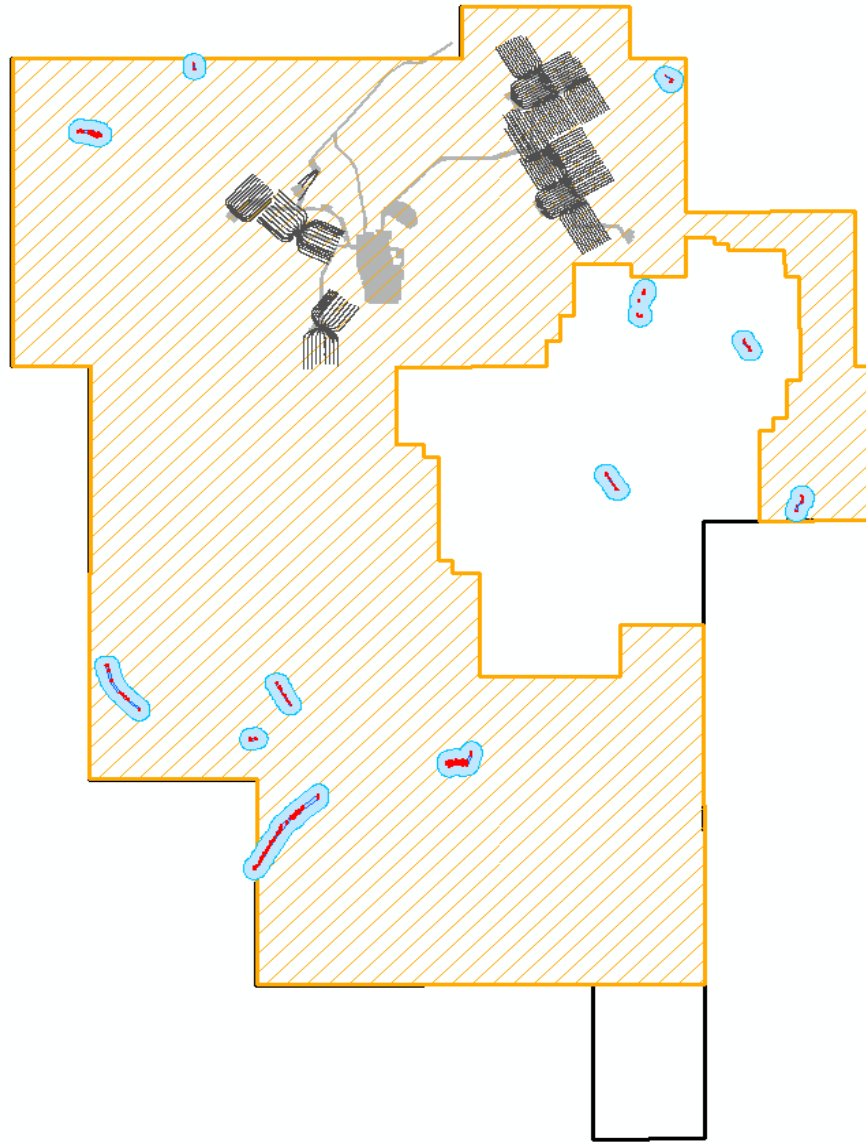


Drainage Areas

Net Bottom Water thickness = sands having

- Deep Resistivity < 10 Ω -m, and
- Vsh < 45%

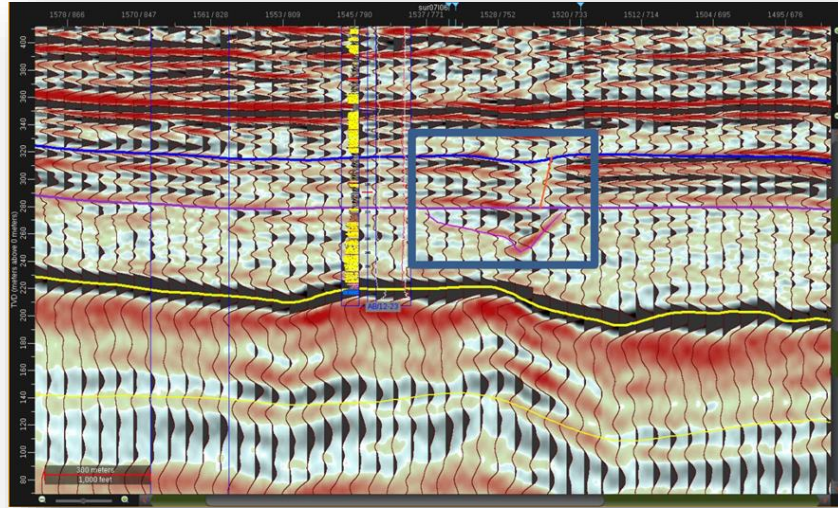
Net Bottom Water Isopach



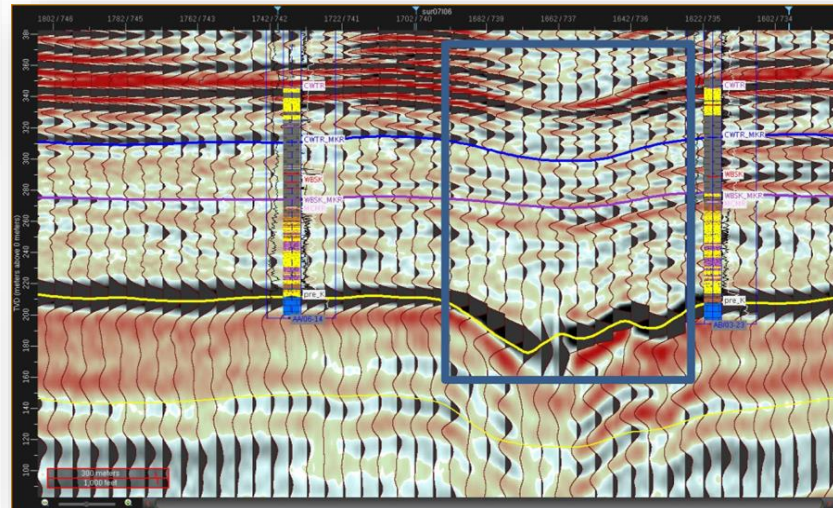
► CAPROCK GEOTECHNICAL HAZARD ANALYSIS

- No new seismic discontinuities have been identified within the Surmont development area since the submission of Lifecycle Application No. 1922683.
- The three highest risk structural mechanisms for caprock integrity are:
 - 1) caprock faulting or fracturing,
 - 2) post-caprock dissolution of the Prairie Evaporite, and
 - 3) post-caprock karsting of underlying Devonian carbonates.
- None of these features are present within the near-term development area. Discontinuities will be investigated prior to pad development activities in those areas.
- ConocoPhillips considers the risk level of each mapped seismic discontinuity individually.
 - Initially a 300m operations buffer is generated around the feature (approx. twice the mapped distance bitumen mobilization occurs from a well pair at Surmont from 4D seismic interpretation).
 - The discontinuities are evaluated and a workplan is formulated to verify cap rock integrity risk which may include new delineation or observation wells, offset well studies and additional seismic processing.
 - Areas with proven compromised cap rock are avoided for development.
 - Monitoring wells and 4D seismic strategies are planned prior to developing areas near possible containment risks.

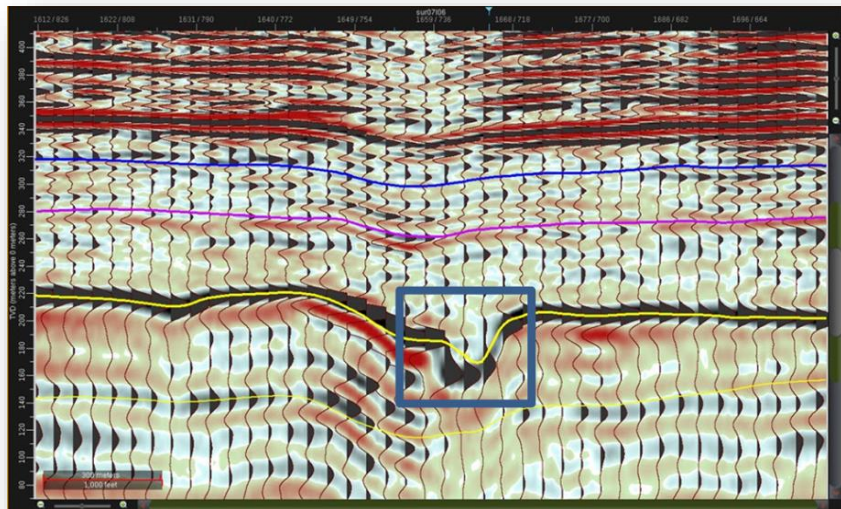
Development Area Maps: Potential Geomechanical Anomalies



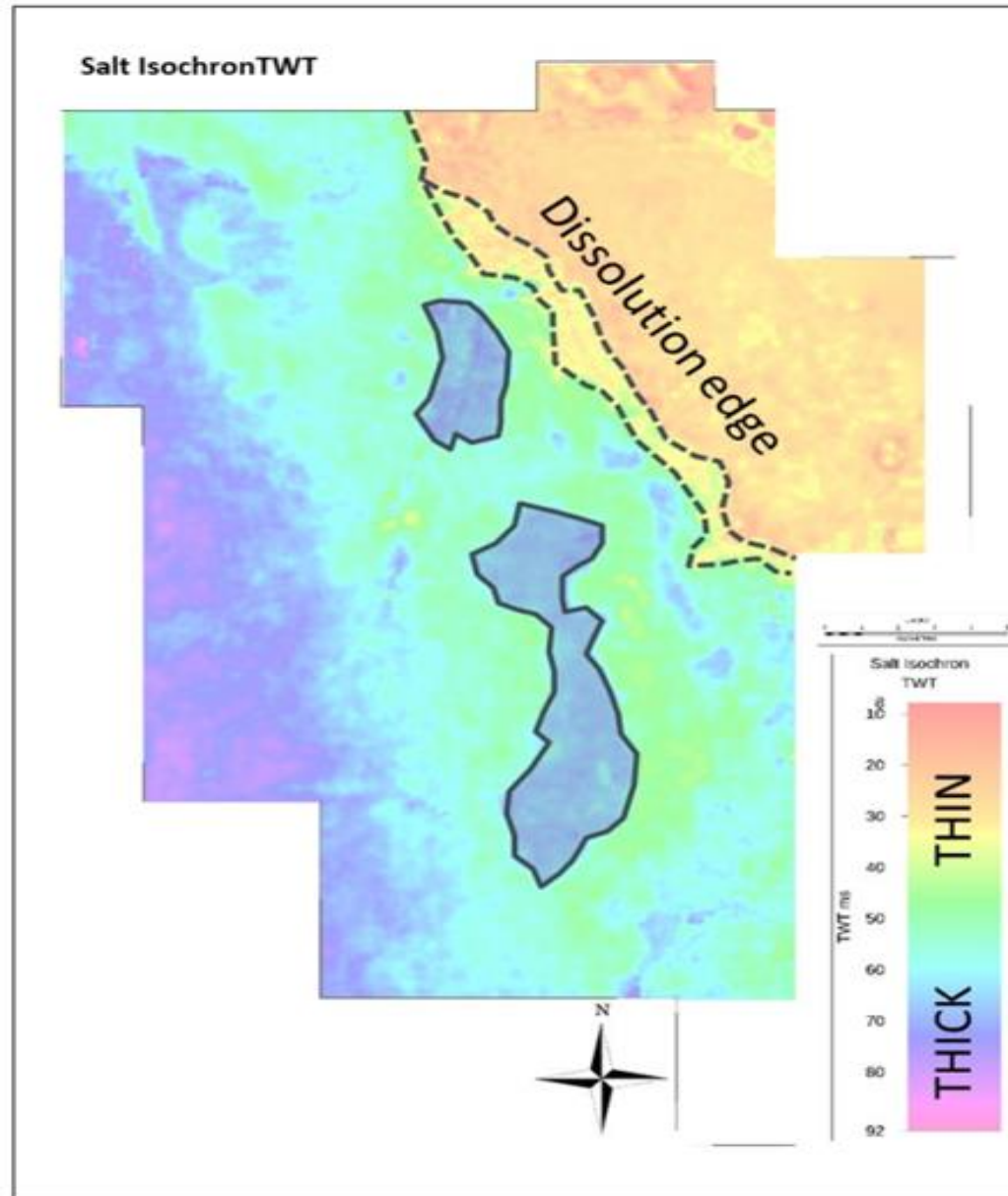
- 1) Caprock seismic discontinuities due to Differential Compaction of McMurray mud abandoned channels



- 2) Post caprock Dissolution of the Prairie Evaporite, Cold Lake, or Lotsberg Salts



- 3) Post caprock Karsting of underlying Devonian carbonates



► MAP OF MAJOR DISSOLUTION

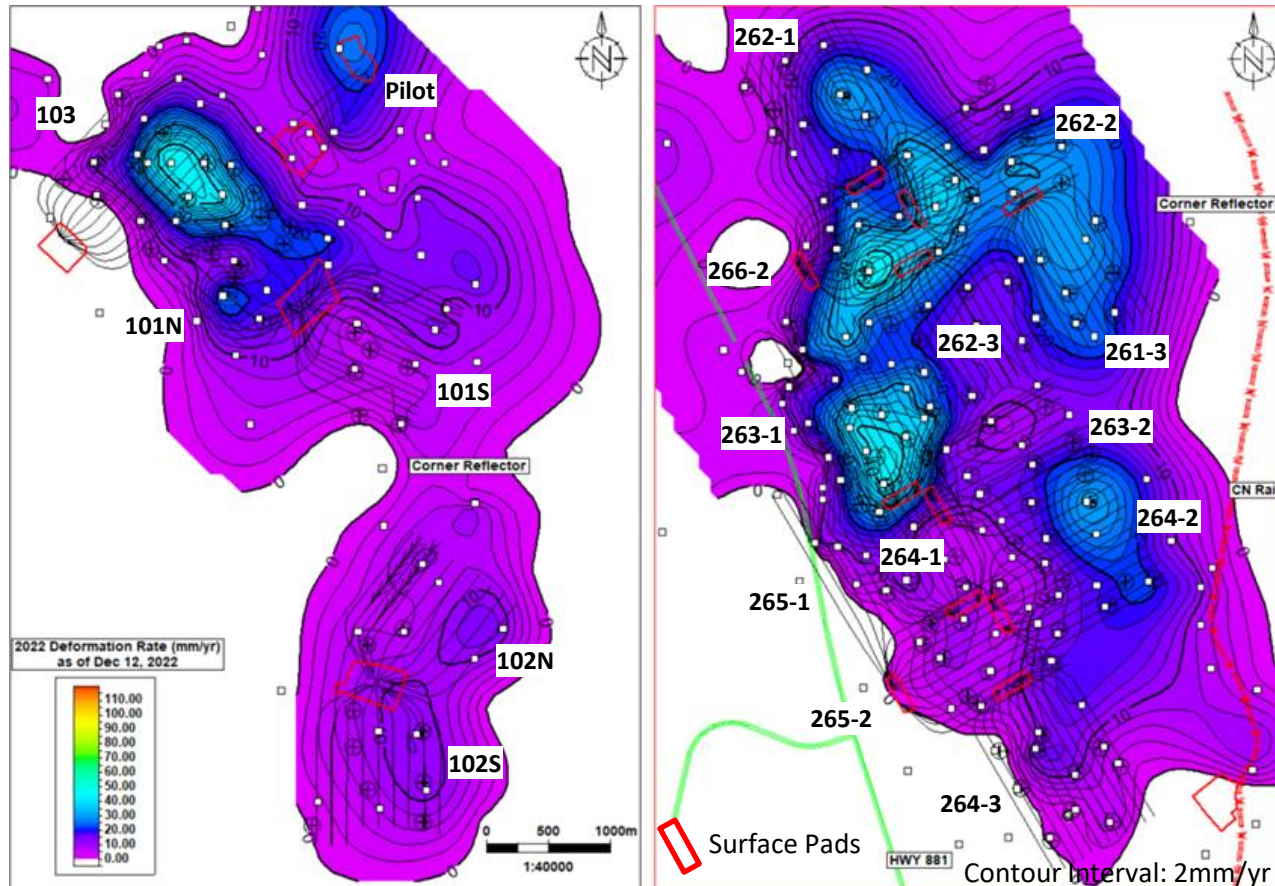
- Seismically interpreted isochron of Prairie Evaporite at Surmont illustrating areas of major dissolution.

