Cenovus Energy Inc.
Christina Lake In-situ Progress Report
Scheme 8591
2021 update

June 30, 2022

cenovus ENERGY

Oil & gas and financial information

Oil & gas information

The estimates of reserves were prepared effective December 31, 2021. All estimates of reserves were prepared by independent qualified reserves evaluators, based on definitions contained in the Canadian Oil and Gas Evaluation Handbook and in accordance with National Instrument 51-101 *Standards of Disclosure for Oil and Gas Activities*. Additional information with respect to pricing and additional reserves and other oil and gas information, including the material risks and uncertainties associated with reserves estimates, is contained in our AIF and Form 40-F for the year ended December 31, 2021 available on SEDAR at www.sedar.com, EDGAR at www.sec.gov and on our website at cenovus.com.

Certain natural gas volumes have been converted to barrels of oil equivalent (BOE) on the basis of one barrel (bbl) to six thousand cubic feet (Mcf). BOE may be misleading, particularly if used in isolation. A conversion ratio of one bbl to six Mcf is based on an energy equivalency conversion method primarily applicable at the burner tip and does not represent value equivalency at the well head.

™ denotes a trademark of Cenovus Energy Inc.
© 2022 Cenovus Energy Inc.

Advisory

This presentation contains information in compliance with:

AER Directive 054 - Performance Presentations, Auditing, and Surveillance of In Situ Oil Sands Schemes

This document contains forward-looking information prepared and submitted pursuant to Alberta regulatory requirements and is not intended to be relied upon for the purpose of making investment decisions, including without limitation, to purchase, hold or sell any securities of Cenovus Energy Inc.

© 2022 Cenovus Energy Inc.

Subsection 4.1 1 Introduction

cenovus ENERGY

CENOVUS AT A GLANCE

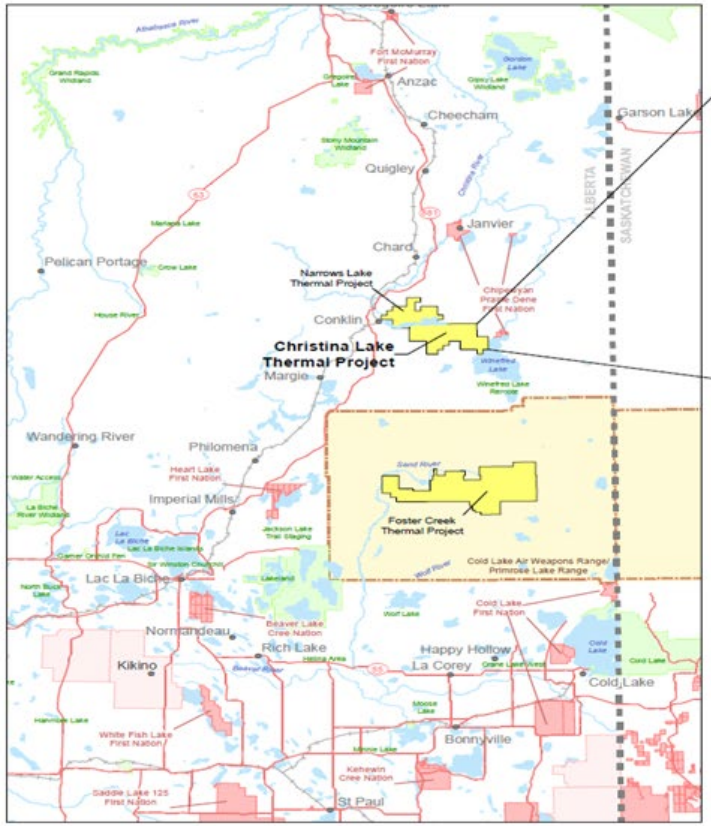
TSX, NYSE | CVE

Market capitalization	**$44 billion**
2022E production	**780 MBOE/d**
• Oil Sands	**580 Mbbls/d**
• Conventional	**126 MBOE/d**
• Offshore	**70 MBOE/d**
Upgrading and refining capacity	**660 Mbbls/d**
2021 proved & probable reserves	**8.3 BBOE**
Reserves life index	**~29 years**

Note: Market capitalization as at April 22, 2022. Values are approximate. Expected production based on April 26, 2022 guidance midpoints. Refining capacity represents net capacity to Cenovus. See Advisory.

© 2022 Cenovus Energy Inc.

Area map



Expressway / Highway
Railway
Cenovus Project Area
Parks and Protected Areas
Cold Lake Air Weapons Range/ Primrose Lake Range
First Nation Reserve
Metis Settlements

0 20 40 60
Kilometres
1:1,200,000

NAD 83 UTM 12N
Page Size: 11x17

cenovus ENERGY

CHRISTINA LAKE THERMAL PROJECT

CVE-0033-004
April 26, 2017

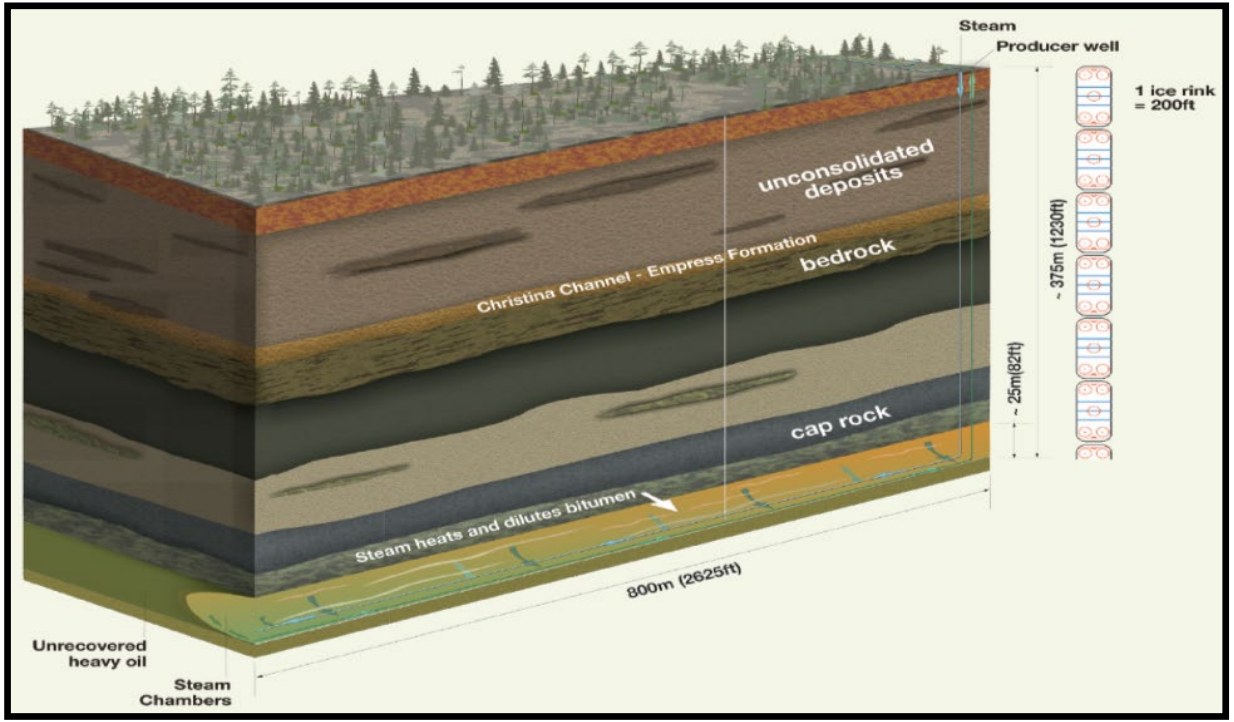
© 2022 Cenovus Energy Inc.

Recovery process

<u>Christina Lake Thermal Project</u>

Uses the dual-horizontal well SAGD (steam-assisted gravity drainage) process to recover oil from the McMurray formation

- Two horizontal wells one above the other approximately 5 m apart
- Steam is injected into the upper well where it heats the oil and allows it to drain into the lower well
- Oil and water emulsion pumped to the surface and treated

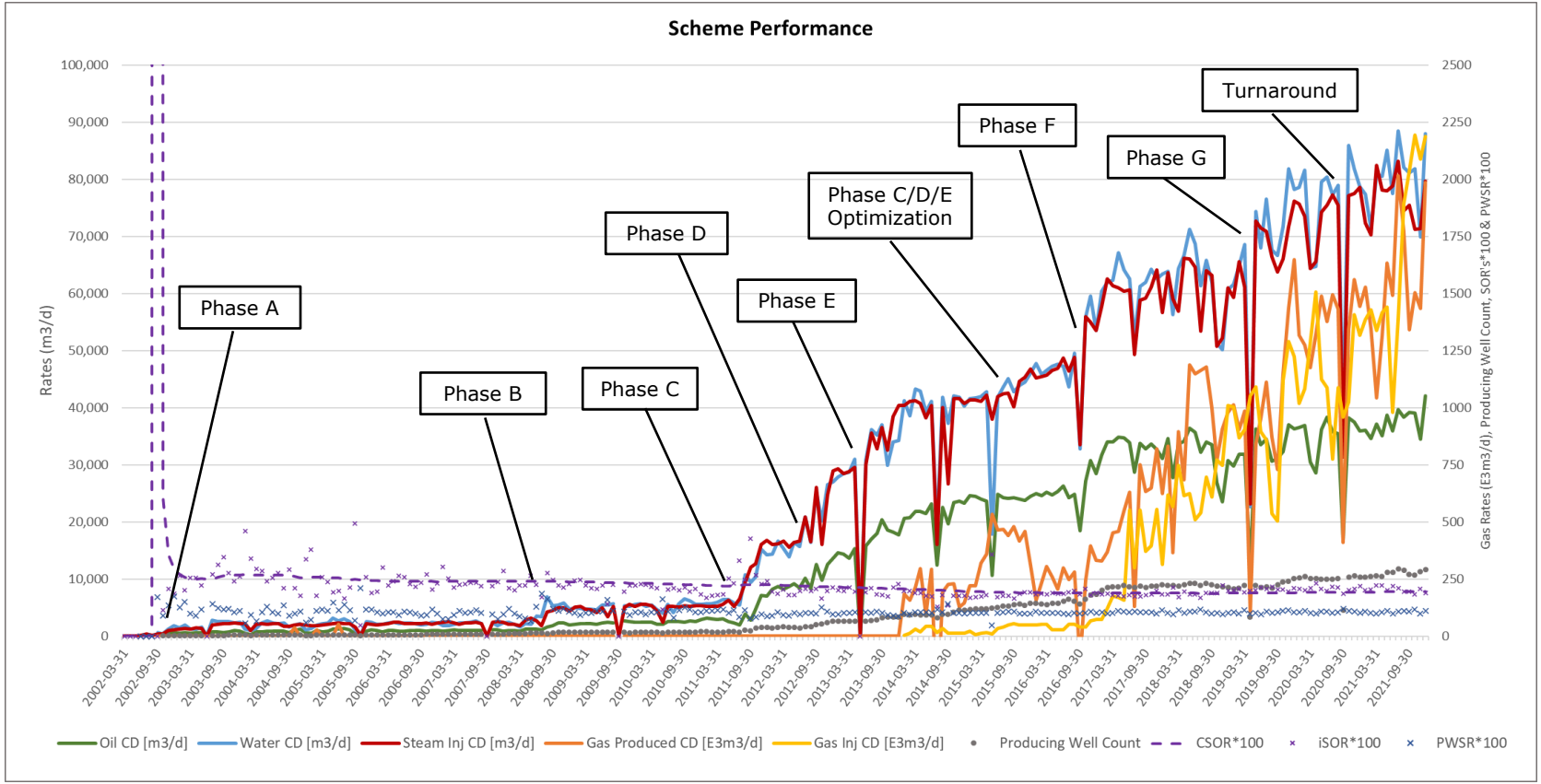


© 2022 Cenovus Energy Inc.

