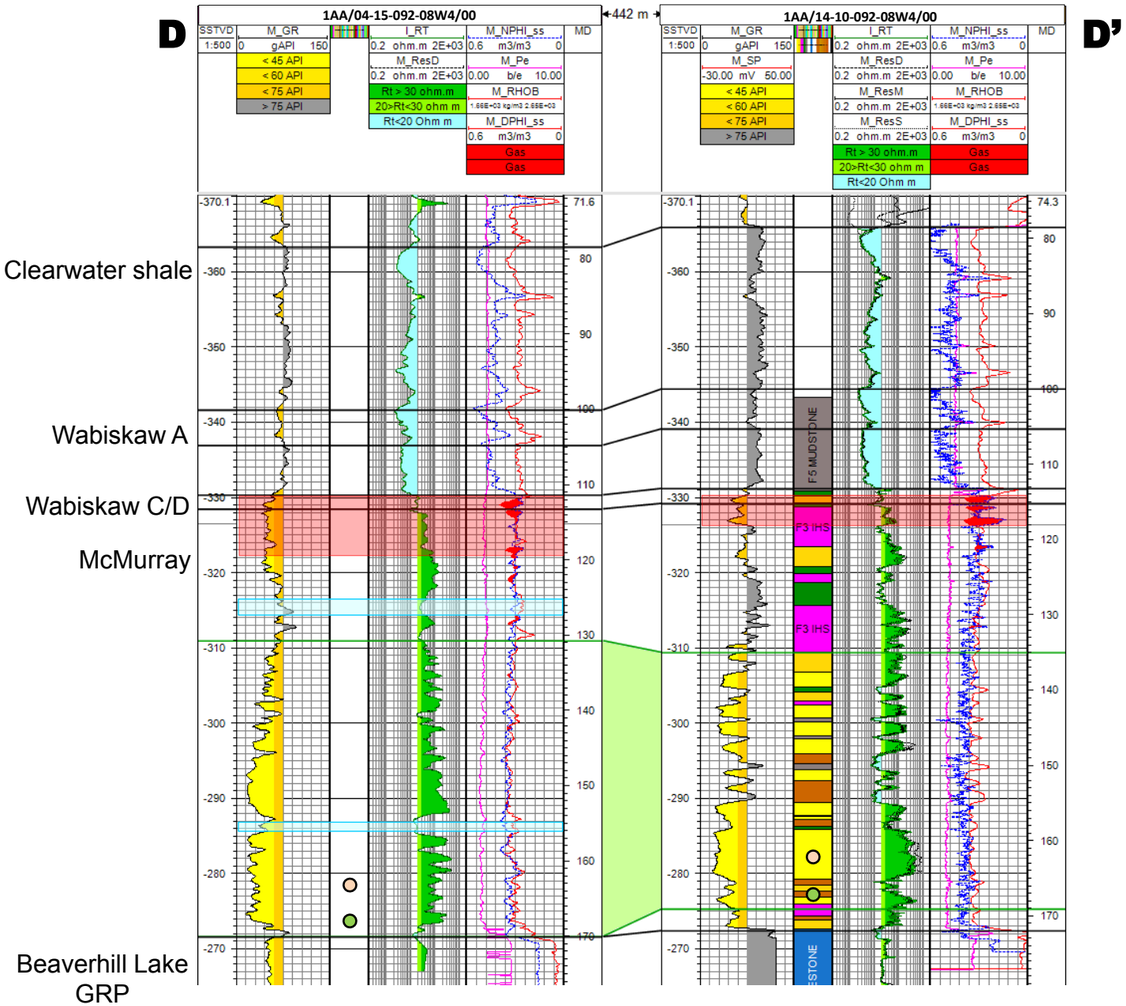
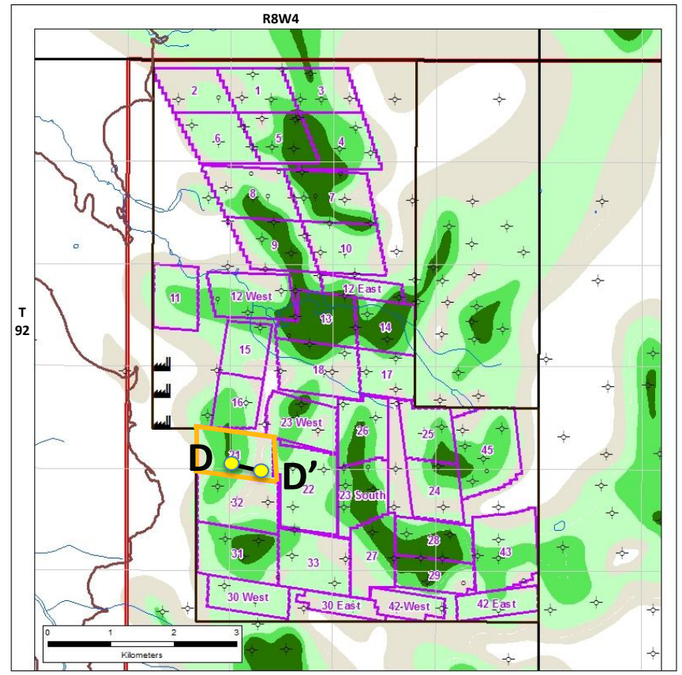
Attachment DAE 4

Structural Cross Sections for Drainage Patterns in the Expanded Development Area (Pads 21 to 45)





Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 21
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**65**	
Average Net Pay m	**35**	
Net/Gross %	**63**	
Porosity %	**32**	
HC Saturation %	**82**	
IVIPDB	**e6 m3 5.90**	**e6 BLS 37**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 21

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 21

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Fig: Drainage Pattern 21

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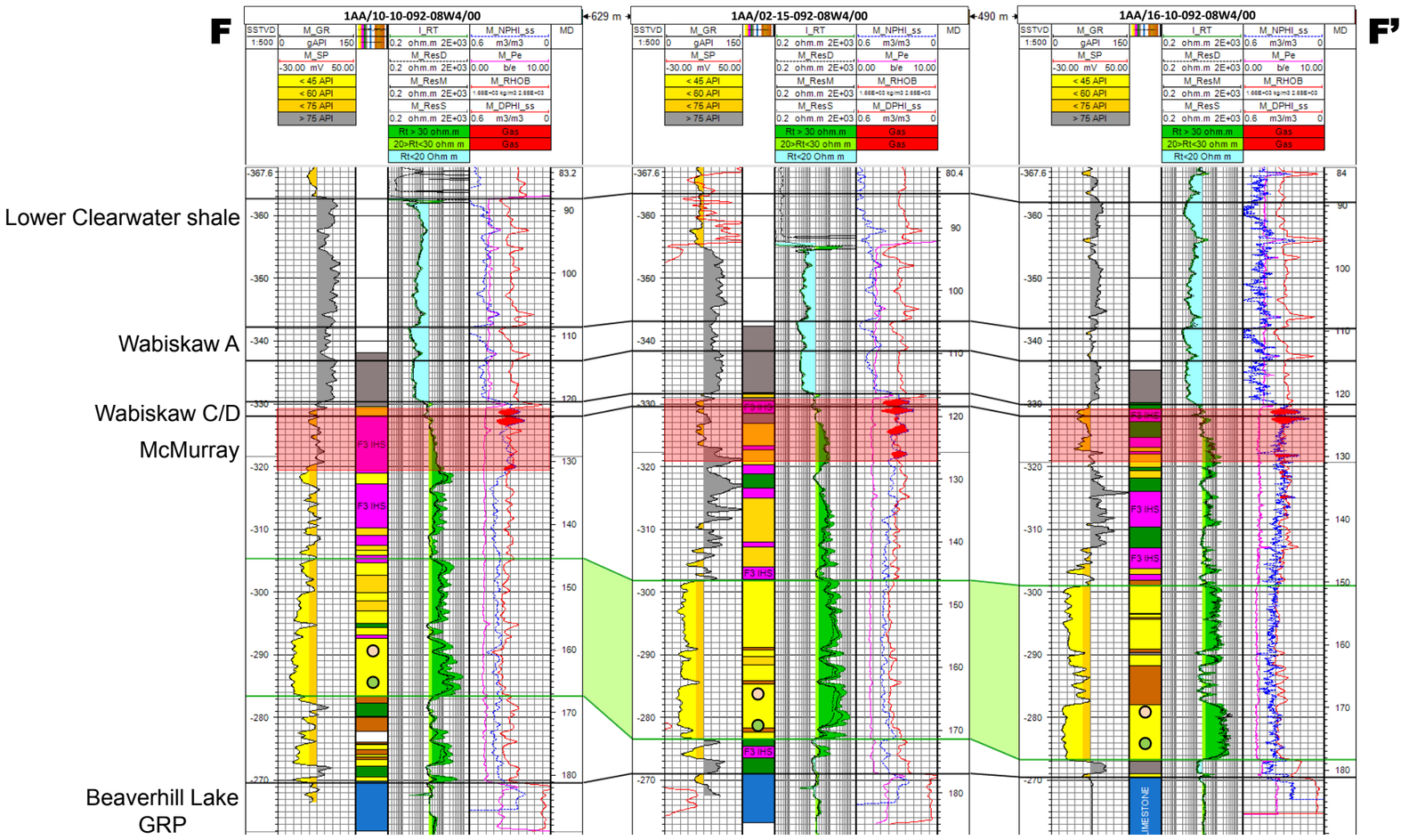

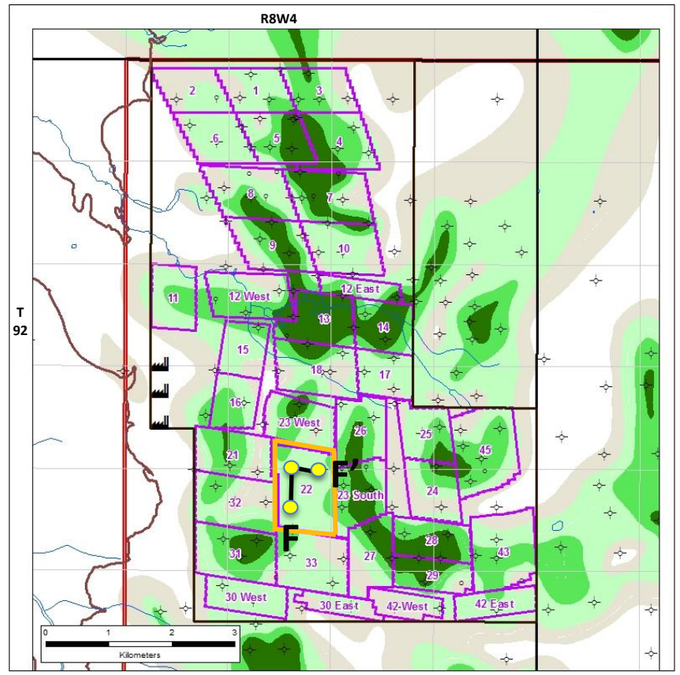

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 22
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	111	
Average Net Pay m	29	
Net/Gross %	59	
Porosity %	33	
HC Saturation %	81	
IVIPDB	e6 m3 8.59	e6 BLS 54