Development Area Maps: Heave Monitoring

Relative surface ground movement at Surmont is measured with satellite based Interferometric Synthetic Aperture Radar (InSAR) every 24 days. There are two types:

➤ **Corner Reflector (CR):** permanent monuments installed on the ground for monitoring surface deformation in the field due to the SAGD process in the subsurface (i.e. injection of steam and production of bitumen)

➤ **Coherent Target Monitor (CTM):** measurements from reflectors (e.g.: pad pipe rack) that can be taken consistently over time and utilized to monitor surface pad heave



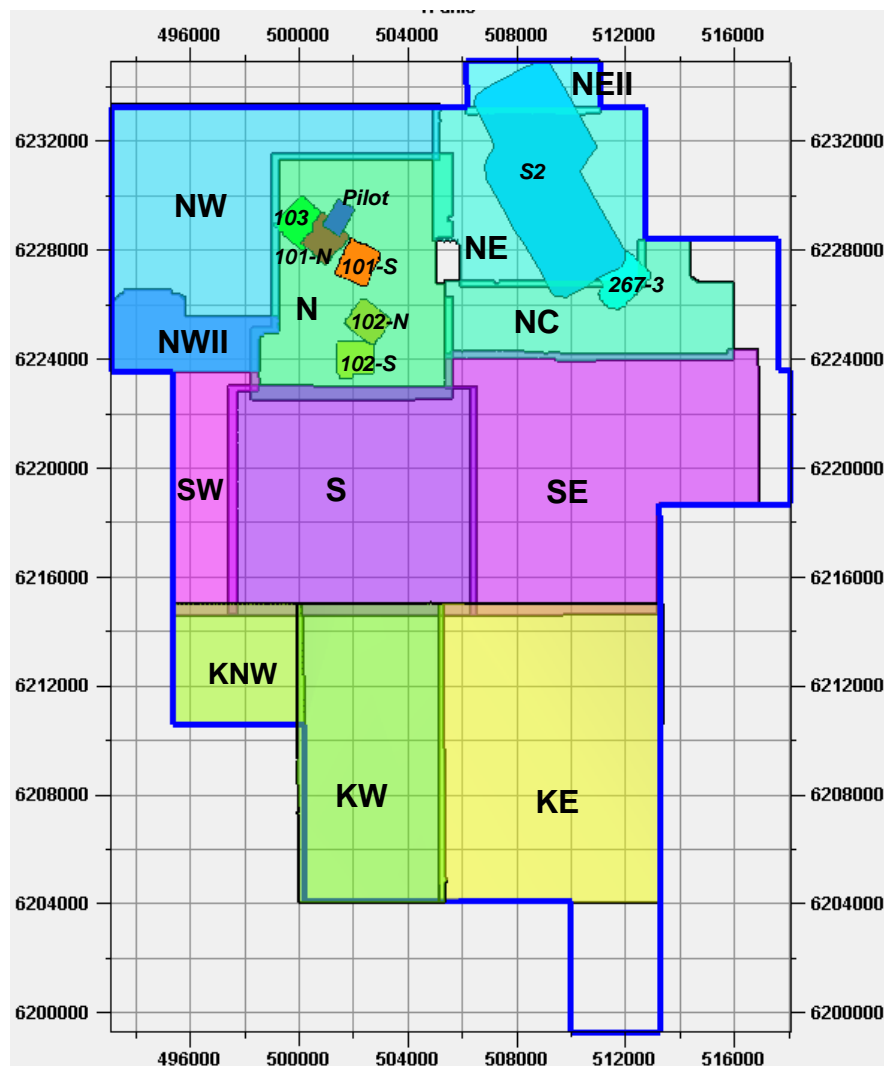
Pad/DA		Average CR DA Heave Rate Since SAGD (mm/yr)	Average CTM Pad Heave Rate Since SAGD (mm/yr)**
101	101N	10	41
	101S	6	
102	102N	8	23
	102S	6	
103		14	40
261-3*		20	42
262-1*		14	42
262-2*		17	56
262-3*		21	55
263-1*		19	95
263-2*		21	60
264-1*		20	70
264-2*		23	85
264-3*		18	65
265-2	265-1	26	91
	265-2	19	
266-2		24	109

*Surface pad is built on top of SAGD well pair from other drainage areas

**Normalized for DA heave rate

Analysis and data captured in 2023 indicates there is no integrity risk

Development Area Maps: Existing Seismic Acquisition



3D SEISMIC AT SURMONT

Existing Seismic

3D	km ²	Shots	S-R line	S-R
N	60	17 004	60	60x30
S	75	33 668	80x120	24x18
NE	50	24 512	120x80	24x18
NW	65	29 906	80(160)x120	20x20
NC	33	24 009	60(120)x80	20x20
NEII	9	3 598	120x80	24x18
NWII	14	4 394	160x120	20x20
SW	23	7 236	160x120	20x20
SE	86	54 801	80x100	20x20
KNW	22	9 543	120x80	20x20
KW	58	24 690	120x80	20x20
KE	85	55 808	80x80	20x20
	580	289 169		

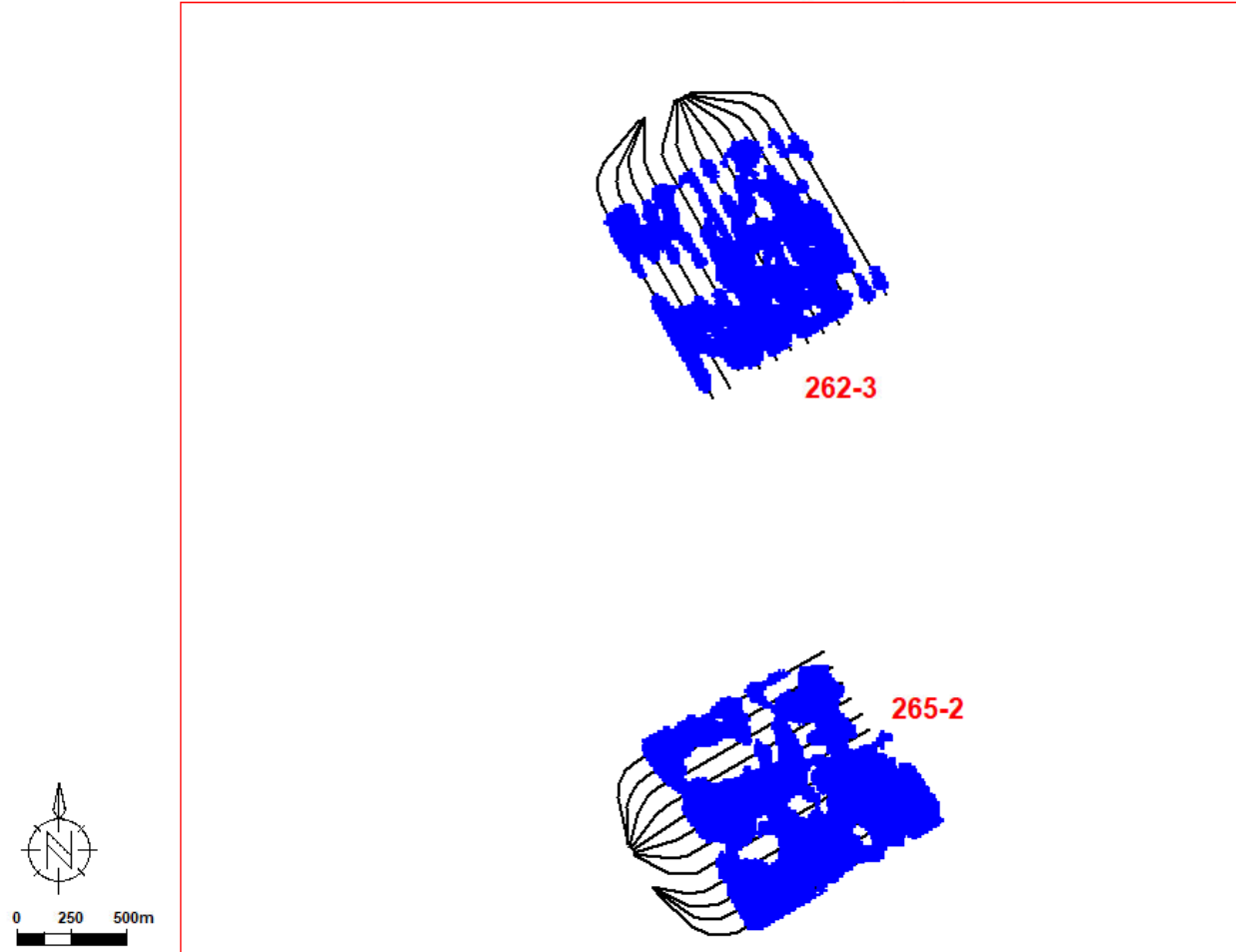
4D SEISMIC AT SURMONT

Existing Seismic

4D	km ²	S-R	# Monitors
101N	1.8	10x10	10
101S	1.8	10x10	10
102N	1.6	20x20	10
102S	1.7	20x20	7
103	1.9	20x20	5
S2	15.0	20x20	3 (*)
267-3	2.0	20x20	0
	25.8		45

(*) Average # Monitor per DA in S2

S2 Monitors - 2022 (Spring)

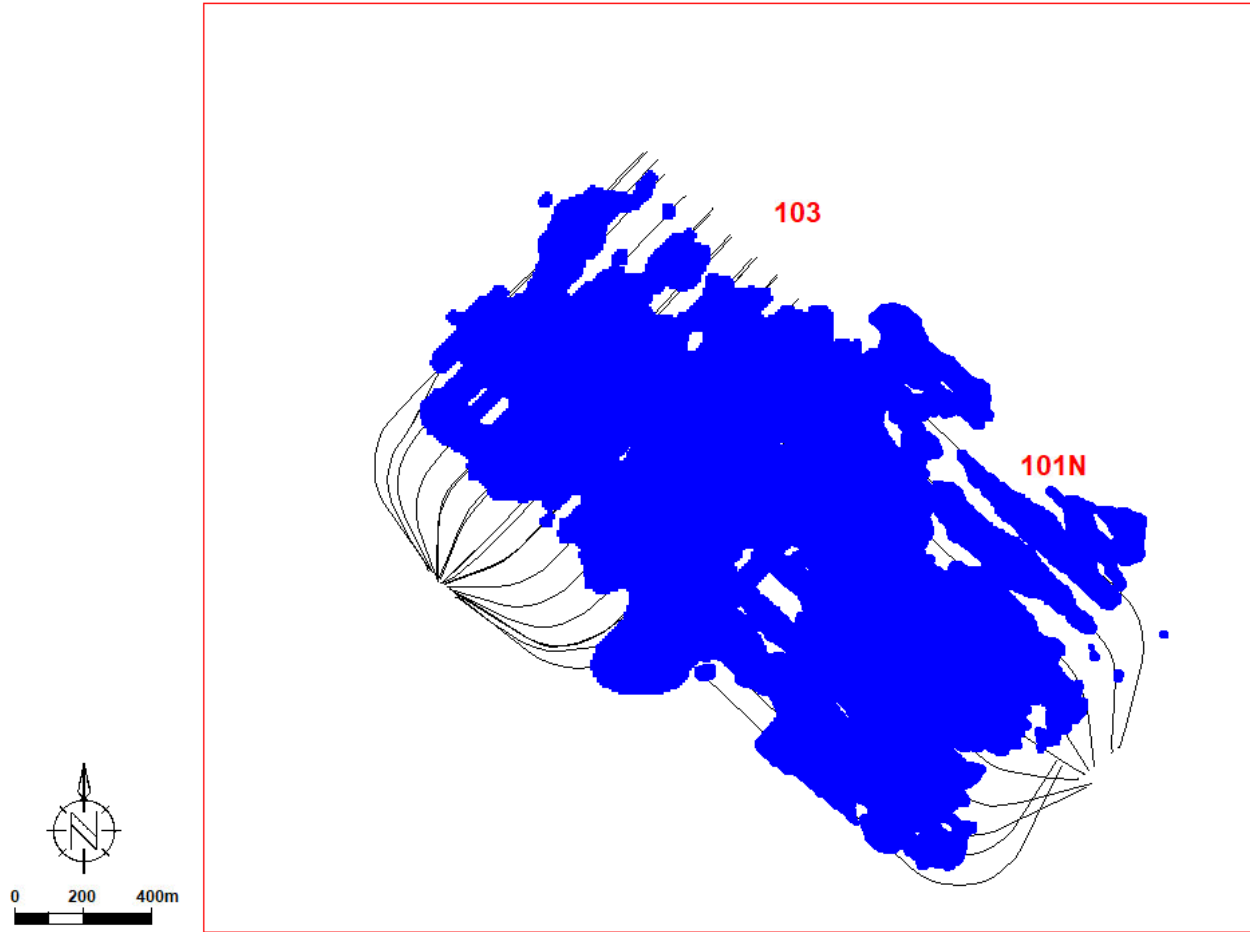


4D SEISMIC AT SURMONT

4D Monitors Spring 2022

4D	S-R	# Monitors
S2 / 262-3	20x20	3 rd
S2 / 265-2	20x20	4 th

S1 Monitors - 2022 (Fall)

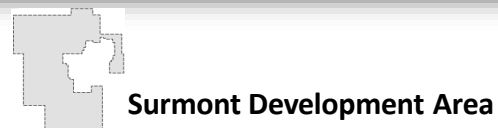
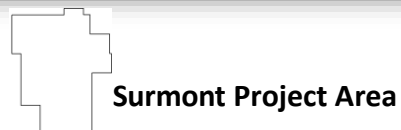
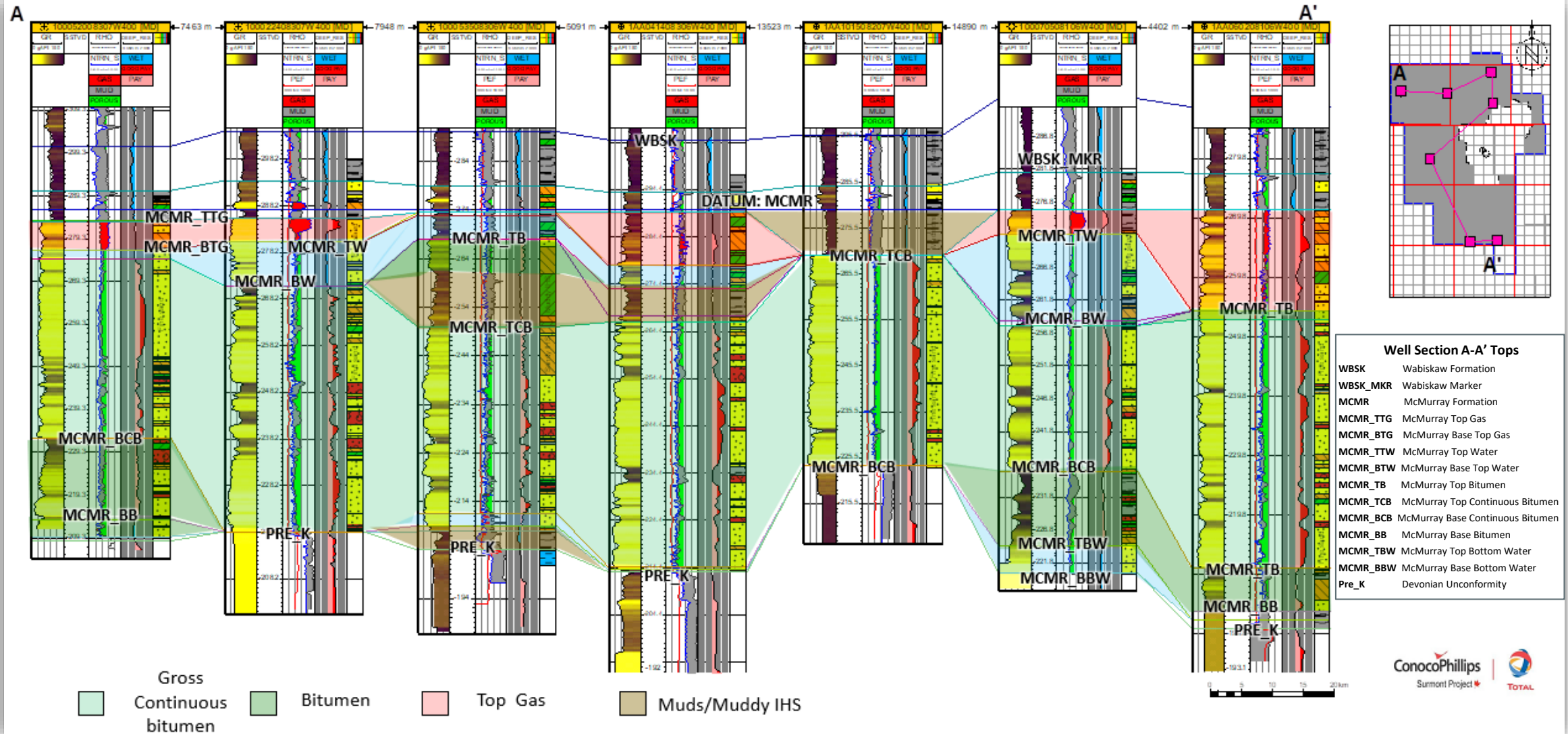