Subsection 4.2 2-7 Subsurface

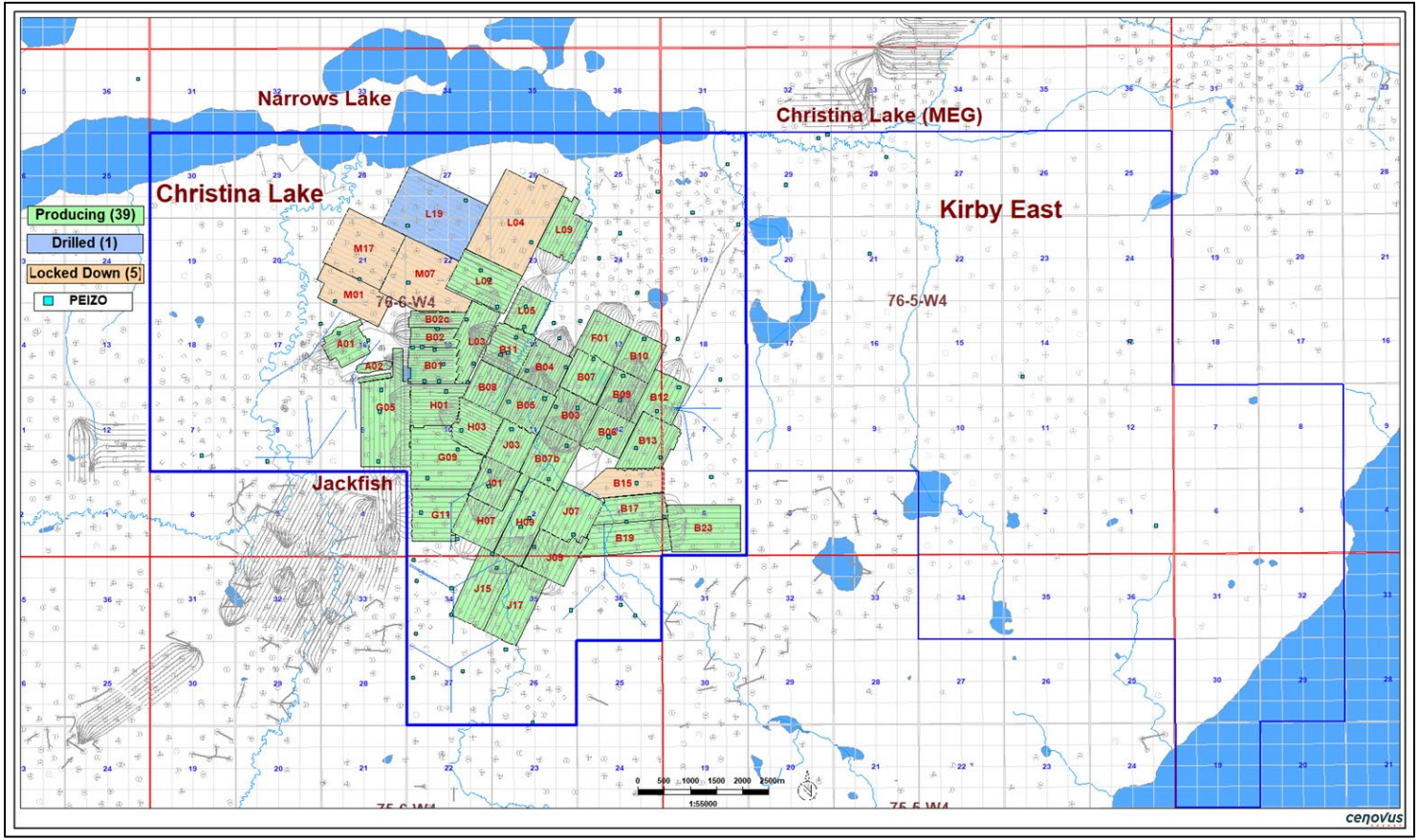
cenovus ENERGY

Performance: full historical



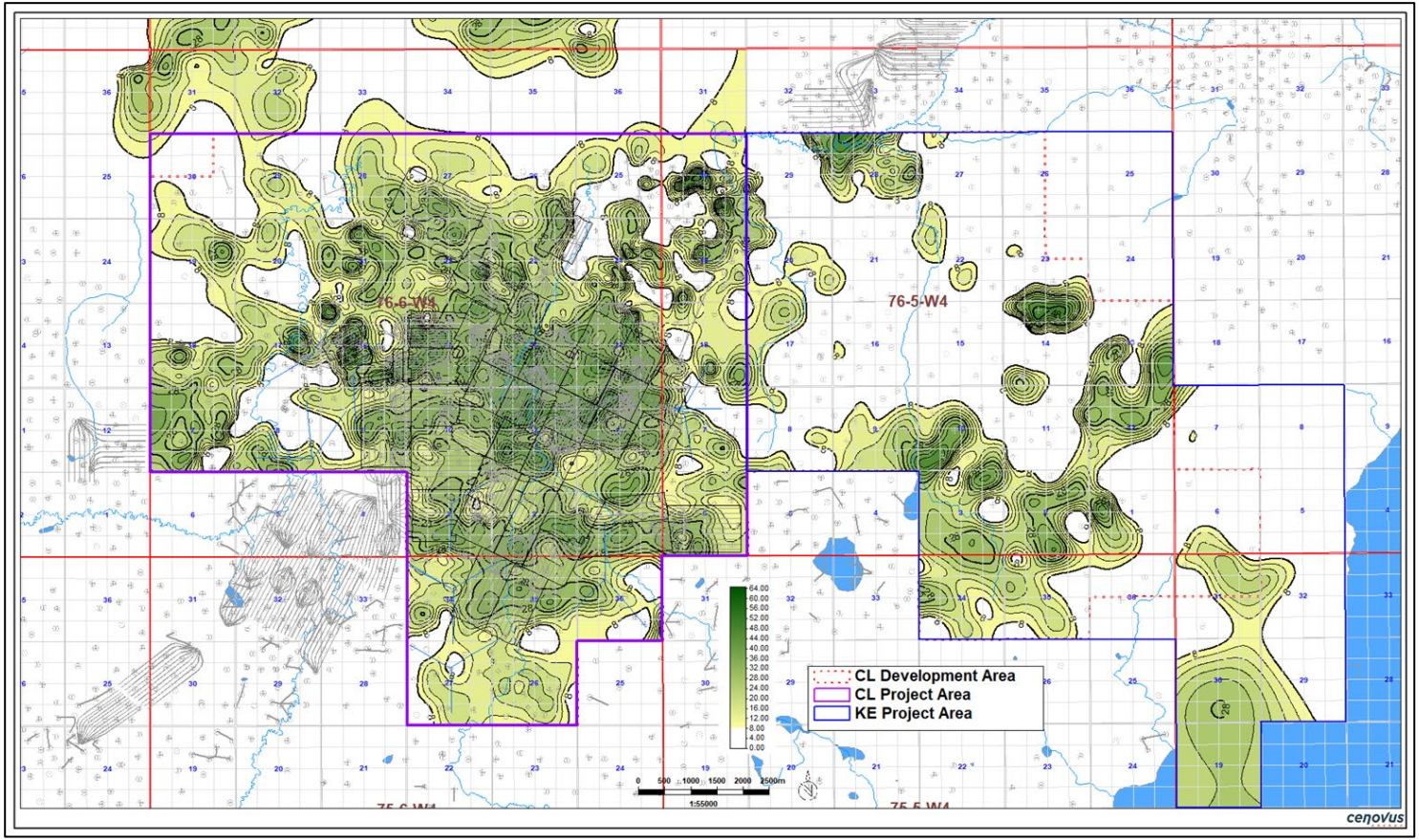
© 2022 Cenovus Energy Inc.

Scheme Map: Christina Lake



© 2022 Cenovus Energy Inc.

McM SAGD Pay Isopach Map (Main Zone)

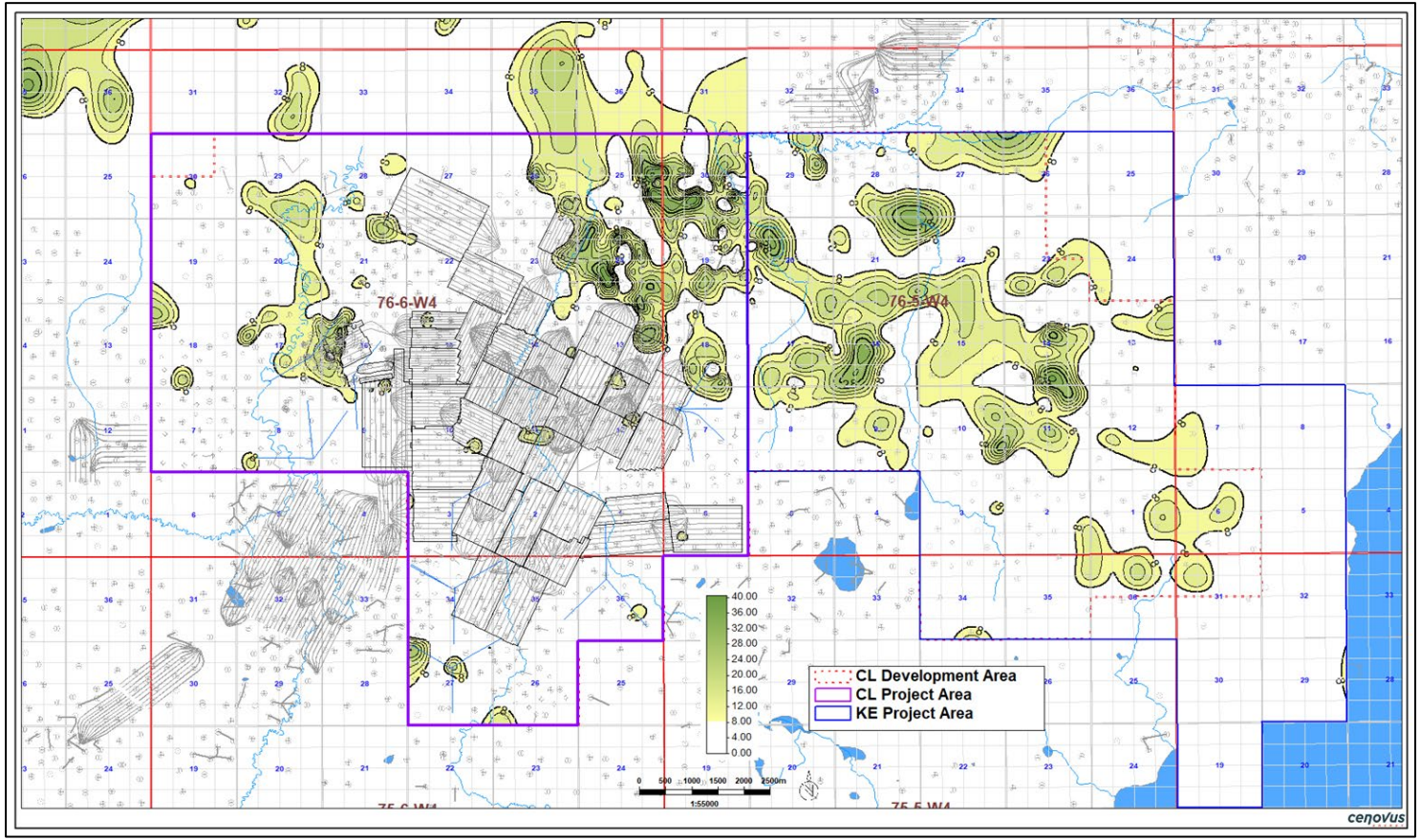


McM SAGD Pay Cutoffs:

Gamma <60 API, Porosity >27%, Rt > 20 ohm-m (=So>50%)

© 2022 Cenovus Energy Inc.

