Cenovus Energy Inc.
Foster Creek In-situ Progress Report
Scheme 8623
2022 update

June 30, 2023

cenovus ENERGY

Oil & gas and financial information

Oil & gas information

The estimates of reserves were prepared effective December 31, 2022. 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, 2022 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.

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.

Subsection 4.1 1 Introduction

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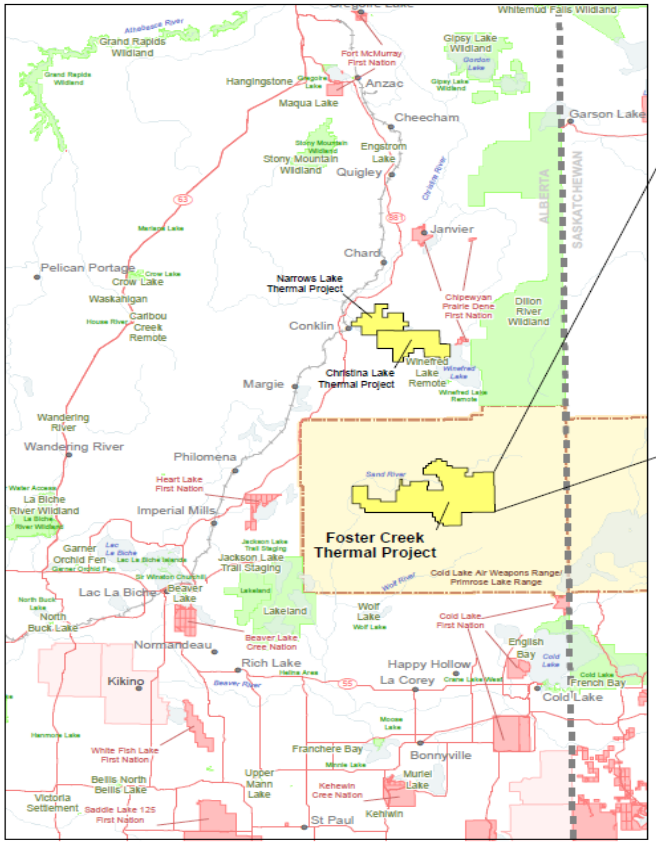
CENOVUS AT A GLANCE

TSX, NYSE | CVE

Market capitalization	**$45 billion**
2023E production	**800 MBOE/d**
• Oil Sands	**612 Mbbls/d**
• Conventional	**133 MBOE/d**
• Offshore	**62 MBOE/d**
Upgrading and refining capacity	**~745 Mbbls/d**
2022 proved & probable reserves	**8.9 BBOE**
Reserves life index	**~31 years**

Note: Market capitalization as at April 24, 2023. Values are approximate. Expected production based on April 25, 2023 guidance midpoints. Refining capacity represents net capacity to Cenovus.

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

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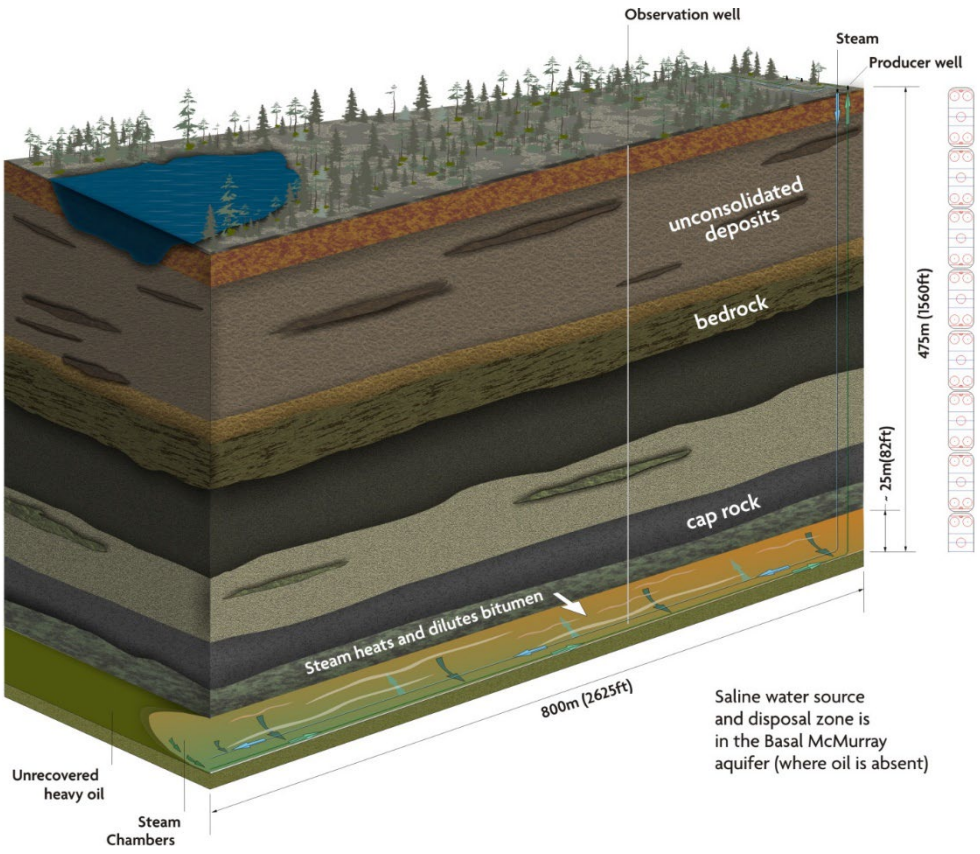
FOSTER CREEK THERMAL PROJECT

CVE-0368-003
March 22, 2023

Recovery process

- The Foster Creek Thermal Project 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



Subsection 4.2 2-7 Subsurface

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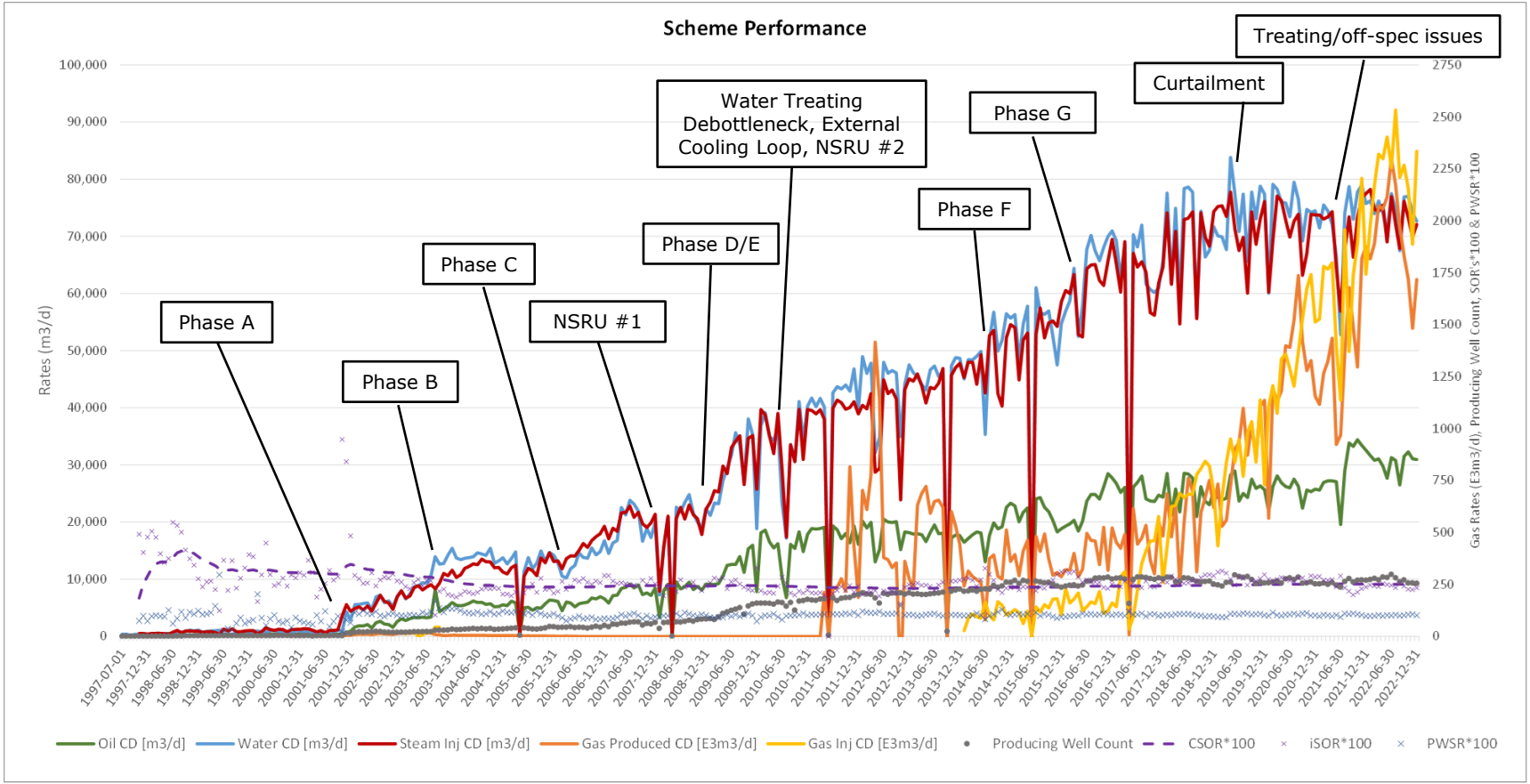
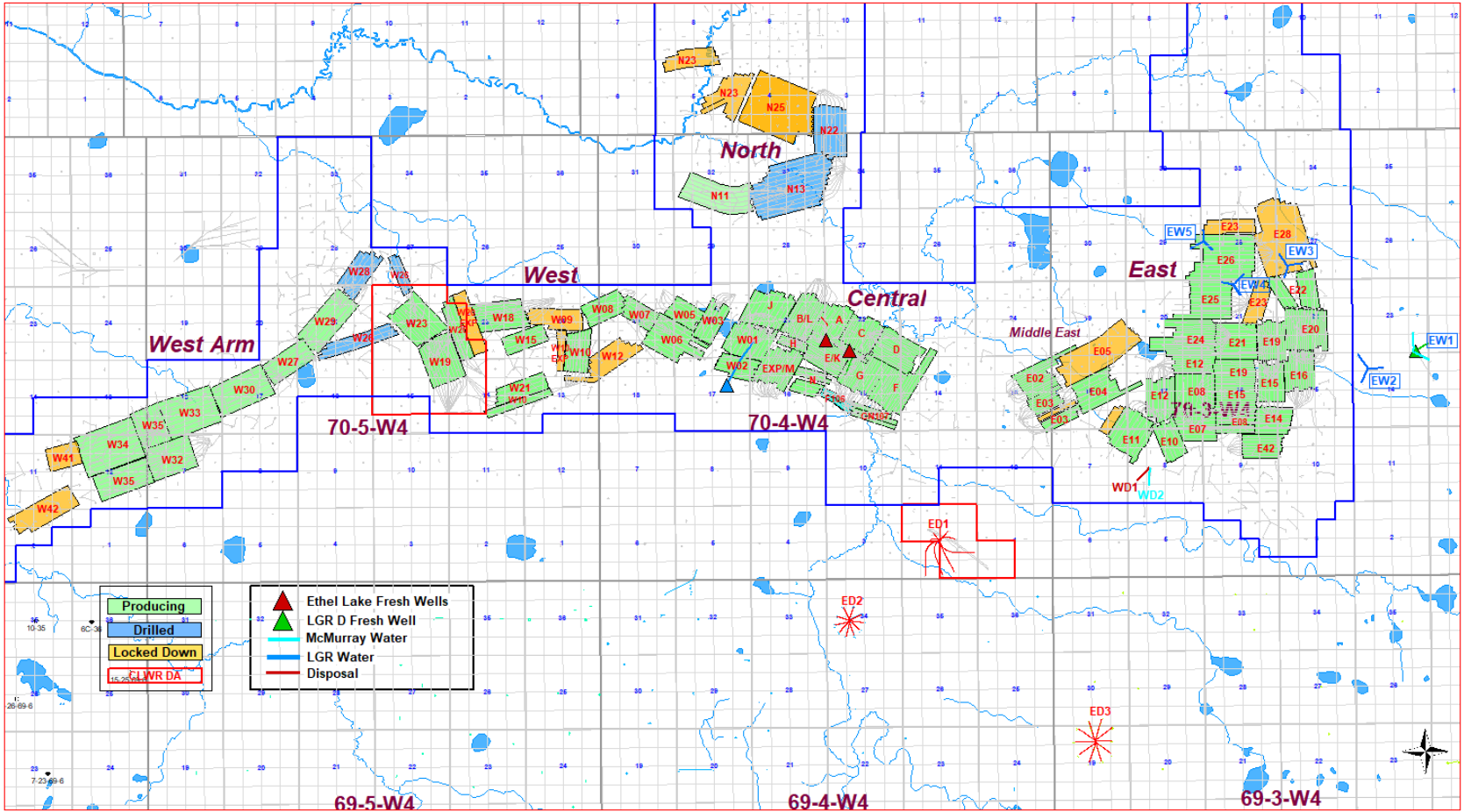
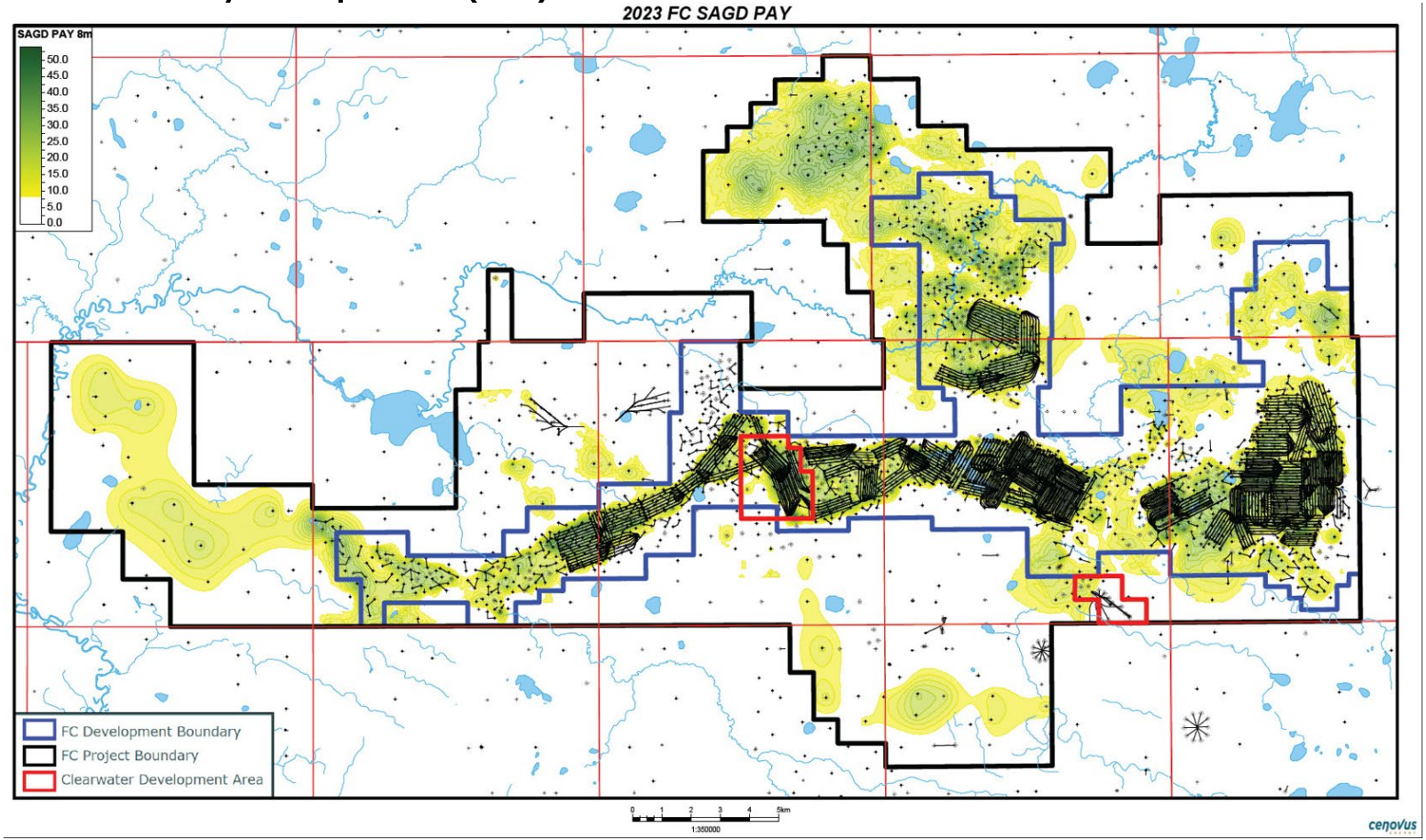
Performance: full historical