4D SEISMIC AT SURMONT

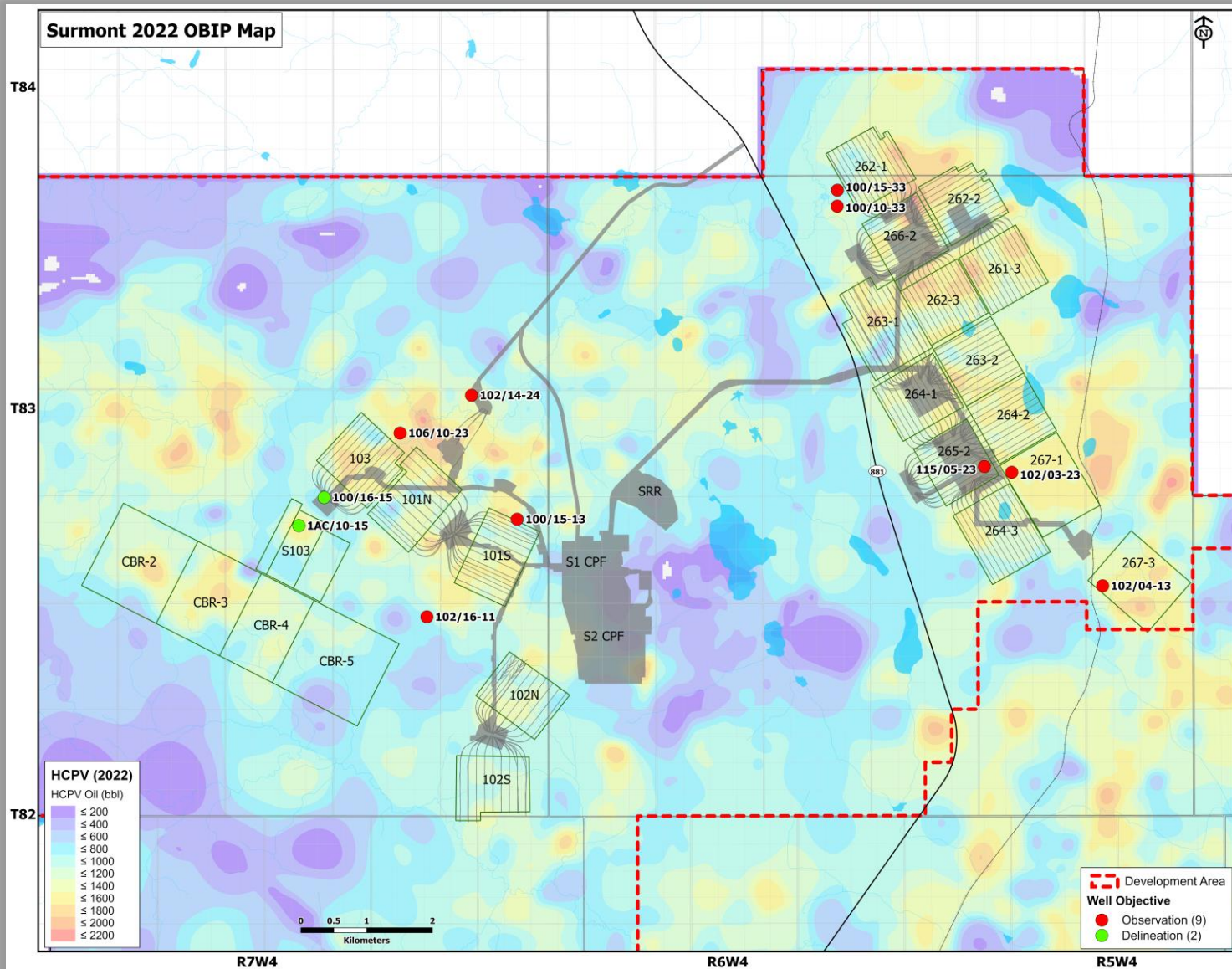
4D Monitors Fall 2022

4D	S-R	# Monitors
101N	10x10	10 th
103	20x20	5 th

Representative Well Cross-Section A - A'

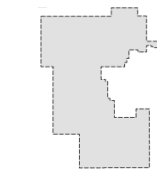


Original Bitumen in Place



Surmont Lease

Project Area



Development Area

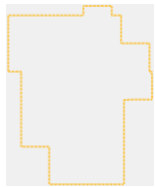
Drainage Areas

Region	MMBBLs
Surmont Lease	20939.03
Project Area	20717.6
Development Area	16341.12
101N	65.61
102N	49.45
103	69.72
101S	66.65
102S	50.27
261-3	69.57
262-1	61.28
262-2	60.28
262-3	66.78
263-1	75.22
263-2	65.05
264-1	63.74
264-2	68.31
264-3	69.21
265-2	56.35
266-2	67.74

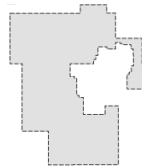
Hydrocarbon Pore Volume (HCPV) Map 2022

Well Patterns, Bitumen Recovery & Reservoir Parameters

Properties	Depth (masl)	Area (m2)	Thickness NCB (m)	Phie in NCB %	So in NCB %	KH in NCB (mD)	KV in NCB (mD)	Initial Pressure (KPa)	Original Bitumen in Place (MMBBLs)	Producible Oil in Place (MMBBLs)	Expected RF	Current RF
Project Area	276.3 - 215.8	561632100	23.7	31.9%	76.9%	4162	3462		20715.36	17205.69	50%	2.30%
Dev Area	276.4 - 216.1	457757230	23.0	31.8%	76.6%	4110	3418		16339.68	13577.19	50%	2.90%
101N	282.01 - 212.12	1090775	37.1	32.3%	80.8%	4385	3643	1690	65.63	57.20	60%	48%
101S	283.95 - 219.77	1064692	37.5	33.2%	80.4%	5423	4549	1684	66.64	59.82	80%	69%
102N	284.63 - 226	975251	31.3	32.7%	80.4%	4633	3901	1735	49.46	43.17	60%	57%
102S	285.39 - 225.41	1019252	34.6	31.4%	74.4%	4039	3328	1800	50.27	44.32	90%	80%
103	282.21 - 213.16	1022239	42.3	32.0%	81.0%	4433	3689	1691	69.72	62.73	70%	61%
261-3	275.77 - 204.42	1000542	44.4	32.0%	78.1%	4365	3582	1328	69.58	58.50	50%	34%
262-1	275.07 - 200.66	996252	39.3	31.7%	80.0%	4143	3430	1307	61.26	52.31	60%	50%
262-2	276.86 - 212.39	974291	38.7	33.1%	78.6%	5251	4429	1296	60.28	52.35	50%	37%
262-3	280.1 - 212.47	943213	43.8	32.8%	78.2%	4876	4060	1368	66.71	60.98	50%	14%
263-1	282.22 - 214.69	1271315	36.0	33.0%	79.3%	5092	4283	1404	75.23	63.58	60%	46%
263-2	285.79 - 216.19	998219	40.9	32.4%	78.1%	4717	3930	1397	65.05	57.09	50%	31%
264-1	289.12 - 215.8	1033834	39.2	32.9%	79.8%	5099	4298	1444	63.74	57.71	50%	22%
264-2	288.06 - 217.12	1011337	42.1	32.7%	78.2%	4784	3985	1437	68.30	60.66	50%	23%
264-3	288.79 - 215.64	1209485	37.4	32.0%	75.6%	4455	3694	1564	69.20	62.84	50%	36%
265-1	278.80 - 226.46	331352	29.0	33.5%	82.7%	5080	4254	1600	16.91	13.31		7%
265-2	289.76 - 220.35	917433	38.9	32.5%	76.8%	5117	4271	1496	56.32	45.93	70%	59%
266-2	280.93 - 210.95	949974	42.9	32.8%	80.1%	4888	4084	1337	67.75	58.50	60%	47%



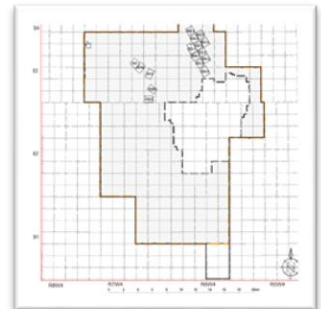
Project Area



Development Area



Drainage Areas



► Casing Integrity

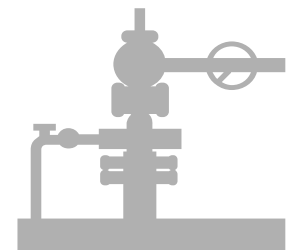
- Casing connection failures identified as a result of casing deformation.
- Continue to perform casing caliper logging to identify features and prove casing integrity as required during interventions.
- Casing repair operations approved and completed as required.

► Surface Casing Vent Flow/Gas Migration

- Testing according to Well Integrity Program and regulatory requirements.
- Gas samples collected for isotope analysis against database of known samples for source identification.

► Wellhead Integrity

- Scheduled wellhead preventative maintenance program.
- Active wellhead valve inspection program to identify compromised valves.
- Continuing with wellhead valve upgrade to reduce freezing/thermal expansion events.



Workovers & Recompletions

Workovers:

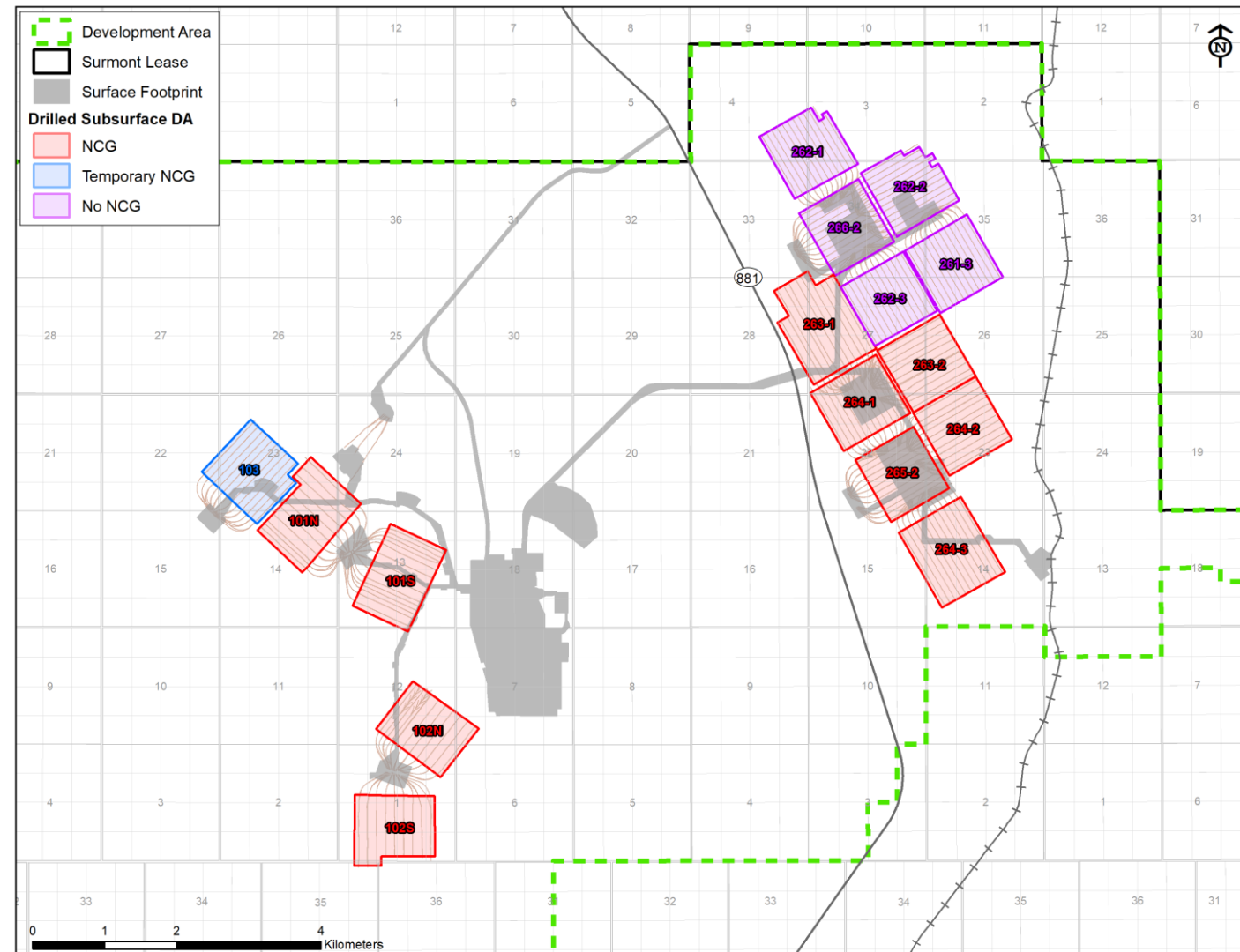
Well	Date	Scope	Status
263-2 P08	Mar-22	Liner repair	Online in 2022
101 P16	Mar-22	Liner repair	Online in 2022
102-P07	Feb-22	Liner repair and tieback	Online in 2022
262-1 P05	Aug-22	Liner repair and tieback	Online in 2022
263-2 P02	Sep-22	Well inspection, shutoff and ESP install	Online in 2022
265-1 P03	Nov-22	Liner repair	Online in 2022
262-1 P09	Dec-22	Liner shut off at toe	Online in 2022

Redrills:

Well	Date	Scope	Status
263-2 P11	Mar-22	Sidetrack producer	Online in 2022
261-3 P09	Mar-22	Sidetrack producer	Online in 2022
261-3 P04	Mar-22	Sidetrack producer	Online in 2022
264-1 WP05	Apr-22	Sidetrack producer and injector	Online in 2022
264-2 WP10	May-22	Sidetrack producer and injector	Online in 2022
266-2 P11	May-22	Sidetrack producer	Online in 2022
266-2 P07	May-22	Sidetrack producer	Online in 2022
262-3 WP05	Jun-22	Sidetrack producer and injector	Online in 2022
103-P04	Jun-22	Stepout producer well	Online in 2022 – old P04 abandoned
103-P05	Jul-22	Stepout producer well	Online in 2022 – old P05 abandoned
103-P12	Jul-22	Stepout producer well	Online in 2022 – old P12 abandoned
261-3 P08	Jul-22	Sidetrack producer	Online in 2022
261-3 P12	Aug-22	Sidetrack producer	Online in 2022

Non-Condensable Gas Co-Injection

- Non-Condensable Gas (NCG) co-injection is deployed on the pads indicated on the map for pressure maintenance and top water thief zone mitigation, where pressure imbalance and steam losses can be a challenge.
- NCG has helped reduce SOR and accelerated re-pressurizing pads under a top water thief zone.
- NCG injection can cause Electric Submersible Pump (ESP) interference and inefficiency due to excess gas production, requiring rate optimization.
- NCG was injected at an average of 6,000 - 15,000 Sm³/d per subsurface pad in 2022. NCG rates vary with recovery factor and injectivity; larger steam chambers have greater rates of gas injected. NCG co-injection concentration varies from 0.1 to 4 mol% steam to maintain steam chamber pressure and manage ESP interference.
- Fuel gas from TransCanada Pipeline is used for NCG co-injection. Surface metering of produced gas is highly uncertain at a pad level because there is no distinction between produced steam and hydrocarbon gas. Produced gas is allocated at the plant level and a per-pad NCG recovery percentage cannot be estimated. Plant level gas production has been steady at a gas oil ratio of 8, regardless of NCG co-injection, which suggests minimal NCG recycle.