McM SAGD Pay Isopach Map (Upper Zone)



McM SAGD Pay Cutoffs:

Gamma <60 API, Porosity >27%, Rt > 20 ohm-m (=So>50%)

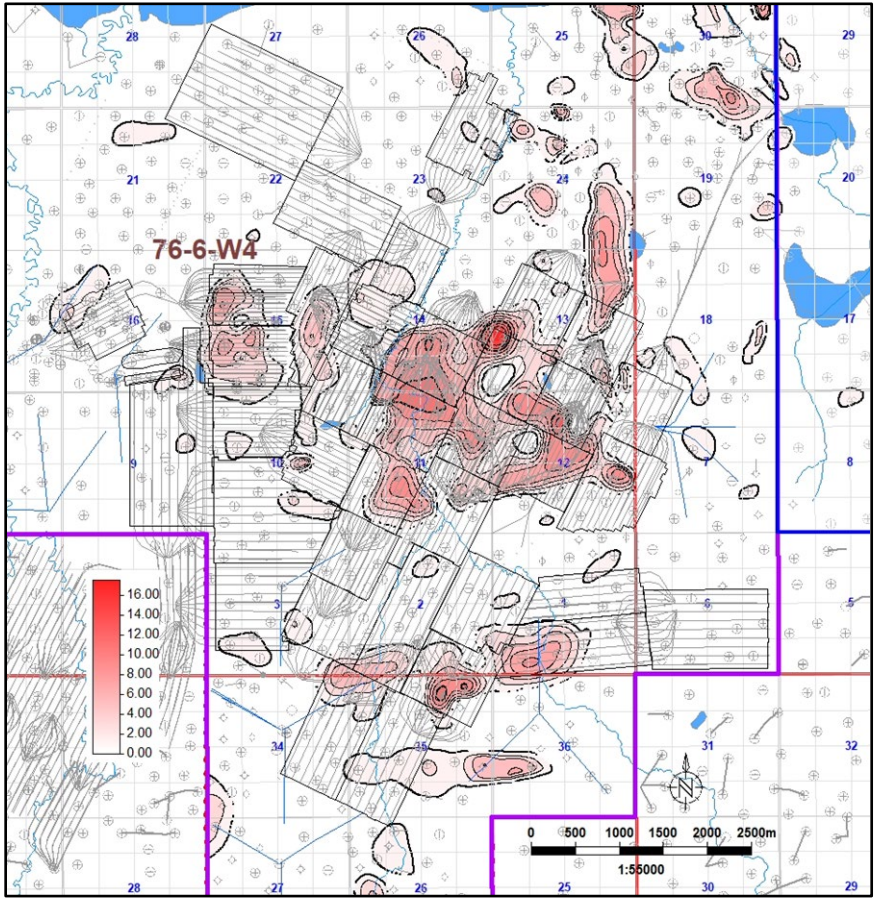
© 2022 Cenovus Energy Inc.
June 30, 2022

SAGD Top Gas Isopach

(2m contour interval)

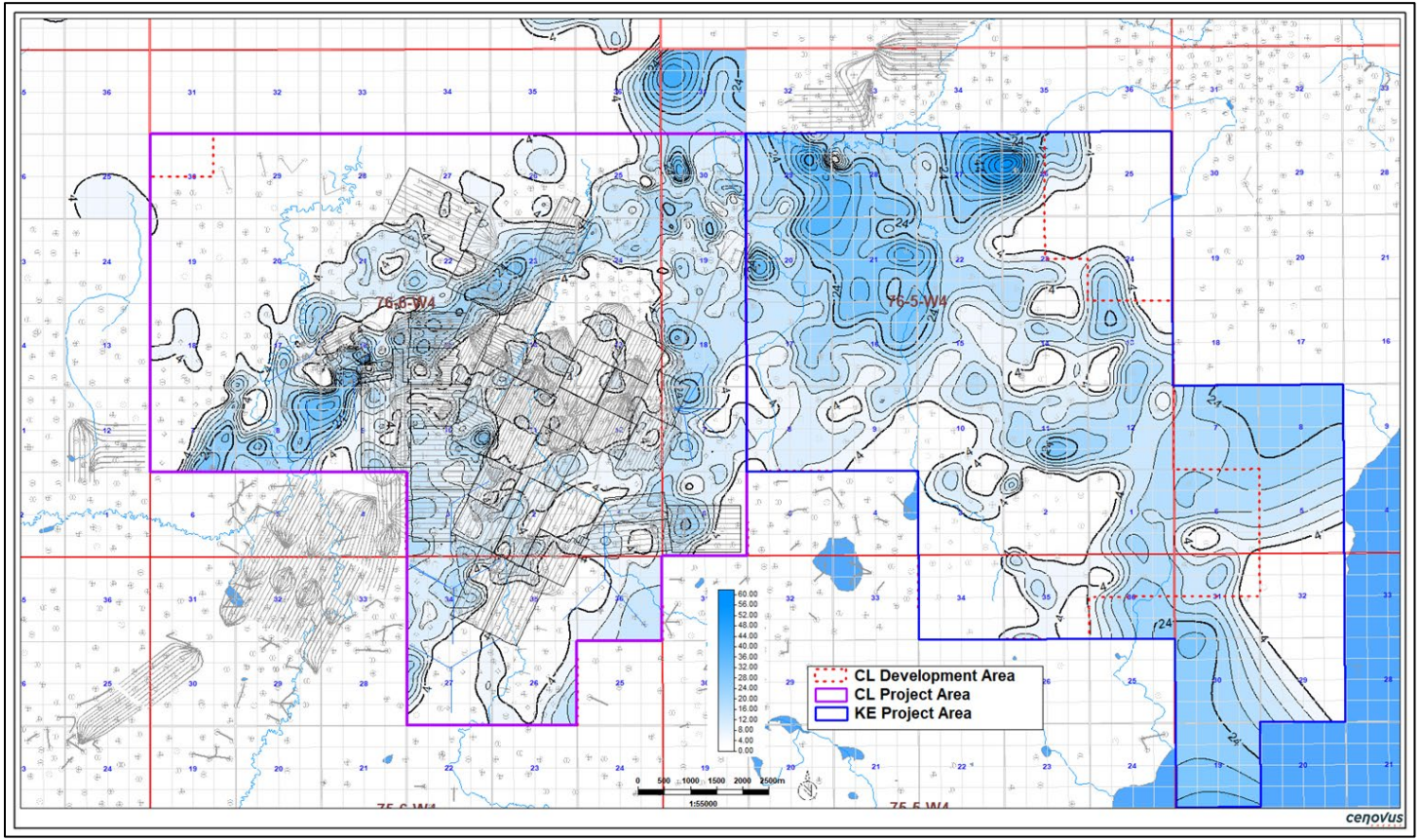
3 main gas pockets:

- **'Sec 15'**
  - centered over Section 15
- **'11-14'**
  - centered over Section 11
- **'Southern'**
  - centered over Section 2



© 2022 Cenovus Energy Inc.

McMurray Water Isopach Map



© 2022 Cenovus Energy Inc.

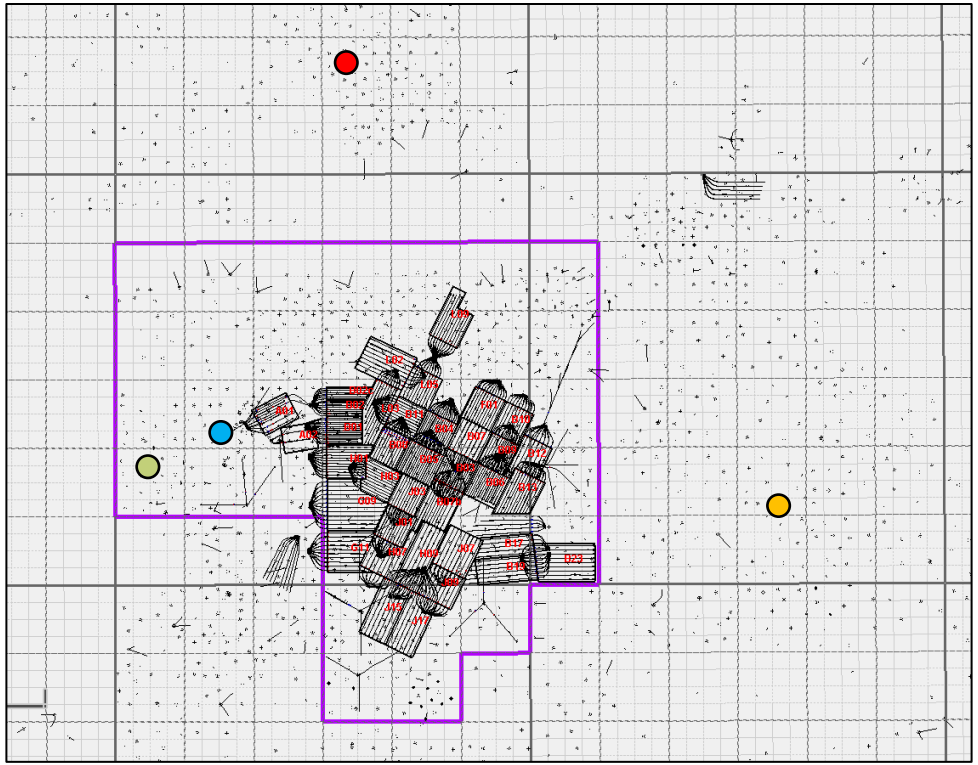
DFIT Wells

- CVE recognizes that tensile and shear failure are two possible ways for integrity to be compromised
- DFIT data gives insight about failure mechanisms and stress magnitudes.

- CVE FCCL 7-17-76-6w4
- CVE FCCL C2 HARDY 2-10-76-5
- CVE FCCL C11 HARDY 11-10-77-6
- CVE FCCL C10 LEISMER 10-7-76-6W4*

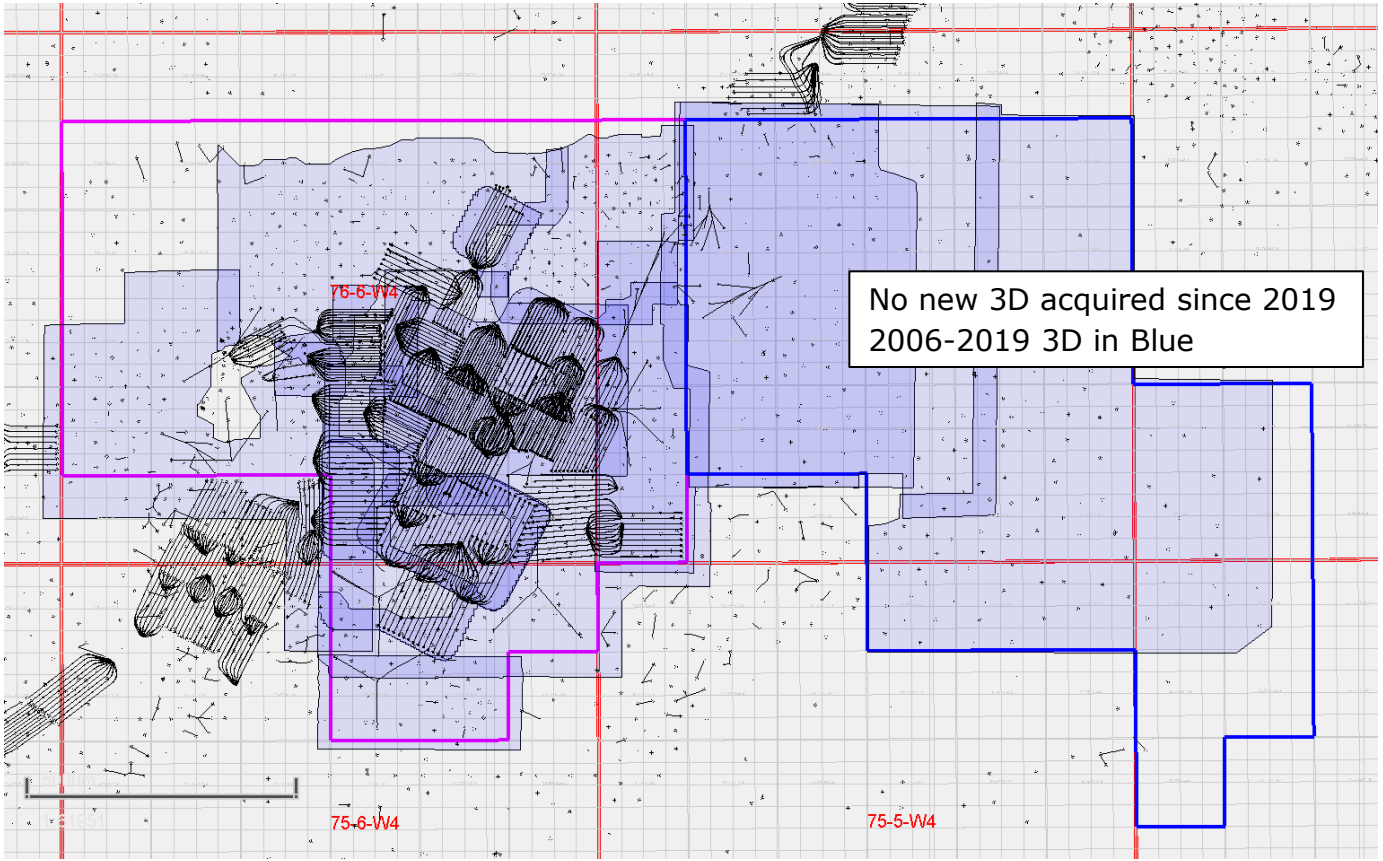
* This well was drilled in 2018. T21 is the caprock. Tested @328.25m, Closure Pressure 17.70 kPa/m

No new DFIT wells drilled in 2021.