Scheme Map



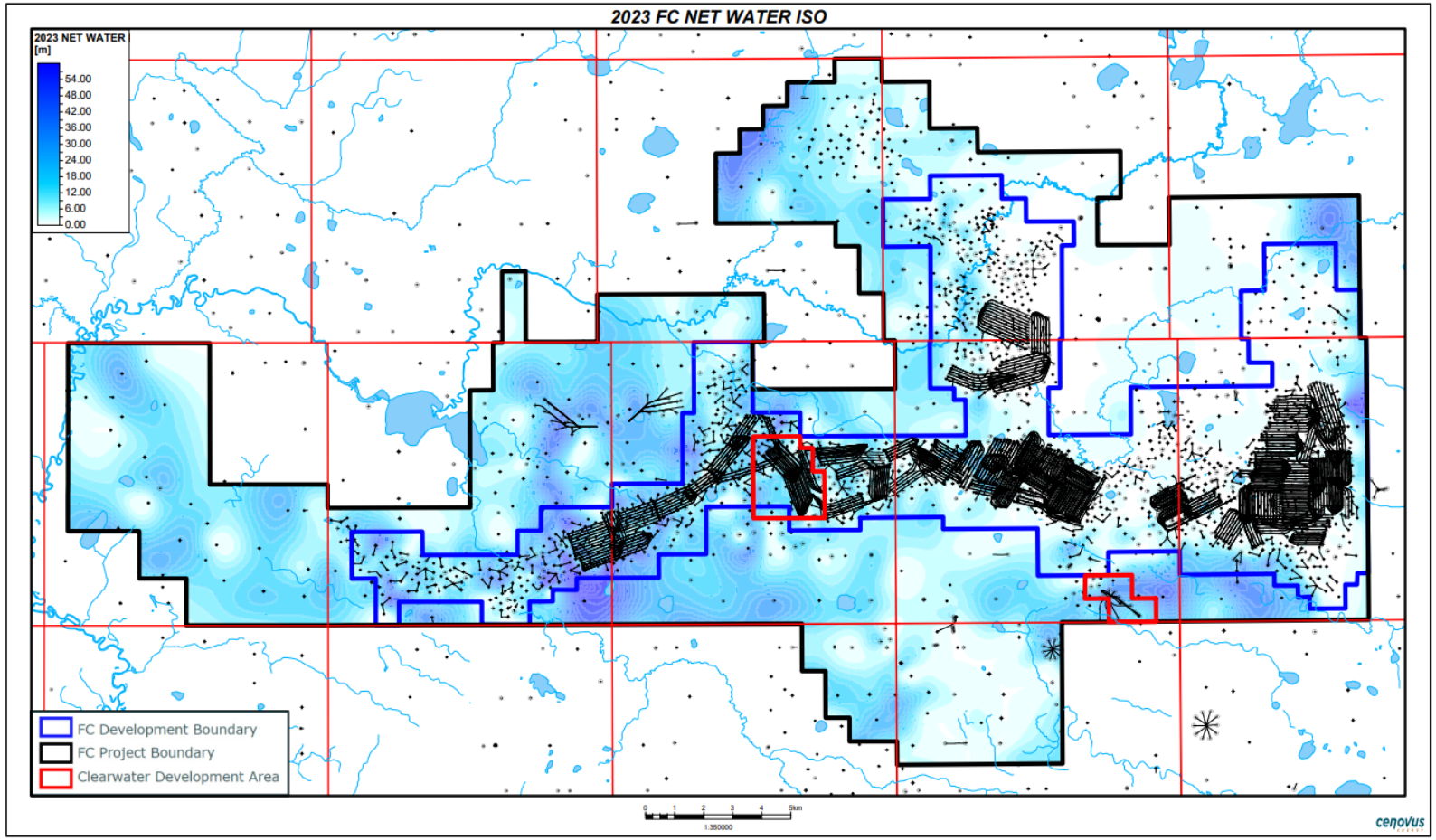
SAGD Pay Isopach (m)



SAGD Pay Cutoffs:

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

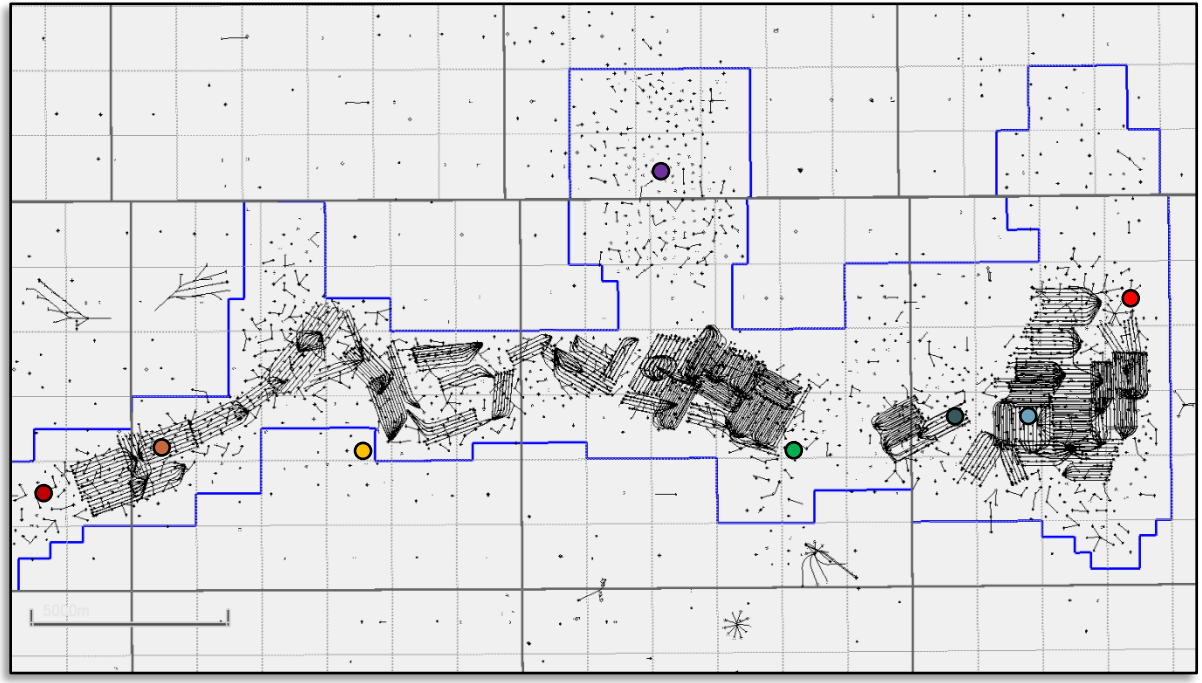
McMurray Bottom Water Isopach (m)



Mini-frac and DFIT wells

- CVE recognizes that tensile and shear failure are two possible ways for integrity to be compromised
- Mini-frac or DFIT data give information about failure mechanisms and stress magnitudes

9-17-70-3 (2009)
2-15-70-5 (2010)
3-14-70-4 (2010)
6-27-70-3 (2011)
9-11-70-6 (2012)
5-4-71-4 (2017)
15-18-70-3 (2018)
3-18-70-5 (2020)