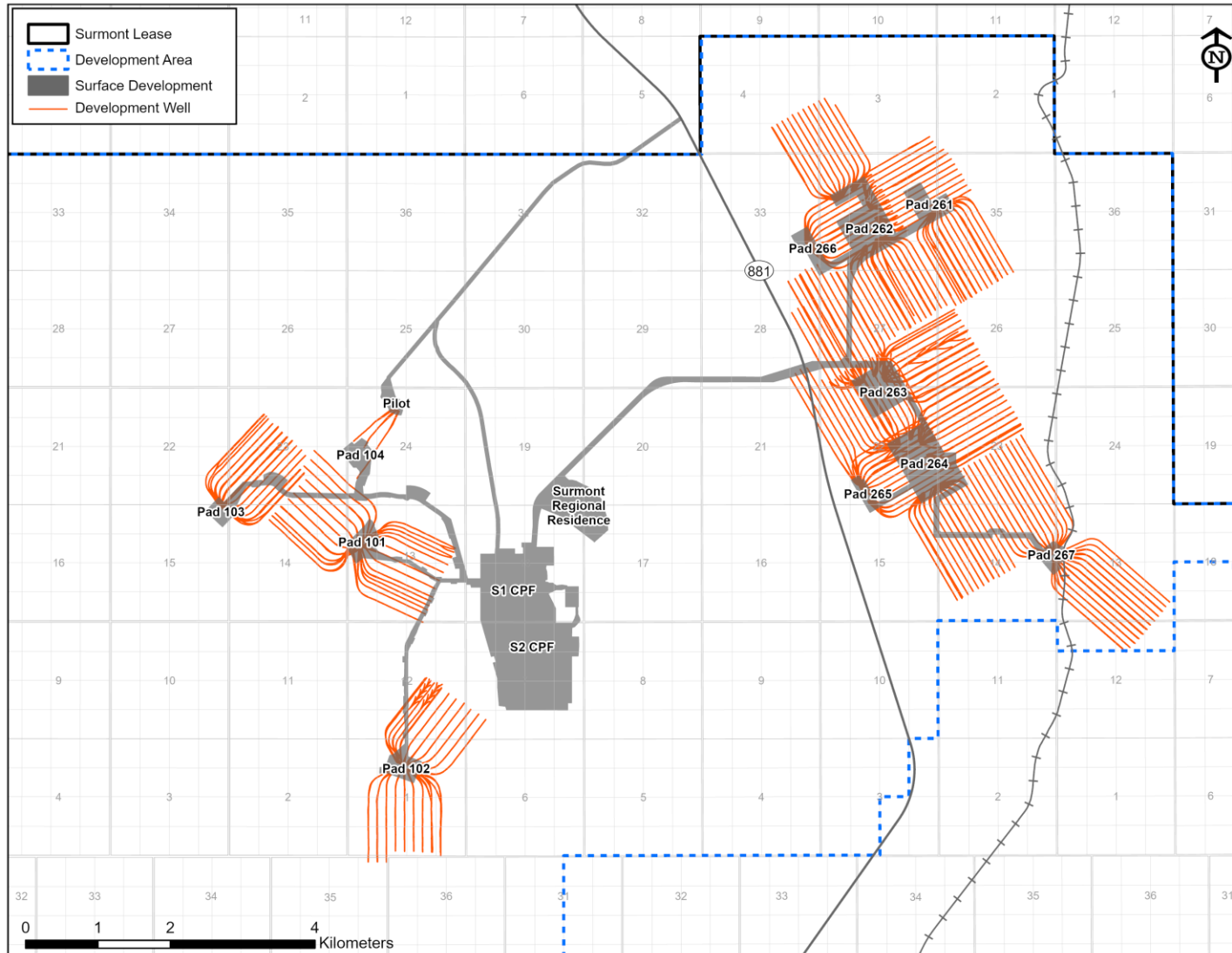


Surface

Directive 054: Section 4.3
OSCA Report: Table 1 (2)



Surface Infrastructure: Built & In Progress



► S1/S2 CENTRAL PROCESSING FACILITIES

► WELL PADS - BUILT

- 101
- 102
- 103
- 261
- 262
- 263
- 264
- 265
- 266
- 267

► WELL PADS – IN PROGRESS

- 104

► SURMONT REGIONAL RESIDENCE

2022 Surmont Operations

GENERAL

- No changes have materially altered the energy and/or material balances of the Surmont Project.
- No new surface technologies were trialed during the reporting period.



SURMONT PHASE 1

- Full plant outage May 30 – June 22, 2022 (planned maintenance).
- No major modifications in 2022.

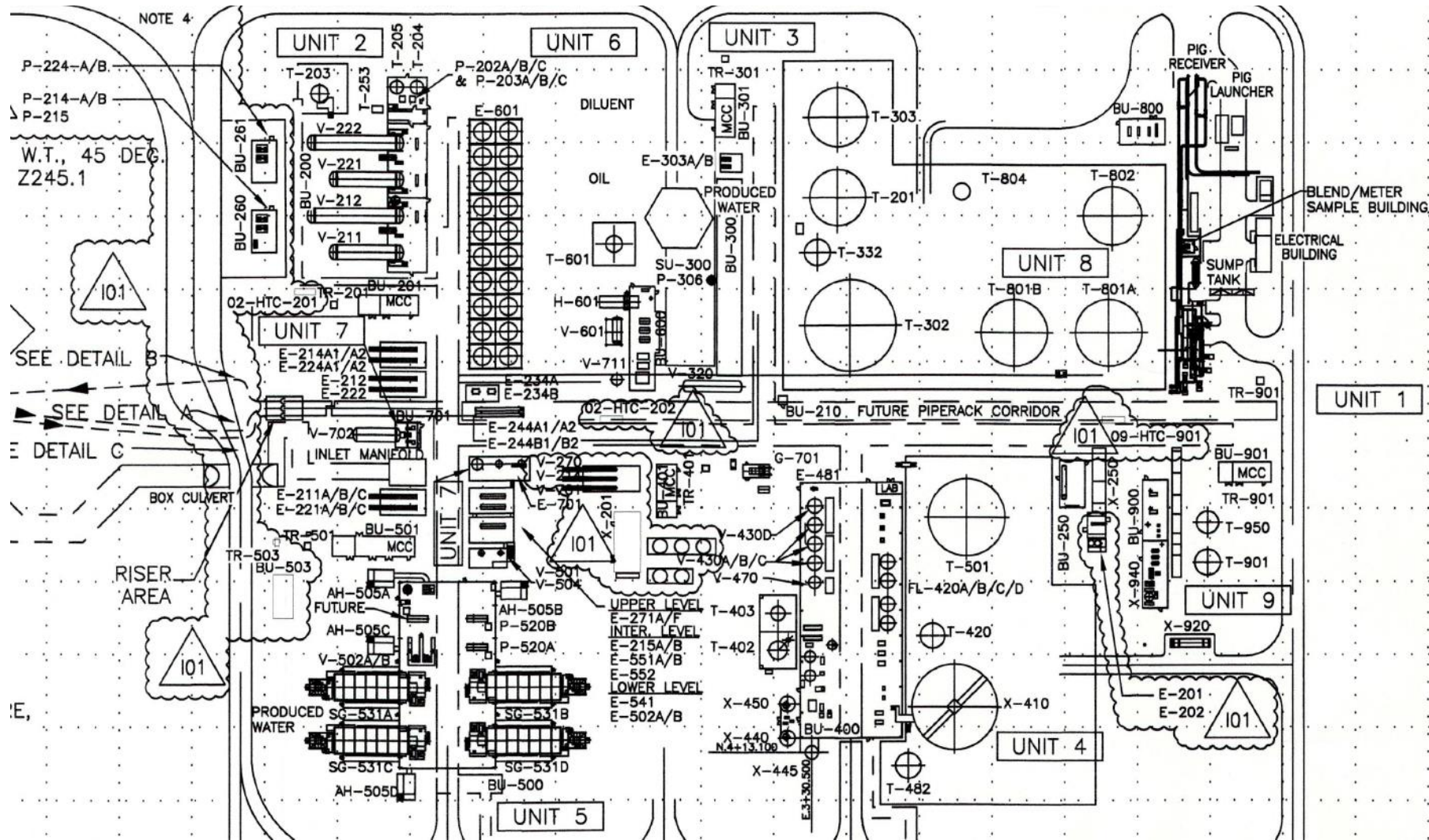


SURMONT PHASE 2

- Steady operation.
- No major modifications in 2022.

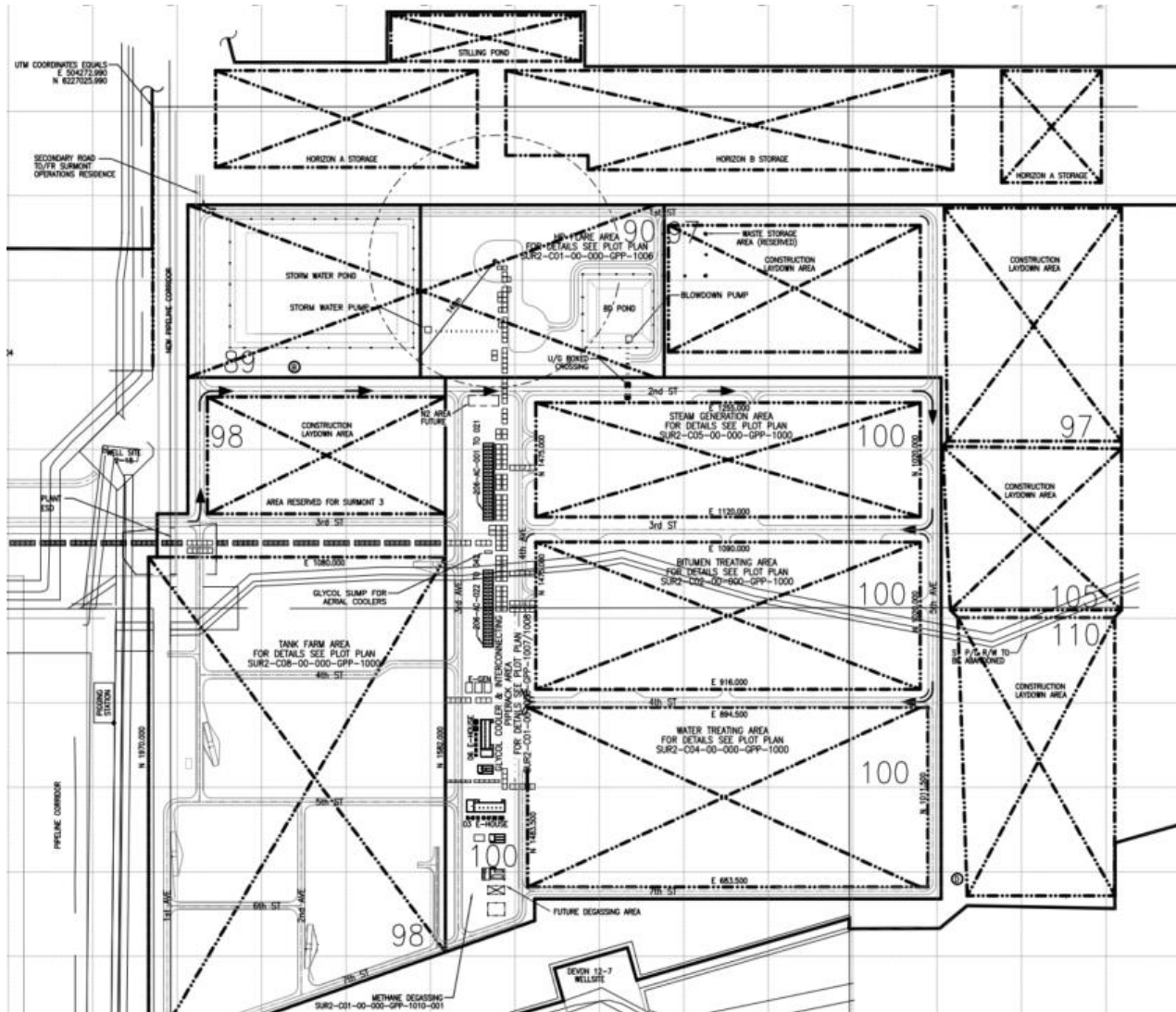


Central Processing Facility Modifications: Surmont Phase 1 Plot Plan



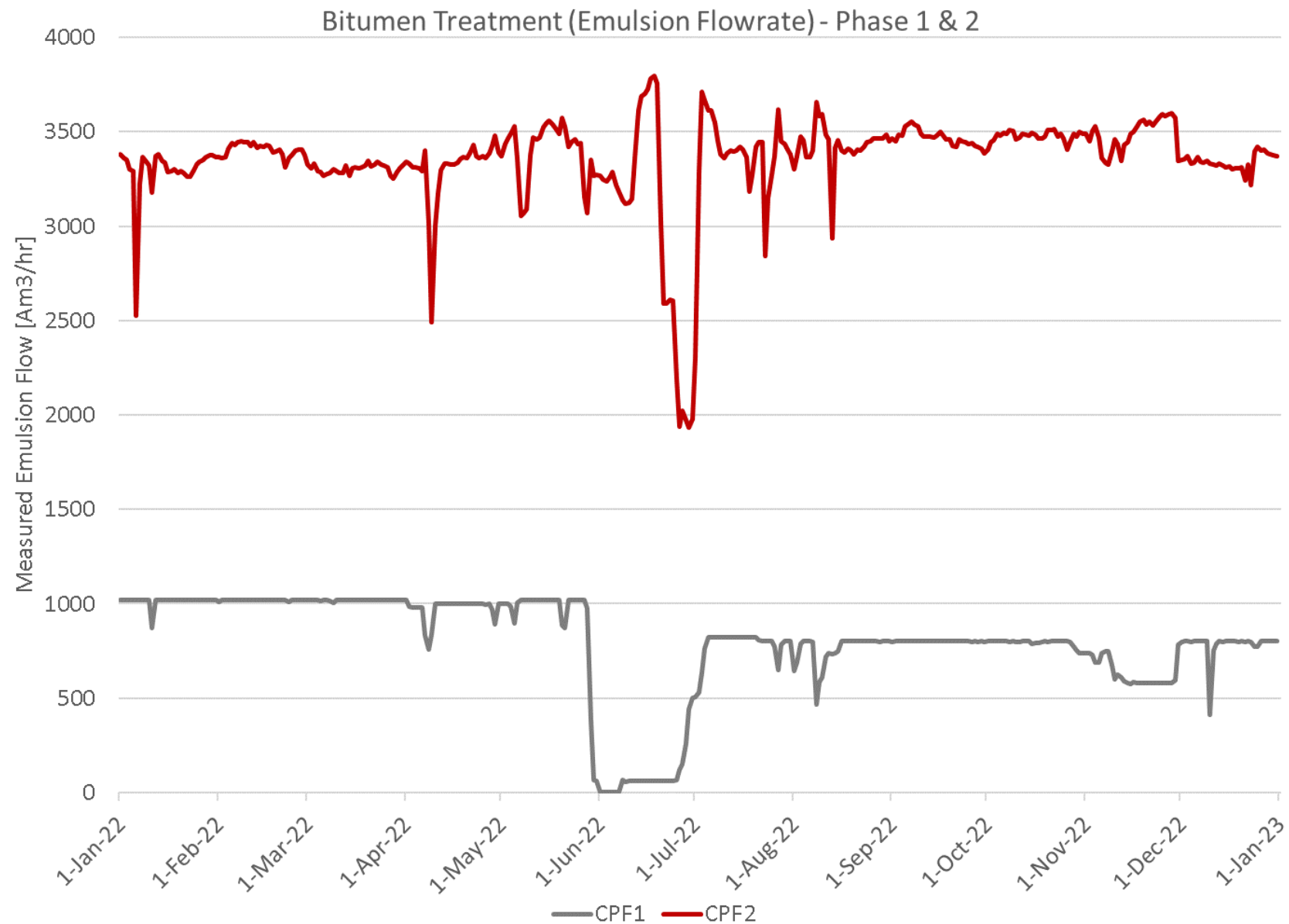
➤ No modifications to the Surmont 1 central processing facility required an AER application approval during the 2022 reporting period.