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 22

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 22

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Fig: Drainage Pattern 22

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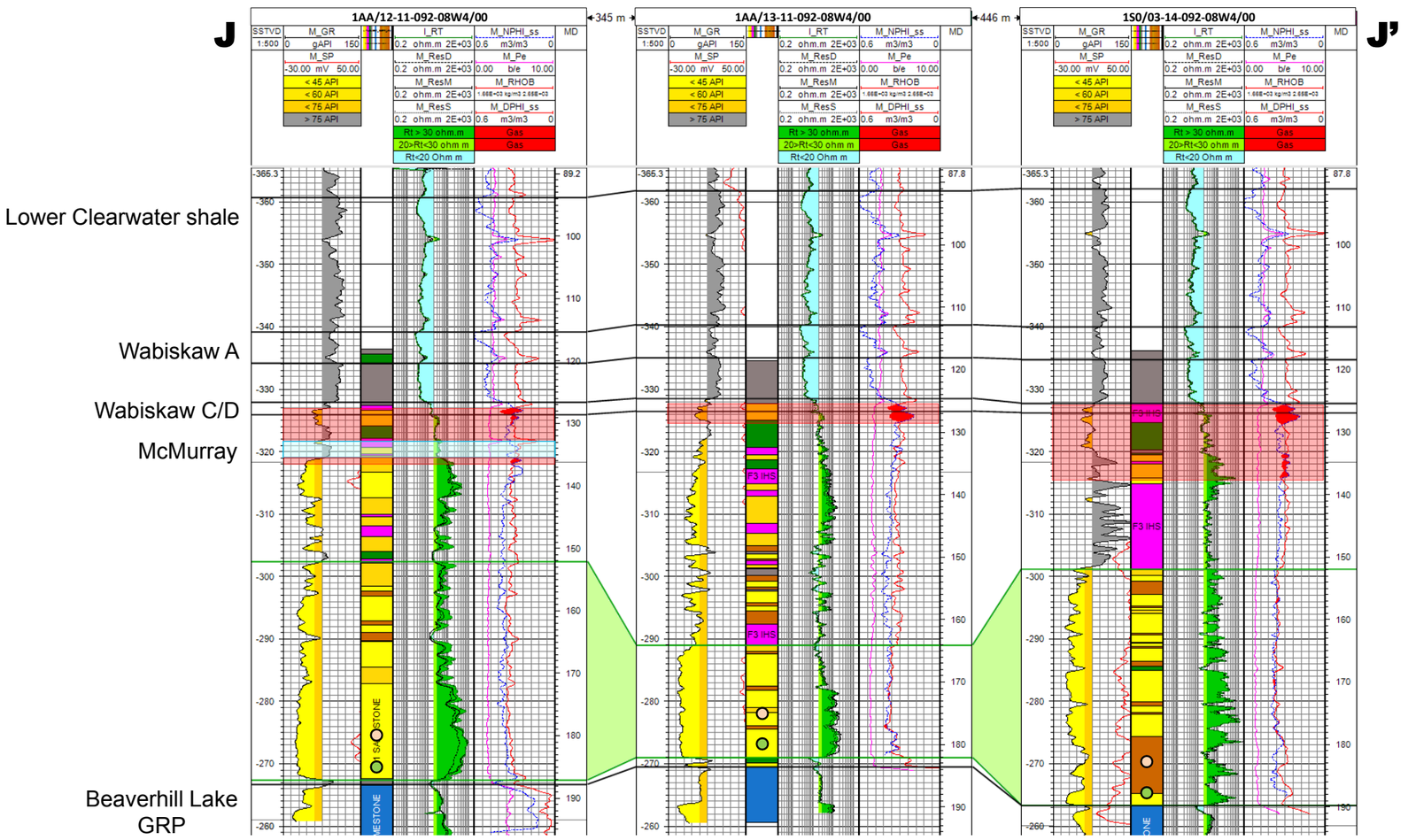

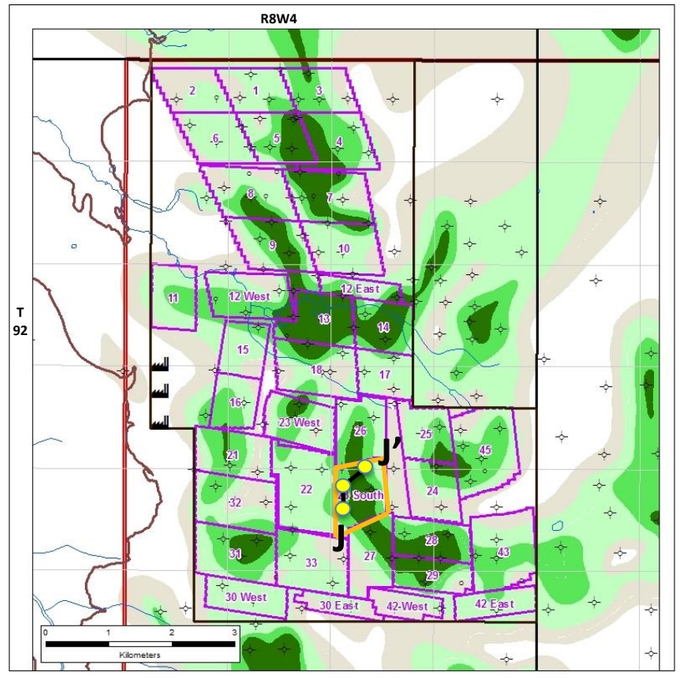

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 23S
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**71**	
Average Net Pay m	**41**	
Net/Gross %	**89**	
Porosity %	**32**	
HC Saturation %	**72**	
IVIPDB	**e6 m3 6.82**	**e6 BLS 43**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 23S

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 23S

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Fig: Drainage Pattern 23S

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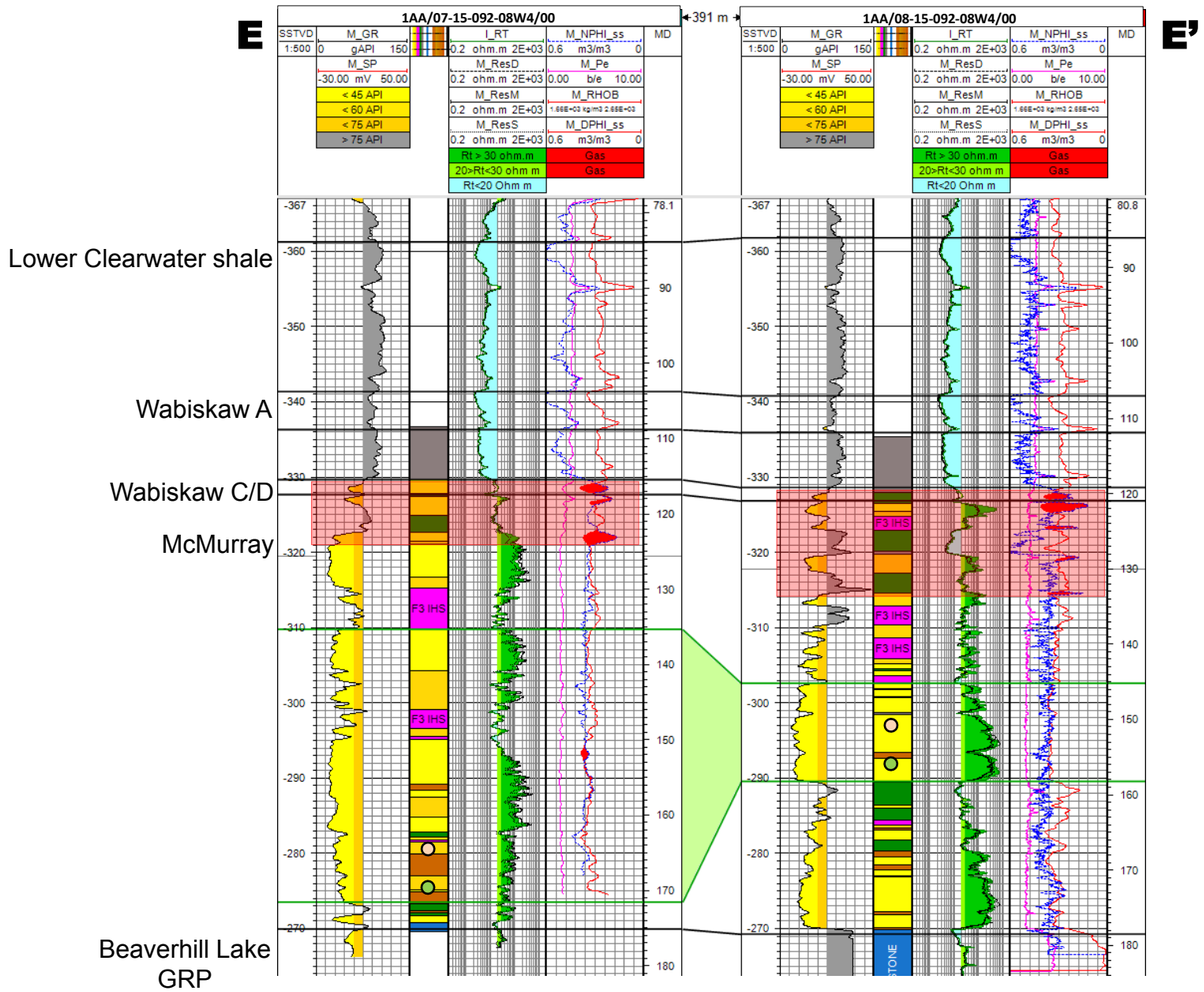

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 23W
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**65**	
Average Net Pay m	**32**	
Net/Gross %	**68**	
Porosity %	**33**	
HC Saturation %	**72**	
IVIPDB	**e6 m3 5.07**	**e6 BLS 32**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 23W

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 23W

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Fig: Drainage Pattern 23W

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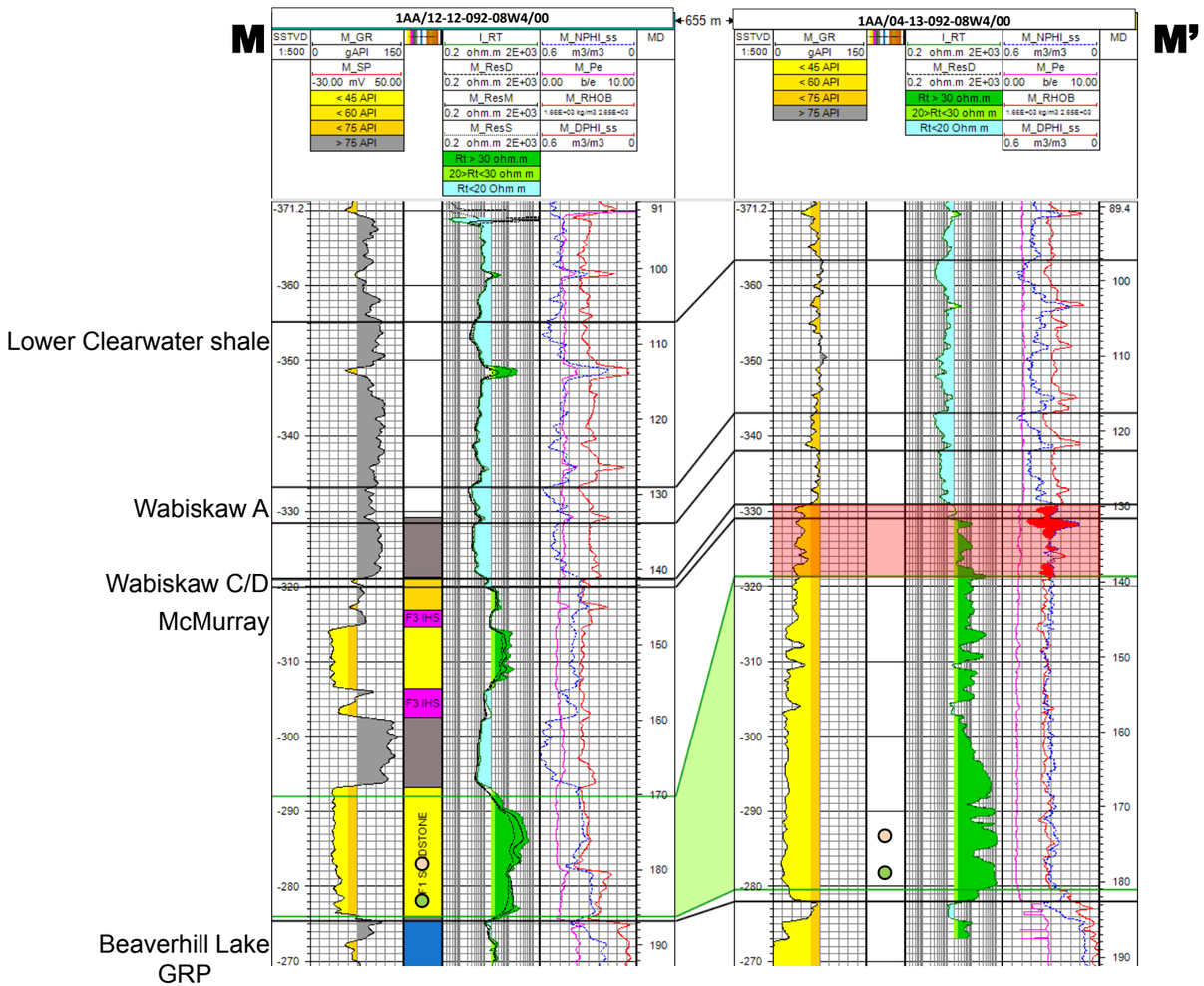