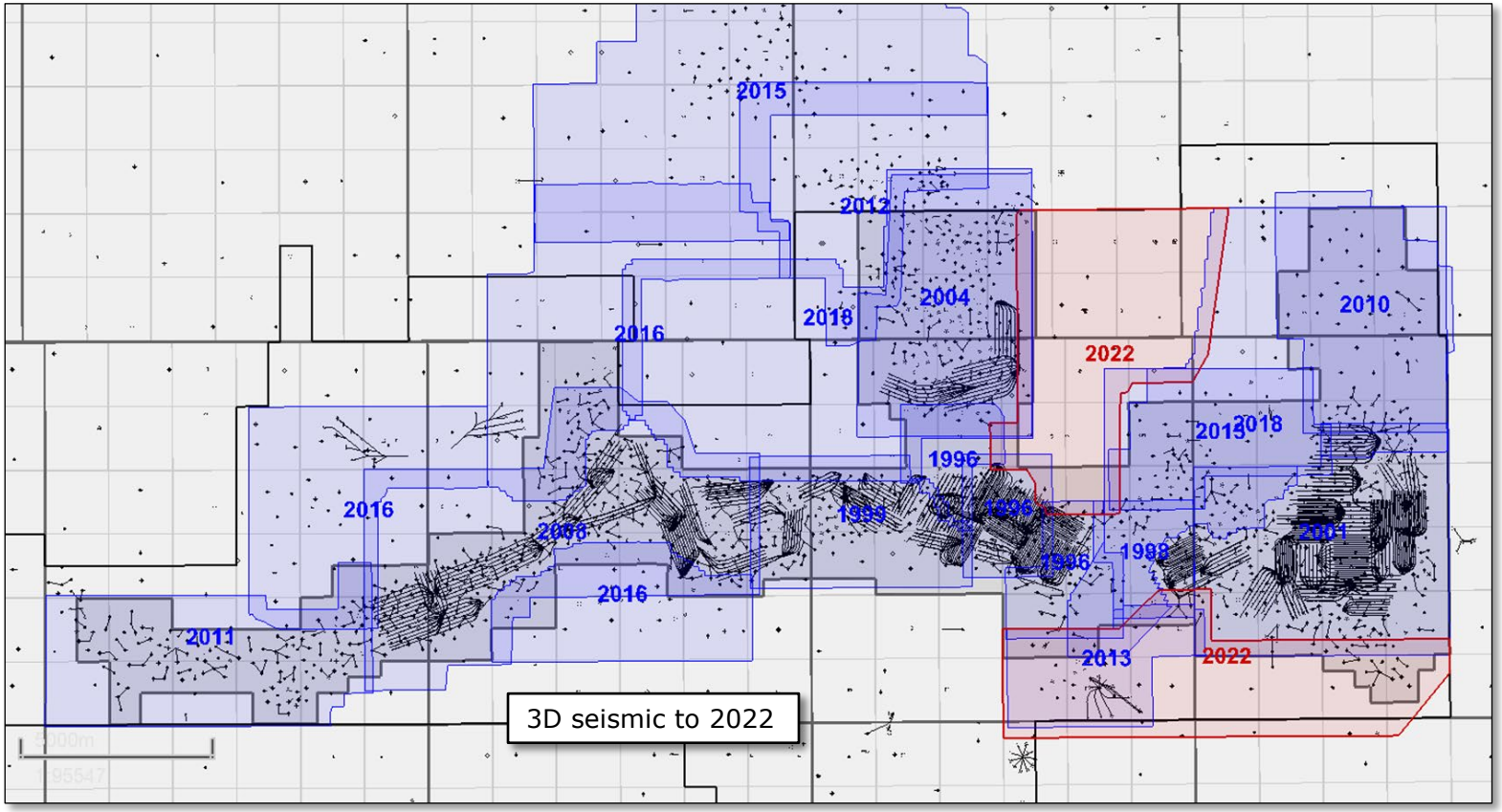
Summary of Mini-frac and DFIT test results

Test date	UWI	Zone	TVD (m)	First Closure Gradient (kPag/m)	Post-steam
2009	9-17-70-3	McMurray Sand	500.30	12.49	N
2010	2-15-70-5	Westgate Shale	280.30	21.79	N
2010	2-15-70-5	Grand Rapids Shale	360.80	17.55	N
2010	2-15-70-5	Clearwater Shale Caprock	421.30	20.98	N
2010	2-15-70-5	T31 (Clearwater Shale) Caprock	437.50	22.24	N
2010	2-15-70-5	Clearwater Sand	447.30	14.09	N
2010	2-15-70-5	Clearwater Sand	455.80	14.88	N
2010	2-15-70-5	Wabiskaw Shale (T11) Caprock	477.80	18.13	N
2010	3-14-70-4	Westgate Shale	260.30	21.67	N
2010	3-14-70-4	Grand Rapids Shale	344.30	16.91	N
2010	3-14-70-4	T31 (Clearwater Shale) Caprock	416.50	21.25	N
2010	3-14-70-4	Wabiskaw Shale (T11) Caprock	447.30	20.00	N
2010	3-14-70-4	McMurray Mudstone	459.30	19.29	N
2011	6-27-70-3	Westgate Shale	270.30	21.05	N
2011	6-27-70-3	Joli Fou Shale	330.30	23.69	N
2011	6-27-70-3	Grand Rapids Shale	395.80	17.22	N
2011	6-27-70-3	T31 (Clearwater Shale) Caprock	470.00	21.08	N
2011	6-27-70-3	T21 (Clearwater Shale) Caprock	493.30	22.91	N
2011	6-27-70-3	McMurray Sand	532.30	12.56	N
2012	9-11-70-6	Joli Fou Shale	313.70	23.46	N
2012	9-11-70-6	Clearwater Shale Caprock	434.00	19.94	N
2012	9-11-70-6	T31 (Clearwater Shale) Caprock	449.50	20.41	N
2012	9-11-70-6	T21 (Clearwater Shale) Caprock	471.50	21.55	N
2012	9-11-70-6	McMurray Sand	525.50	11.73	N
2017	5-4-71-4	T31 (Clearwater Shale) Caprock	404.00	20.90	N
2018	15-18-70-3	T31 (Clearwater Shale) Caprock	419.25	19.56	Y
2020	3-18-70-5	T31 (Clearwater Shale) Caprock	425.32	21.96	N

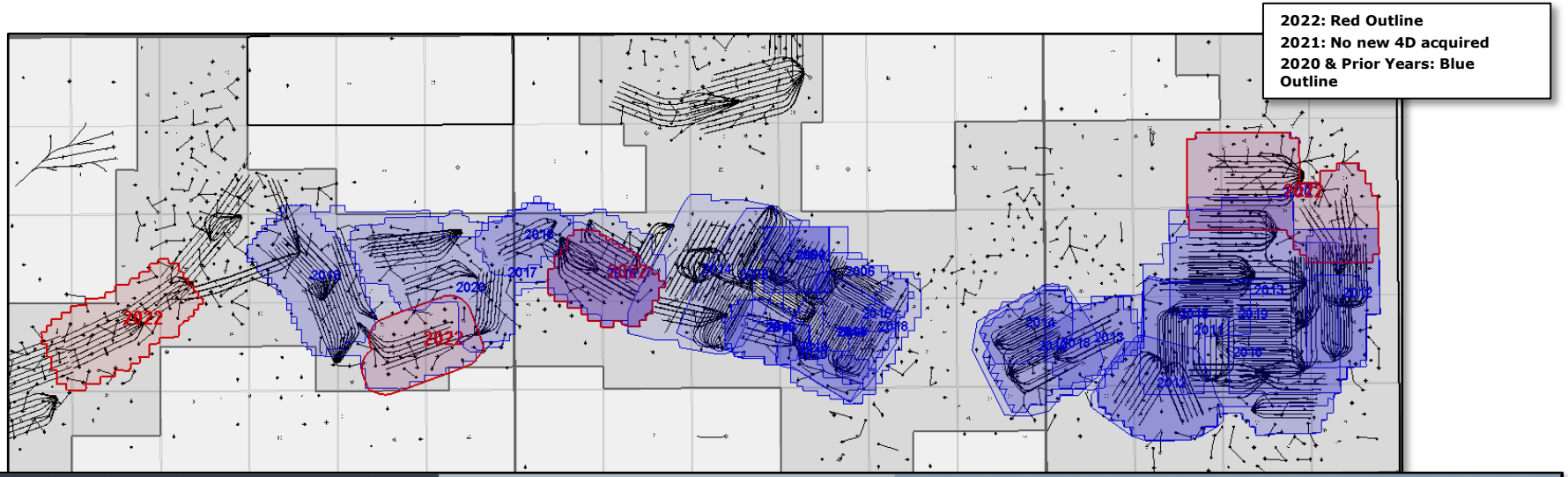
Surface heave monitoring

- Interferometric synthetic aperture radar (InSAR) surface heave monitoring at Foster Creek was deferred due to minimal observed historical vertical surface displacement (average +3.5 cm)
  - Deferral approved by the AER in 2018 (Scheme Approval No. 8623UUU)
- Cenovus has multiple subsurface monitoring tools as alternatives to using InSAR data
  - Observation well network monitors pressure and temperature above and below the primary caprock. This network is connected through an internal surveillance monitoring dashboard and is viewed regularly by integrated pad teams
  - Real-time well head and bottom-hole injection pressure monitoring
  - Multiple 4-D seismic acquisitions over the lifecycle of the well pads