Central Processing Facility Modifications: Surmont Phase 2 Plot Plan

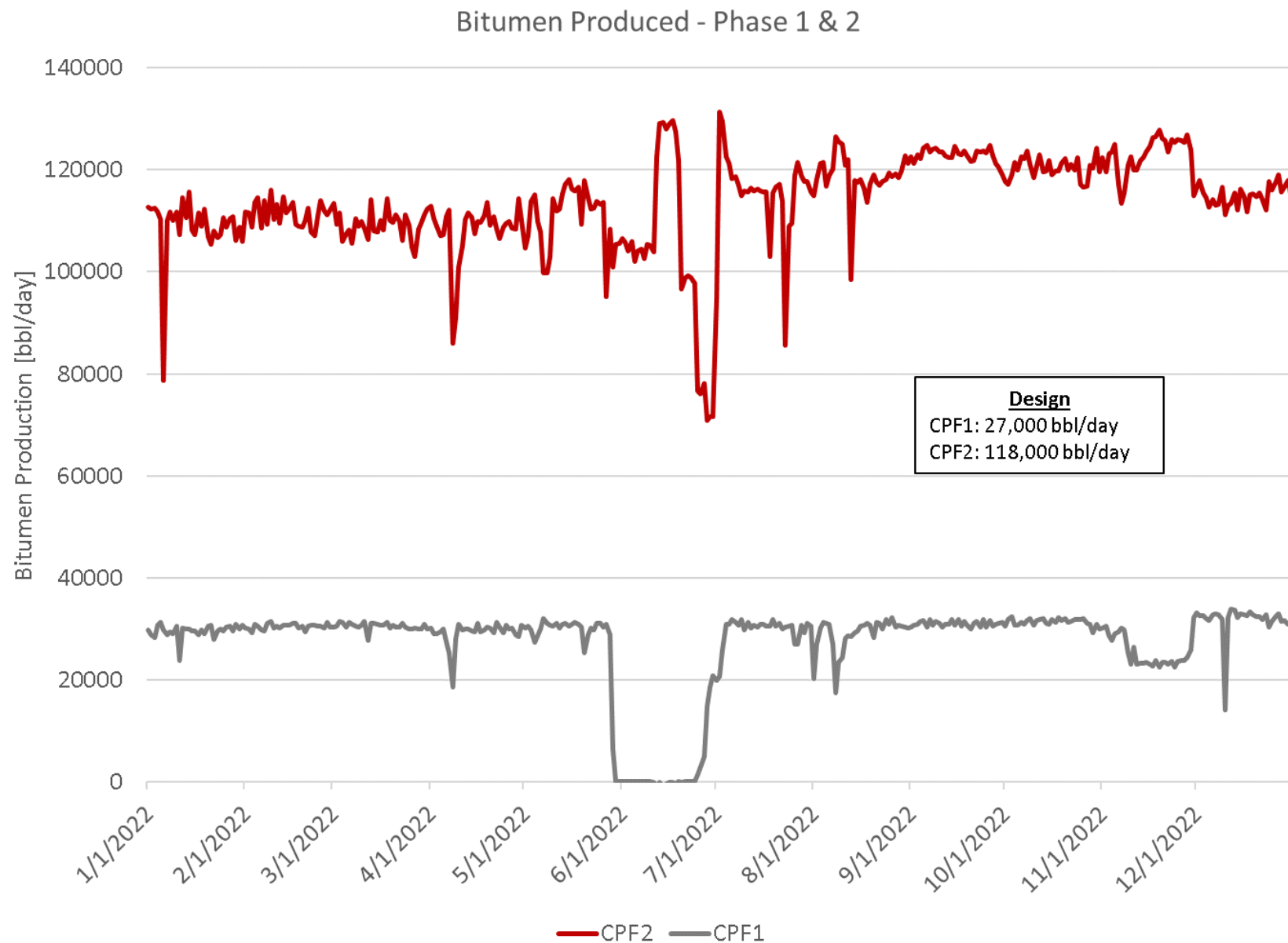


No modifications to the Surmont 2 central processing facility required an AER application approval during the 2022 reporting period.

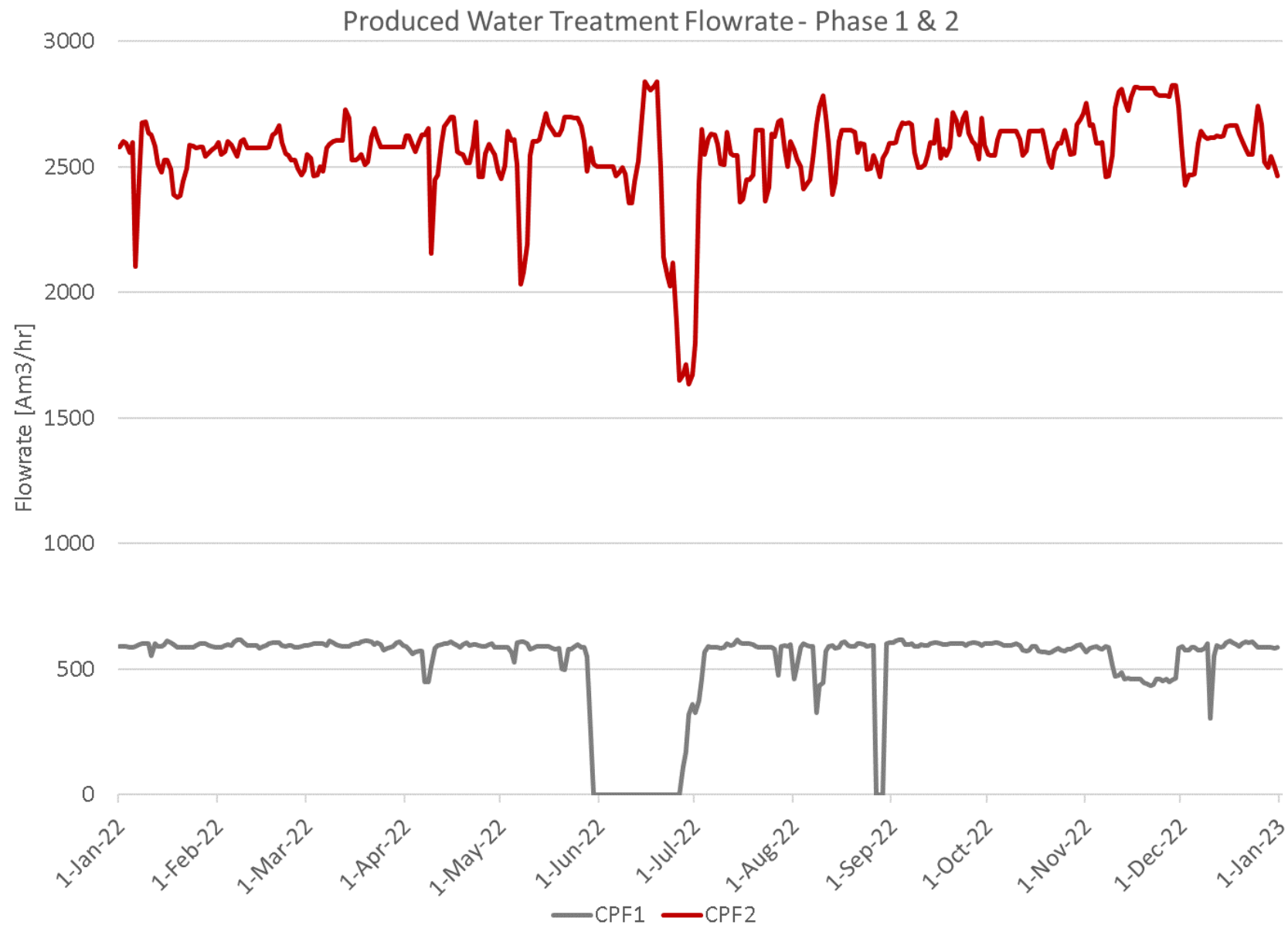
Facility Performance: Bitumen Treatment by Central Processing Facility (CPF)



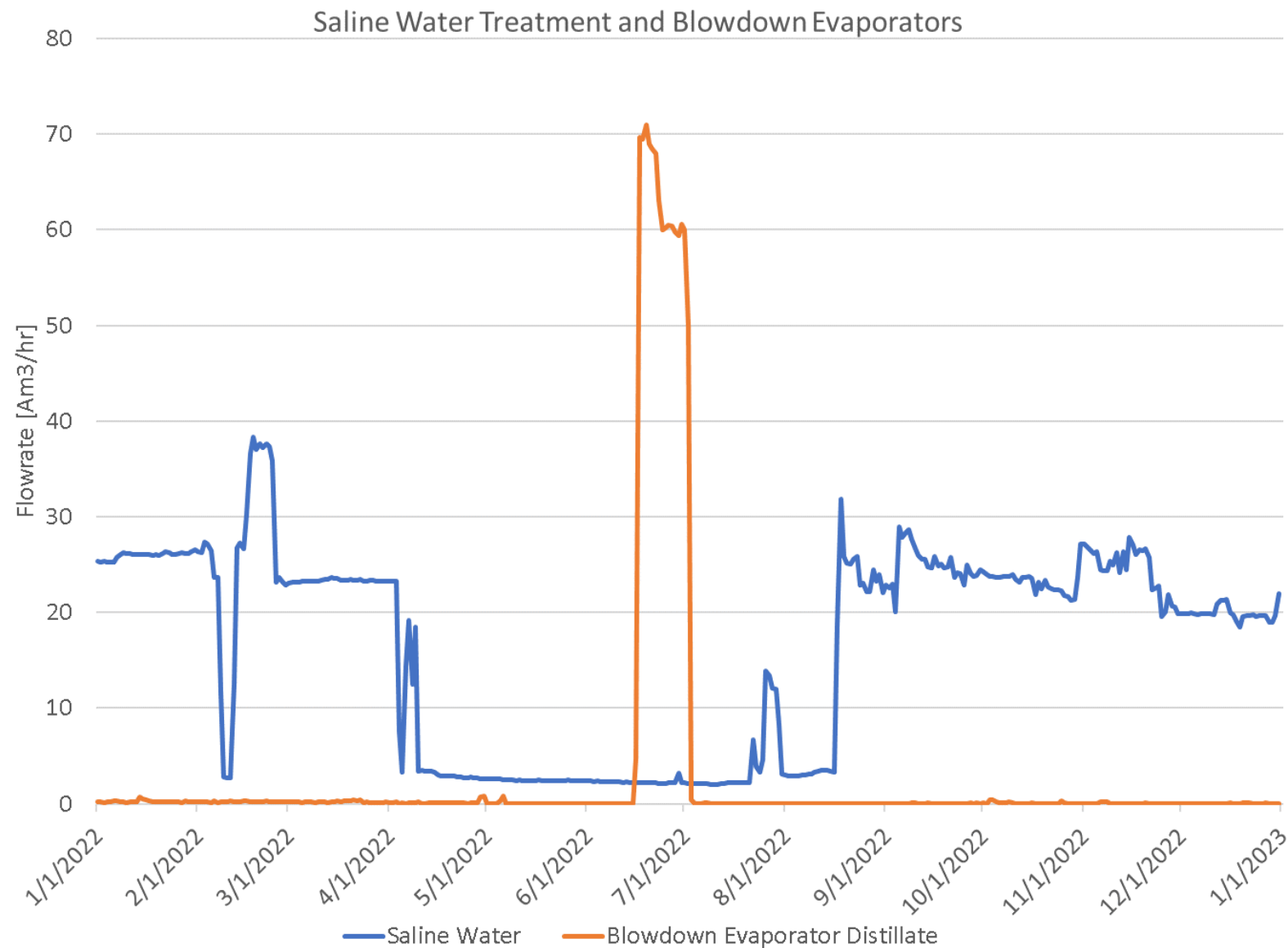
Facility Performance: Bitumen Production by CPF



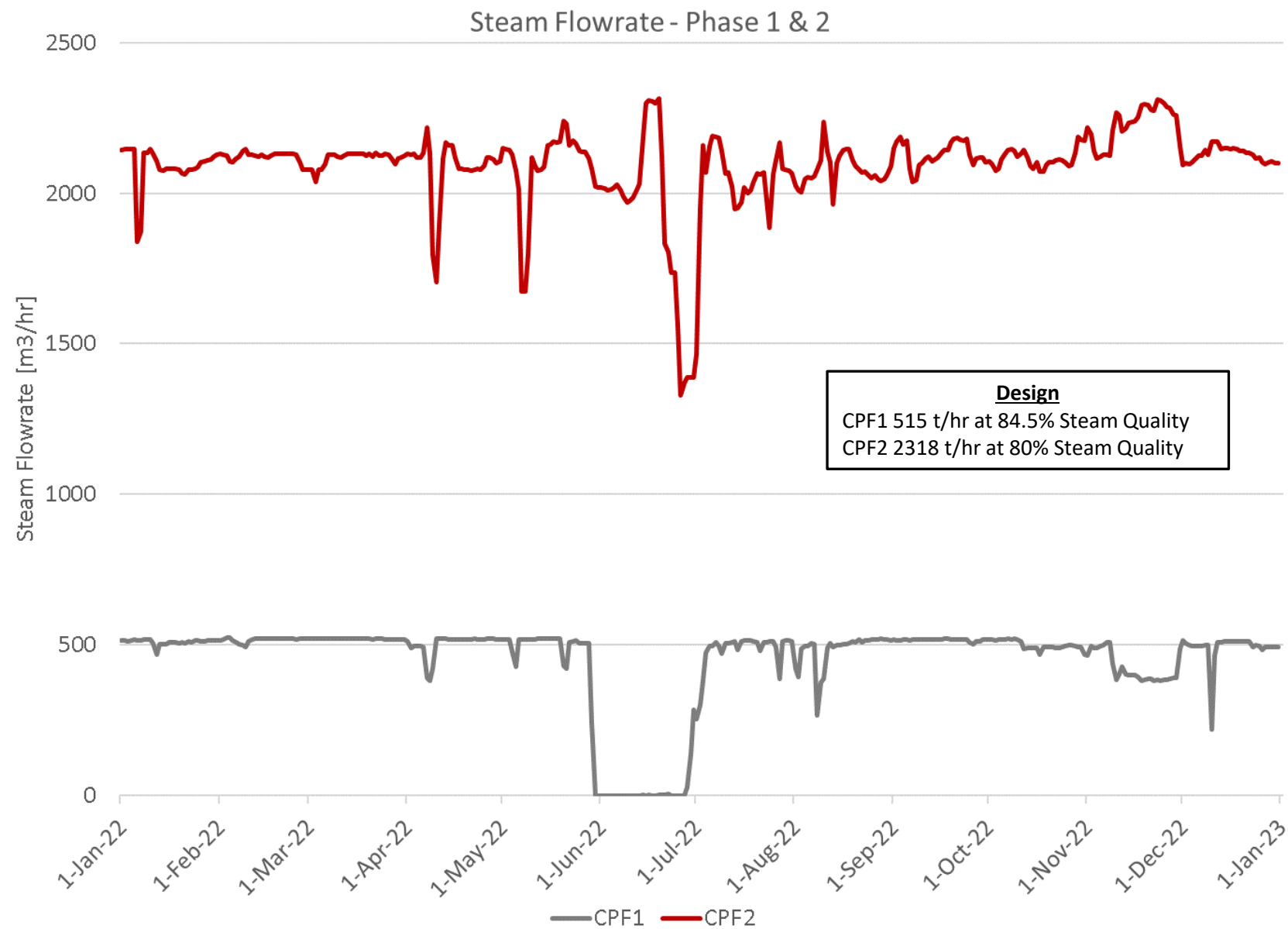
Facility Performance: Water Treatment by CPF