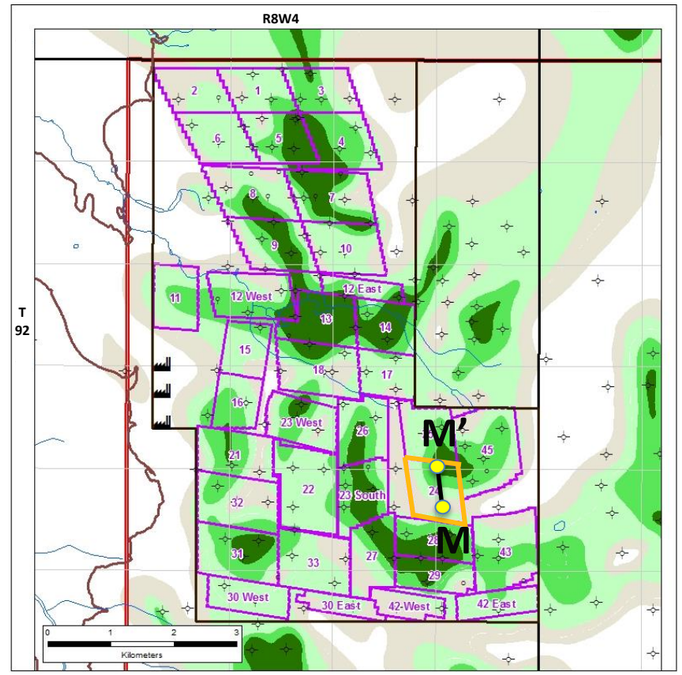

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 24
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**65**	
Average Net Pay m	**30**	
Net/Gross %	**71**	
Porosity %	**32**	
HC Saturation %	**80**	
IVIPDB	**e6 m3 4.88**	**e6 BLS 31**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 24

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 24

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Fig: Drainage Pattern 24

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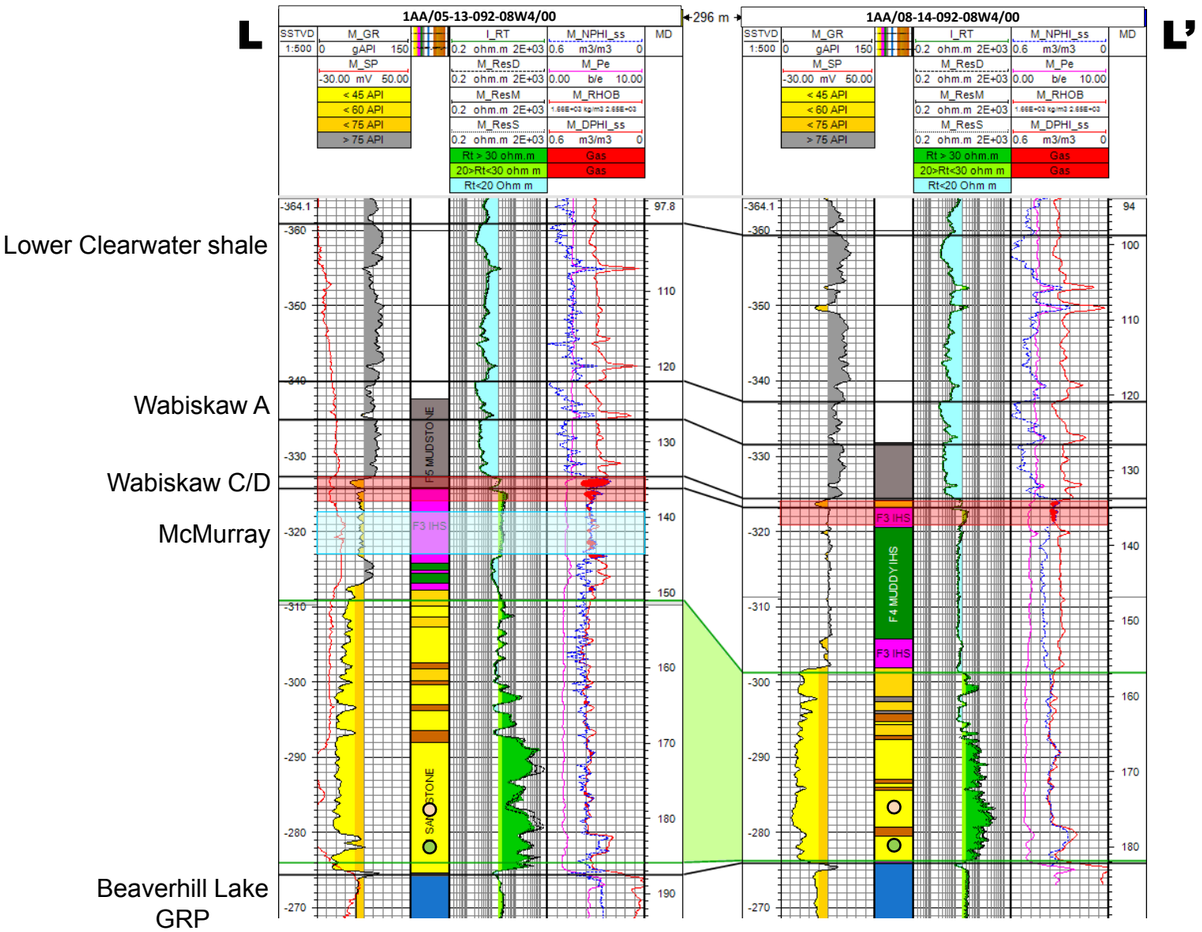

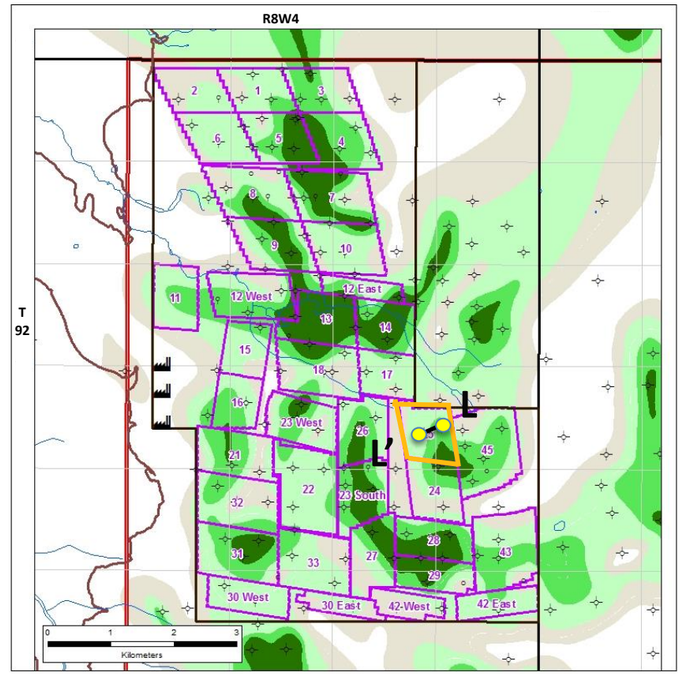

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 25
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**61**	
Average Net Pay m	**32**	
Net/Gross %	**1.00**	
Porosity %	**33**	
HC Saturation %	**72**	
IVIPDB	**e6 m3 4.68**	**e6 BLS 29**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 25

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 25

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Fig: Drainage Pattern 25

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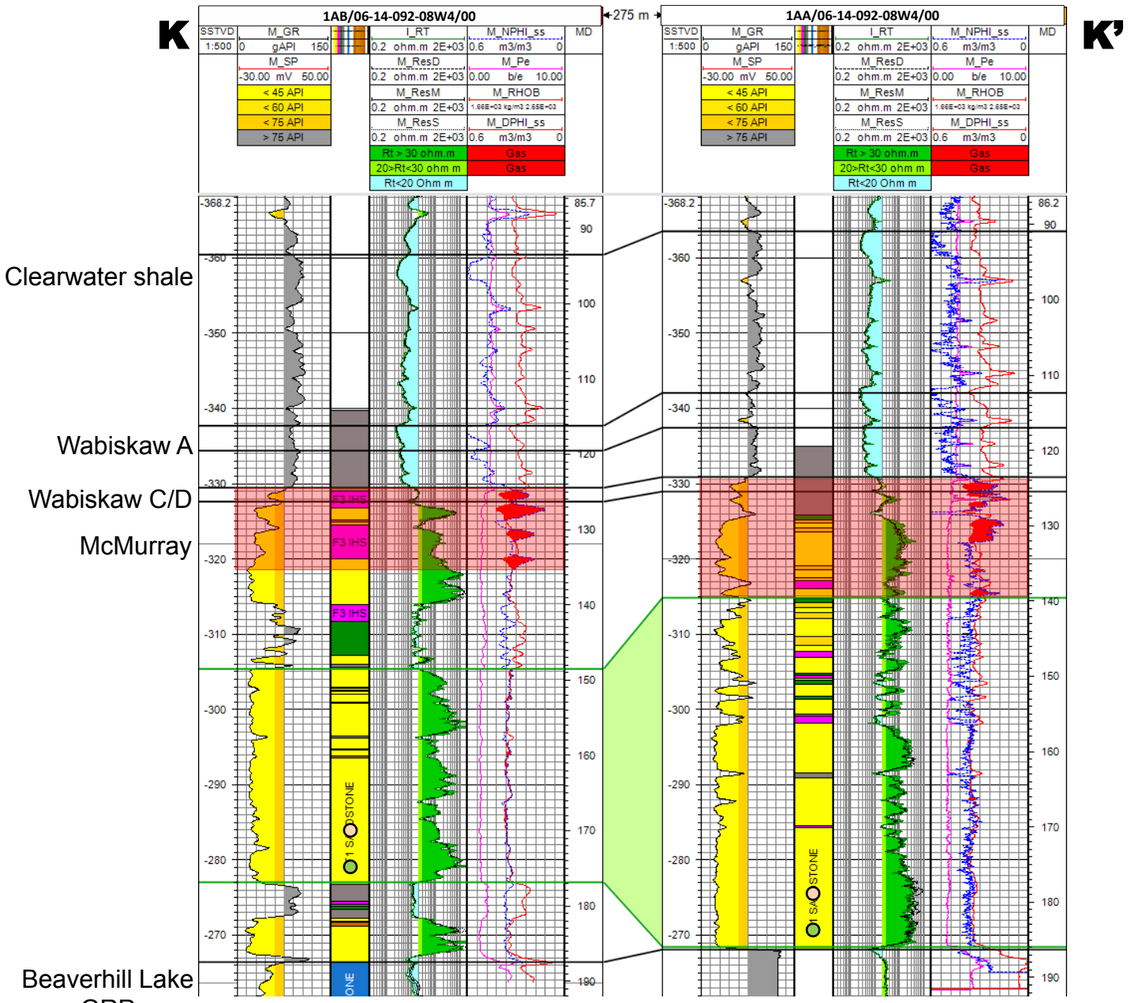

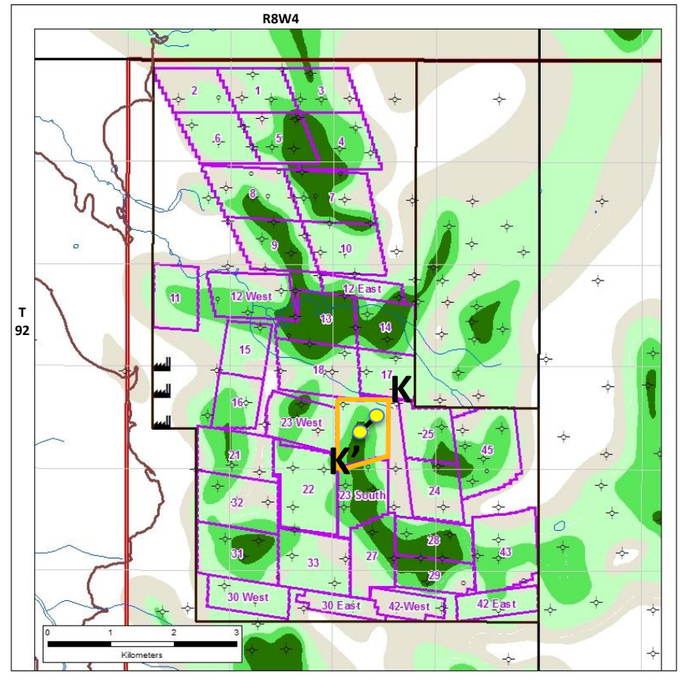

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 26
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**72**	
Average Net Pay m	**36**	
Net/Gross %	**74**	
Porosity %	**34**	
HC Saturation %	**78**	
IVIPDB	**e6 m3 6.75**	**e6 BLS 42**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 26