3D Seismic within Project Area

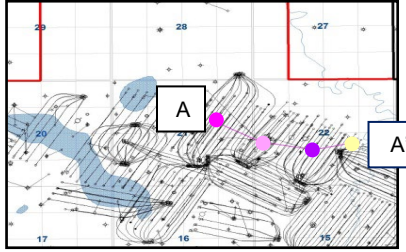


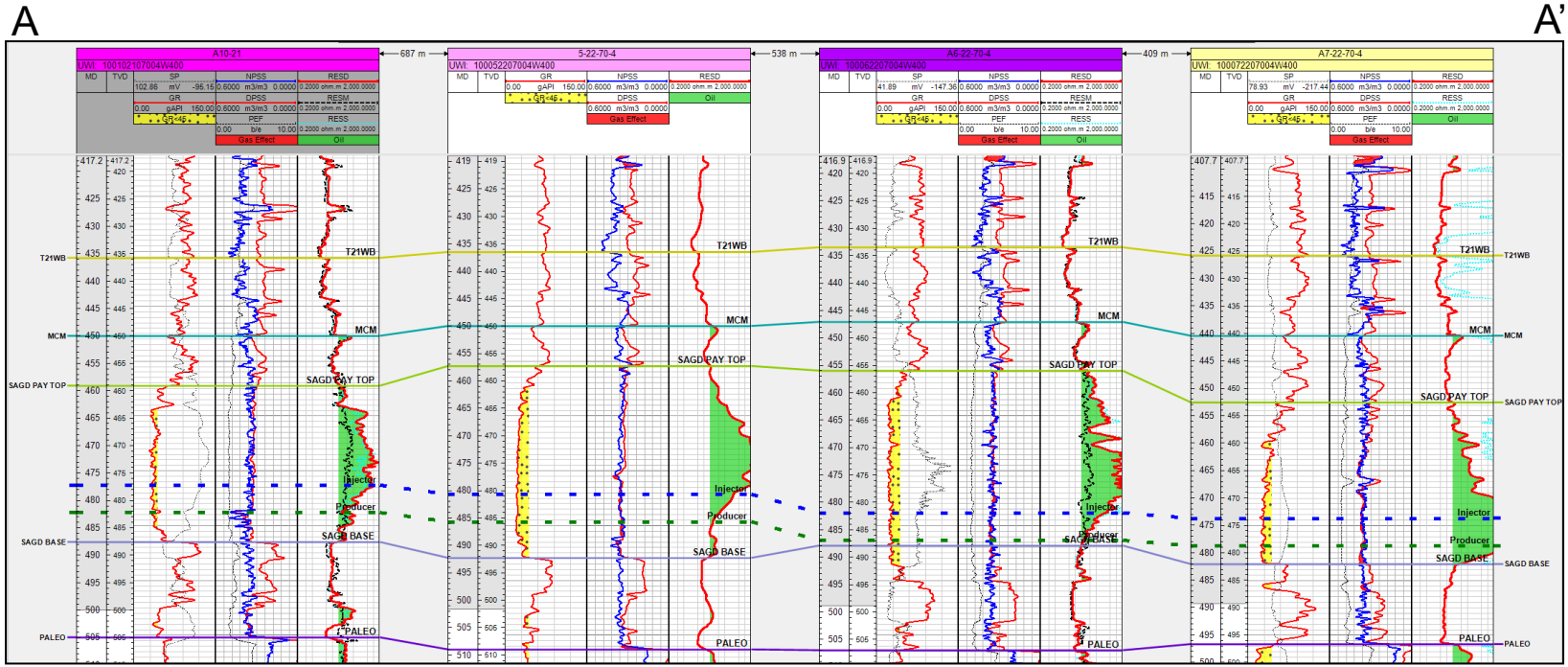
4D Seismic within Project Area



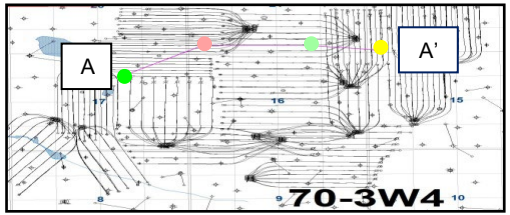
ACQUISITION YEAR	West Pod Pad Name														Central Pod Pad Name													East Pod Pad Name																	
	W03	W05	W06	W08	W10NS	W10EW	W15	W18	W19	W20	W21	W23	W27	W30	A	B/L	C	D	E/K	F	G	H	Exp M	N	W01	W02	J	E02	E03	E04	E07	E08	E10	E11	E12	E14	E15	E16	E19	E20	E21	E22	E24	E25	E26	E42
2006															x		x	x																													
2007																																														
2008																x																														
2009																				x	x																									
2010																												x	x																	
2011																																			x											
2012																																	x	x				x		x						
2013																														x							x	x	x	x	x		x	x		
2014																				x	x	x	x		x	x	x	x																		
2015																																	x	x	x	x	x		x		x		x	x		
2016				x														x		x				x				x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x		x
2017	x	x	x	x	x		x	x																																						
2018			x						x			x								x				x				x	x	x																
2019			x																					x							x	x	x	x	x	x	x	x	x	x	x		x	x		x
2020	x	x	x	x	x	x	x	x	x	x	x	x												x																		x				x	
2021																																														
2022			x			x					x		x	x																												x			x	

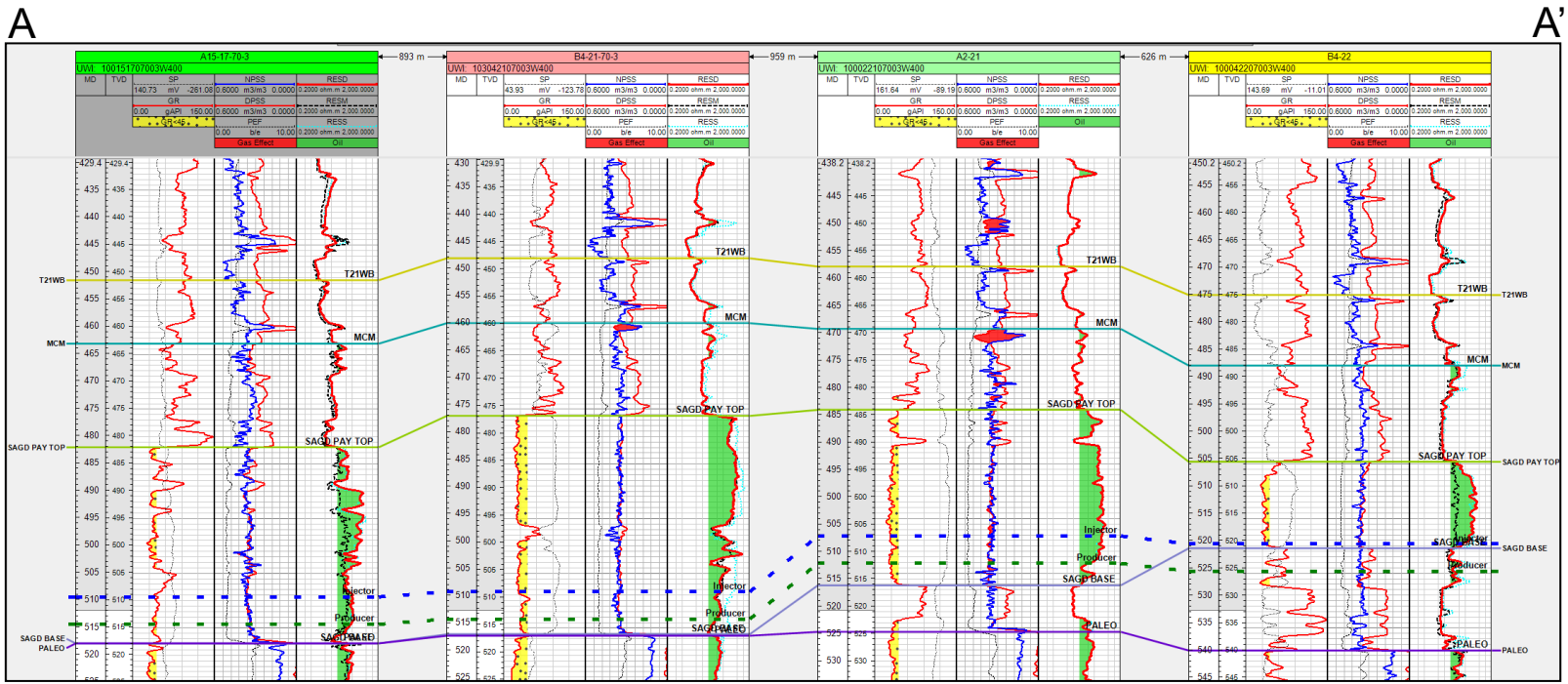
Representative structural cross-section over Central area



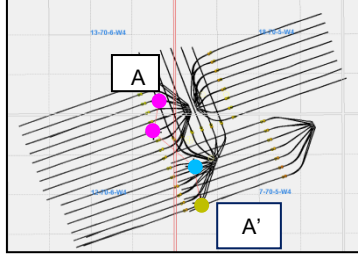


Representative structural cross-section over East area





Representative structural cross-section over West area



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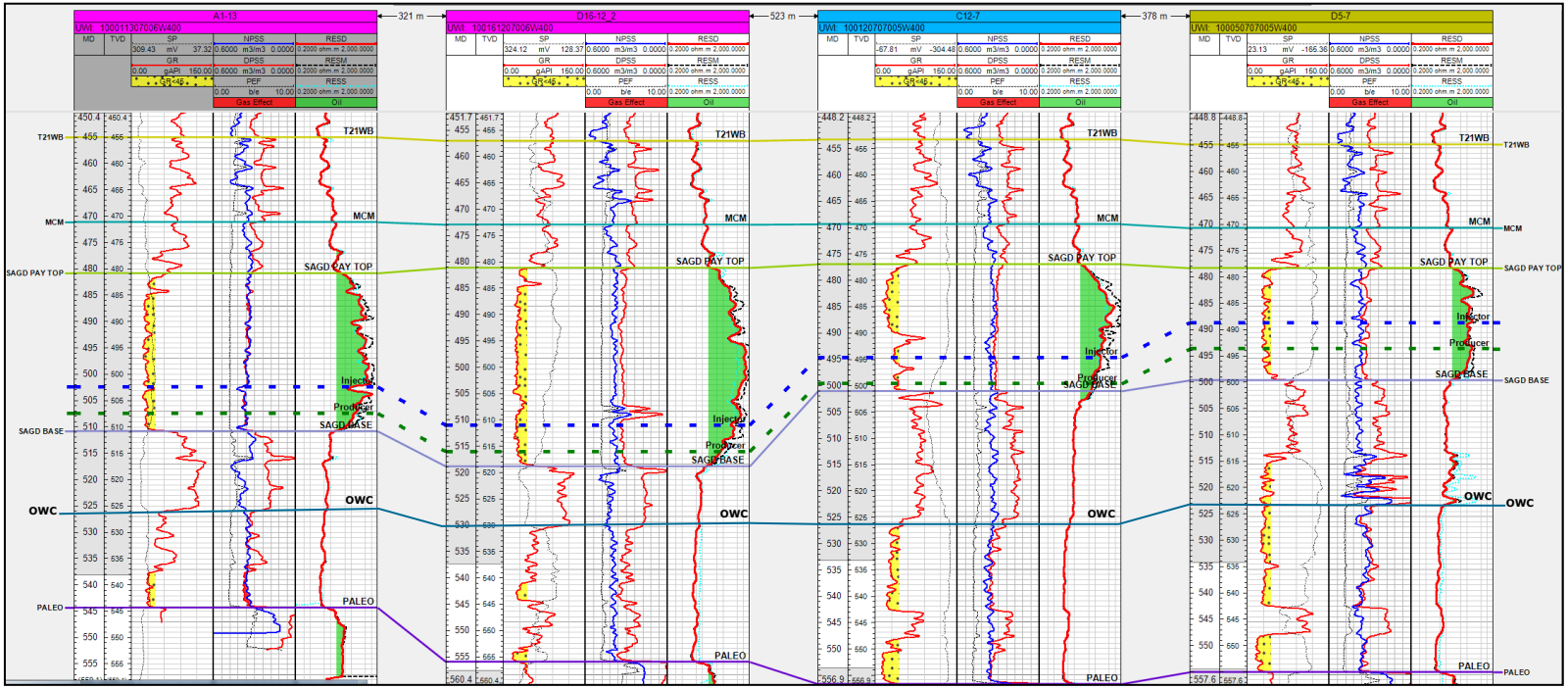


OBIP Volumes

- Project Area OBIP
  - 950 MMm^3
- Development Area OBIP
  - 619 MMm^3

- Combined Active Well Patterns OBIP
  - 262 MMm^3
- Cumulative% Recovery OBIP
  - 47%

Reservoir properties

Reservoir Characteristics	West Area	Central Area	East Area
Reservoir Depth (m subsea)	180 - 225	180 - 225	180 - 225
Average SAGD Pay Thickness (m)	Up to 30+	Up to 30+	Up to 30+
Porosity (%)	34%	34%	34%
Horizontal Permeability (D)	Up to 10	Up to 10	Up to 8
Vertical Permeability (D)	Up to 8	Up to 8	Up to 6
Oil Saturation (%)	~85%	~85%	~85%
Water Saturation (%)	~15%	~15%	~15%
Original Reservoir Pressure (kPa)	~2700	~2700	~2700
Original Reservoir Temperature (°C)	12°C	12°C	12°C

POIP & OBIP & percent recovery – Central

Central Pad	Area (m2)	Height (m)	Average Permeability (D)	Porosity (%)	So (%)	POIP (Mm3)	OBIP (Mm3)	Cum Oil (Mm3) to Dec 31, 2022	Recovery % POIP	Recovery % OBIP	Estimated Ultimate Recovery (Mm3)	Ultimate Recovery as % of POIP	Ultimate Recovery as % of OBIP
A PAD	531,100	22	5.5	35%	87%	4,131	4,310	3,686	89%	86%	3,784	92%	88%
B_L PAD	569,545	22	5.5	34%	87%	4,017	4,082	2,751	68%	67%	2,836	71%	69%
C PAD	541,344	24	5.5	36%	87%	4,738	4,949	4,520	95%	91%	4,638	98%	94%
D PAD	676,265	22	5.5	33%	88%	4,919	5,255	4,612	94%	88%	4,730	96%	90%
E_K PAD	576,442	19	5.5	34%	87%	3,860	4,071	3,106	80%	76%	3,201	83%	79%
EXP_M PAD	583,159	20	5.5	34%	86%	4,086	4,453	2,788	68%	63%	2,873	70%	65%
F PAD	817,054	19	5.5	33%	89%	5,963	6,160	4,076	68%	66%	4,202	70%	68%
G PAD	619,866	19	5.5	33%	88%	4,908	5,255	3,136	64%	60%	3,230	66%	61%
H PAD	121,557	16	5.5	34%	87%	641	675	249	39%	37%	257	40%	38%
J PAD	569,736	14	5.5	34%	88%	3,678	3,947	2,113	57%	54%	2,177	59%	55%
N PAD	423,299	10	5.5	33%	86%	1,681	1,981	655	39%	33%	675	40%	34%
W01 PAD	673,003	18	5.5	34%	87%	4,453	4,702	2,674	60%	57%	2,756	62%	59%
W02 PAD	376,851	14	5.5	34%	89%	1,896	1,964	840	44%	43%	866	46%	44%
Total Central	**7,079,220**					**48,972**	**51,804**	**35,207**	**72%**	**68%**	**36,224**	**74%**	**70%**
Total FC	**34,048,388**					**230,692**	**261,805**	**125,661**	**54%**	**48%**	**123,132**	**53%**	**47%**