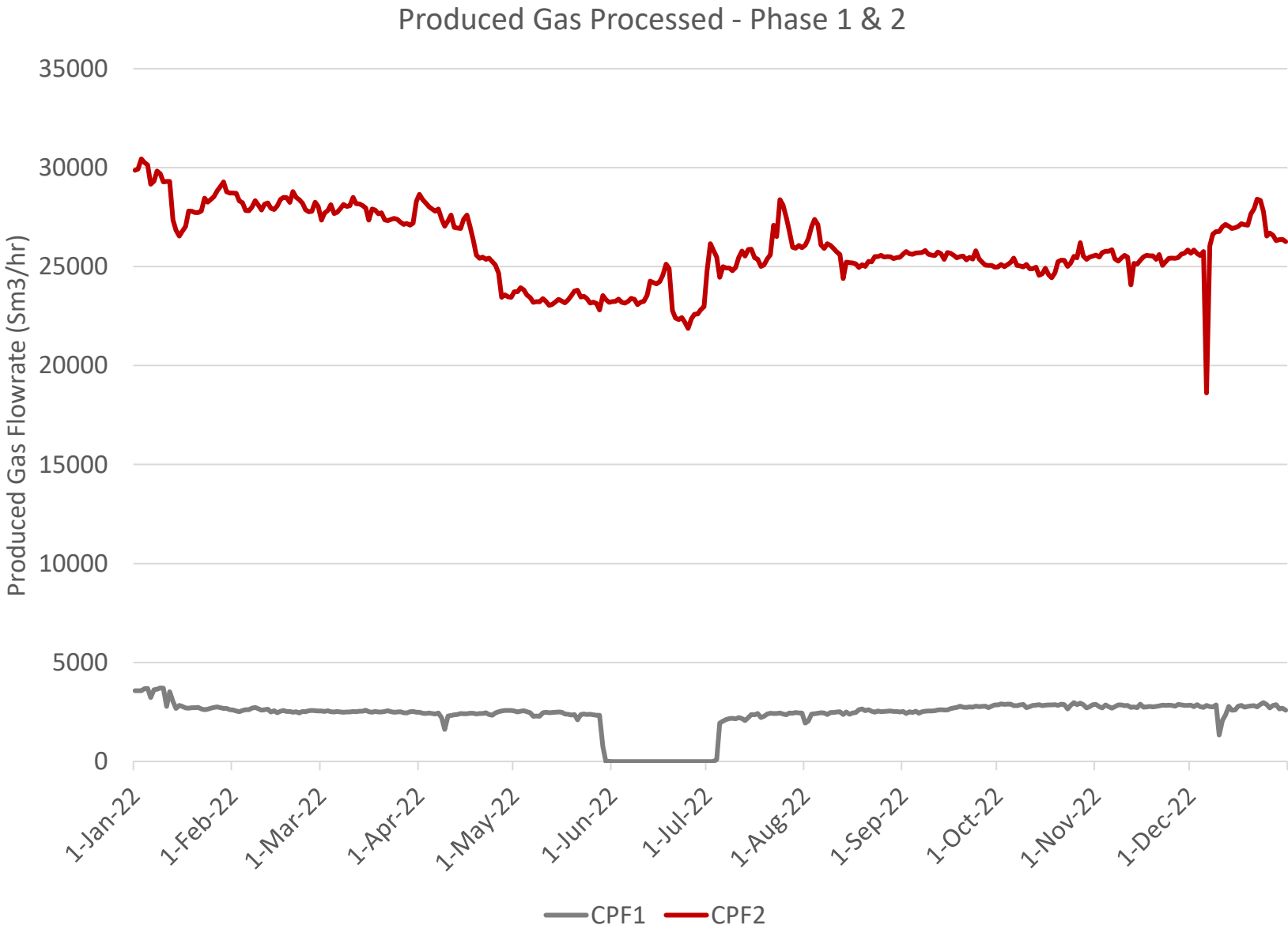
Facility Performance: Saline Water Treatment and Blowdown Evaporators



Facility Performance: Steam Production by CPF



Facility Performance: Produced Gas Production by CPF



Surmont Water Source & Disposal Wells

Directive 054: Section 4.3 (8)(a)
Class 1b Disposal Approval No. 10044M



Surmont Phase 1 and Phase 2 Water Source Wells

Surmont Phase 1 Alternative Non-Saline Water Source Wells

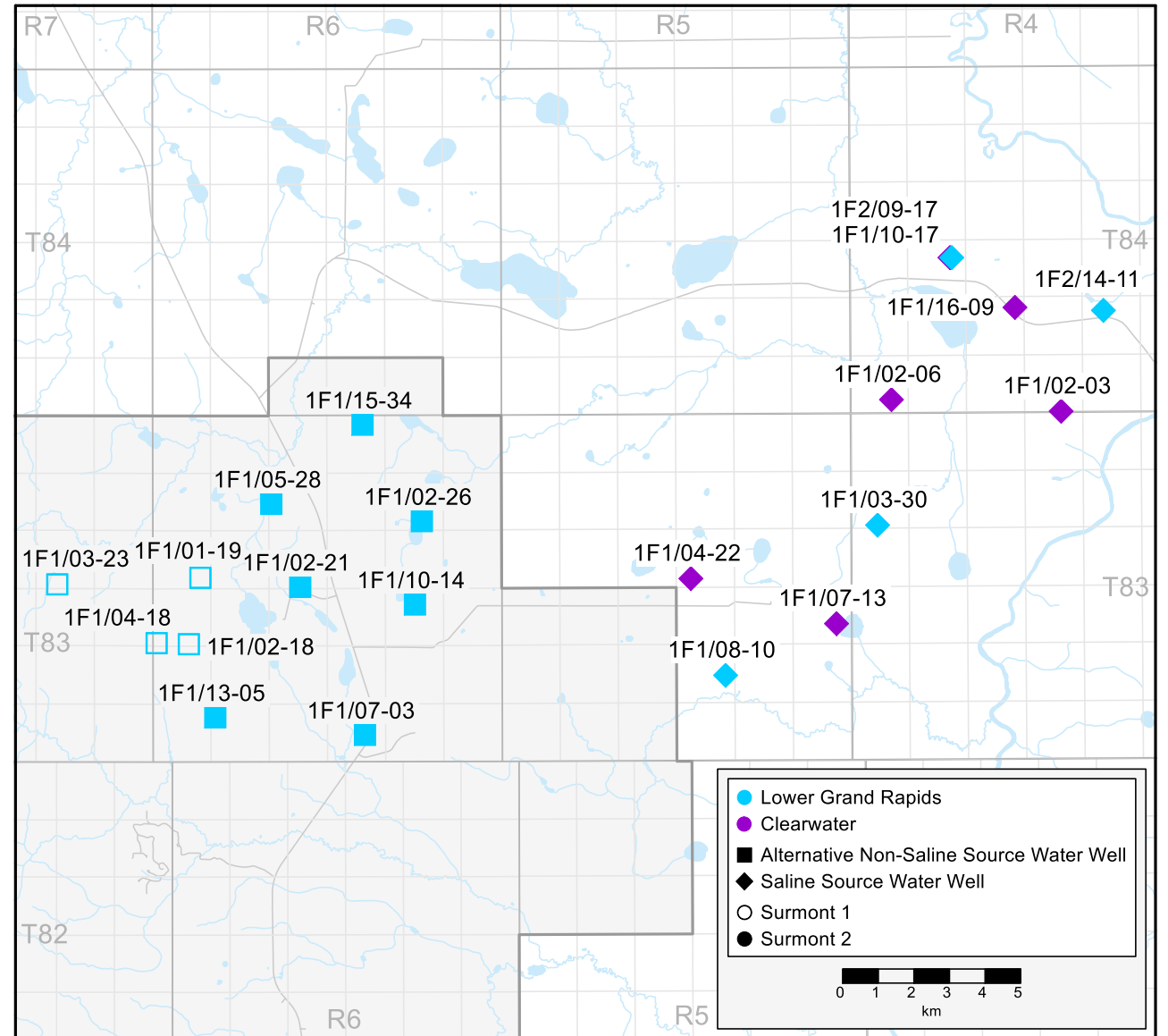
Source Well	Observation Well	Formation	Water Act Licence No.
1F1021808306W400	1F2021808306W400	Lower Grand Rapids	00253532-03-00
1F1041808306W400	102041808306W400	Lower Grand Rapids	00253532-03-00
1F1011908306W400	100011908306W400	Lower Grand Rapids	00253532-03-00
1F1032308307W400	100032308307W400	Lower Grand Rapids	00253532-03-00

Surmont Phase 2 Alternative Non-Saline Water Source Wells

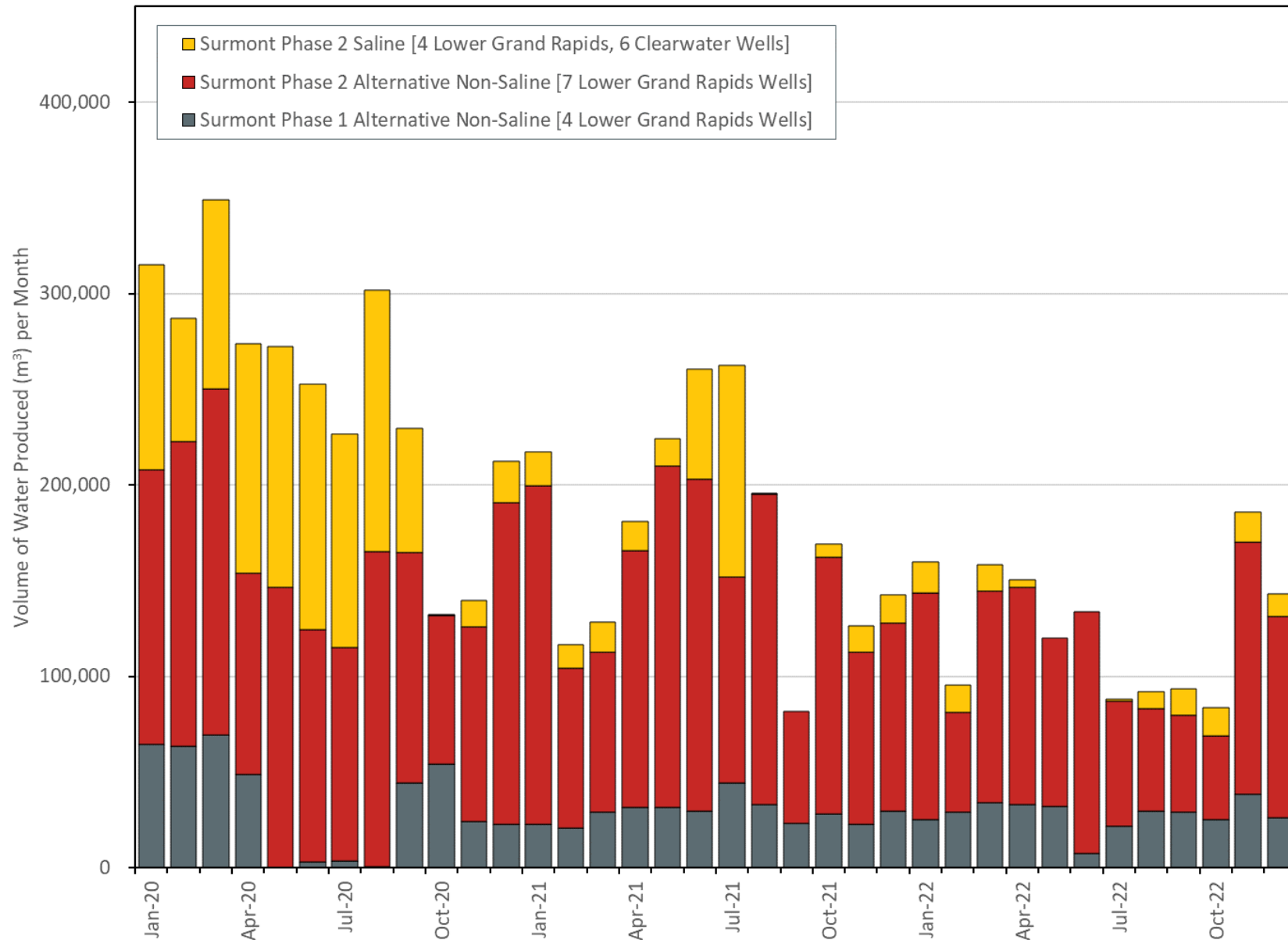
Source Well	Observation Well	Formation	Water Act Licence No.
1F1022108306W400	100022108306W400	Lower Grand Rapids	00312463-02-00
1F1022608306W400	100022608306W400	Lower Grand Rapids	00312463-02-00
1F1052808306W400	100052808306W400	Lower Grand Rapids	00312463-02-00
1F1070308306W400	1F2070308306W400	Lower Grand Rapids	00312463-02-00
1F1101408306W400	1F1111408306W400	Lower Grand Rapids	00312463-02-00
1F1130508306W400	100130508306W400	Lower Grand Rapids	00312463-02-00
1F1153408307W400	1F2153408307W400	Lower Grand Rapids	00312463-02-00

Surmont Phase 2 Saline Water Source Wells

Source Well	Formation
1F1020308404W400	Clearwater
1F1020608404W400	Clearwater
1F1033008304W400	Lower Grand Rapids
1F1042208305W400	Clearwater
1F1071308305W400	Clearwater
1F1081008305W400	Lower Grand Rapids
1F1101708404W400	Clearwater
1F1160908404W400	Clearwater
1F2091708404W400	Lower Grand Rapids
1F2141108404W400	Lower Grand Rapids



Surmont Alternative Non-Saline and Saline Water Source Wells: Production Volumes



Surmont Phase 1 and Phase 2 Water Disposal Wells

Surmont Phase 1 Water Disposal Wells

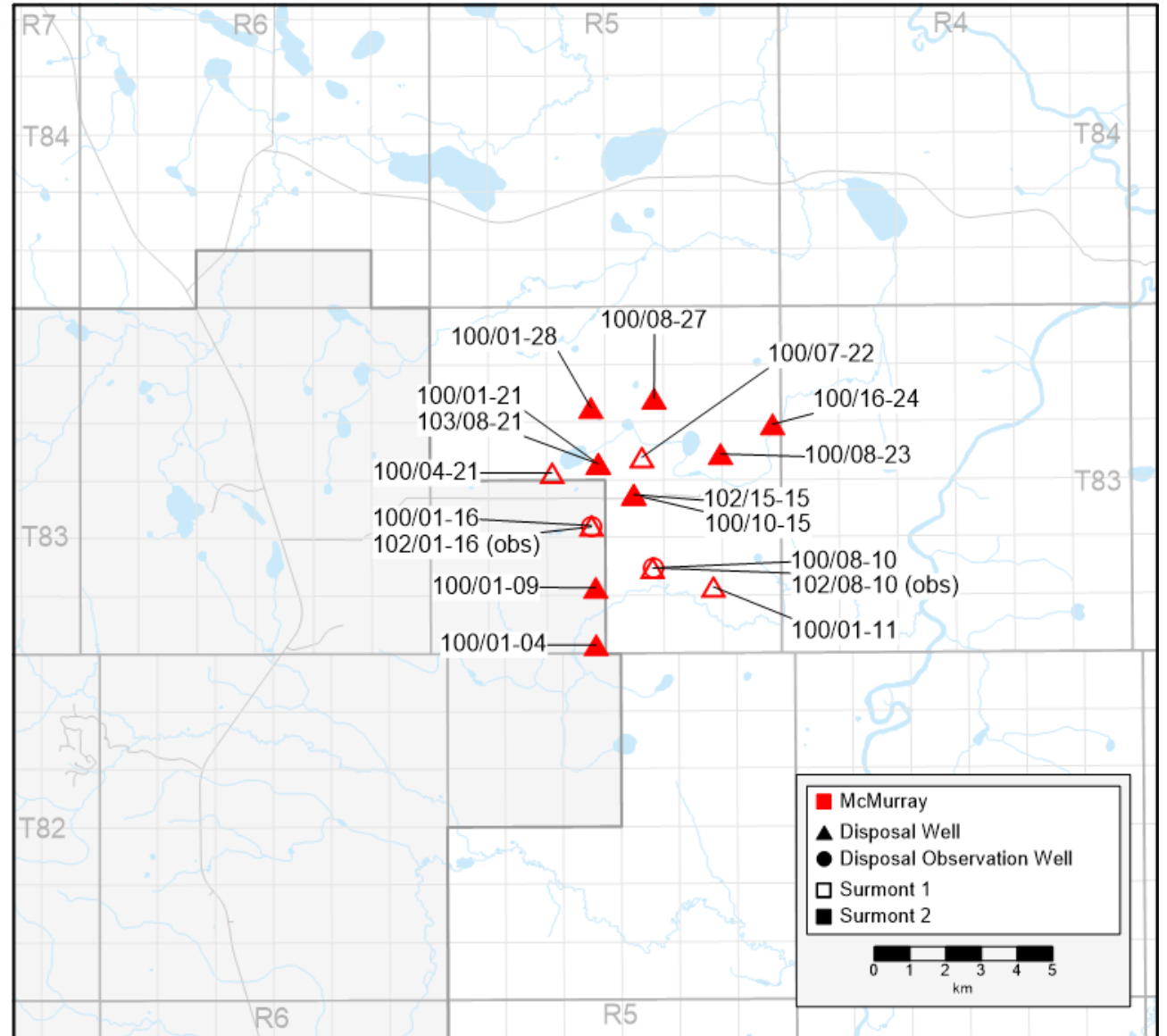
UWI	Formation	Approval No.
100011608305W400	McMurray	10044M
100072208305W400	McMurray	10044M
100081008305W400	McMurray	10044M
100042108305W400	McMurray	10044M
100011108305W400	McMurray	10044M