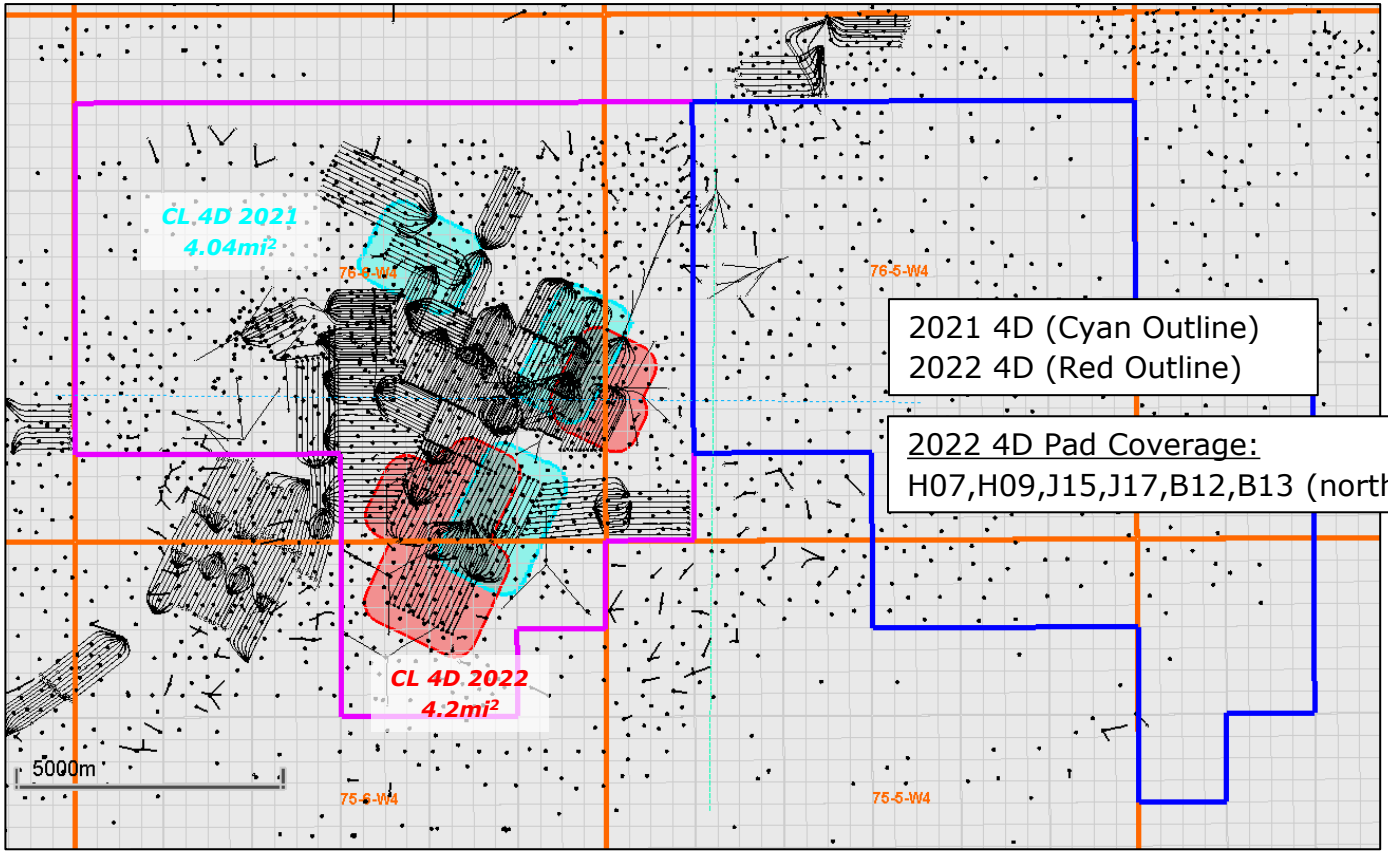
© 2022 Cenovus Energy Inc.

3D Seismic within Project Area



© 2022 Cenovus Energy Inc.

4D Seismic within Project Area



2021 4D (Cyan Outline)
2022 4D (Red Outline)

2022 4D Pad Coverage:
H07,H09,J15,J17,B12,B13 (northern half)

© 2022 Cenovus Energy Inc.

Cross-section (structural): north

A

A′

WBSK (T21)

T11

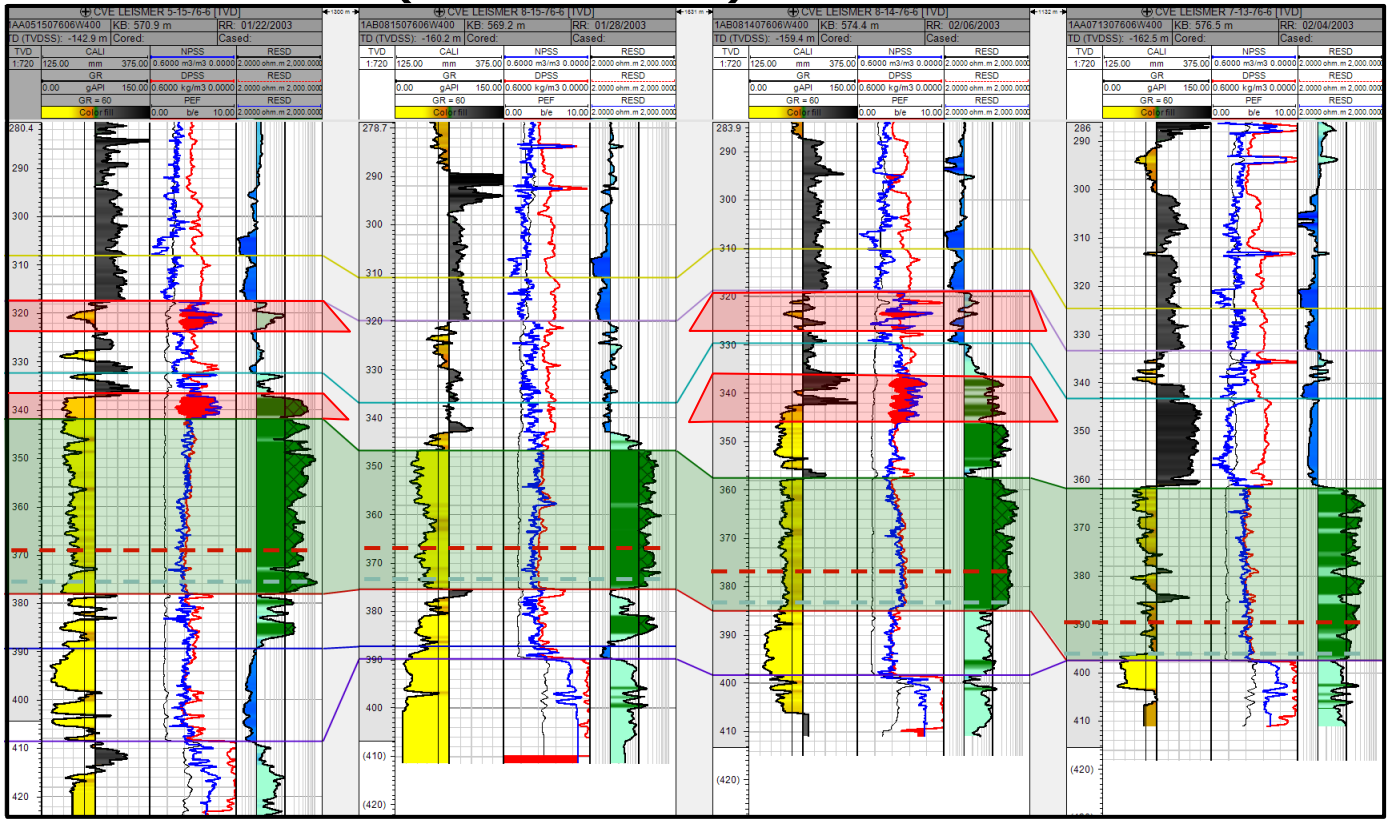
MCMR

SAGD Pay

SAGD Base

Water Top

Paleo

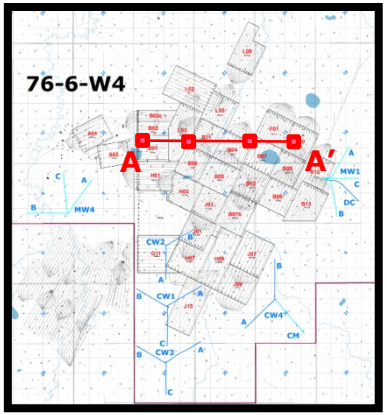


Identified Gas

McM SAGD Pay

Injector Level (est.)

Producer Level (est.)



© 2022 Cenovus Energy Inc.

Cross-section (structural): mid

B

B′

WBSK (T21)

T11

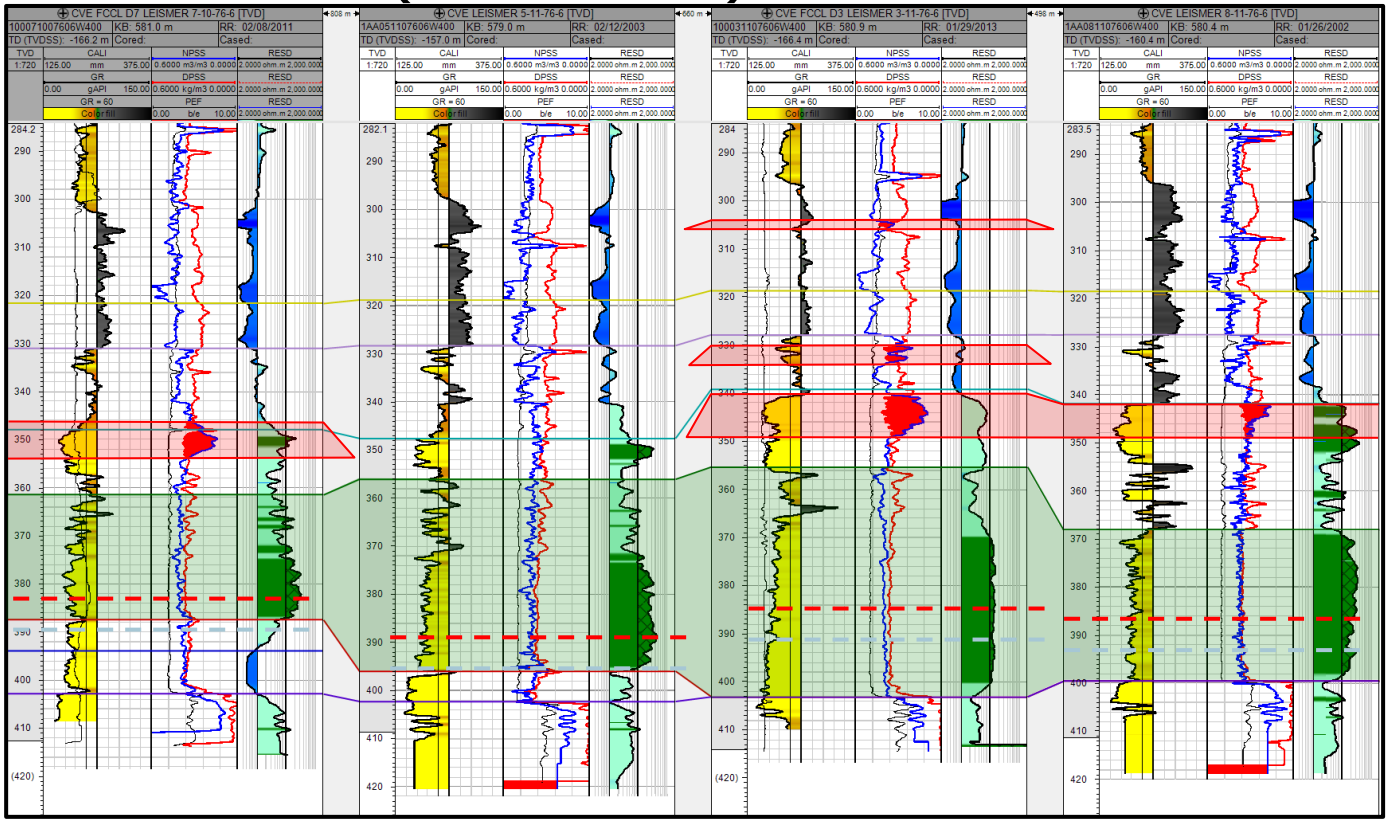
MCMR

SAGD Pay

SAGD Base

Water Top

Paleo

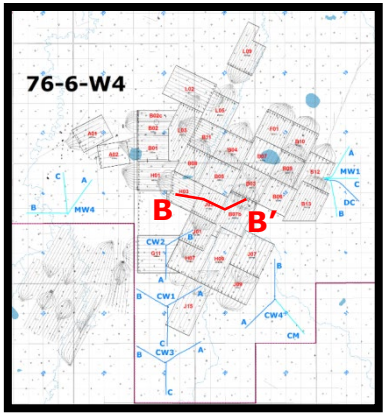


Identified Gas

McM SAGD Pay

Injector Level (est.)