**As of December 31st, 2022*

POIP & OBIP & percent recovery – North

North Pad	Area (m2)	Height (m)	Average Permeability (D)	Porosity (%)	So (%)	POIP (Mm3)	OBIP (Mm3)	Cum Oil (Mm3) to Dec 31, 2022	Recovery % POIP	Recovery % OBIP	Estimated Ultimate Recovery (Mm3)	Ultimate Recovery as % of POIP	Ultimate Recovery as % of OBIP
N11 PAD	881,883	10	5.5	33%	90%	4,154	4,966	95	2%	2%	99	2%	2%
Total North	**881,883**					**4,154**	**4,966**	**95**	**2%**	**2%**	**99**	**2%**	**2%**
Total FC	**34,048,388**					**230,692**	**261,805**	**125,661**	**54%**	**48%**	**123,132**	**53%**	**47%**

**As of December 31st, 2022*

POIP & OBIP & percent recovery – East

East Pad	Area (m2)	Height (m)	Average Permeability (D)	Porosity (%)	So (%)	POIP (Mm3)	OBIP (Mm3)	Cum Oil (Mm3) to Dec 31, 2022	Recovery % POIP	Recovery % OBIP	Estimated Ultimate Recovery (Mm3)	Ultimate Recovery as % of POIP	Ultimate Recovery as % of OBIP
E02 PAD	400,710	24	5.5	32%	83%	3,892	4,691	2,014	52%	43%	2,076	53%	44%
E03 PAD	455,394	23	5.5	31%	81%	3,856	5,360	1,919	50%	36%	1,977	51%	37%
E04 PAD	524,105	19	5.5	32%	83%	4,946	6,870	1,731	35%	25%	1,783	36%	26%
E07 PAD	532,122	6	5.5	28%	82%	1,651	2,793	402	24%	14%	415	25%	15%
E08 PAD EW	163,743	11	5.5	32%	83%	676	992	516	76%	52%	532	79%	54%
E08 PAD NS	484,928	16	5.5	33%	88%	3,104	3,823	1,594	51%	42%	1,642	53%	43%
E10 PAD	431,584	13	5.5	31%	82%	1,974	3,259	1,211	61%	37%	1,247	63%	38%
E11 PAD	715,946	22	5.5	32%	85%	5,466	7,701	3,703	68%	48%	3,815	70%	50%
E12 PAD EW	355,868	30	5.5	34%	89%	3,423	3,594	2,454	72%	68%	2,529	74%	70%
E12 PAD NS	534,198	27	5.5	35%	85%	4,993	6,059	3,444	69%	57%	3,548	71%	59%
E14 PAD	413,200	14	5.5	33%	88%	2,410	2,831	1,422	59%	50%	1,465	61%	52%
E15 PAD EW	613,225	15	5.5	34%	89%	3,297	3,848	2,483	75%	65%	2,557	78%	66%
E15 PAD NS	478,421	25	5.5	33%	89%	4,055	4,356	2,603	64%	60%	2,681	66%	62%
E16 PAD	540,038	25	5.5	34%	89%	4,076	4,338	3,096	76%	71%	3,188	78%	73%
E19 PAD EW	625,909	18	5.5	34%	90%	4,132	4,345	2,871	69%	66%	2,959	72%	68%
E19 PAD NS	509,920	22	5.5	34%	88%	3,584	3,900	3,101	87%	80%	3,192	89%	82%
E20 PAD	789,360	25	5.5	34%	89%	6,296	6,540	5,065	80%	77%	5,213	83%	80%
E21 PAD	794,403	13	5.5	33%	88%	4,505	4,947	2,661	59%	54%	2,742	61%	55%
E22 PAD	584,313	13	5.5	34%	88%	2,886	3,822	1,483	51%	39%	1,528	53%	40%
E24 PAD	924,647	23	5.5	34%	88%	7,257	7,965	5,384	74%	68%	5,545	76%	70%
E25 PAD	877,764	15	5.5	33%	86%	5,250	6,166	3,187	61%	52%	3,284	63%	53%
E26 PAD	1,189,582	15	5.5	33%	85%	5,968	7,230	2,681	45%	37%	2,763	46%	38%
E42 PAD	348,633	11	5.5	31%	86%	1,411	2,059	980	69%	48%	1,011	72%	49%
Total East	**13,288,012**					**89,108**	**107,489**	**56,008**	**63%**	**52%**	**51,443**	**58%**	**48%**
Total FC	**34,048,388**					**230,692**	**261,805**	**125,661**	**54%**	**48%**	**123,132**	**53%**	**47%**

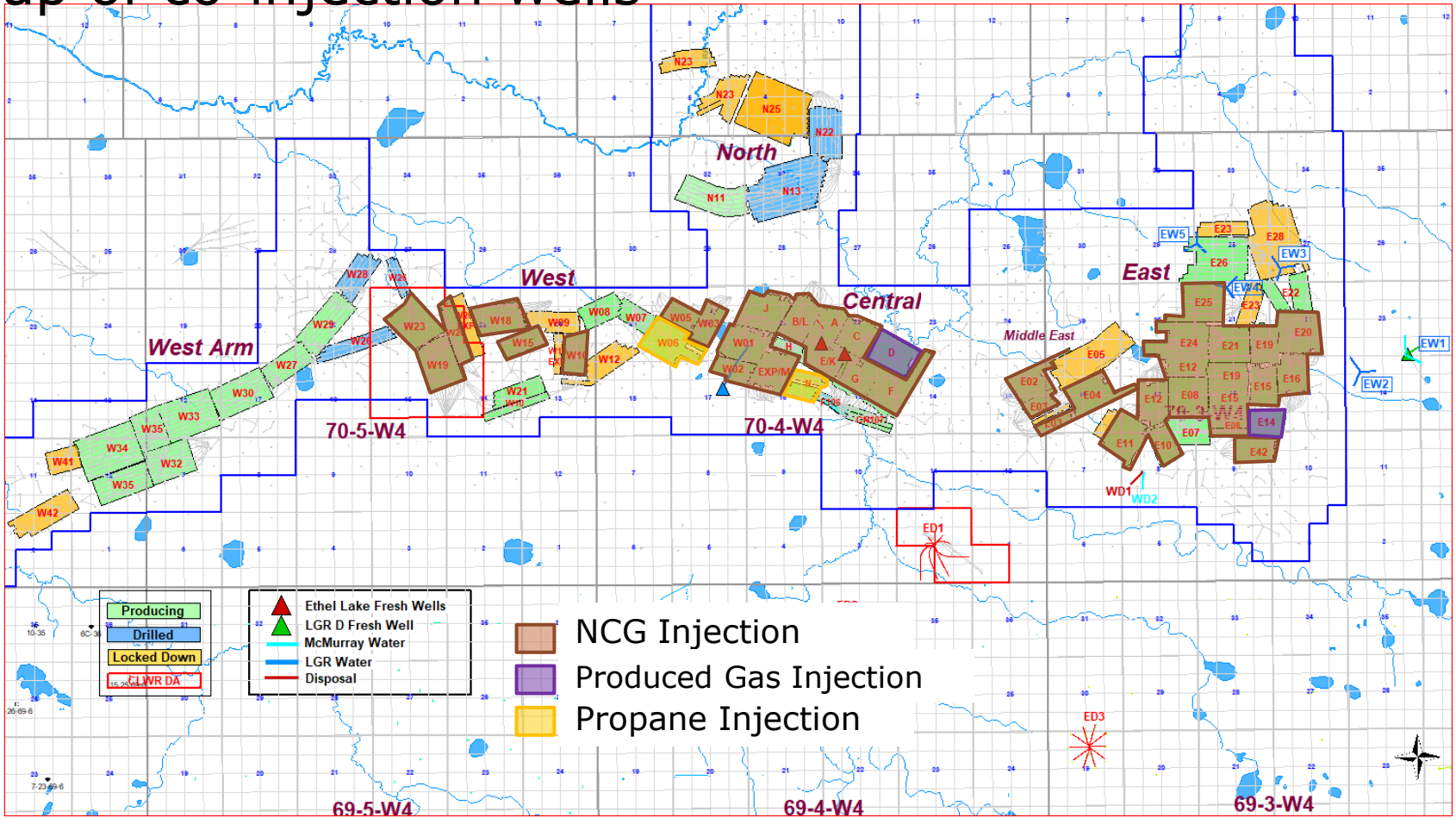
**As of December 31st, 2022*

POIP & OBIP & percent recovery – West

West 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 (Mm3)	Ultimate Recovery as % of POIP	Ultimate Recovery as % of OBIP
W03 PAD	425,325	11	5.5	33%	87%	1,949	2,696	963	49%	36%	978	50%	36%
W05 PAD	341,146	8	5.5	30%	86%	1,353	2,623	496	37%	19%	557	41%	21%
W06 PAD	762,639	18	5.5	32%	88%	4,657	5,048	2,004	43%	40%	2,040	44%	40%
W07 PAD	337,372	29	5.5	33%	85%	3,109	3,261	1,176	38%	36%	1,229	40%	38%
W08 PAD	437,329	22	5.5	32%	88%	3,274	3,510	1,742	53%	50%	1,823	56%	52%
W10 PAD	464,355	16	5.5	33%	88%	2,999	3,293	1,872	62%	57%	1,912	64%	58%
W15 PAD	379,950	12	5.5	33%	89%	2,190	2,562	1,307	60%	51%	1,416	65%	55%
W18 PAD	691,116	20	5.5	34%	89%	5,077	5,761	3,619	71%	63%	3,740	74%	65%
W19 PAD	809,984	21	5.5	34%	90%	6,768	7,293	3,988	59%	55%	4,030	60%	55%
W20 PAD	426,744	16	5.5	33%	89%	3,236	3,640	1,358	42%	37%	1,396	43%	38%
W21 PAD	704,560	16	5.5	34%	90%	4,623	5,469	2,064	45%	38%	2,188	47%	40%
W23 PAD	789,579	23	5.5	33%	90%	6,009	6,367	4,056	67%	64%	4,097	68%	64%
W27 PAD	566,098	15	5.5	34%	90%	3,377	3,621	1,330	39%	37%	1,336	40%	37%
W29 PAD	828,239	15	5.5	35%	88%	5,553	6,773	179	3%	3%	224	4%	3%
W30 PAD	816,182	13	5.5	34%	90%	4,142	4,434	1,509	36%	34%	1,513	37%	34%
W32 PAD	705,335	15	5.5	33%	90%	4,084	4,416	130	3%	3%	178	4%	4%
W33 PAD	950,787	21	5.5	35%	90%	7,384	7,603	1,570	21%	21%	1,663	23%	22%
W34 PAD	1,160,643	27	5.5	34%	91%	10,874	11,048	3,070	28%	28%	3,084	28%	28%
W35 PAD EW	668,110	15	5.5	33%	90%	3,478	3,600	449	13%	12%	494	14%	14%
W35 PAD NS	533,779	23	5.5	33%	90%	4,322	4,530	1,469	34%	32%	1,469	34%	32%
Total West	**12,799,274**					**88,458**	**97,547**	**34,351**	**39%**	**35%**	**35,367**	**40%**	**36%**
Total FC	**34,048,388**					**230,692**	**261,805**	**125,661**	**54%**	**48%**	**123,132**	**53%**	**47%**

**As of December 31st, 2022*

Map of co-injection wells



Injected fluids

Non-condensable gas:

- 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)
- Some pads receive NCG injection support from neighboring coalesced pads
- NCG injection and injection support on A, C, F, G, J, M_Exp, B/L, E/K, E02, E03, E04, E08, E10, E11, E12, E15, E16, E19, E20, E21, E24, E25, E42, W01, W02, W03, W05, W06, W10, W15, W18, W19, W20, W23
- No measurable impacts observed to the aquifer

Produced gas Injection

- PG is currently injected on D Pad and E14 pad at 100% gas mol fraction

Stimulation treatments

- Wells are occasionally treated with HCl and/or Thermosolv to minimize skin

Solvent

- Have used solvent in start-up work-overs and have approval to use this as a potential start-up process
- N pad propane (3 to 10 wt%) SAP pilot
- W06 pad propane (60 – 80 wt%) co-injection pilot

*Based on current approval of 100 t/d min steam and 75 e^3m^3/d max gas injection per injector well on pad average basis during co-injection.