Surmont Phase 2 Water Disposal Wells

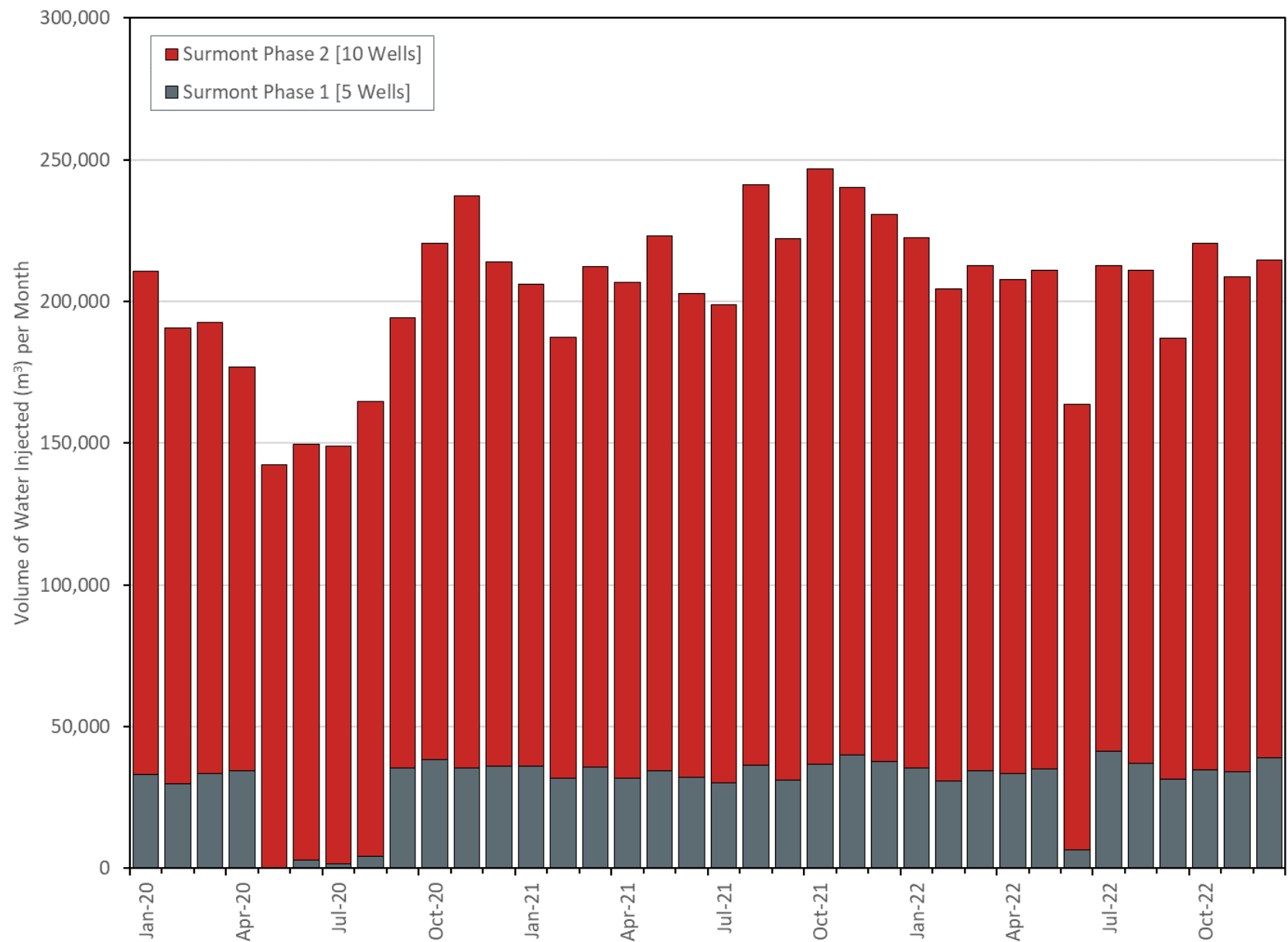
UWI	Formation	Approval No.
100010908305W400	McMurray	10044M
100010408305W400	McMurray	10044M
100012808305W400	McMurray	10044M
100101508305W400	McMurray	10044M
102151508305W400	McMurray	10044M
100082708305W400	McMurray	10044M
100082308305W400	McMurray	10044M
100162408305W400	McMurray	10044M
100012108305W400	McMurray	10044M
103082108305W400	McMurray	10044M

Surmont Water Disposal Observation Wells

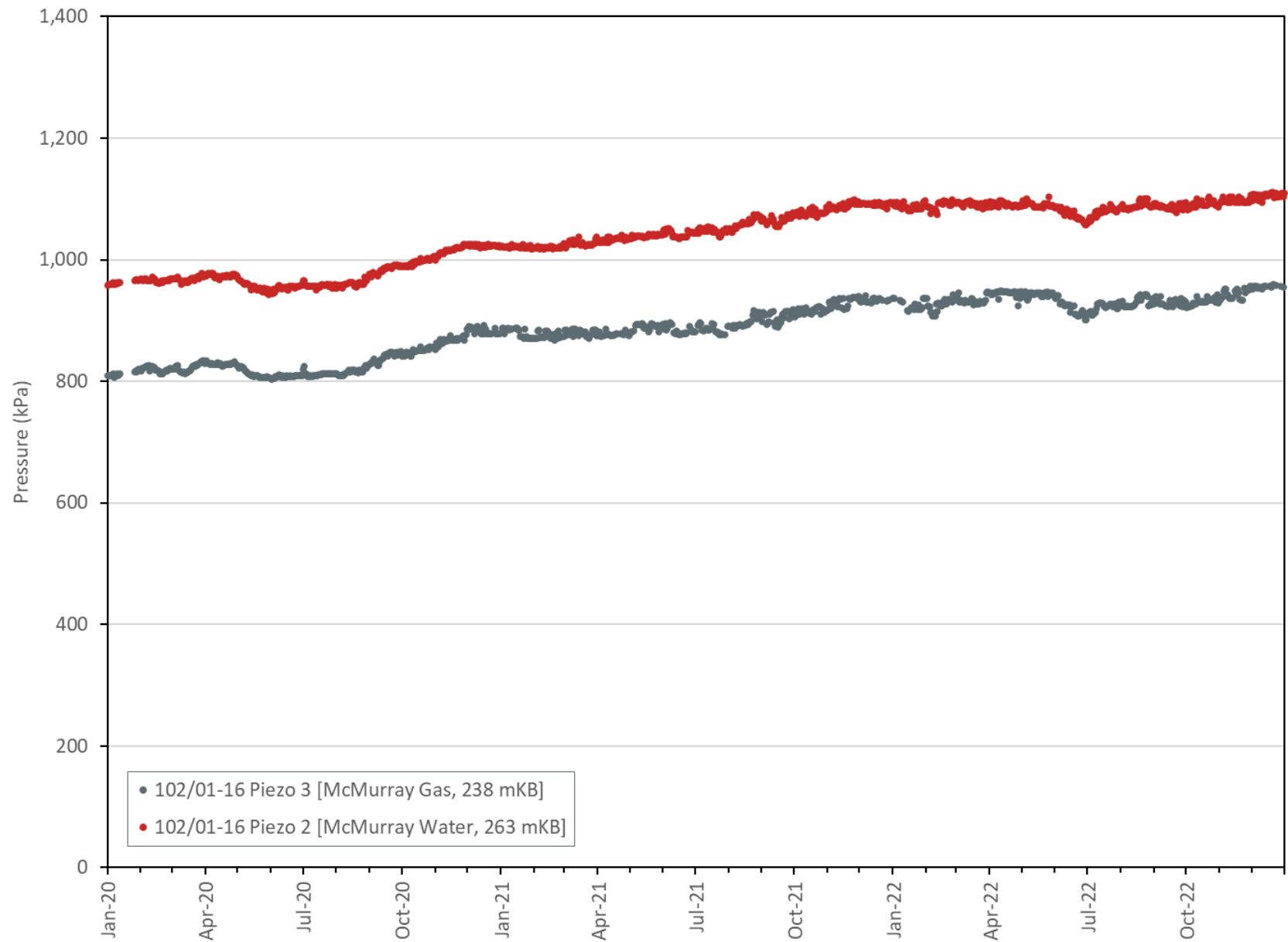
UWI	Formation
102011608305W400	McMurray
102081008305W400	McMurray



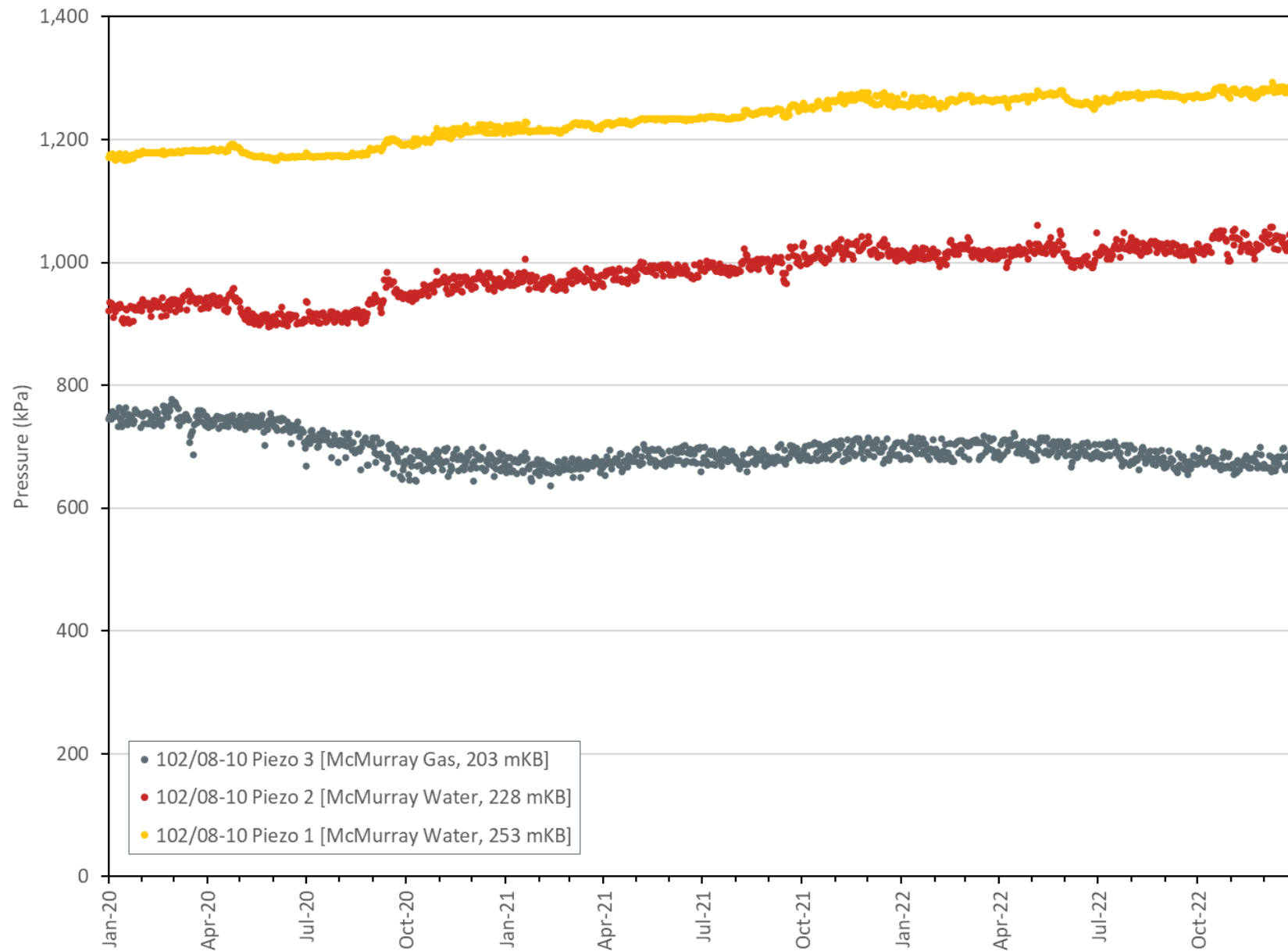
Surmont Water Disposal Wells: Injection Rates (McMurray)



Water Disposal Well 102/01-16-083-05 W4M Observation Well Pressure (McMurray)



Water Disposal Well 102/08-10-083-05 W4M Observation Well Pressure (McMurray)

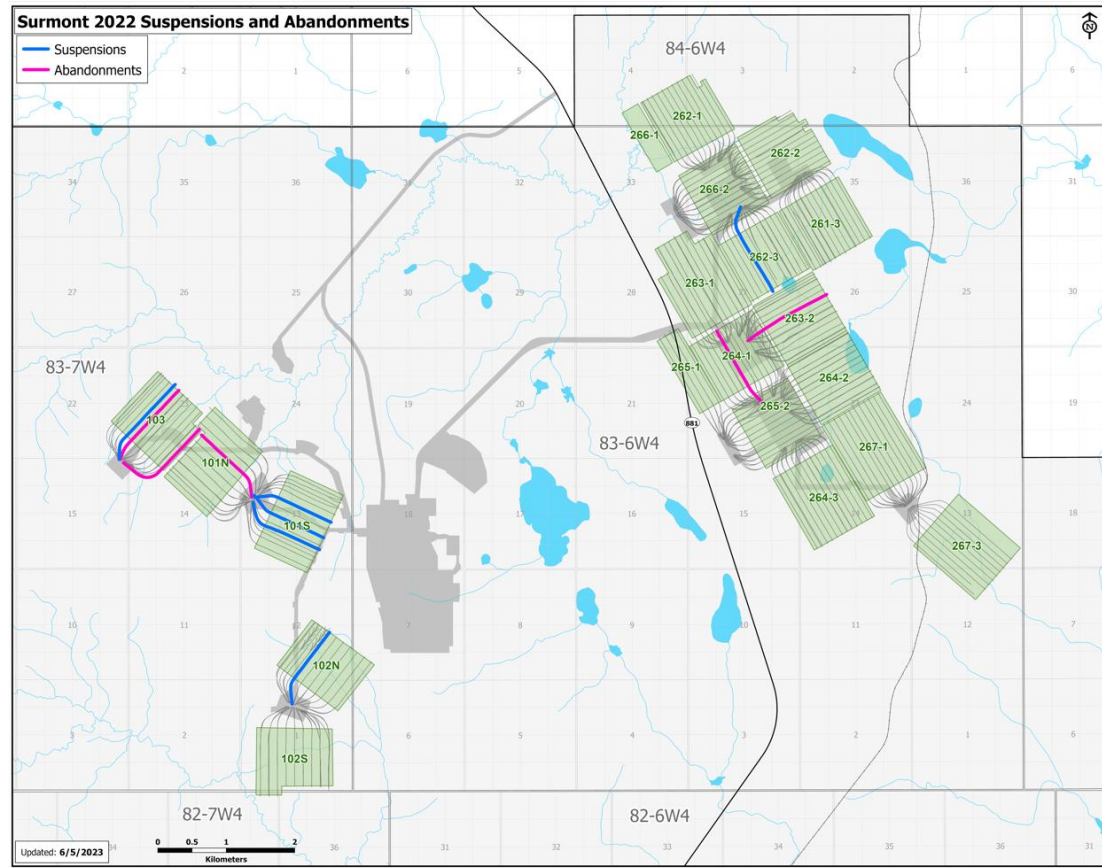


Historical & Upcoming Activity

Directive 054: Subsection 4.4



2022 Suspension & Abandonment Activity



Surmont: 2022 Suspended Wells

Well	Comments
101-I15	Casing failure
101-I16	Surface casing vent flow
101-I13	Casing deformation
102-P03	Liner failure – DTS installed for monitoring
103-P04	Casing deformation, step out re-drill
262-3-P07	Casing formation

Surmont: 2022 Abandoned Wells

Well	Comments
101-P06	Casing deformation and failure
101-P13	Casing deformation
103-P05	Casing deformation, step out re-drill
103-P12	Casing deformation, step out re-drill
263-2-P05	Casing deformation and failure
264-1-P05	Casing deformation, up hole step out re-drill

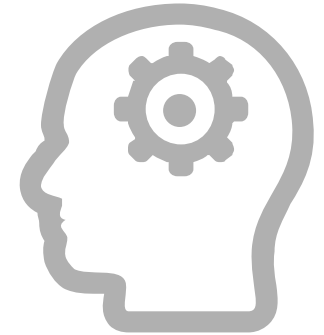
- ▶ No pads currently in place for full scale suspension/abandonment
- ▶ No impact to remaining reserves



- ▶ **No regulatory applications were submitted during the 2022 reporting period.**
- ▶ **No lifecycle activities were conducted during the 2022 reporting period.**
- ▶ **No activities took place that could materially affect scheme performance or energy or material balances.**

▶ LESSONS LEARNED

- Some Flow Control Device (FCD) designs are prone to erosion and failure over time, requiring workovers or redrills to resume production.
- NCG co-injection can accelerate top water production through gravity segregation.
- NCG co-injection can cause production losses due to gas breakthrough and ESP interference, including slug flow and gas-locking.
- 265-2-P13 infill well was too far away or drilled too early for primary production, requiring extended circulation time (>12 months).
- Surface Heave
 - Surmont is seeing ongoing surface heave directly under our surface pad facilities, unrelated to steam chambers within the reservoir. The working hypothesis is that this type of heave is a result of conductive heating of the overburden from the vertical section of SAGD wells.
 - The amount of heave has caused impacts to structures at surface like stairs, beams, and columns. The effects of ground heave are being monitored and impacted structures are being repaired in a prioritized manner.
 - ConocoPhillips is working with the AER to better understand and manage surface heave related to wellbore heating.