Producer Level (est.)



© 2022 Cenovus Energy Inc.

Cross-section (structural): south

C

C′

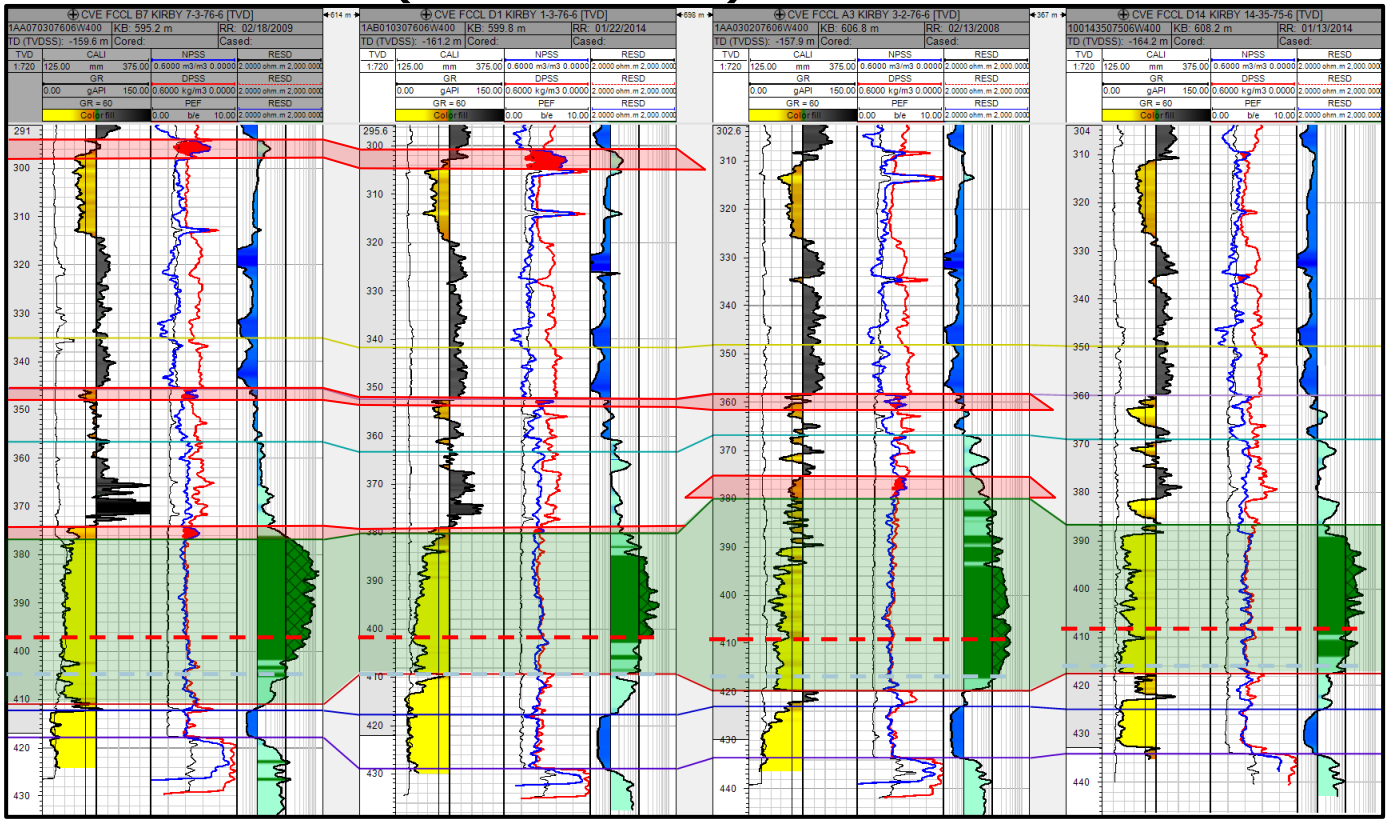
WBSK (T21)

T11

MCMR

SAGD Pay

SAGD Base
Water Top
Paleo

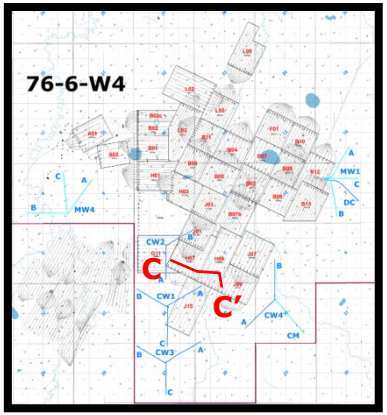


Identified Gas

McM SAGD Pay

Injector Level (est.)

Producer Level (est.)



© 2022 Cenovus Energy Inc.

OBIP Volumes

- Project Area OBIP
  - 776 MMm^3
- Development Area OBIP
  - 767 MMm^3
- Combined Active Well Patterns OBIP
  - 182 MMm^3
- Cumulative % Recovery
  - 50%

© 2022 Cenovus Energy Inc.

Reservoir properties

Reservoir Characteristics	Christina Lake Project Area	Kirby East Project Area	Approved Development Area
Reservoir Depth (m subsea)	170 - 245	170 - 245	170 - 245
Average SAGD Pay Thickness (m)	Up to 45+	Up to 25+	Up to 35+
Porosity (%)	31%	29%	30%
Horizontal Permeability (D)	Up to 10	Up to 8	Up to 10
Vertical Permeability (D)	Up to 7	Up to 6	Up to 7
Oil Saturation (%)	~80%	~75%	~80%
Water Saturation (%)	~20%	~25%	~20%
Original Reservoir Pressure (kPa)	~2500	~2500	~2500
Original Reservoir Temperature (°C)	12°C	12°C	12°C

© 2022 Cenovus Energy Inc.

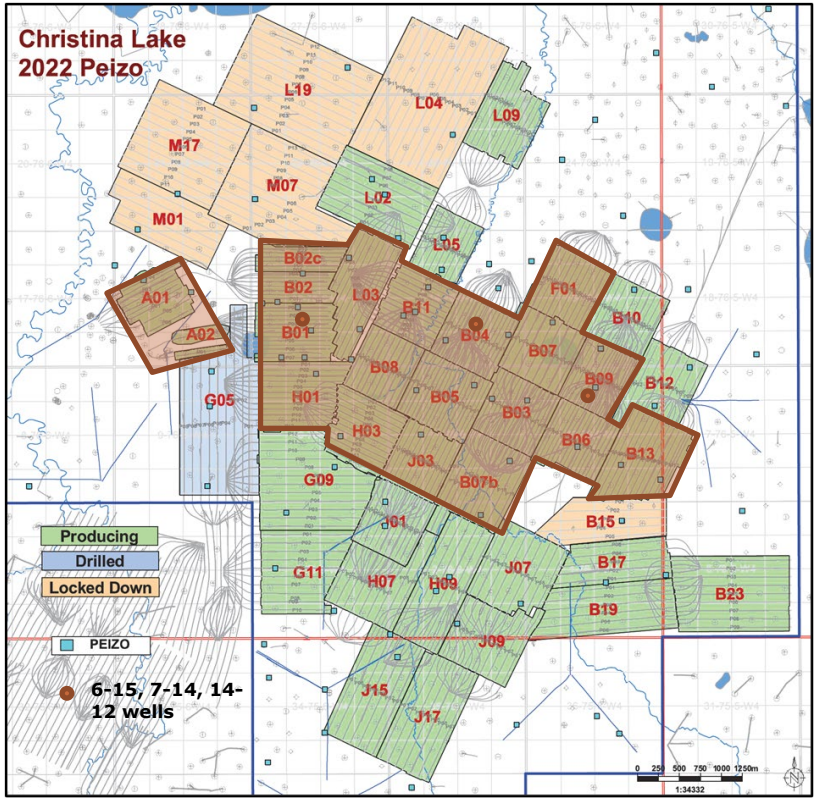
POIP & OBIP & recovery per pad

Pad	Area (m2)	Height (m)	Average Permeability (D)	Porosity (%)	So (%)	POIP (Mm3)	OBIP (Mm3)	Cum Oil (Mm3) to Dec 31, 2021	Recovery % POIP	Recovery % OBIP	Estimated Ultimate Recovery (m3)	Ultimate Recovery as % of POIP	Ultimate Recovery as % of OBIP
A01 PAD	514,091	25	6.0	32%	89%	3,715	6,181	2,463	66%	40%	2,513	68%	40.7%
A02 PAD	174,358	31	6.0	33%	90%	1,531	1,604	680	44%	42%	922	60%	57.4%
B01 PAD	655,033	39	6.0	33%	87%	7,276	7,499	4,620	63%	62%	5,272	72%	70.3%
B02 PAD	333,162	44	6.0	32%	87%	4,074	4,193	3,174	78%	76%	3,462	85%	82.6%
B02C PAD	322,343	33	6.0	32%	87%	3,037	3,125	2,067	68%	66%	2,101	69%	67.2%
B03 PAD	676,898	42	6.0	32%	86%	7,863	8,483	5,910	75%	70%	6,111	78%	72.0%
B04 PAD	652,375	46	6.0	31%	86%	7,962	8,517	6,158	77%	72%	6,237	78%	73.2%
B05 PAD	731,534	49	6.0	31%	86%	9,522	9,850	6,702	70%	68%	7,165	75%	72.7%
B06 PAD	605,198	40	6.0	31%	82%	6,120	7,462	4,791	78%	64%	4,924	80%	66.0%
B07 PAD	675,472	45	6.0	31%	86%	8,012	8,100	5,787	72%	71%	5,949	74%	73.4%
B07B PAD	859,517	33	6.0	31%	87%	7,463	9,103	3,600	48%	40%	4,711	63%	51.8%
B08 PAD	568,267	37	6.0	33%	89%	6,199	6,463	4,165	67%	64%	4,239	68%	65.6%
B09 PAD	558,380	49	6.0	33%	85%	7,628	7,786	4,836	63%	62%	5,091	67%	65.4%
B10 PAD	595,522	37	6.0	32%	87%	6,211	6,589	2,375	38%	36%	3,157	51%	47.9%
B11 PAD	640,668	41	6.0	32%	88%	7,333	7,579	4,930	67%	65%	5,000	68%	66.0%
B12 PAD	652,771	26	6.0	31%	84%	4,540	4,960	1,012	22%	20%	2,655	58%	53.5%
B13 PAD	836,206	29	6.0	31%	84%	6,159	7,139	3,118	51%	44%	3,504	57%	49.1%
B17 PAD	641,423	20	6.0	33%	88%	3,725	4,811	149	4%	3%	1,930	52%	40.1%
B19 PAD	959,618	29	6.0	34%	88%	8,272	9,387	177	2%	2%	4,861	59%	51.8%
B23 PAD	1,227,378	21	6.0	30%	86%	6,640	7,616	74	1%	1%	3,014	45%	39.6%
F01 PAD	700,391	34	6.0	32%	86%	6,381	7,332	3,936	62%	54%	4,392	69%	59.9%
G09 PAD	1,347,350	24	6.0	33%	89%	9,413	13,692	254	3%	2%	4,869	52%	35.6%
G11 PAD	917,788	24	6.0	32%	89%	6,355	7,185	521	8%	7%	3,318	52%	46.2%
H01 PAD	773,342	29	6.0	33%	88%	6,560	7,355	3,564	54%	48%	3,893	59%	52.9%
H03 PAD	658,249	29	6.0	34%	90%	5,690	6,582	3,177	56%	48%	3,329	59%	50.6%
H07 PAD	787,787	24	6.0	33%	89%	5,486	5,990	719	13%	12%	3,325	61%	55.5%
H09 PAD	934,727	27	6.0	33%	90%	7,608	8,530	970	13%	11%	4,338	57%	50.9%
J01 PAD	600,387	23	6.0	31%	86%	3,800	5,106	1,941	51%	38%	2,555	67%	50.0%
J03 PAD	561,300	43	6.0	33%	87%	6,917	7,598	4,758	69%	63%	4,981	72%	65.6%
J07 PAD	856,438	25	6.0	33%	90%	6,199	7,598	1,697	27%	22%	4,609	74%	60.7%
J09 PAD	758,443	28	6.0	33%	86%	6,039	7,056	1,952	32%	28%	4,194	69%	59.4%
J15 PAD	991,475	26	6.0	31%	89%	7,053	7,777	1,104	16%	14%	3,909	55%	50.3%
J17 PAD	992,561	22	6.0	32%	89%	6,234	7,447	945	15%	13%	4,415	71%	59.3%
L02 PAD	955,312	26	6.0	32%	88%	7,120	9,117	989	14%	11%	4,240	60%	46.5%
L03 PAD	716,007	31	6.0	34%	90%	6,825	7,335	3,362	49%	46%	4,443	65%	60.6%
L05 PAD	475,523	31	6.0	29%	86%	3,703	4,361	2,024	55%	46%	2,512	68%	57.6%
L09 PAD	754,344	27	6.0	32%	90%	5,931	6,644	2,460	41%	37%	3,875	65%	58.3%
Total CL	**26,661,636**					**230,595**	**263,153**	**101,160**	**44%**	**38%**	**150,016**	**65%**	**57%**