Injection Strategy and Impacts

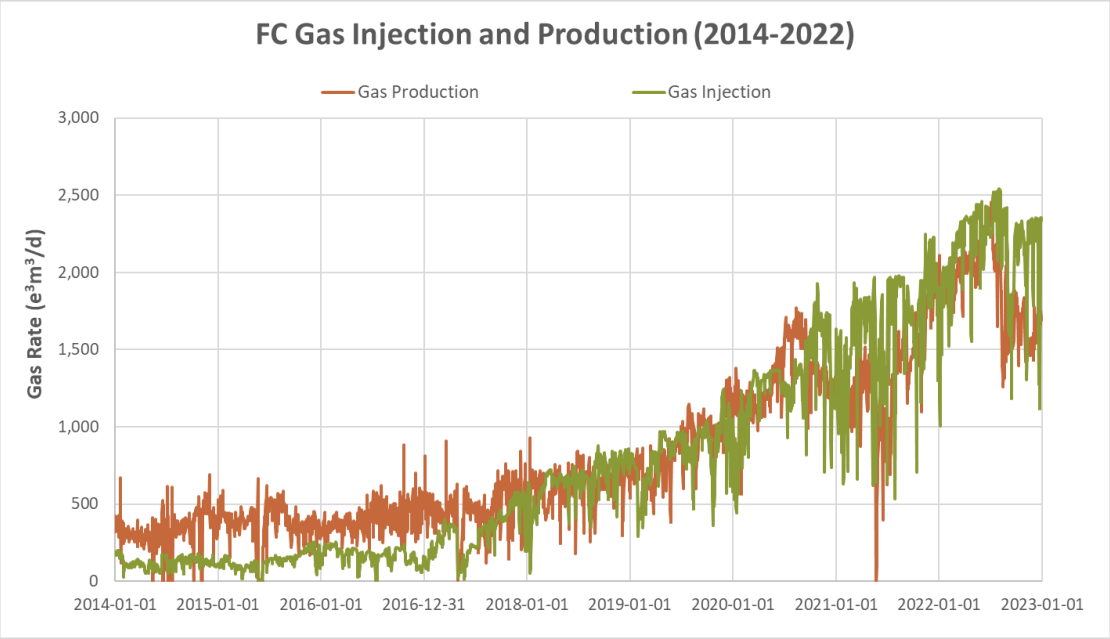
NCG Injection commencement is based on:

- 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.



Co-injection Impact to Wellbore Integrity

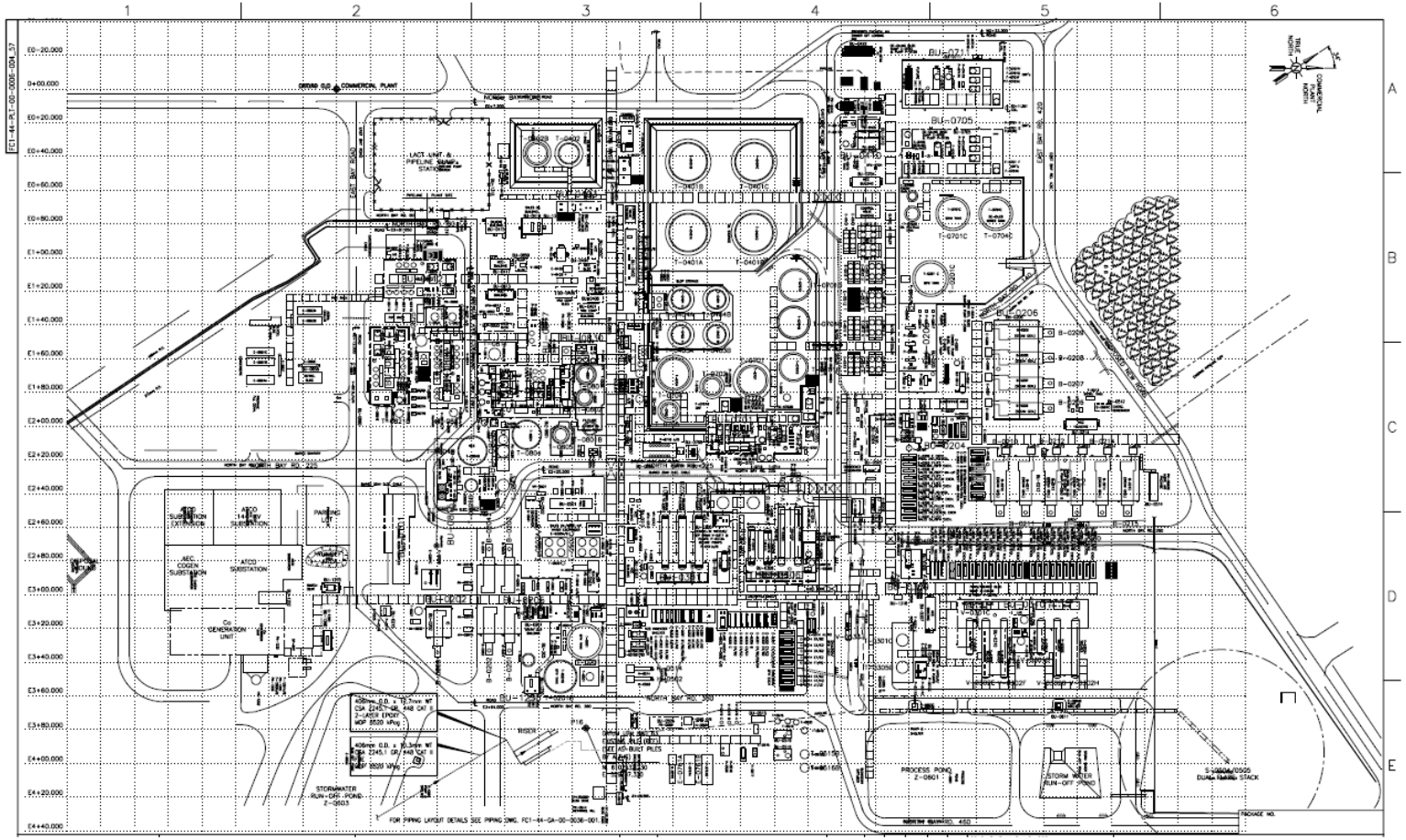
To date, no impacts of co-injection on wellbore integrity and aquifer have been seen:

- Well Integrity Management Program (WIM, refer to slide 40) supports the monitoring of co-injection wells and manages the mitigation of near surface casing corrosion.
- Corrosion rate of the co-injection wells are evaluated with casing age and operating condition.

Subsection 4.3 8
Surface

cenovus
ENERGY

Foster Creek A/E Plot Plan



**A high-resolution drawing has been included as an attachment (FC1-44-PLT-00-0006-004)*

Foster Creek F/G/H Plot Plan

**A high-resolution drawing has been included as an attachment (FC3-44-SK-00-003-01)*

Brackish Source Wells

Source LGR Wells:

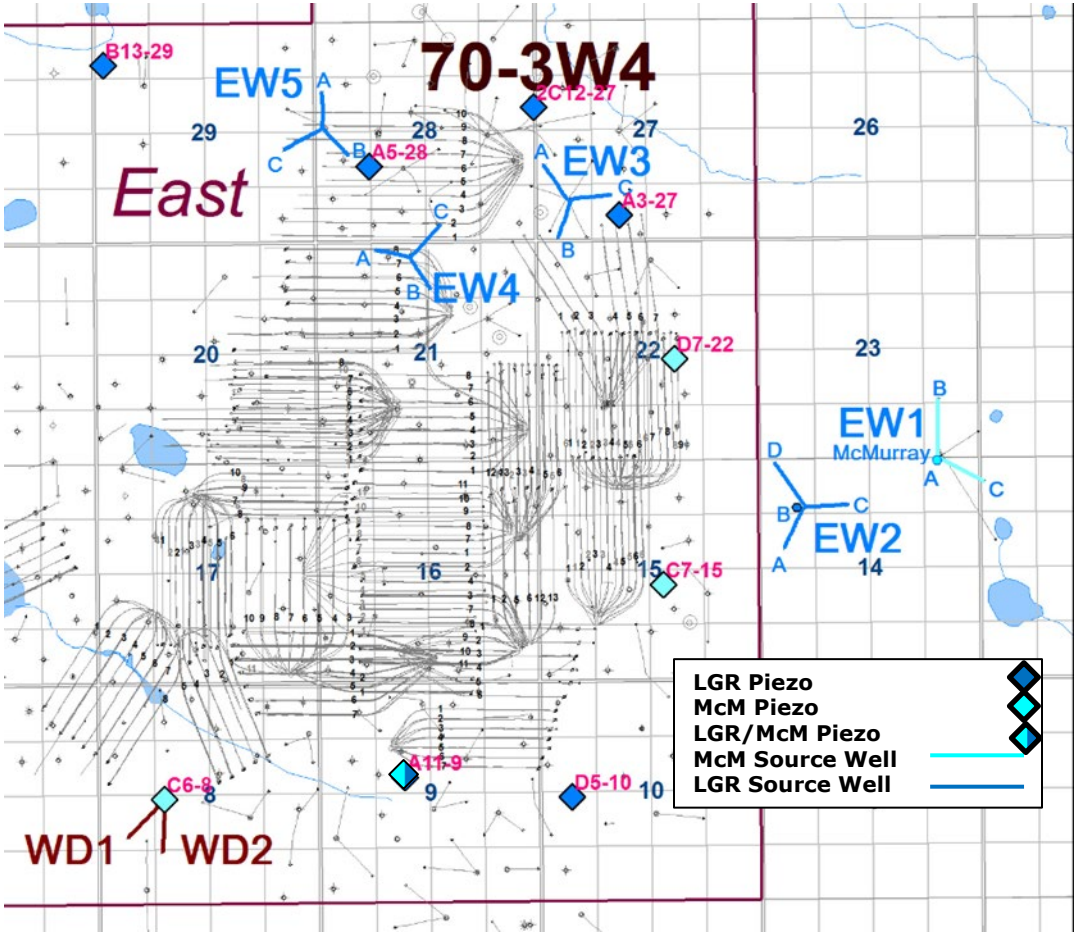
EW2-A	1F1/12-14-070-03W4
EW2-C	1F1/14-14-070-03W4
EW2-D	1F2/13-14-070-03W4
EW3-A	1F1/05-27-070-03W4
EW3-B	1F1/04-27-070-03W4
EW3-C	1F2/03-27-070-03W4
EW4-A	1F1/14-21-070-03W4
EW4-B	1F1/15-21-070-03W4
EW4-C	1F1/02-28-070-03W4
EW5-A	1F2/12-28-070-03W4
EW5-B	1F1/05-28-070-03W4
EW5-C	1F2/08-29-070-03W4

Source McM Wells:

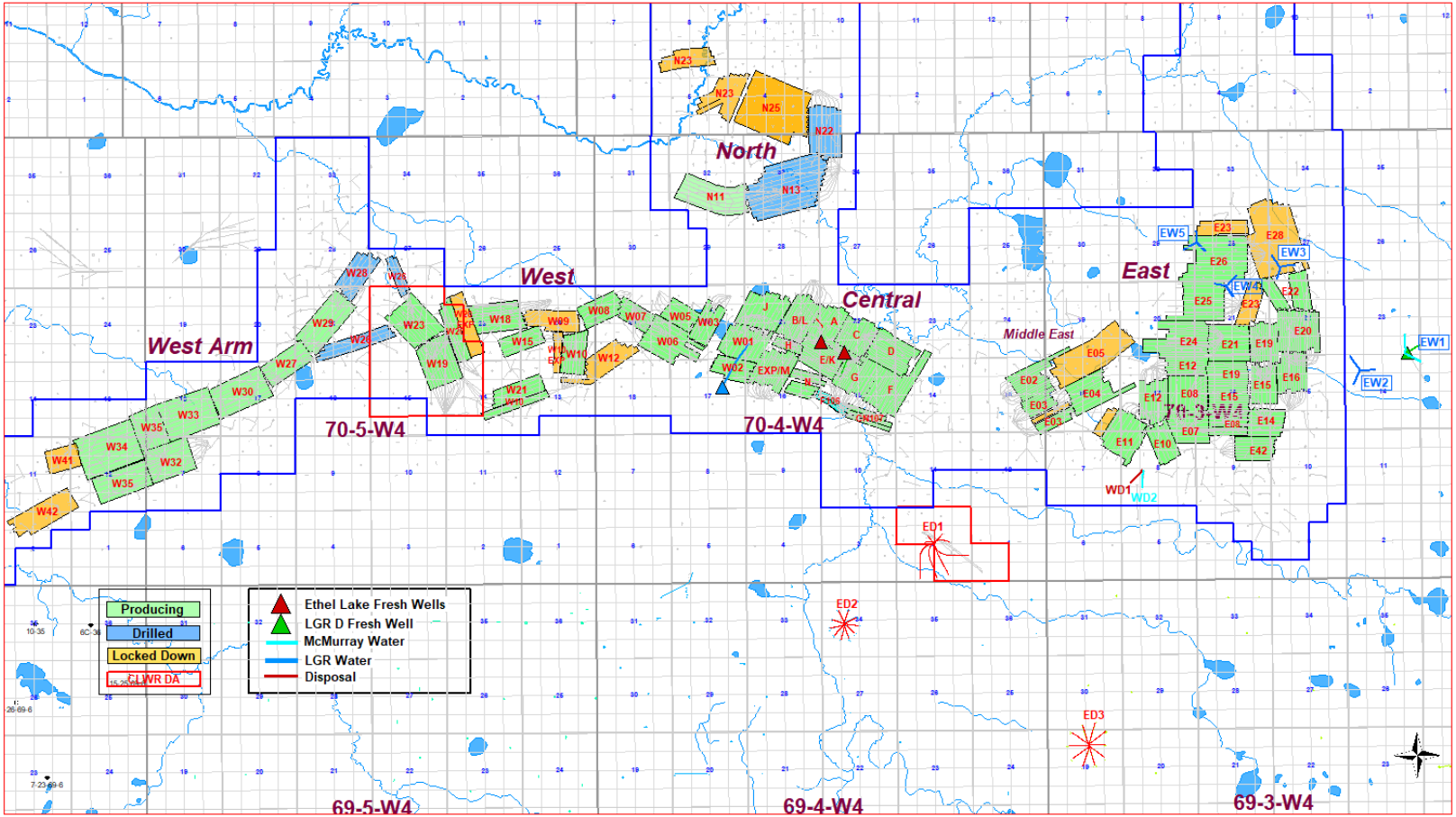
EW1-A	1F2/01-23-070-03W4
EW1-B	1F1/08-23-070-03W4
EW1-C	1F1/13-13-070-03W4
EW2-B Redrill	1F1/13-14-070-03W4/02

Pressure Sink Wells:

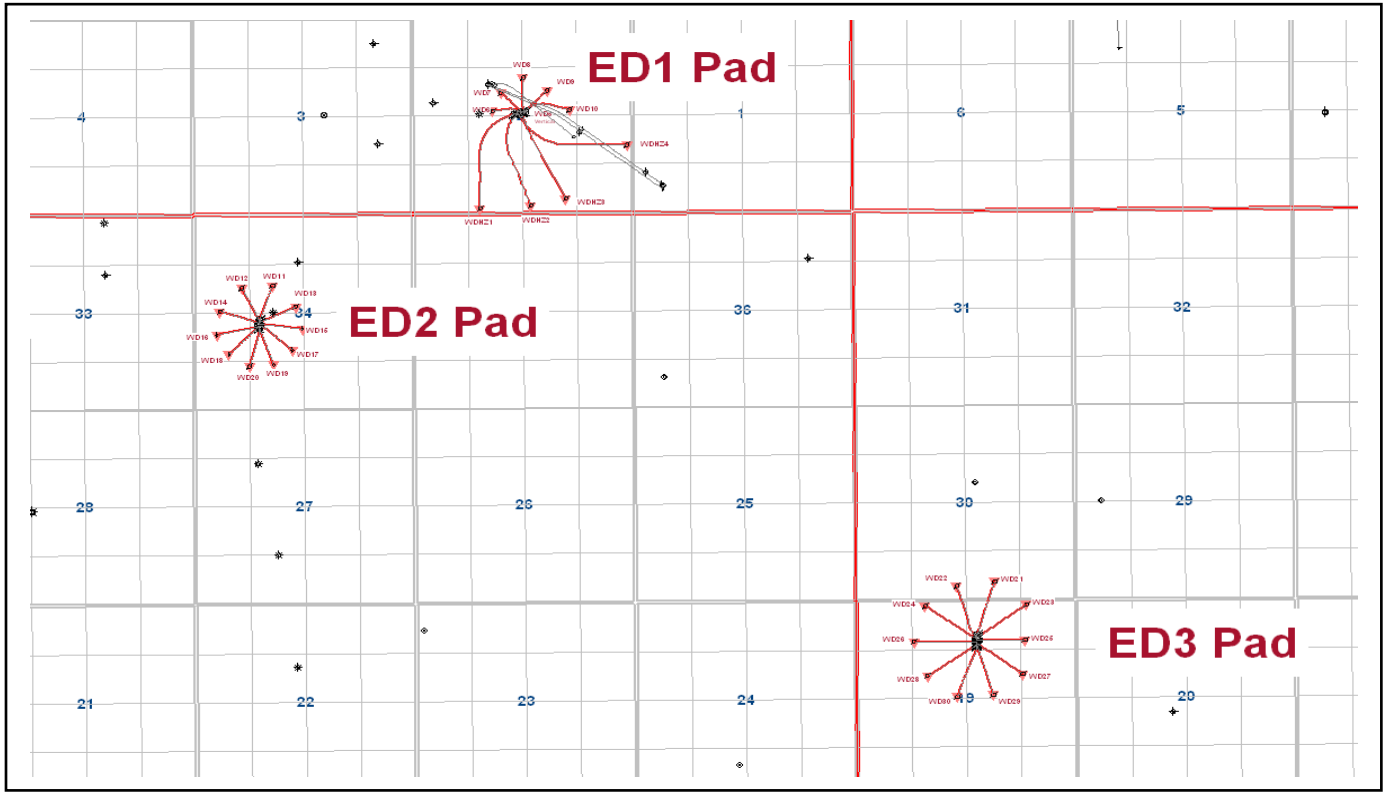
WD1 (LGR Disposal)	100/05-08-070-03W4
WD2 (McM Source)	1F1/03-08-070-03W4



Location of Fresh Source Wells



Current Disposal Well Locations



Legend

Disposal Wells:

ED1 Pad:

WDHZ 1 – 100/03-02-070-04W4 (McM)
WDHZ 4 – 100/08-02-070-04W4 (McM)
WD6 – 104/11-02-070-03W4 (McM)
WD10 – 103/10-02-070-03W4 (McM)

ED2 Pad (McMurray):

WD11 – 102/11-34-069-04W4
WD12 – 100/12-34-069-04W4
WD13 – 103/11-34-069-04W4
WD14 – 102/12-34-069-04W4
WD15 – 100/06-34-069-04W4
WD16 – 100/05-34-069-04W4
WD17 – 102/06-34-069-04W4
WD18 – 102/05-34-069-04W4
WD19 – 100/03-34-069-04W4
WD20 – 100/04-34-069-04W4

ED3 Pad (McMurray):

WD21 – 100/02-30-069-03W4
WD22 – 100/03-30-069-03W4
WD23 – 100/16-19-069-03W4
WD24 – 100/14-19-069-03W4
WD25 – 100/16-19-069-03W4
WD26 – 102/14-19-069-03W4
WD27 – 100/09-19-069-03W4
WD28 – 100/11-19-069-03W4
WD29 – 100/10-19-069-03W4
WD30 – 102/11-19-069-03W4

Suspended Wells:

WDHZ 2 – 100/02-02-070-04W4 (LGR)
WDHZ 3 – 102/02-02-070-04W4 (LGR)
WD9 – 102/10-02-070-03W4 (LGR)

Zone Abandoned Wells:

WD7 – 105/11-02-070-03W4 (LGR)
WD8 – 104/10-02-070-03W4 (LGR)

Abandoned Disposal well:

WD5 – 103/11-02-070-03W4

Facility Summary

- Submitted (and received approval) for Foster Creek amine claus application

Plant Performance

Steam

- System capacity at 77,400 Sm^3/d
- Calendar year 2022 average flowrate is 72,839 Sm^3/d | 94.1% of Capacity
- Continued operation at high steam qualities

Oil

- System capacity at 34,818 Sm^3/d (219,000 bbl/d)
- Calendar year 2022 average flowrate is 30,377 Sm^3/d (191,066 bbl/d) | 87.2% of Capacity

Subsection 4.4 9-12 Historical and Upcoming Activity

cenovus ENERGY

Pad Abandonments

- No pad abandonments are currently planned at Foster Creek in the next 5 years.

Well integrity - casing

Well Integrity Management (WIM) Program:

- Ongoing monitoring and inspection program to assess casing condition and repair as required, including EMAT and UT of surface casing depending on severity
- Cenovus complies with all regulations surrounding inactive wells, including tracking compliance status and reporting well suspensions in the DDS system
- Pursuing application and viability of Potassium Silicate coating on surface casing to prevent and/or slow down corrosion

Casing Corrosion

Corrosion Location	Status
Surface Casing Exterior	Mitigation program in place
Surface Casing Interior / Intermediate Casing Exterior	Mitigation program in place
Pack-Off	Investigation on-going

Well Integrity - SCVF

- Cenovus complies with all regulations and when a surface casing vent flow is identified, Cenovus reports non-serious and serious surface casing vent flows into the DDS system per ID 2003-01
- Cenovus engages with the AER to discuss appropriate strategies related to managing SCVFs
- Cenovus communicates with the AER regularly on the status of the vents and presents an annual update on activities executed to manage surface casing vent flows
- Cenovus is currently tracking 55 separate SCVF events across FCCL which have been reported. In 2022, 10 new wells have been recorded at FC