► **SUCSESSES**

- Drilled and started up three uphole well pairs to accelerate capture of undrained resource.
- Chelant stimulations have been effective in mitigating producer scaling/plugging and maximizing production.

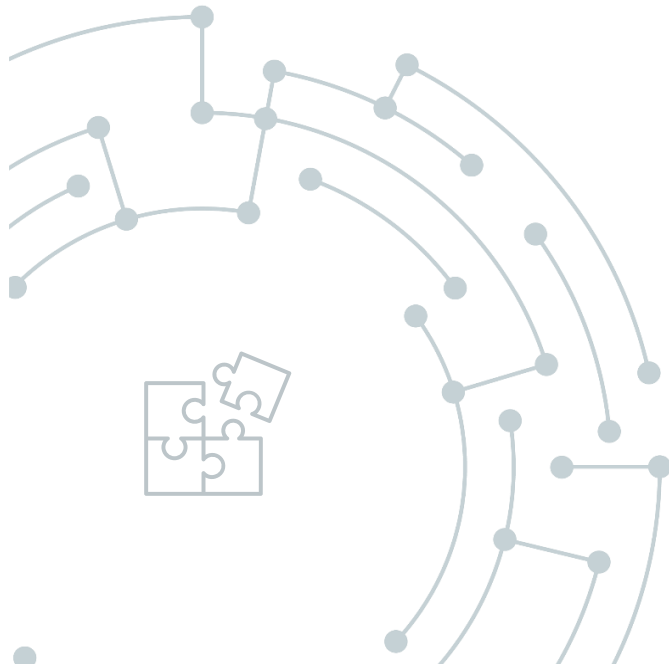


► **STEAM ADDITIVES PILOT** - *Lifecycle Activity*

- Continued operation of a pilot project for the injection of steam additives into the reservoir. The objective of this pilot is to reduce the viscosity of emulsion at downhole SAGD conditions and accelerate the flow of emulsion drainage in the reservoir.

► **WARM APPLIED SOLVENT PROCESS (WASP) PILOT** - *Lifecycle Activity*

- Started operation of a solvent co-injection (WASP) technology pilot in Surmont 1.



Compliance History: Reportable Incidents and Contraventions

Incident / Contravention	Reference Number	Date	Detail	Action
Warm Lime Softener Release	EDGE 386874	6 Jan 2022	Release of 27 m ³ of process water from the Warm Lime Softener (WLS). This release was due to an equipment failure that tripped the CPF2 facility when the facility was shutting down.	Flow of the WLS was immediately stopped from the control room and free liquid was vac trucked and disposed of in the plant blowdown pond. Frozen released material was scrapped up with an excavator and sent to a third-party facility for disposal.
EPEA Approval Contravention	EDGE 387813	10 Feb 2022	CEMS monitoring equipment on steam generator SG-007 reading erratically due to the sensing line freezing and did not meet the 90% uptime in January.	A CEMS method 4 missing data authorization request was submitted to the AER on February 10, 2022. A revised request was submitted on March 4 and was approved by the AER on March 25.
Oil Emulsion and Solution Gas Release	EDGE 0389466	8 Apr 2022	Release of 53.3 m ³ of oil emulsion from a well pad pressure safety valve (PSV) failure. The PSV was tied into a vent knockout drum where the vent released gas and emulsion.	The well pad was isolated to allow the PSV to reseal. A vac truck removed all the free fluids from the lease.
Produced Water Release	EDGE 390306	5 May 2022	Release of 6.5 m ³ of produced water due to a pinhole leak in piping.	The leak was isolated and piping was replaced. All released water was contained in the building's sump equipped with a liner.
Condensate and Natural Gas Release	EDGE 400444	19 Jun 2022	Release of 349 e ³ m ³ of natural gas and 0.2 m ³ of condensate caused by a cracked weld.	The pipeline was de-pressured and the damaged section of pipe was cut out with a new section of pipe welded in place.
Oil Emulsion Release	EDGE 400581	23 Jun 2022	Release of 21.4 m ³ of emulsion due to an open valve.	The valve was closed, which stopped the bitumen release. A vac truck removed all the free fluids from the lease.
EPEA Approval Contravention	EDGE 0400781	28 Jun 2022	CEMS monitoring equipment on steam generator SG-013 was down due to a failed cylinder gas audit and did not meet the 90% uptime in April and May.	ConocoPhillips will continue to review CEMS data daily to identify any issues with CEMS unit performance and continue with preventative maintenance activities to ensure equipment is running accordingly.

Compliance History: Reportable Incidents and Contraventions

Incident / Contravention	Reference Number	Date	Detail	Action
EPEA Approval Contravention	EDGE 402030	29 Jun 2022	CEMS monitoring equipment on steam generator SG-A was offline for most of the month and did not meet the 90% uptime in June.	ConocoPhillips will continue to review CEMS data daily to identify any issues with CEMS unit performance and continue with preventative maintenance activities to ensure equipment is running accordingly.
Diesel Release	EDGE 401575	18 Jul 2022	Release of 0.4 m ³ of diesel from a diesel tank that had a broken sightglass, and the sightglass's isolation valve wasn't in the closed position.	The sightglass isolation valve was closed and the valve will be closed when not checking the tanks level in the future. Contaminated soil was scraped up and hauled to a third-party disposal facility.
Disposal Water Release	EDGE 0405136	2 Oct 2022	Release of 5.3 m ³ of disposal water from a failed injection pump.	Isolated and de-pressured the section of failed pipe – the release was contained inside the pump building.
Hydrochloric Acid Release	EDGE 0405765	17 Oct 2022	Release of 0.04 m ³ of hydrochloric acid caused by a puncture in the plastic barrel holding the chemical with a lack of secondary containment around the barrel.	Contaminated material was removed. ConocoPhillips initiated safety conversations around placing future chemicals back into their appropriate racking system that has secondary containment.
MagOx Slurry Release	EDGE 0405930	19 Oct 2022	Release of 5.38 m ³ of MagOx Slurry due to the MagOx slurry tank overflowing into the building sump.	Stopped the flow to the subject tank – the release was contained inside the building's sump equipped with a synthetic liner.
EPEA Approval Contravention	EDGE 407180	28 Nov 2022	CEMS monitoring equipment on steam generator SG-013 was down due to a failed flow relative accuracy test audit and did not meet the 90% uptime in October and November.	CEMS Method 4 Missing Data Authorization request was submitted to the AER on December 23, 2022. The request was approved by the AER January 12, 2023.
Methanol Release	408071	27 Dec 2022	Release of 0.6 m ³ of methanol due to a frozen failed methanol pump.	Installed a heater and tarp to prevent the pump filter from freezing. A vac truck removed all free fluid.

Compliance History: Voluntary Self-Disclosures and Noncompliance

Self Disclosure / Non-Compliance	Reference Number	Date	Detail	Action
Building Sump Integrity Issue	VSD 11289	7 Mar 2022	Voluntary self-disclosure related to the integrity of a building sump that was compromised and groundwater was seeping into the sump's secondary containment.	Identified the leak point, developed an appropriate repair plan, and kept the AER updated on the scheduled repairs until fully repairing the leak point on January 27, 2023.
Disposal Water Tank Integrity Issue	VSD 11384	21 Jun 2022	Voluntary self-disclosure related to the integrity of the Surmont 1 disposal water tank. The primary wall of the double walled tank had integrity issues.	Completed a hydrostatic test on the secondary wall and determined that it was still holding. With AER's approval, ConocoPhillips brought the tank back into service and operated it as a temporary tank until the disposal water tank was replaced on November 21, 2022.
Wellsite Inspection	Inspection ID 524932	27 Sep 2022	Well signage had the incorrect unique well identifier (UWI).	Replaced the sign with the correct UWI on the subject well.
Drilling Waste Inspection	Inspection ID 525037	29 Sep 2022	Drilling waste sump requires remediation; site and sump fencing we're not properly maintained; cement returns not buried or removed within the required 18 months since rig release.	Site closure plans were submitted to the AER and remediation will be complete by the end of 2023. Proper fencing around the site was installed.
Oil Facility Inspection	Inspection ID 525539	21 Oct 2022	Failed to immediately report a reportable release to the AER.	ConocoPhillips enhanced internal reporting processes and implemented new measures to ensure immediate reporting occurs moving forward.
Oil Facility Inspection	Inspection ID 527448	23 Nov 2022	The pad entrance sign had an incorrect location.	Corrected the location on the pads entrance sign.
Oil Facility Inspection	Inspection ID 527438	23 Nov 2022	The pad entrance sign had an incorrect location.	Corrected the location on the pads entrance sign.

Future Plans: Next 12 Months



SURMONT PHASE 1

- Continue operation of the Warm Applied Solvent Process (WASP) pilot through 2023 – *Lifecycle Activity*



SURMONT PHASE 2

- First steam for Pad 267 (Q4 2023 for 267-1, Q1 2024 for 267-3)
- Execute expansion of steam additives trial to full pad – *Lifecycle Activity*
- Redrill failed wells – *Lifecycle Activity*
- Drilled uphole well pairs on 262-3, 264-1 – *Lifecycle Activity*
- NCG co-injection expansion to more drainage areas (262-1, 261-3, 266-2) – *Lifecycle Activity*
- Possible execution of Surmont 2 infills – *Lifecycle Activity*

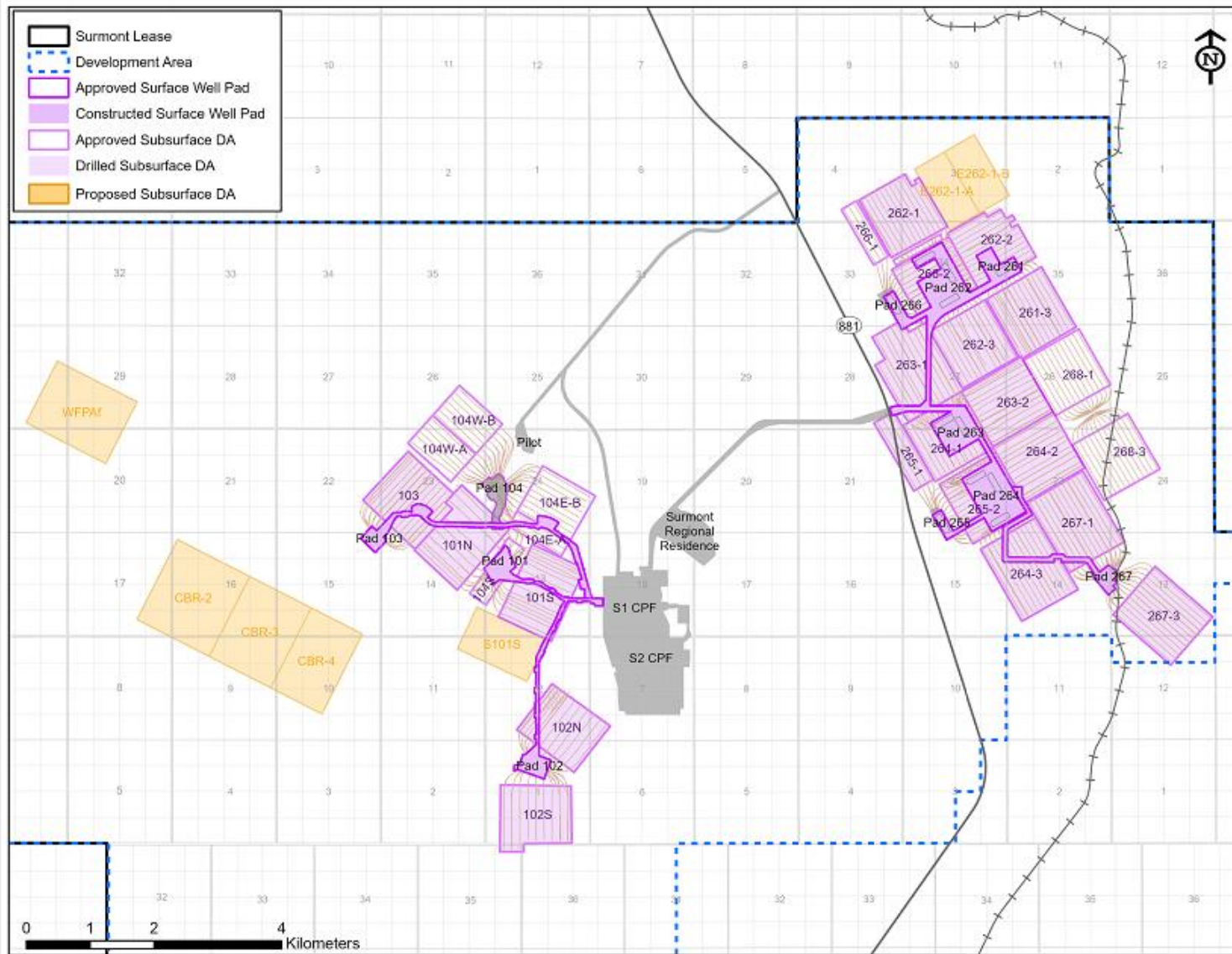


EXPECTED APPLICATIONS

- Temporary MOP increase for infill well on 265-2
- Development area expansion to encompass the entire project area and conduct multiple routine, low risk activities/modifications using a lifecycle approach within the expanded development area



Future Plans: Five Year Development & Delineation Outlook



FUTURE PAD DEVELOPMENT OPTIONS

- Drainage areas targeted for development (5 years):
 - 267-1 & 267-3 (in progress)
 - 104W, S101S, CBR4, CBR3, E262-1

DELINEATION & OBSERVATION WELLS

Year	Observation Wells	Delineation Wells	Target Drainage Areas for Delineation
2023	0	0	None – no program
2024	15	3	104W, 104S, 267-3, E262-1, S101S, CBR4, CBR3, CBR2, WFPaf
2025	18	6	TBD
2026	18	6	TBD
2027	12	12	TBD
2028	12	12	TBD

SEISMIC

- 4D seismic monitors as required
- Proposed 4D baseline seismic at 104W: Q1 2024
- 104S and CBR3/4 4D baseline seismic timing TBD (~1 year pre-steam)