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 26

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Fig: Drainage Pattern 26

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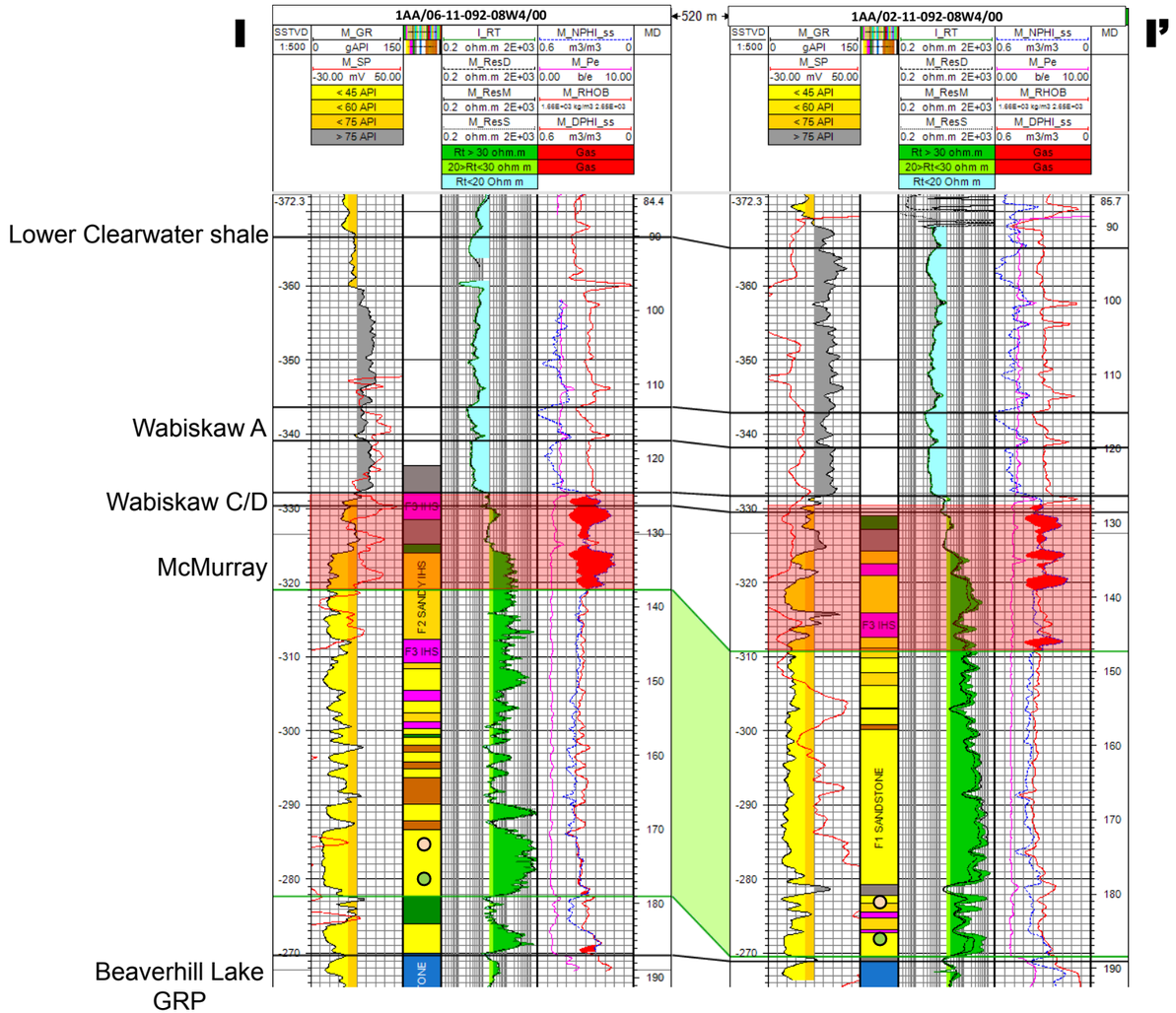

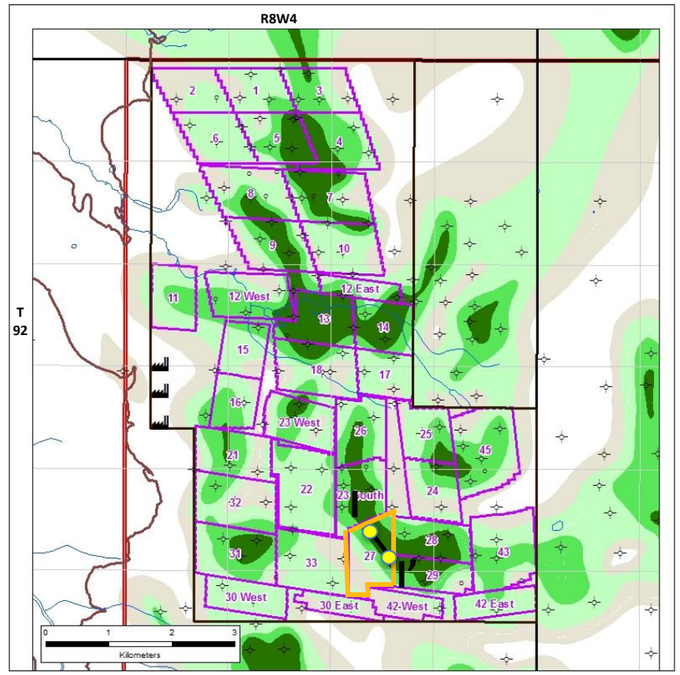

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 27
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**71**	
Average Net Pay m	**34**	
Net/Gross %	**73**	
Porosity %	**32**	
HC Saturation %	**84**	
IVIPDB	**e6 m3 6.54**	**e6 BLS 41**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 27

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 27

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Fig: Drainage Pattern 27

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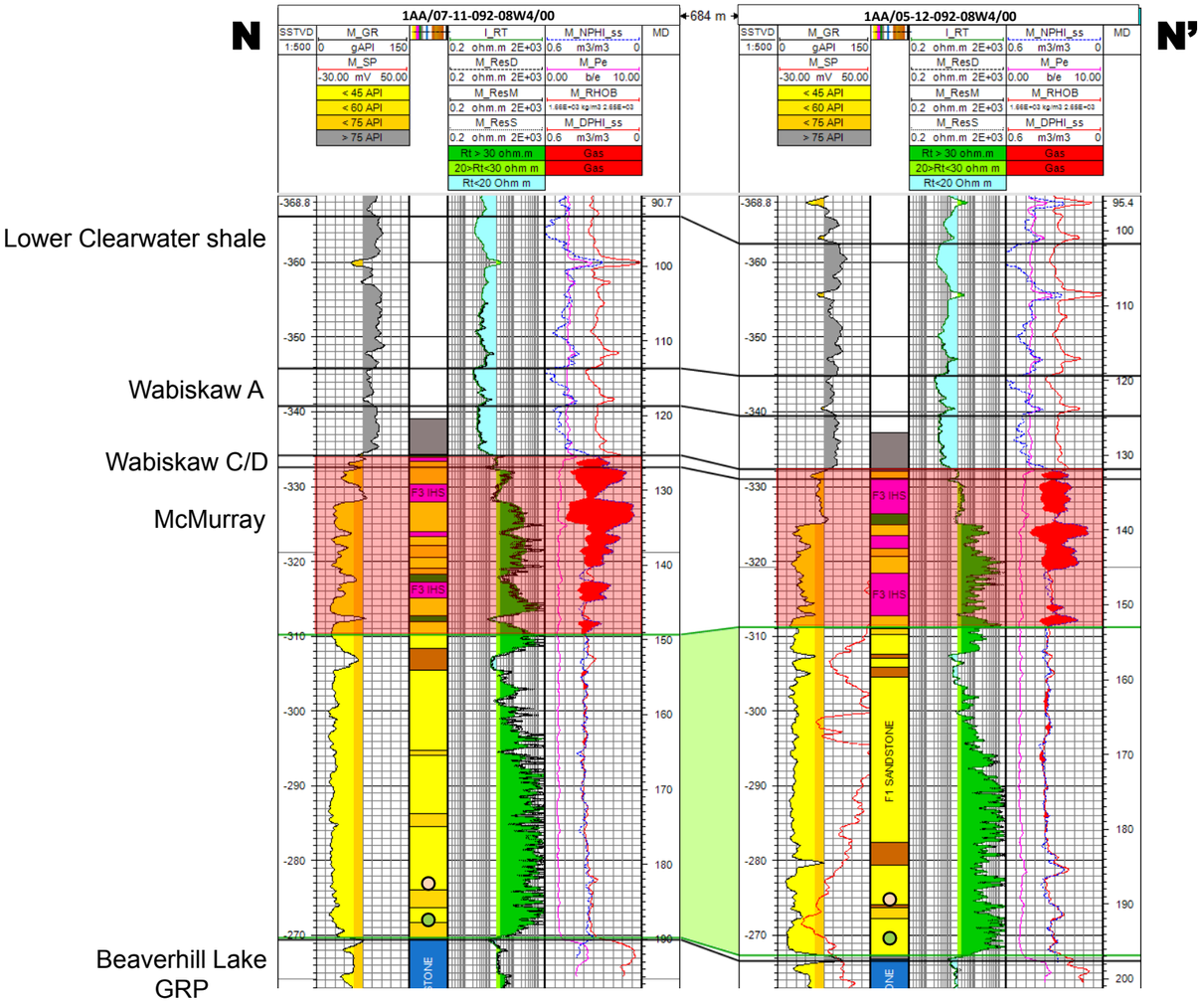

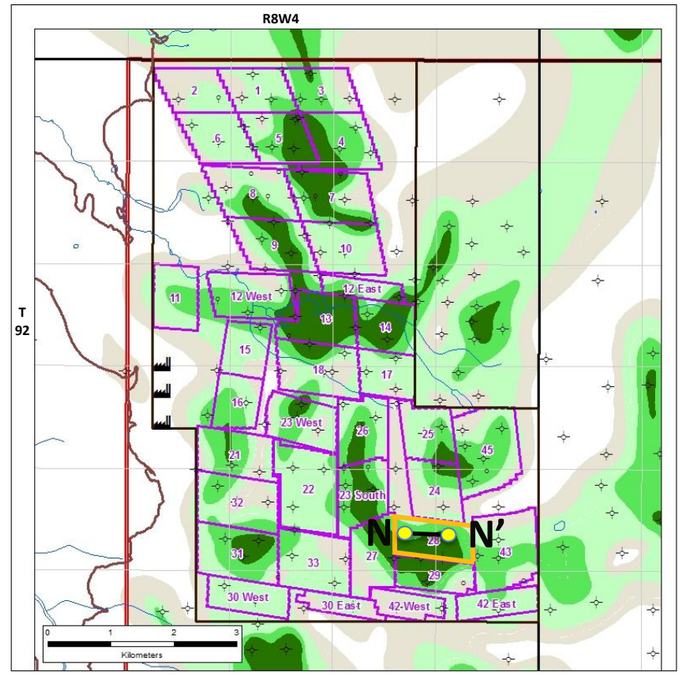

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 28
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**66**	
Average Net Pay m	**44**	
Net/Gross %	**85**	
Porosity %	**33**	
HC Saturation %	**82**	
IVIPDB	**e6 m3 7.82**	**e6 BLS 49**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 28