**As of December 31st, 2021*

© 2022 Cenovus Energy Inc.

Map of co-injection wells



Non-condensable gas

- NCG injected in 6-15 well, 7-14 well, 14-12 well, and wells on A01, A02, B01, B02, B02C, B03, B04, B05, B06, B07, B07b, B08, B09, B11, B13, H01, H03, J03, L03 and F01 pads
- Fuel gas up to 36% mol fraction during co-injection*; 100% gas mol fraction during blowdown
- Composition of the injected non-condensable gas is methane (fuel gas)
- Taking into account formation GOR, daily recovery of injected NCG fluids ranges from 50%-80%. This range fluctuates due to changes in daily operations

Solvent

- No solvent injection at CL, currently

*Based on current approval of 100 t/d min steam and 75 e3m3/d max gas injection per injector well on pad average basis during co-injection.

© 2022 Cenovus Energy Inc.

Injection Strategy and Impacts

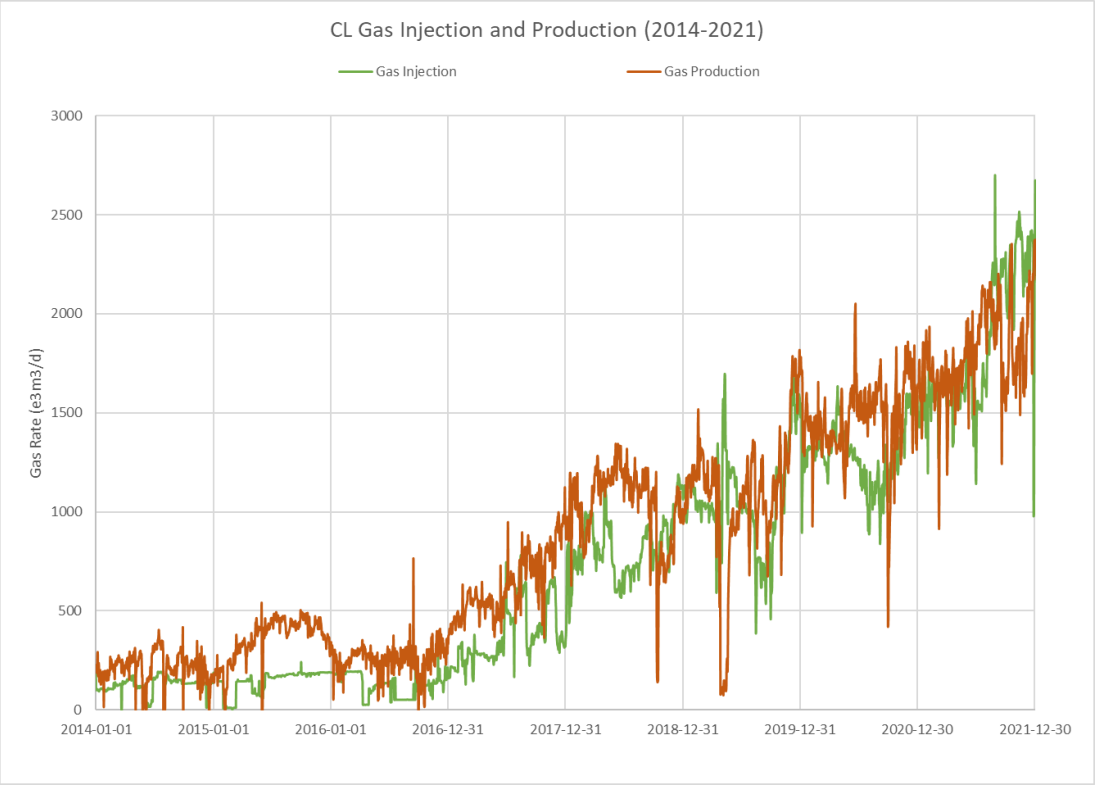
NCG Injection commencement is based on:

- Pads with high RF
- Pads with high SOR/declining oil rates

Steam cuts are typically made in 25% increments.

Impact of co-injection:

- Trials underway to optimize late life strategy and reduce gas production.
- Based on data to date, Cenovus does not expect material impact to ultimate recovery due to co-injection.

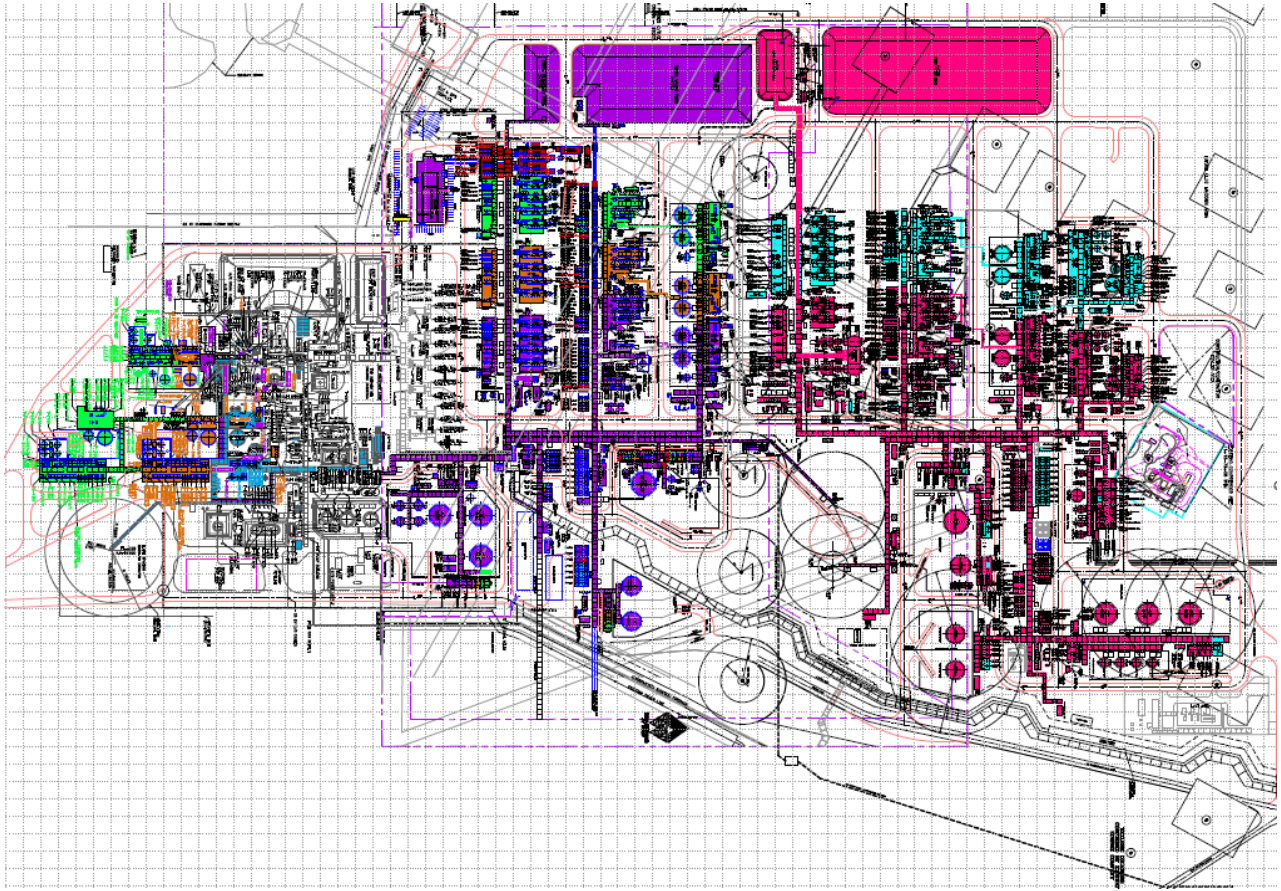


© 2022 Cenovus Energy Inc.

Subsection 4.3 8
Surface

cenovus
ENERGY

Overall plot plan



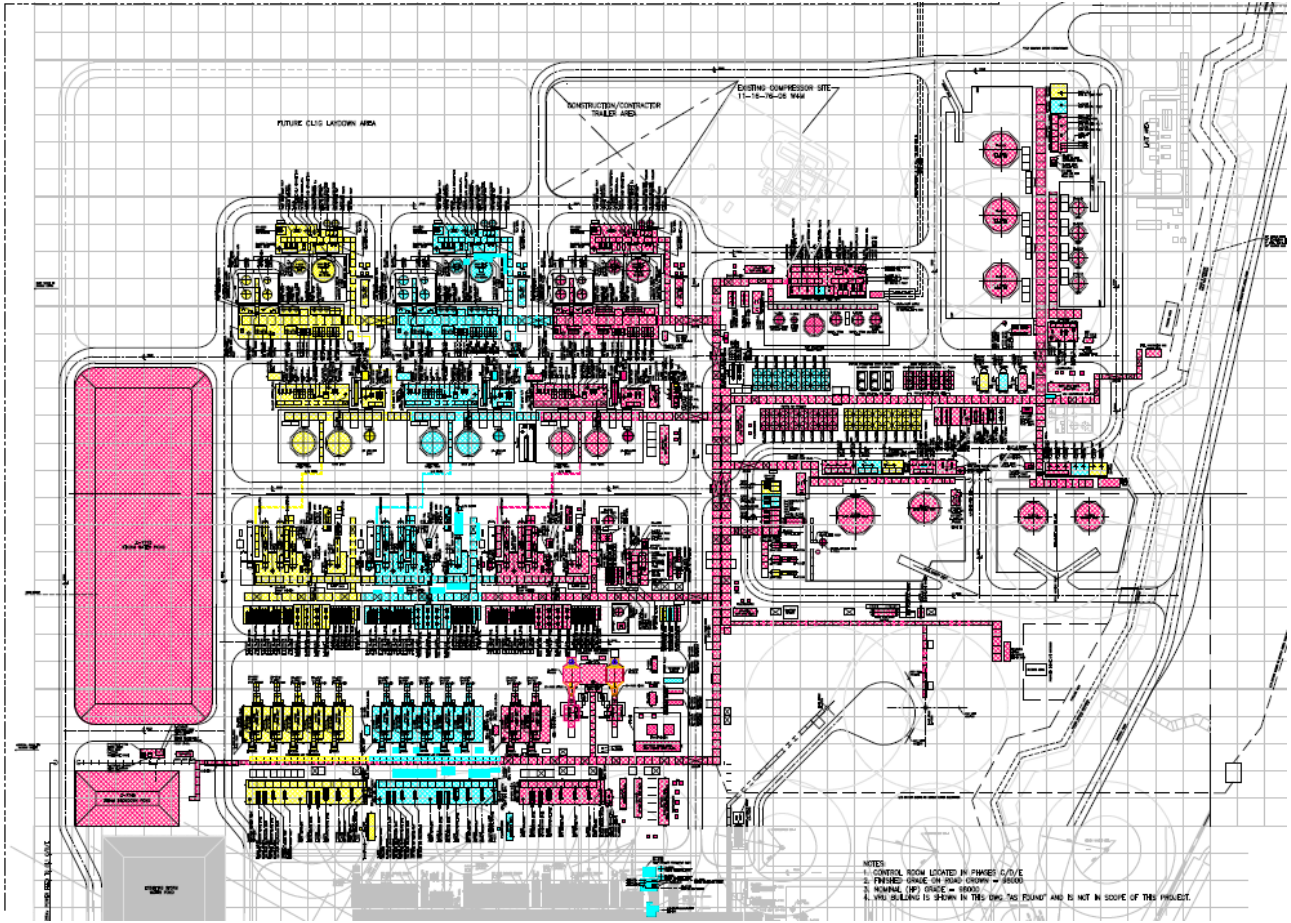
PHASE 1B
PHASE 1C
PHASE 1D
PHASE 1E
PHASE BB
PHASE 1F
PHASE 1G

All Phases indicated on Plot Plan have been built and in operation.