Well Integrity - Wellheads

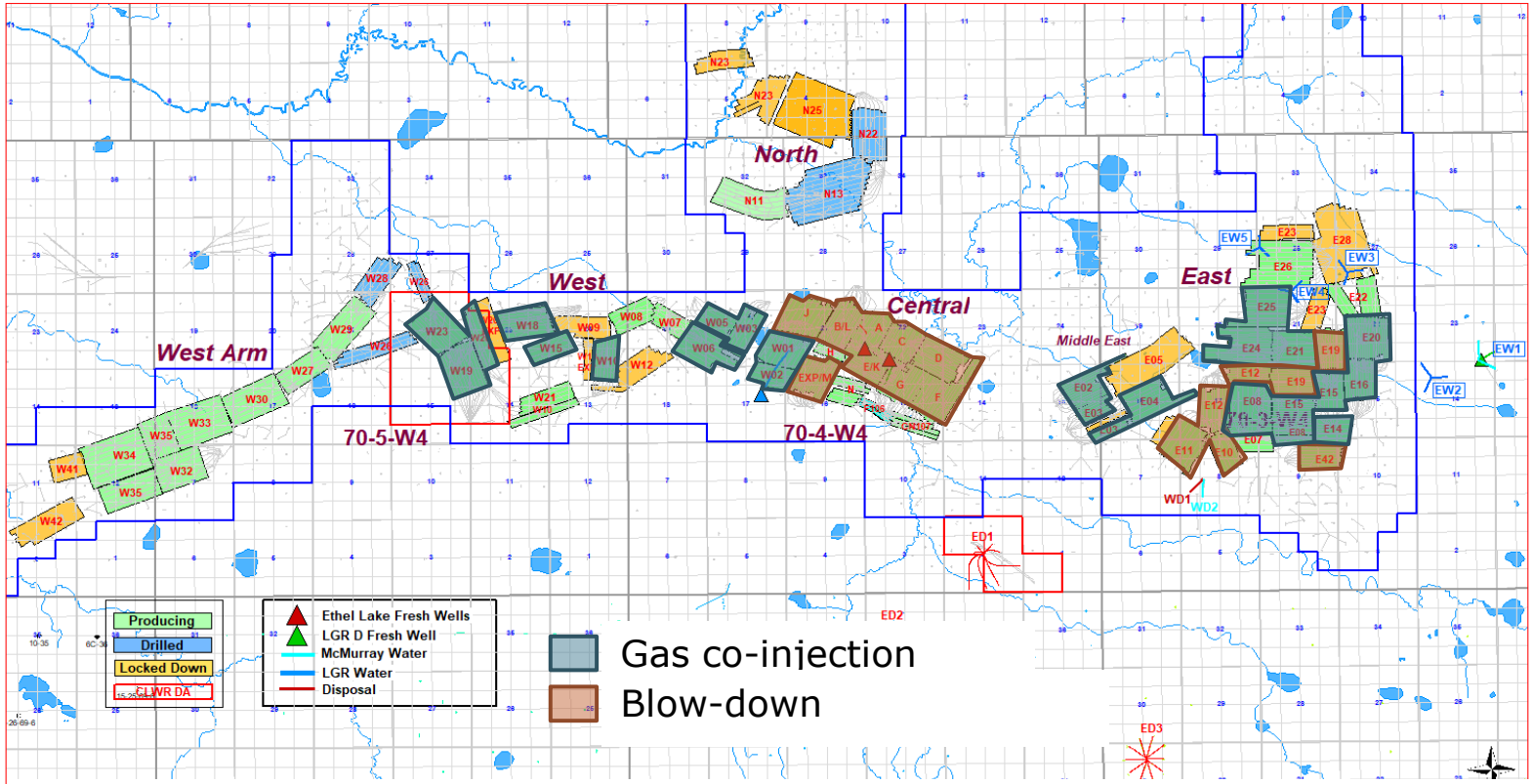
- Wellhead integrity monitoring is ongoing. No wellhead failures observed

Well integrity – strain monitoring

Strain monitoring wells installed:

- Baseline data in non-thermally affected zones and in lateral sections
  - 102/03-23-070-05W4/00 (FC W20 Pad)
  - 102/05-23-070-05W4/00 (FC W20 Pad)
  - 100/05-28-070-03W4/00 (FC E26 Pad)
  - 100/14-14-070-05W4/00 (FC W20 Pad)
  - 104/03-18-070-05W4/00 (FC W33 Pad)
  - 106/13-07-070-05W4/00 (FC W32/35 Pad)
  - 1AB/02-32-070-04W4/00 (FC North)
- Field measurements scheduled relative to milestone dates

Well patterns with active gas injection: Status as of January 1, 2023



*J, EXP/M, E08, E10, E21, E24, W02, W03 and W20 pad co-injection supported by offset well pads

2022 OSCA application/approval summary

Act	Application No.	Application Description	Approval Date
OSCA	1935417	East Casing Gas Re-Injection Rate Increase Application	2022-01-18 (Category 1)
OSCA	1934967/ 1935384	N Pad P04-1 Well Pair Addition Application E04 Pad P01-1 Well Pair Addition Application	2022-01-21
OSCA	1935531	E02 and N Pad Well Pair Addition Application	2022-02-28
OSCA	1936180	N11 Pad Temporary MOP Increase Application	2022-05-19
OSCA	1937728	N22, N27, N28 and N29 Pads Trajectory Update Application	2022-06-22
OSCA	1938521	W32, W33, W34, W35 Pads Test Separator Variance	2022-07-20 (Category 1)
OSCA	1936441	W19/23 Pads Clearwater Co-injection Trial Application	2022-08-15
OSCA	1939024	E05 Pad Trajectory Update Application	2022-08-31
OSCA	1938903	Orifice Plate Inspection Modification Application	2022-09-06 (Category 1)
OSCA	1939455	Allowable Multiphase Flow Meter Request Application	2022-10-24 (Category 1)

2022 OSCA/EPEA application/approval summary

Act	Application No.	Application Description	Approval Date
EPEA	038-68492	Predictive Emissions Monitoring System Application (B-0206)	2022-04-14
EPEA	037-68492	EPEA Renewal Application	2022-09-20
OSCA/ EPEA	1935331/ 039-68492	North Project Area Extension Application	2022-12-15
OSCA/ EPEA	1939500/ 042-68492	Sulphur Recovery Unit Application	2023-02-10
OSCA	1939818	W03 Pad Trajectory Extension Application	2022-11-16 (Category 1)
OSCA	1940883	Temporary MOP Increase Application (N13, N22, N23 and N25 Pads)	2022-12-13

Facility Modifications

De-oiling

- Adding a temporary Compact Flotation Unit (CFU) that will allow major maintenance activity on 2 of FC's deoiling trains in 2023

Facility performance

Process Treating Area

- Facility performed exceptionally in 2022
- Facility focuses on opex reduction and diluent optimization in 2022

De-oiling

- Focus in 2022 was debottlenecking the deoiling trains to allow for major tank maintenance in 2023
- Relocating Compact Flotation Unit in FC1 to assist with lost deoiling capacity that will allow major maintenance activity on existing Skim and Deoiling tanks scheduled for 2023

Facility performance

Water Treatment

- Brackish pipeline failure (corrosion) and resulting repairs impacted FC3 WLS performance
- Extended outage to repair warm lime softener FC1-T-0804 for Regulatory inspection and repairs to corrosion issues

Steam Generation

- Significant downtime on FC1 steam generators for mechanical repairs (economizer) and HRSG Regulatory activity
- Reduced steam production due to FC1 de-oiled water tank roof repair

Facility performance

Utilities

- NRSU outage in Q4 to complete modifications and repairs
- NRSU modifications showing reductions in chemical carry-over and improved chemical efficiency

Pilots/technical innovations

No pilots proposed in 2022

2022 Non-compliance Summary

Date	Non-compliance	Follow-up
2022-02-09	EDGE Ref# 0387792. NOx exceedance on COGEN 1 and COGEN 2 due to islanding during a power grid isolation breaker trip (lean/lean firing).	Breaker closed and normal cogen operations re-commenced.
2022-04-02	EDGE Ref# 0389434. E26 Pad surface water discharged with pH below EPEA approval limit (6.0-9.5).	pH recorded believed to be a clerical error. Reviewed discharge processes and training with contractors.
2022-05-03	EDGE Ref# 0390157. Stormwater from North Storm Pond was released off-site without daily testing being performed from April 27 to May 3.	Stormwater testing procedures reviewed with Operations.
2022-05-06	EDGE Ref# 0390886. E10 Pad surface water discharged with undocumented pH analysis on second day of pumping.	Site wide advisory provided on pump-off procedures. Additional training provided to contractors.
2022-05-22	EDGE Ref# 0400377. FC3-B-0205 CEMS uptime contravention due to failed Cylinder Gas Audit (CGA).	Analyzer recalibrated, subsequent CGA passed.
2022-06-17	EDGE Ref# 0400452. Stormwater from North Storm Pond was released off-site without daily testing being conducted on June 17.	Procedures updated to ensure daily samples are taken for multiple day pump-offs.
2022-08-12	EDGE Ref# 0402603. Unauthorized air emission release due to hole in de-oiled water tank FC1-T-0704C.	Tank was isolated and tank roof repaired.
2022-09-22	EDGE Ref# 0404132. FC1-B-0210 CEMS uptime contravention due to failed Cylinder Gas Audit (CGA).	Analyzer recalibrated, subsequent CGA passed.

Future plans

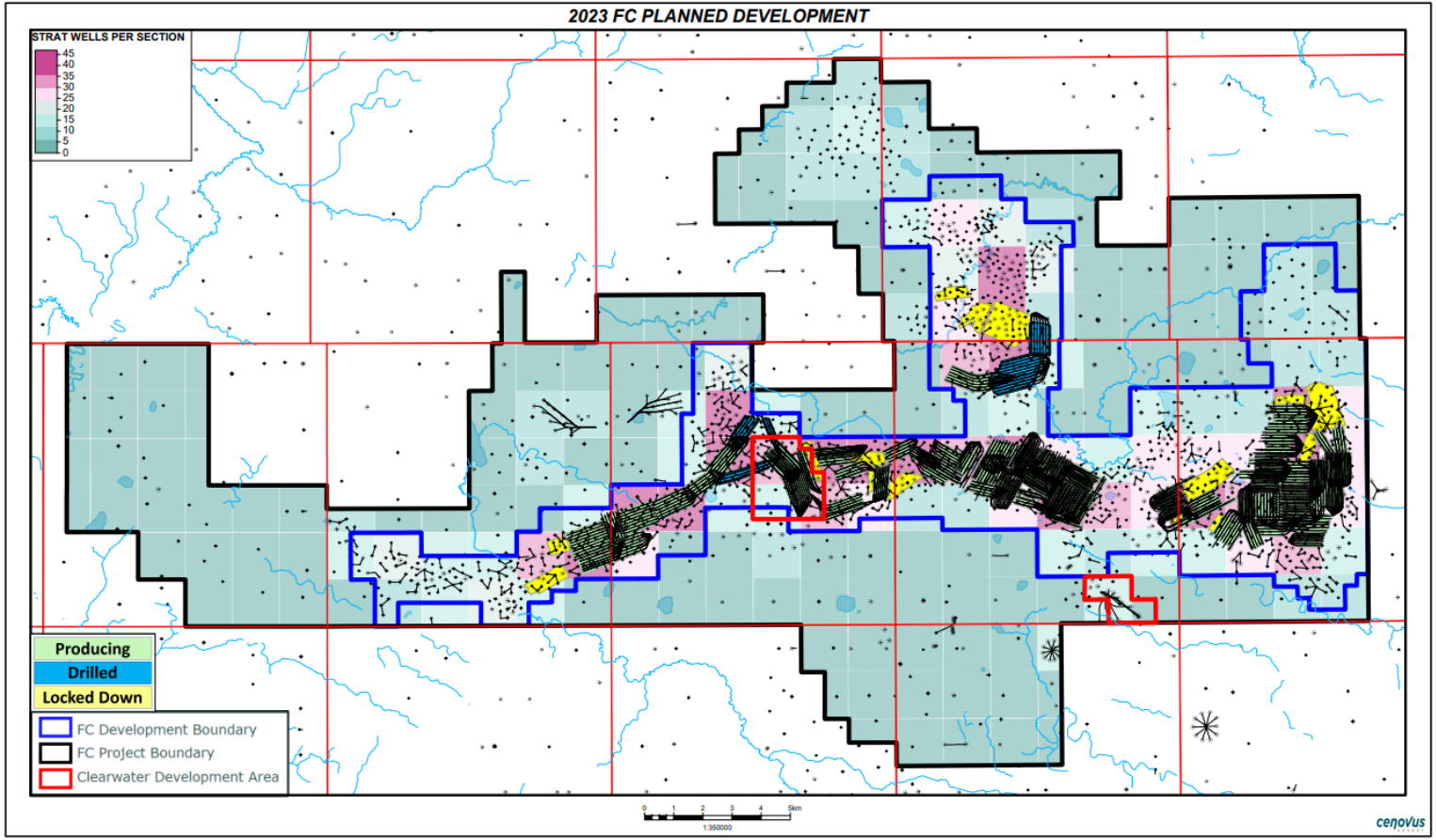
Potential Future Applications

- Clearwater development
- North area well pad amendment

Future Plant Activity

- Oil Debottlenecking (Phase H)
- Improving water cycle efficiency
- Conversion of remaining NRSU train to counter-current operation
- Amine-claus facility construction

Planned development map



Questions

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