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 28

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Fig: Drainage Pattern 28

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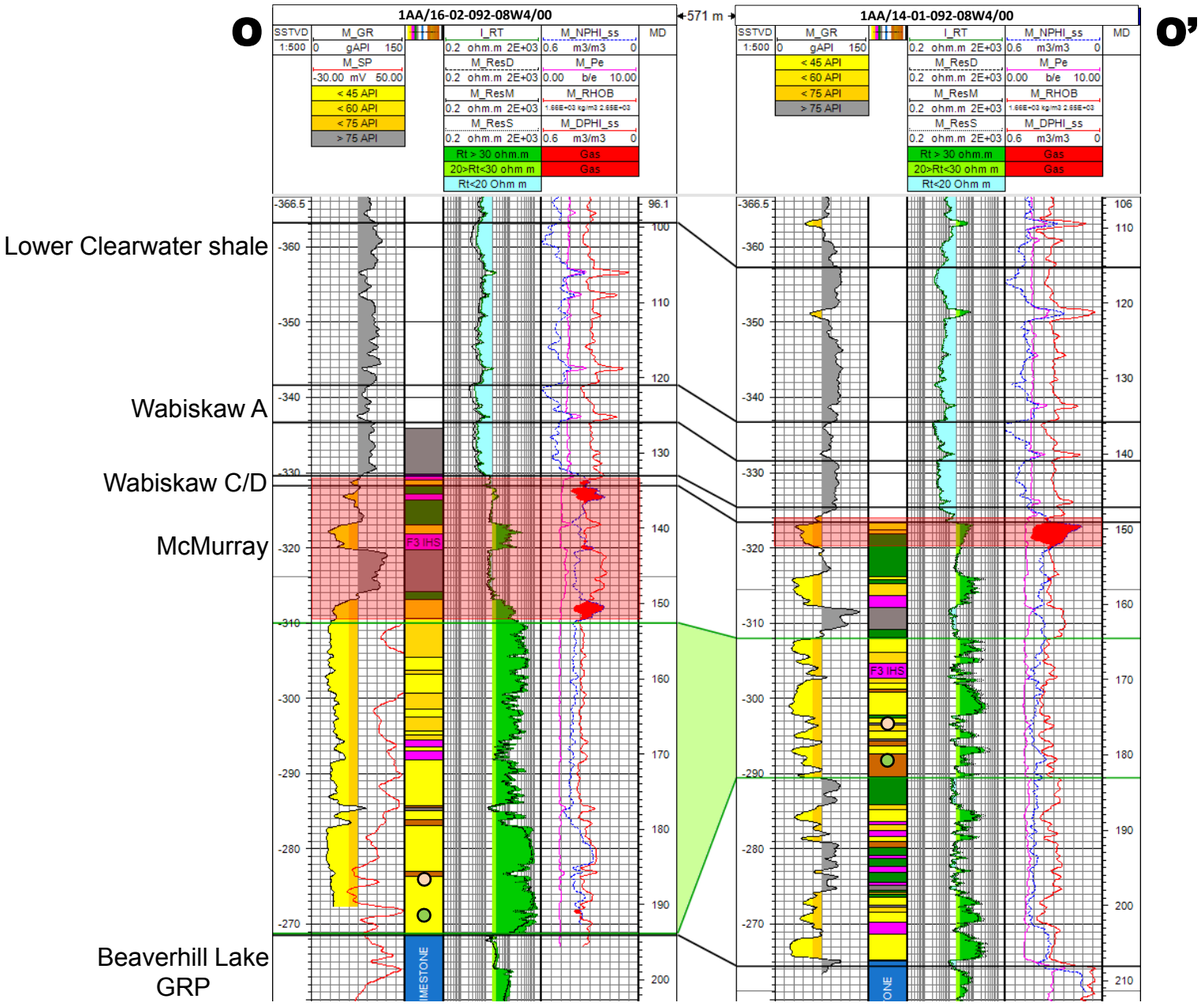

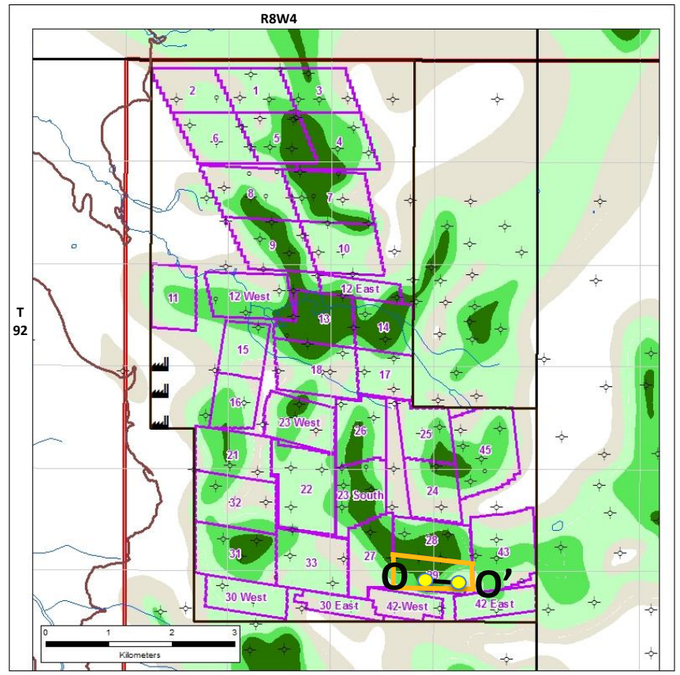

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 29
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**54**	
Average Net Pay m	**42**	
Net/Gross %	**85**	
Porosity %	**33**	
HC Saturation %	**79**	
IVIPDB	**e6 m3 5.79**	**e6 BLS 36**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 29

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 29

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Fig: Drainage Pattern 29

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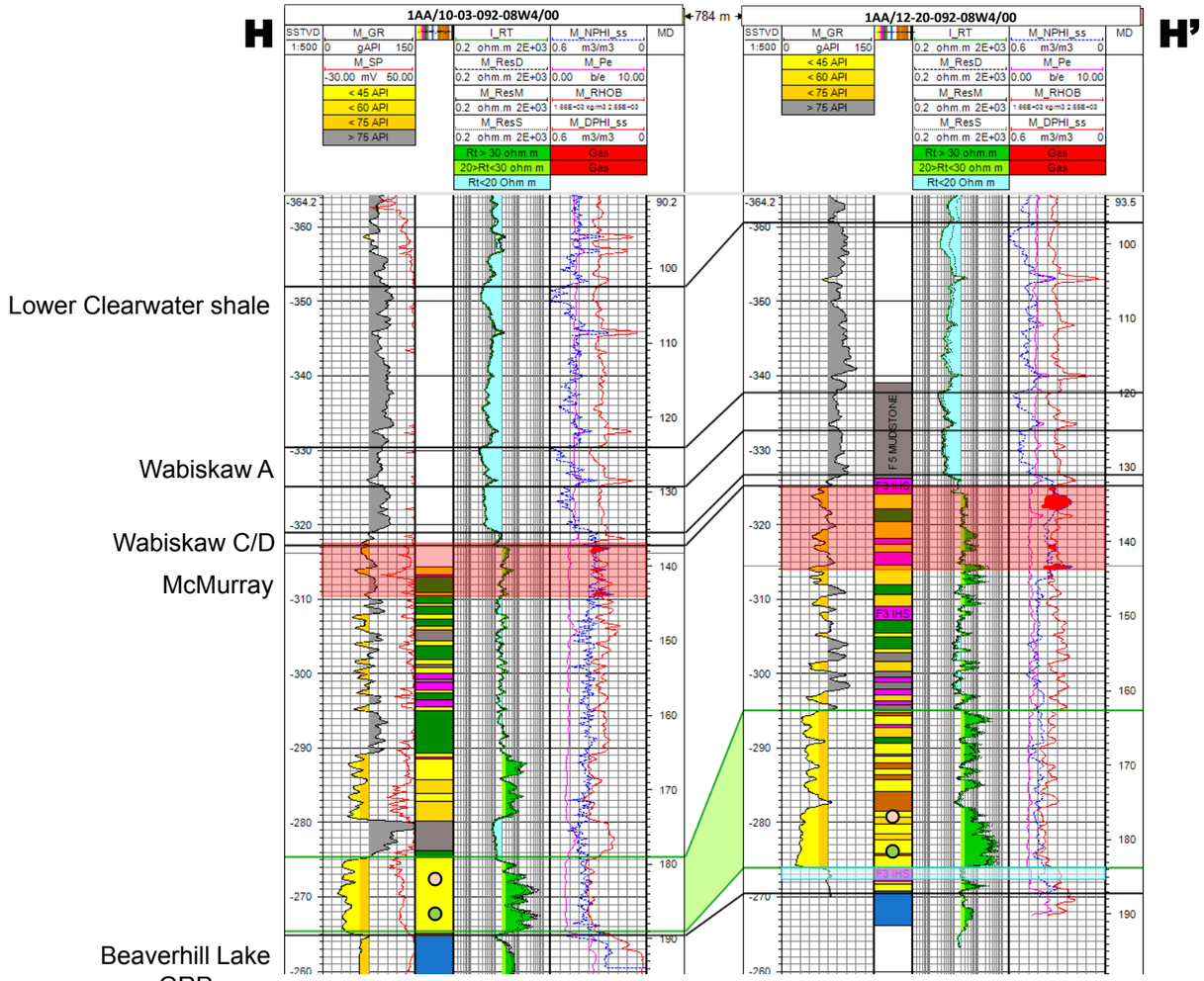

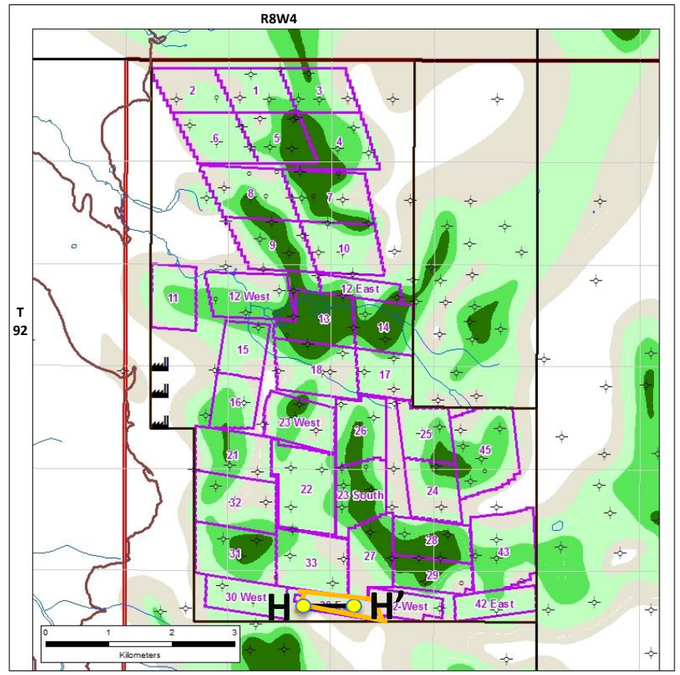

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 30E
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**24**	
Average Net Pay m	**25**	
Net/Gross %	**61**	
Porosity %	**34**	
HC Saturation %	**74**	
IVIPDB	**e6 m3 1.54**	**e6 BLS 10**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 30E