A high-resolution drawing has been included as an attachment (CL1-44-PLT-00-0010-002)

© 2022 Cenovus Energy Inc.

Plot Plan with Future Phase H



PHASE 1F

PHASE 1G

PHASE 1H

Phase H has not been constructed, nor in operation

A high-resolution drawing has been included as an attachment (CL1-44-PLT-00-0040-001)

© 2022 Cenovus Energy Inc.

Source Water Infrastructure

Fresh water source wells – Empress Aquifer :

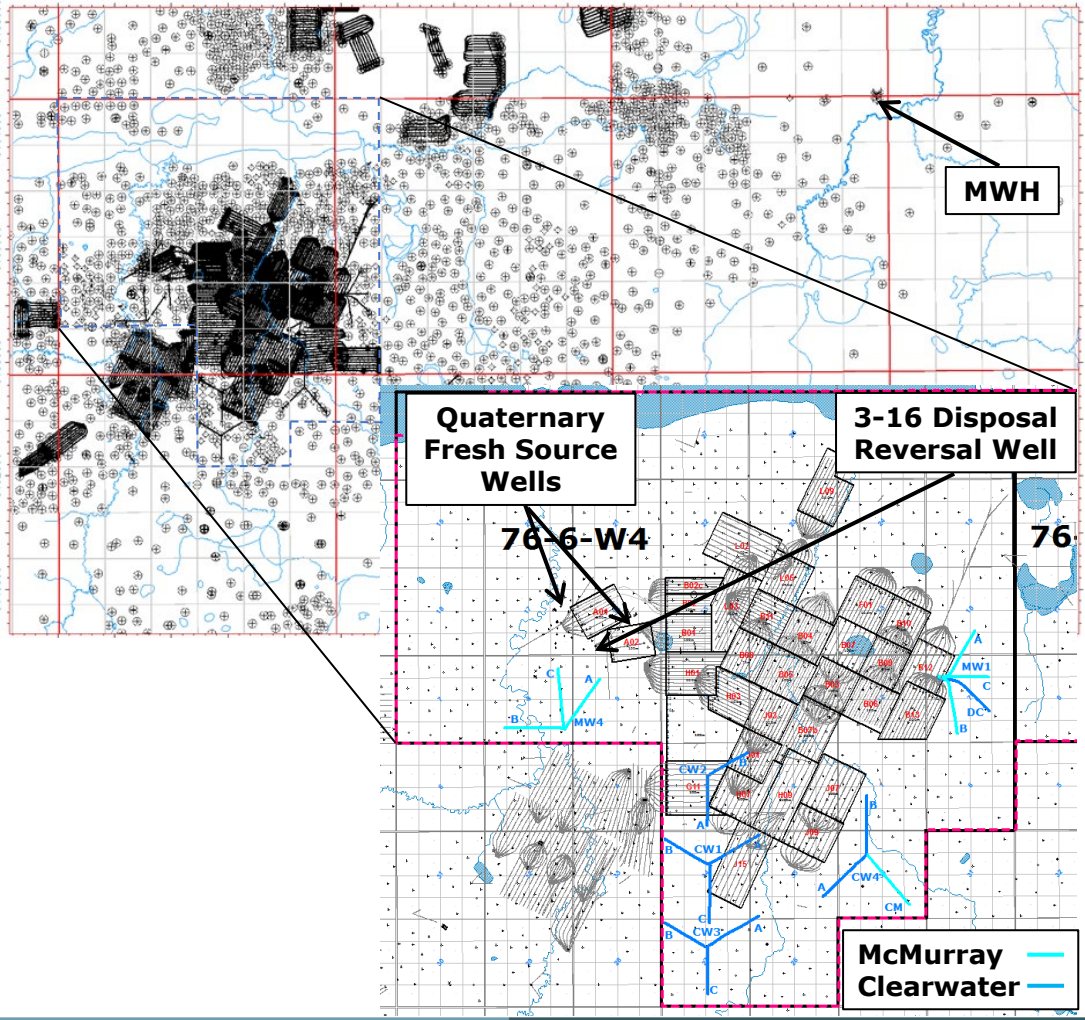
- Two wells at 09-17-076-06W4M (TDS ~440-560 mg/L)
- One well at 06-16-076-06W4M (TDS ~380-650 mg/L)

Brackish water source wells – Clearwater B Aquifer:

- CW1-A 1F1/13-35-075-06W4/00 TDS ~ 7,400 mg/L
- CW1-B 1F1/13-34-075-06W4/00 TDS ~ 5,070 mg/L
- CW1-C 1F1/15-27-075-06W4/00 TDS ~ 7,780 mg/L
- CW2-A 1F1/16-03-076-06W4/00 TDS ~ 4,600 mg/L
- CW2-B 1F1/02-03-076-06W4/00 TDS ~ 5,580 mg/L
- CW3-A 100/04-35-075-06W4/00 TDS ~ 9,730 mg/L
- CW3-B 100/13-27-075-06W4/00 TDS ~ 8,900 mg/L
- CW-3C 100/02-27-075-06W4/00 TDS ~ 11,700 mg/L
- CW4-A 1F1/01-35-075-06W4 TDS ~ 13,200 mg/L
- CW4-B 1F1/06-01-076-06W4 TDS ~ 8,800 mg/L
- MW1-DC 1F1/07-07-076-05W4 TDS ~ 4,300 mg/L

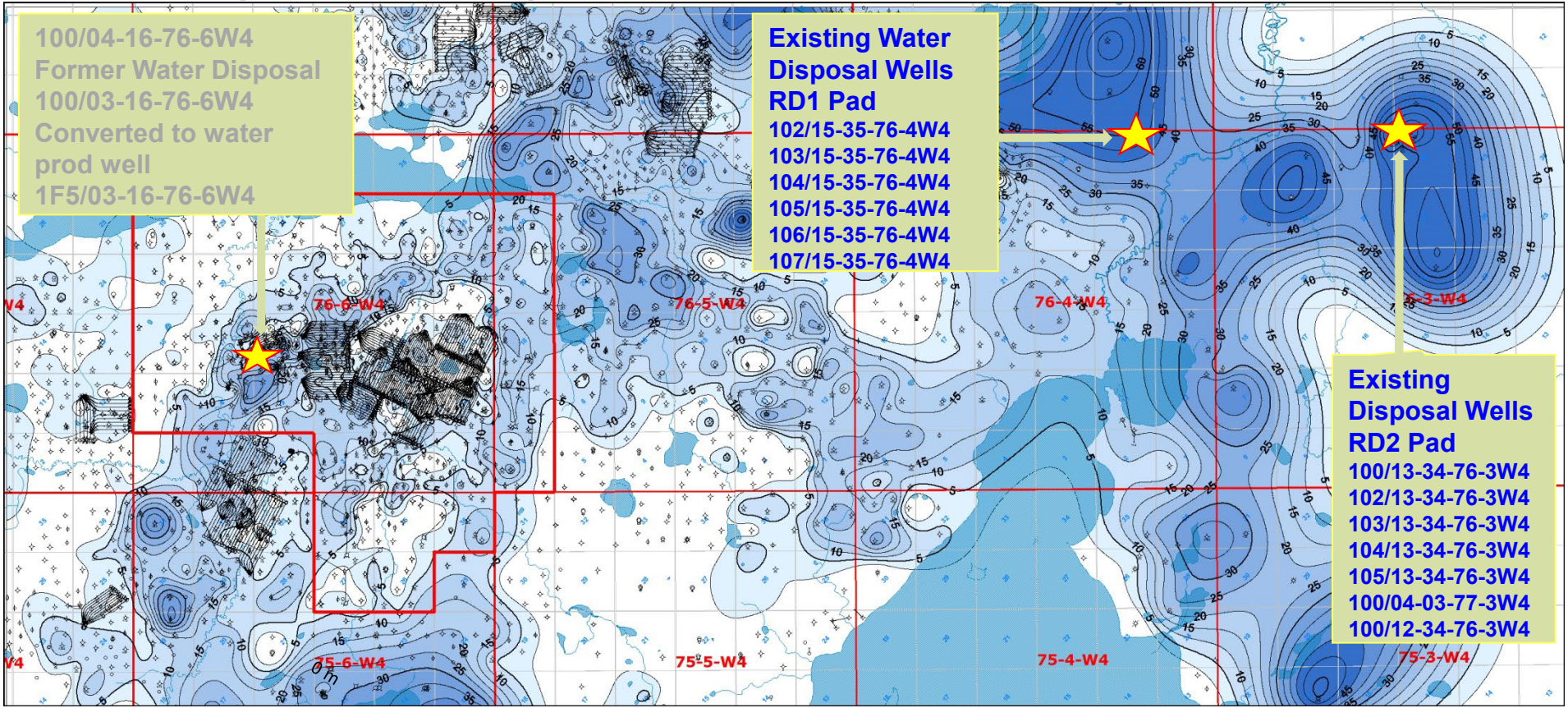
McMurray water source wells (Online Q4 2016):

- MW1-A 1F1/07-18-076-05W4 TDS ~ 16,880 mg/L
- MW1-B 1F1/03-07-076-05W4 (not in use) TDS ~ 16,520 mg/L
- MW1-C 1F1/09-07-076-05W4 TDS ~ 16,420 mg/L
- MW4-A 1F3/11-09-076-06W4 TDS ~ 10,850 mg/L
- MW4-B 1F1/04-08-076-06W4 TDS ~ 11,300 mg/L
- MW4-C 1F1/16-08-076-06W4 TDS ~ 10,990 mg/L
- CW4-C 1F1/01-36-075-06W4 TDS ~ 18,600 mg/L
- 3-16 1F5/03-16-076-06W4/00 TDS ~ 8,400 mg/L
- MWH 1F1/01-01-077-04W4 (not in use)
- MWH 1F1/02-01-077-04W4 (not in use) MWH TDS ~ 13700-16800 mg/L
- MWH 1F2/01-01-077-04W4 (not in use)
- MWH 1F1/15-36-076-04W4 (not in use)
- MWH 1F1/16-36-076-04W4 (not in use)
- MWH 1F2/16-36-076-04W4 (not in use)



© 2022 Cenovus Energy Inc.

McMurray water disposal wells



© 2022 Cenovus Energy Inc.

Facility summary

- No major facility modifications during reporting period

© 2022 Cenovus Energy Inc.

Plant performance

Steam

- System capacity 83,300 t/d of steam
- Average flowrate for 2021 of 77,102 t/d | 93% of Capacity
- Phase A to H approved steam capacity is 92,618 t/d

Oil

- System capacity 43,880 Sm^3/d of oil (276,000 bbl/d)
- Average flowrate for 2021 of 37,625 Sm^3/d (236,656 bbl/d) | 84% of Capacity
- Phase A to H approved annual average bitumen capacity is 49,284 Sm^3/d (310,000 bbl/d)

© 2022 Cenovus Energy Inc.