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 30E

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Fig: Drainage Pattern 30E

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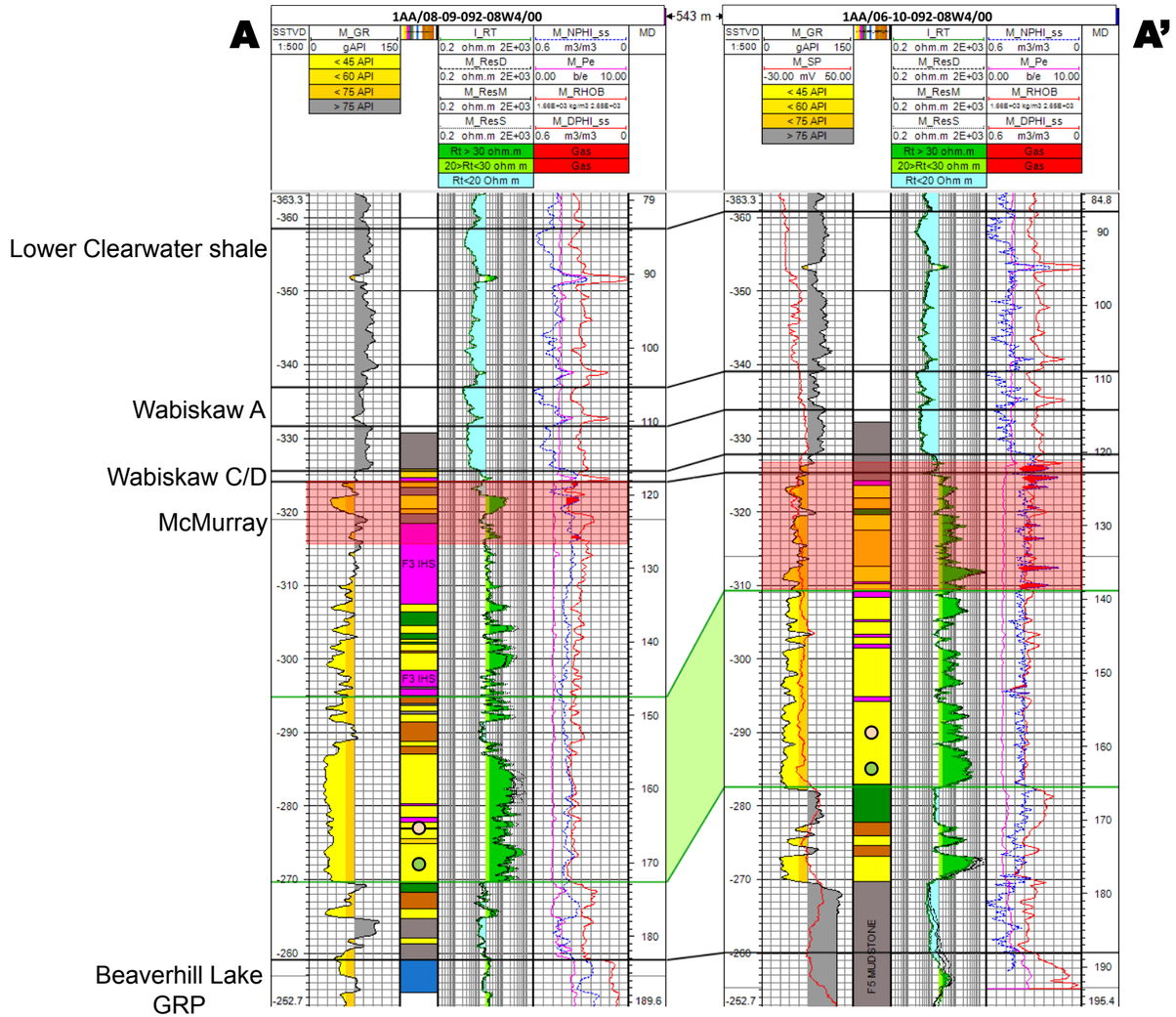

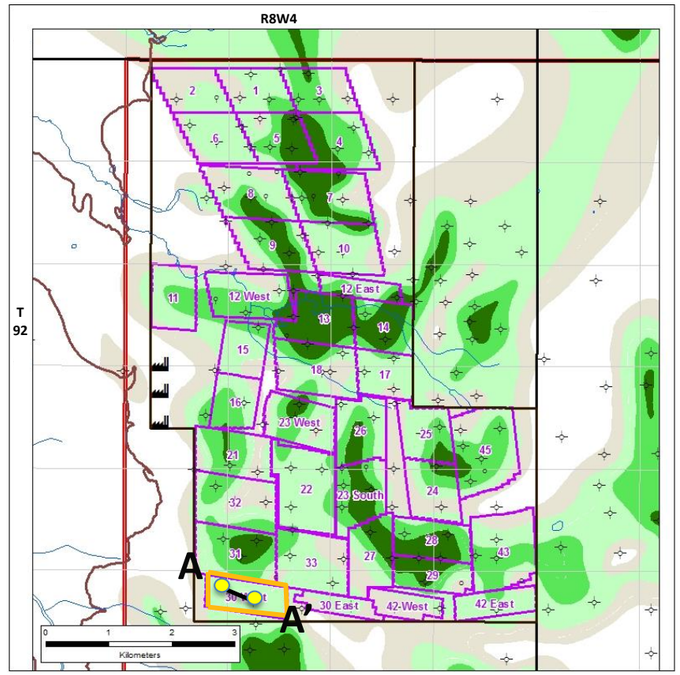

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 30W
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**55**	
Average Net Pay m	**30**	
Net/Gross %	**67**	
Porosity %	**34**	
HC Saturation %	**73**	
IVIPDB	**e6 m3 4.19**	**e6 BLS 26**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 30W

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 30W

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Fig: Drainage Pattern 30W

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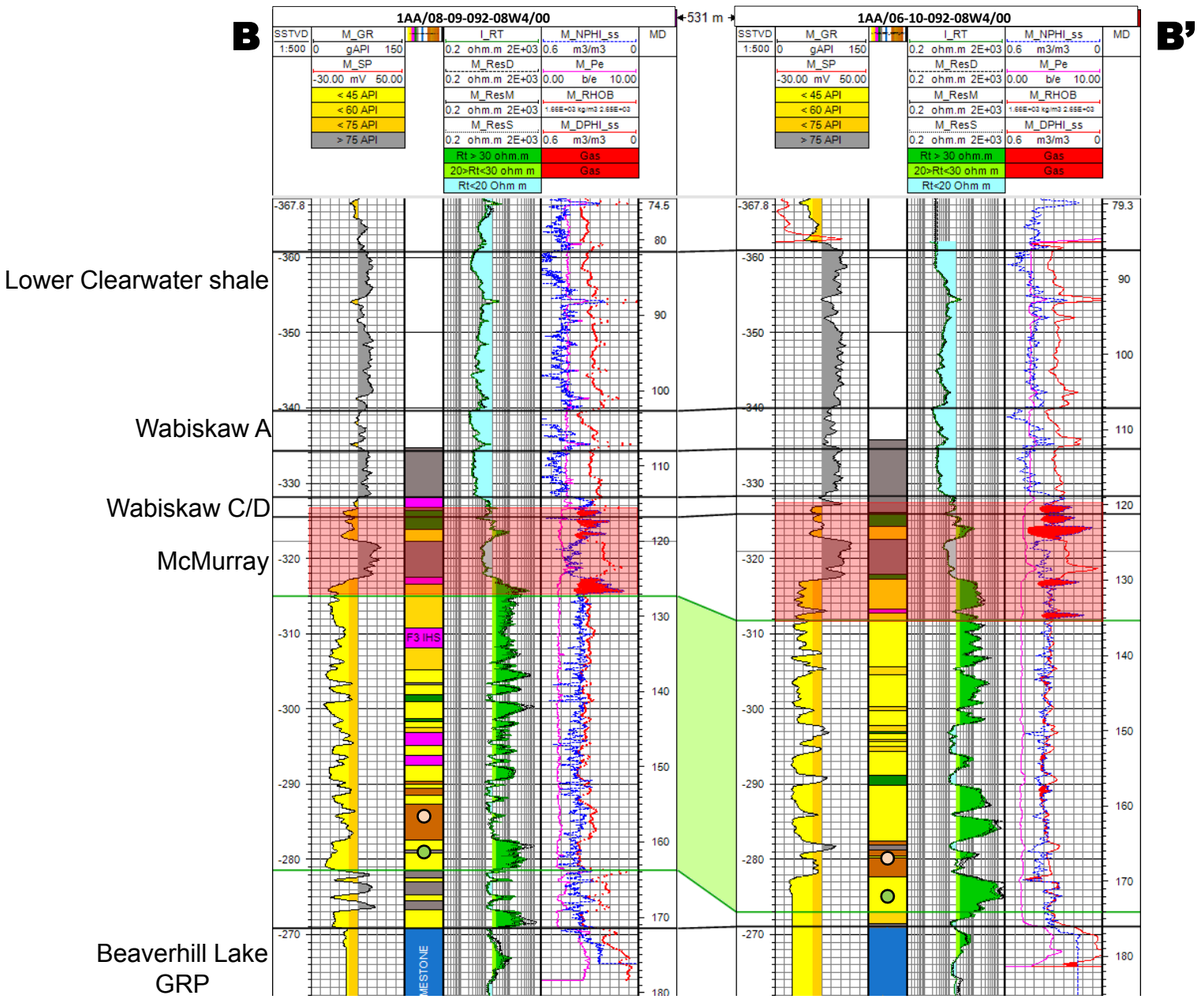

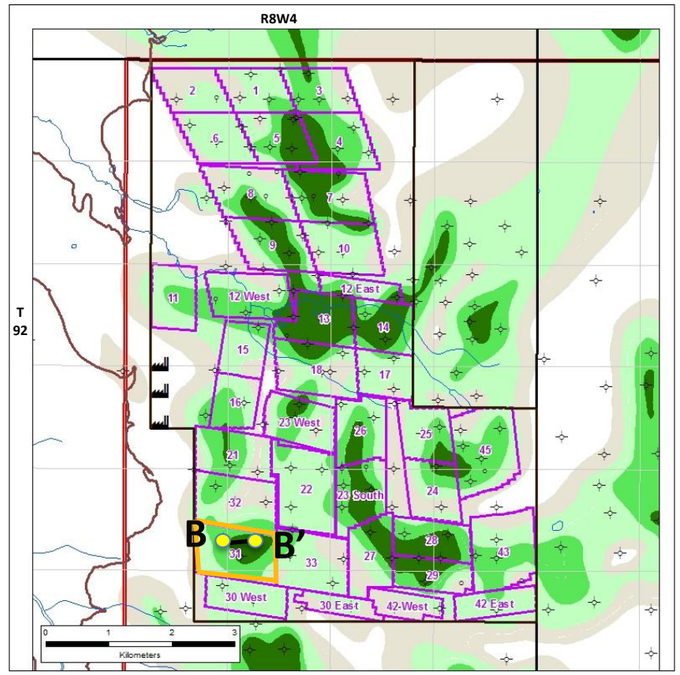

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 31
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**95**	
Average Net Pay m	**37**	
Net/Gross %	**93**	
Porosity %	**33**	
HC Saturation %	**71**	
IVIPDB	**e6 m3 8.07**	**e6 BLS 51**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 31

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 31

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Fig: Drainage Pattern 31

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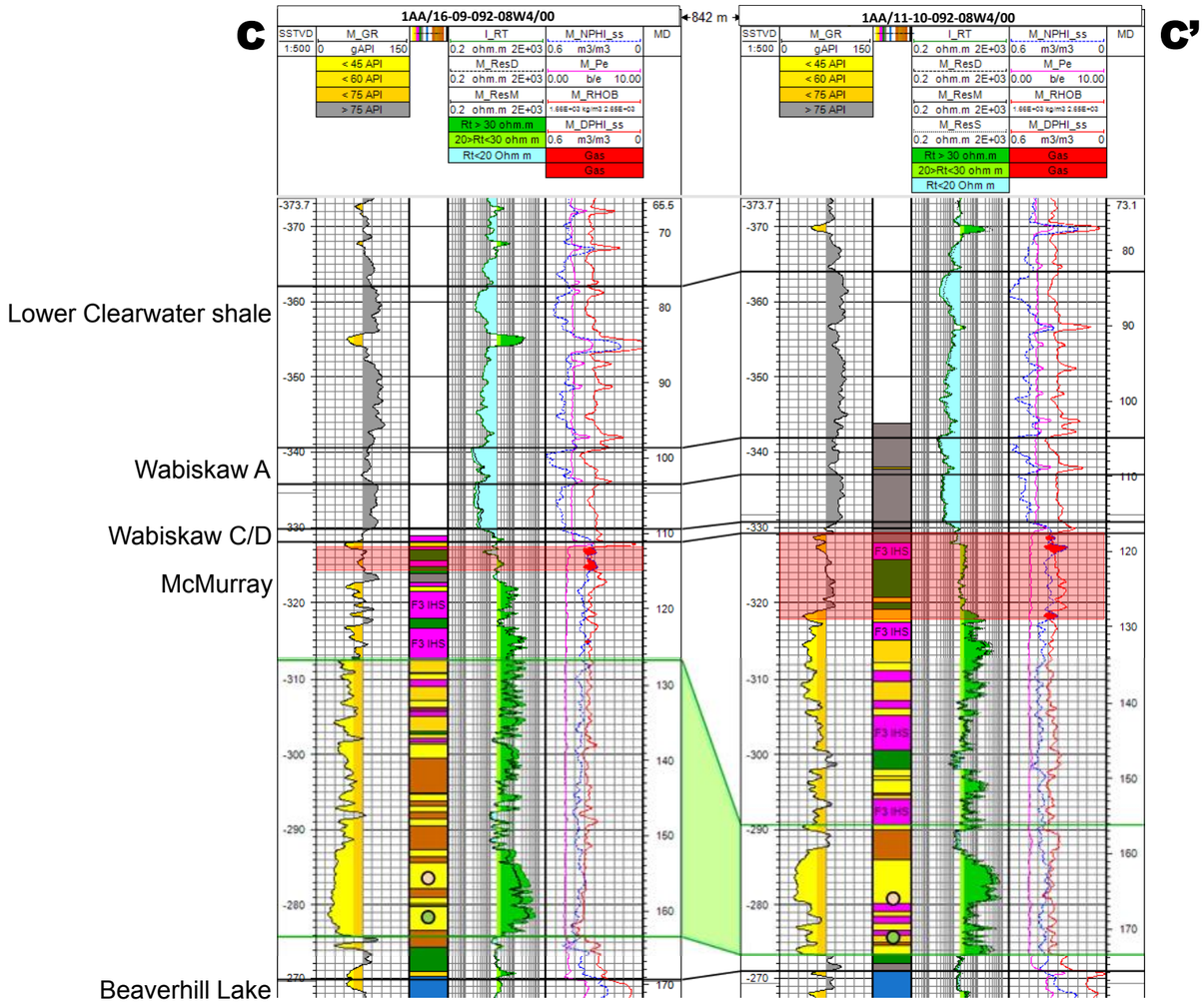

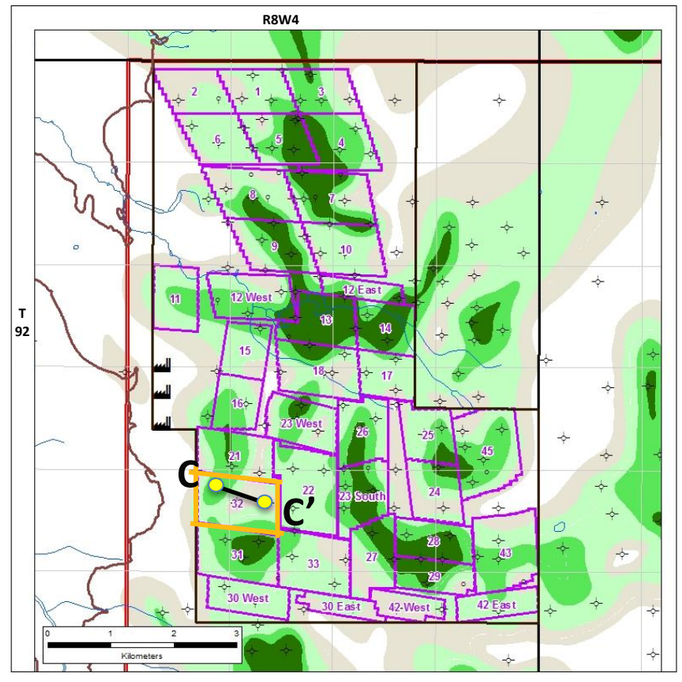

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 32
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**90**	
Average Net Pay m	**29**	
Net/Gross %	**66**	
Porosity %	**33**	
HC Saturation %	**72**	
IVIPDB	**e6 m3 6.03**	**e6 BLS 38**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 32

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 32

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Fig: Drainage Pattern 32

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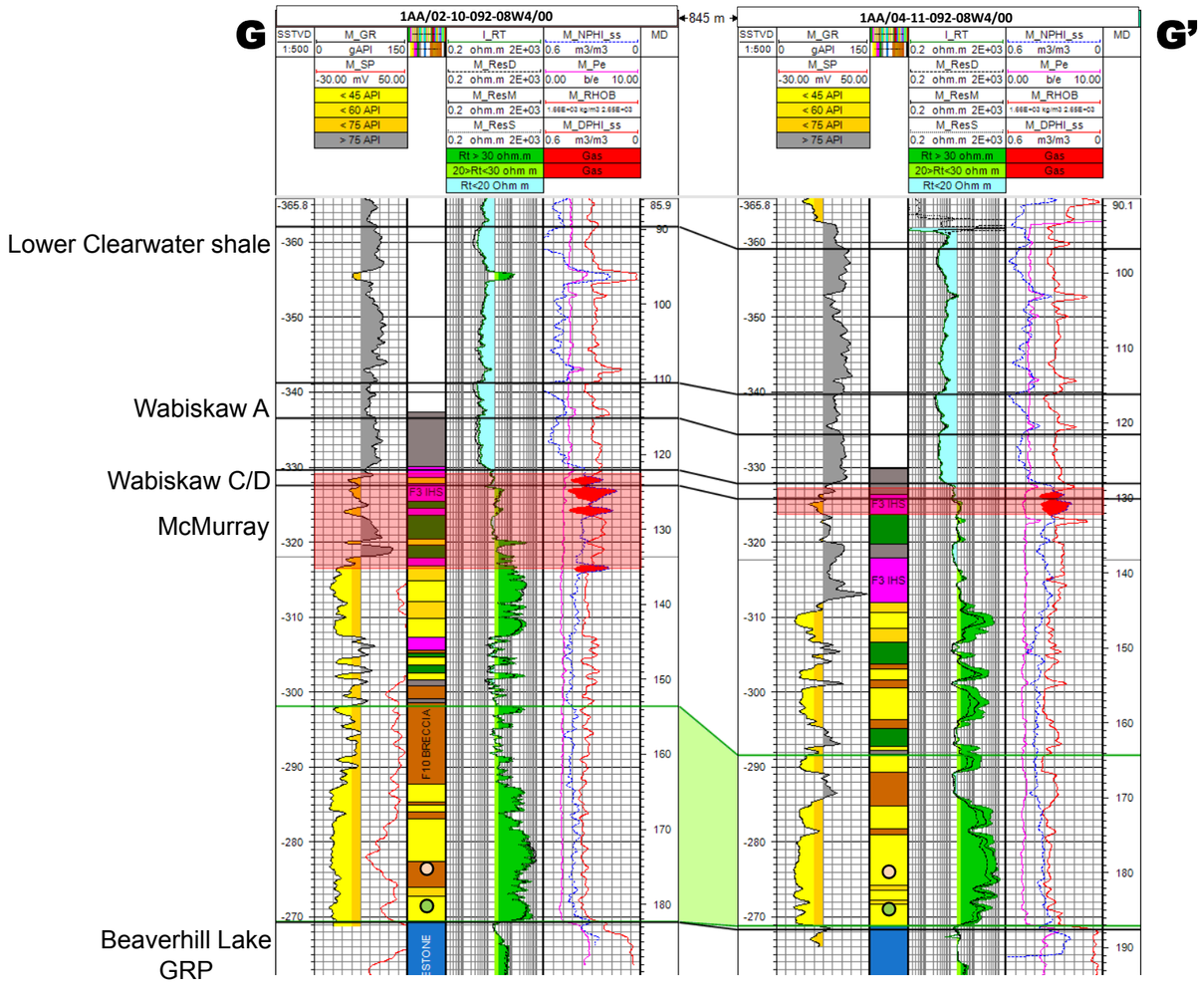

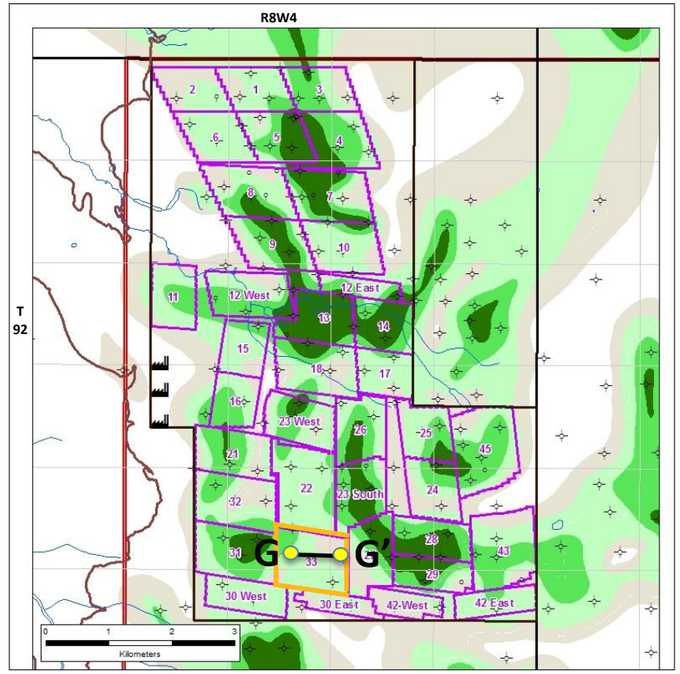

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 33
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**95**	
Average Net Pay m	**26**	
Net/Gross %	**61**	
Porosity %	**33**	
HC Saturation %	**79**	
IVIPDB	**e6 m3 6.43**	**e6 BLS 40**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 33

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 33

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Fig: Drainage Pattern 33

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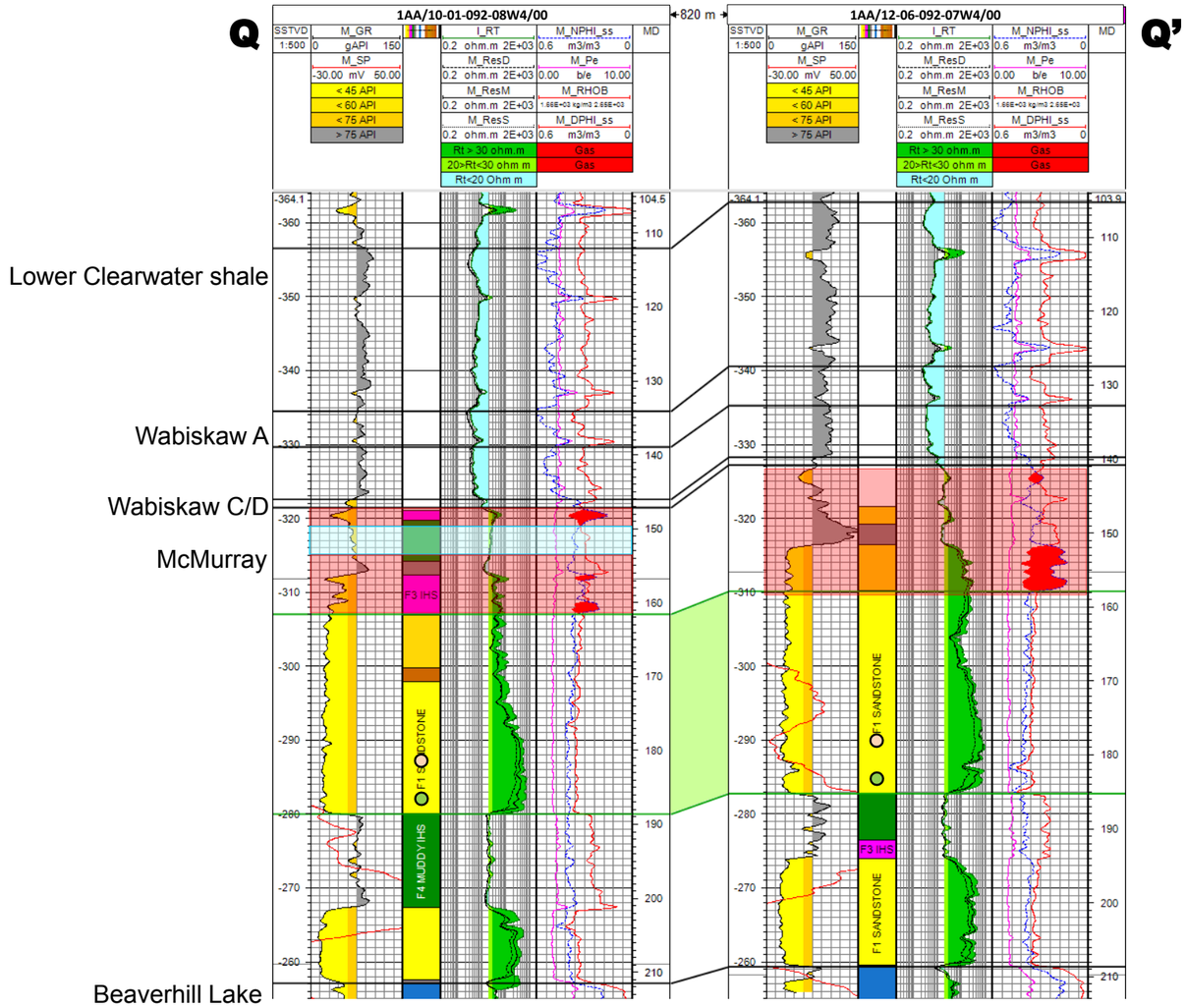