Subsection 4.4 9-12 Historical and Upcoming Activity

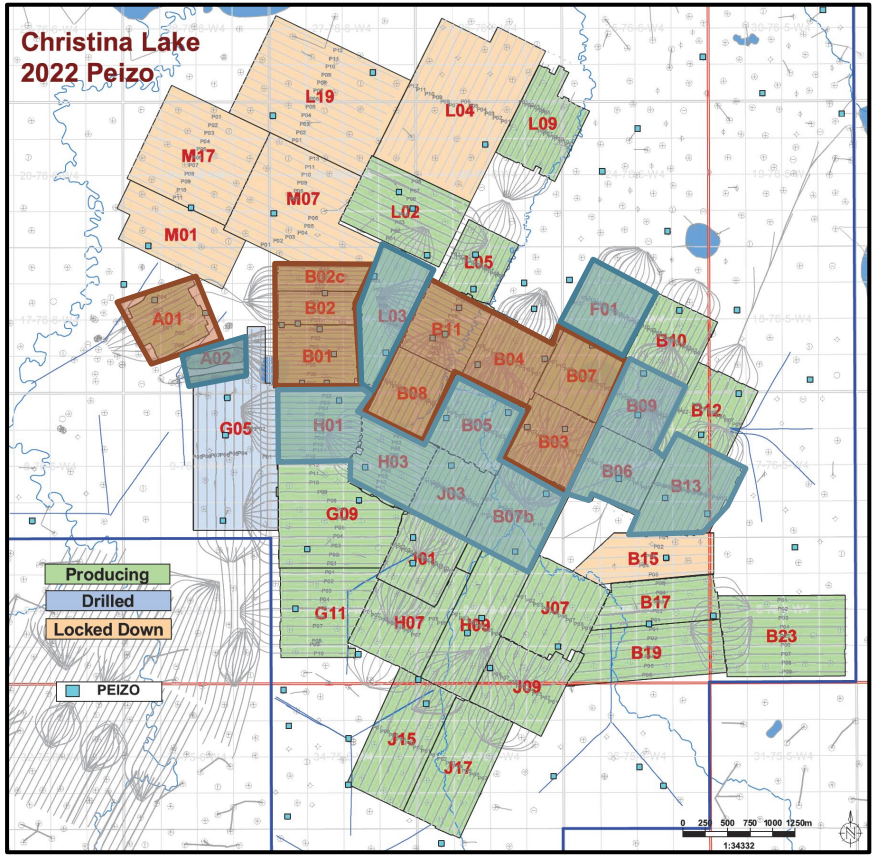
cenovus ENERGY

Pad Abandonments

- No pad abandonments are currently planned at Christina Lake in the next 5 years.

© 2022 Cenovus Energy Inc.

Well patterns with active gas injection



Gas co-injection

Blow-down

© 2022 Cenovus Energy Inc.

2021 OSCA & EPEA application/approval summary

Act	Application No.	Application Description	Approval Date
EPEA	031-48522	EPEA Renewal Application	2021-06-18 (48522-02-00)
OSCA/ EPEA	1932396/ 033-48522	Sulphur Management Plan Application	2021-03-31 (8591UUU/48522-01-17)
OSCA/ EPEA	1934492/ 036-48522	Casing Gas Re-injection Application	2021-12-10 (8591WWW/48522-02-01)
OSCA/ EPEA	1934605/ 037-48522	Sulphur Management Plan Update Application	2021-12-10 (8591WWW/48522-02-01)
OSCA	1934769	B03 Lower McMurray Pay Wells Application	2021-12-07 (8591VVV)
OSCA	1934781	Wabiskaw Producer Well Application	2021-12-07 (8591VVV)

© 2022 Cenovus Energy Inc.

Facility modifications

- no major facility modifications or expansions completed

© 2022 Cenovus Energy Inc.

Facility performance

Process Treating Area:

- Increase in Phase F/G PG capacity (1700 – 2060 Se^3m^3/d)
  - PG aerial coolers (AC-4085E/F) added to debottleneck cooling limitations
  - SRU inlet valve upsized
- Phase A-G oil production record of 271,830 bbl/d achieved in Dec from: PG debottlenecks, heat integration improvements, B23 pad startup and redrill / redev. Programs.
- Phases A-G constrained due to gas capacity limitations
- Phases AB down for PSV discharge piping repairs (end of august)
- Phase F/G treaters cleaned (Q1-Q3) to remove solids buildup:
  - Improved treating performance and reduced dilburn

© 2022 Cenovus Energy Inc.

Facility performance

Process Treating Area (cont'd):

- Sales Oil / Slop Tank Venting from plant upsets due to back-flow from low pressure VRU ejector system
  - Implemented automated control logic which has reduced frequency and duration of venting upsets
- Slug Catcher liquids management
  - Increased monitoring has reduced oil-in-water excursions into deoiling area

© 2022 Cenovus Energy Inc.

Facility performance

De-oiling Area:

- Phase D Skim and De-oiled water tanks down for roof top repairs (April/May)
- Skim Tank / De-Oiled Water Tank venting from plant upsets
    - Implemented automated control logic which has reduced frequency and duration of venting upsets
- Skim tank oil-in-water analyzer trial to identify upstream excursions and prevent downstream process upsets

© 2022 Cenovus Energy Inc.

Facility performance

Water Treatment Area:

- Developed new playbook which increased throughput of produced water and brackish water volumes and improved water treating KPIs such as hardness and turbidity removal.
- Completed CW4C McMurray brackish trial.
  - Proved use as an alternative makeup water stream to offset Clearwater brackish aquifer decline despite being significantly poorer water quality.
- Fresh water temporary diversion license supported the plant water balance to help maximize steam production during periods of low PWSR.

© 2022 Cenovus Energy Inc.

Facility performance

Steam Generation Area:

- Achieved daily steam production record of 84,249 t/d.
- Phase AB blowdown tank repairs and roof replacement completed in Q4
- Produced gas capacity increased to 2,060 e^3Sm^3/d due to additional cooling and valve upgrades in the Phase F/G SRU; completed Phase F/G SRU outage in Q4
- Submitted and received approval for the Sulphur Management Plan; operating under a variance until projects completed to increase sulphur recovery capacity at Christina Lake

© 2022 Cenovus Energy Inc.

Pilots/technical innovations

Butane Blending Project – displace diluent volumes to reduce Opex

- Phase 1 and 2 trials commenced in 2019 and 2020
- Trial results successful and facility turned over to operations
- Project includes 3 – 341 m^3 butane bullets, injection pumps and truck unloading facilities
- Butane injection to date has resulted in a ~3.6% decrease in diluent volumes

Non-Condensable Gas Co-injection Trials:

- B07b Pad – trial is continuing with observed iSOR reduction
- L09 Pad – under evaluation for potential trial

© 2022 Cenovus Energy Inc.

2021 Non-compliance Summary – EPEA

Date	Non compliance	Follow-up
2021-07-12	EDGE Ref# 381079. CEMS unit B-3500 failed to meet 90% availability due to oscillating FloSic flow rate meter.	Replaced and re-calibrated FloSic meter.
2021-08-31	EDGE Ref# 383053. CEMS unit B-3500 failed to meet 90% availability due to failed FloSic flow rate meter.	Replaced and re-calibrated FloSic meter.
2021-10-30	EDGE Ref# 385113. B-3460 exceeded the hourly NOx emission limit due to turbine combuster fouling.	Turbine combuster cleaned and returned to service.

© 2022 Cenovus Energy Inc.

Future plans

Potential Future Applications

- Well Pad trajectory amendment (H11 Pad)

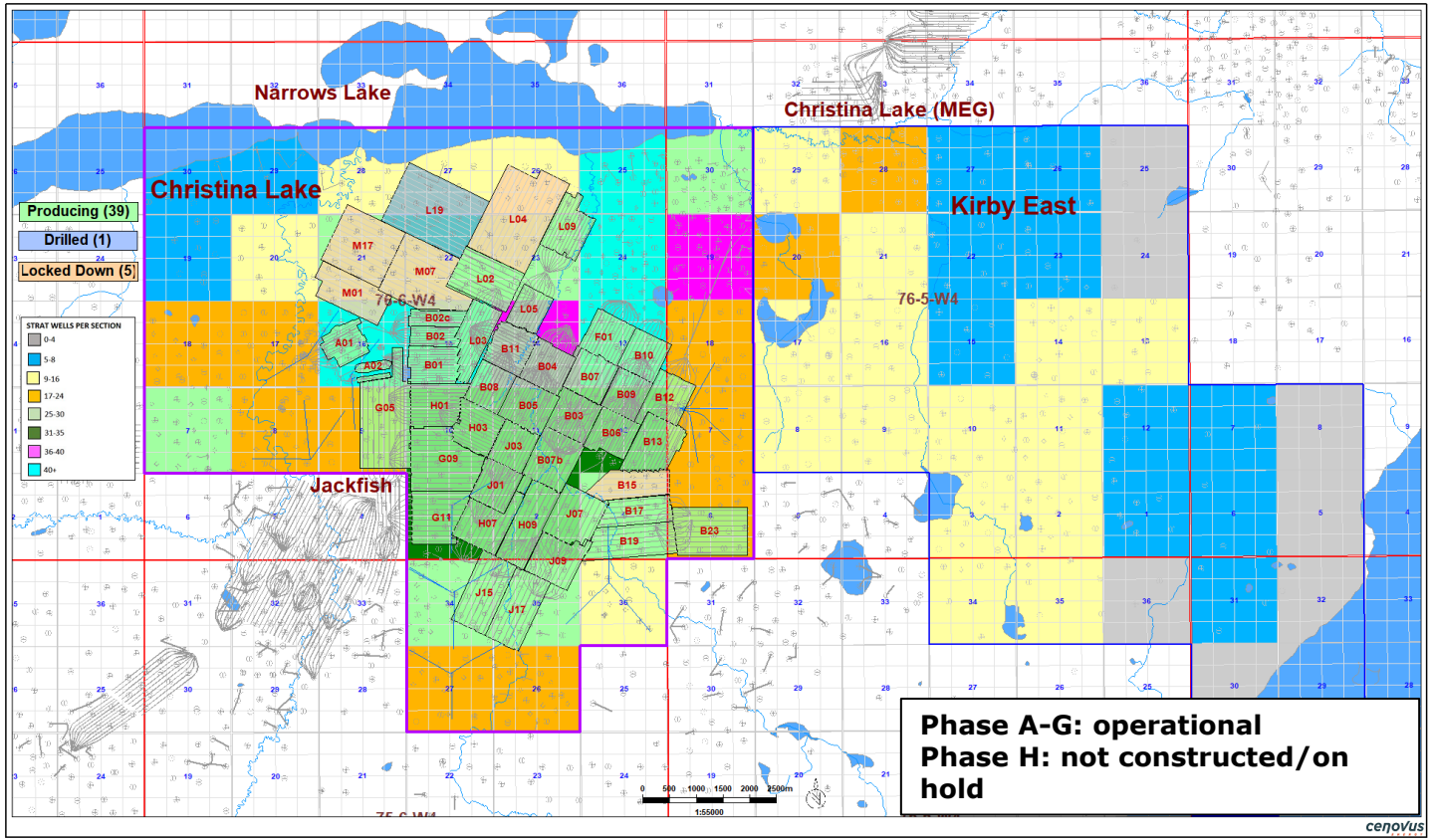
Future Plant Activity

- Narrows Lake tie-back
- Casing Gas Re-injection at B04/B08 Pads
- VRU Compressor Project (Sulphur management)
- Skim/Sales Tank Vent Gas Project (Sulphur management)
- Phase H (not constructed) is on hold

© 2022 Cenovus Energy Inc.

Planned development

* No new strat wells drilled in 2021.



© 2022 Cenovus Energy Inc.

Questions

please contact us

Cenovus Energy Inc.
225 - 6 Ave SW
PO Box 766
Calgary, Alberta T2P 0M5 Telephone: 403.766.2000
Toll free in Canada: 1.877.766.2066 Fax: 403.766.7600
cenovus.com

cenovus ENERGY