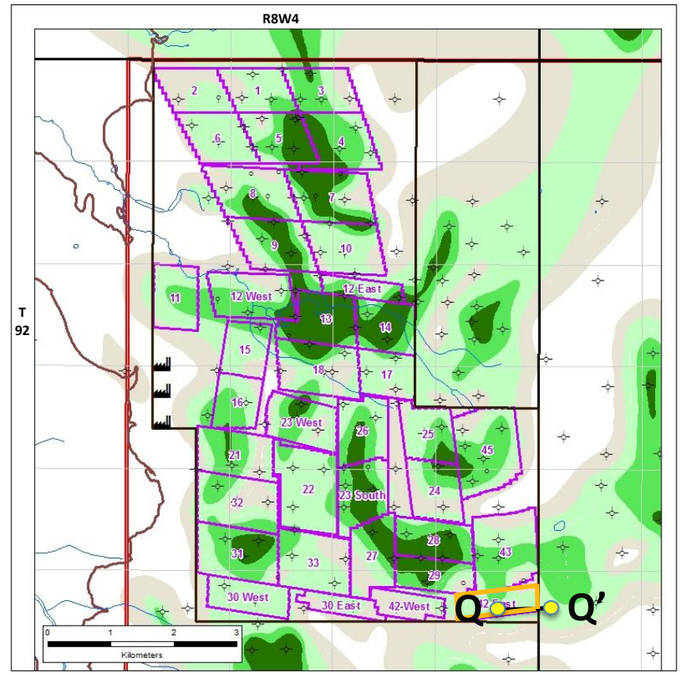

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 42E
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**44**	
Average Net Pay m	**29**	
Net/Gross %	**65**	
Porosity %	**35**	
HC Saturation %	**83**	
IVIPDB	**e6 m3 3.65**	**e6 BLS 23**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 42E

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 42E

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Fig: Drainage Pattern 42E

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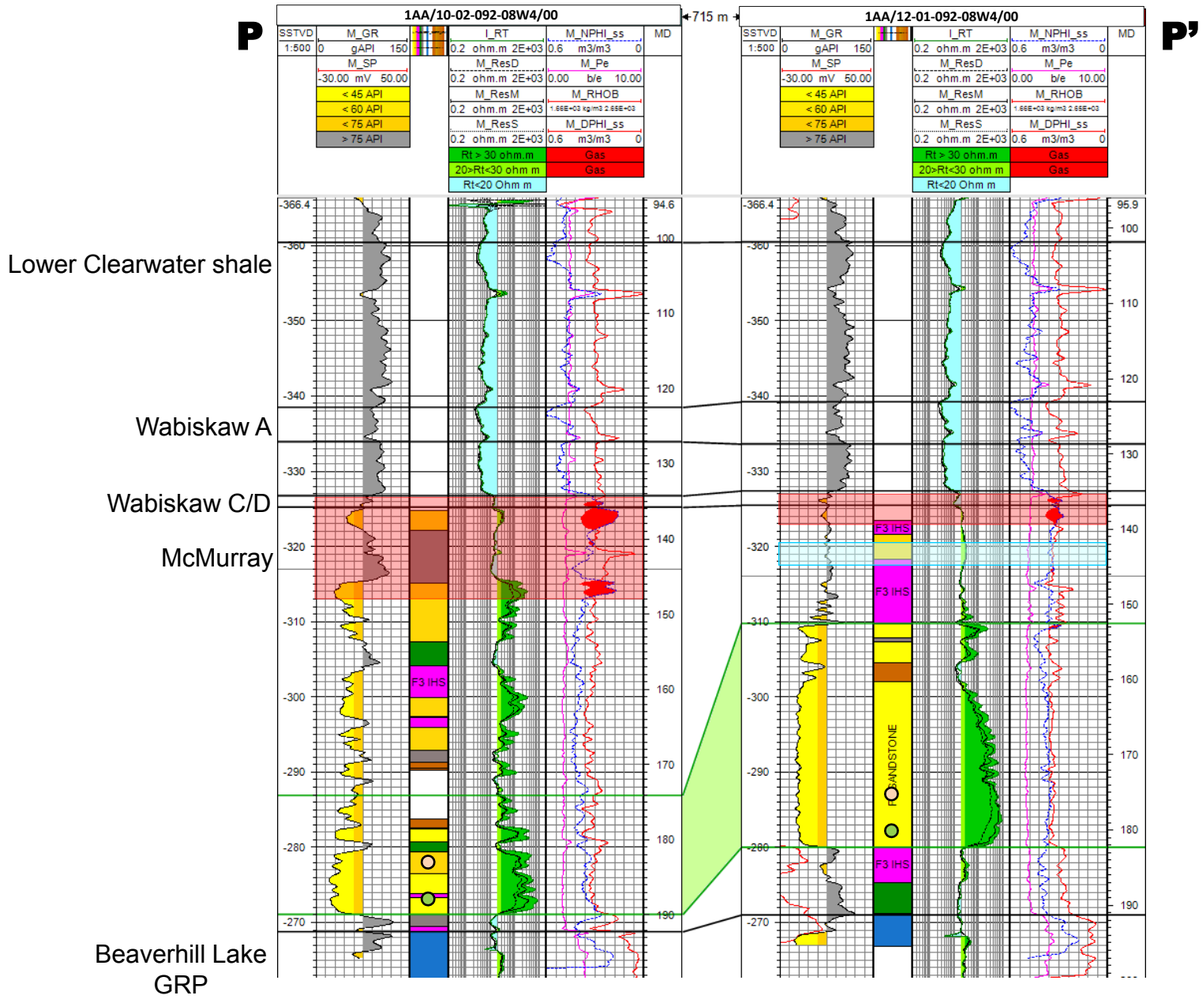

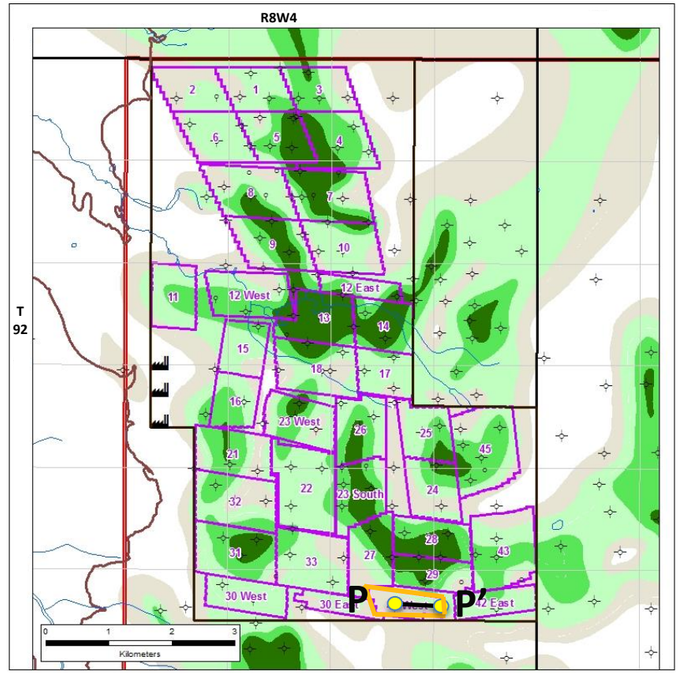

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 42W
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**29**	
Average Net Pay m	**23**	
Net/Gross %	**44**	
Porosity %	**32**	
HC Saturation %	**83**	
IVIPDB	**e6 m3 1.74**	**e6 BLS 11**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 42W

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 42W

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Fig: Drainage Pattern 42W

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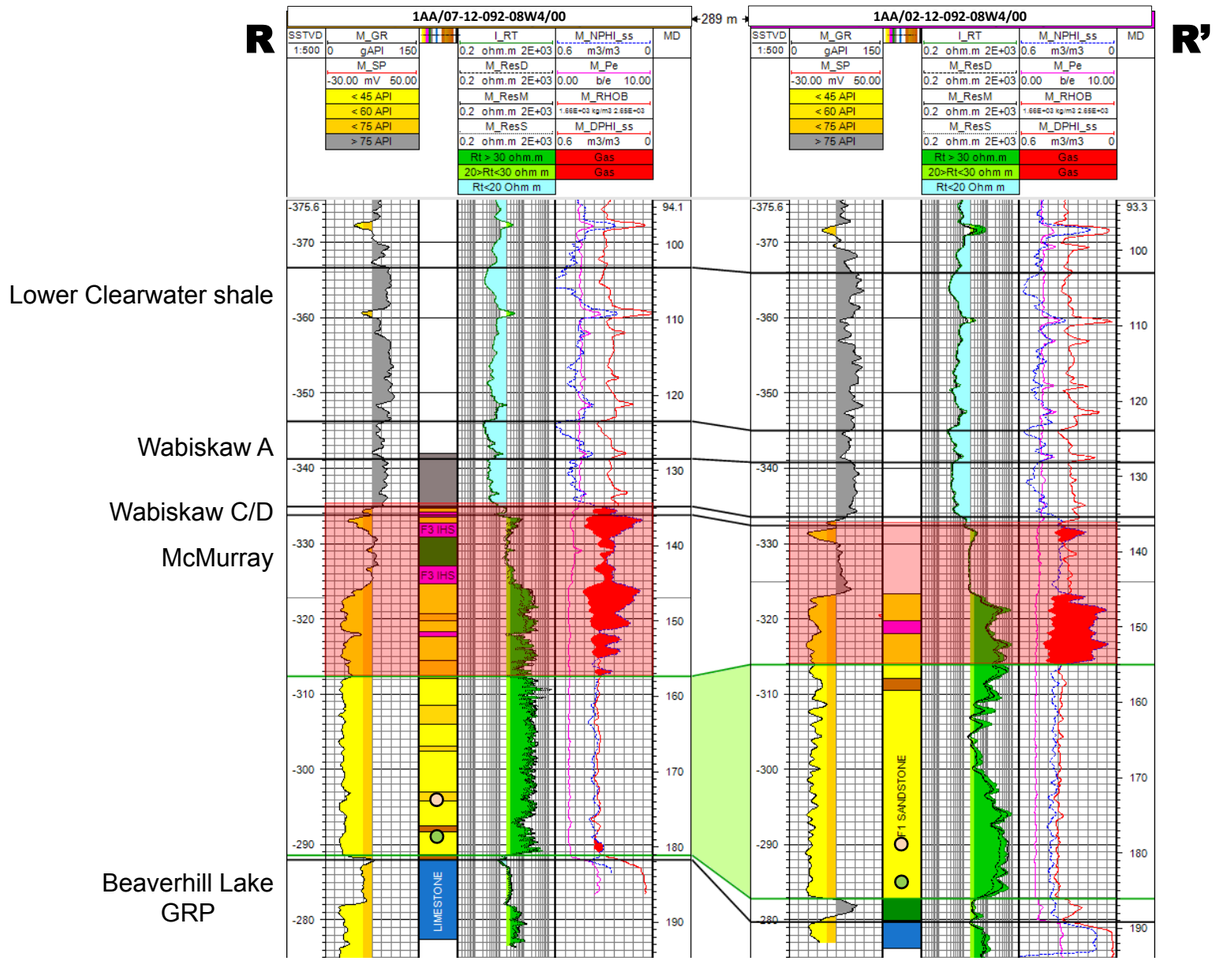

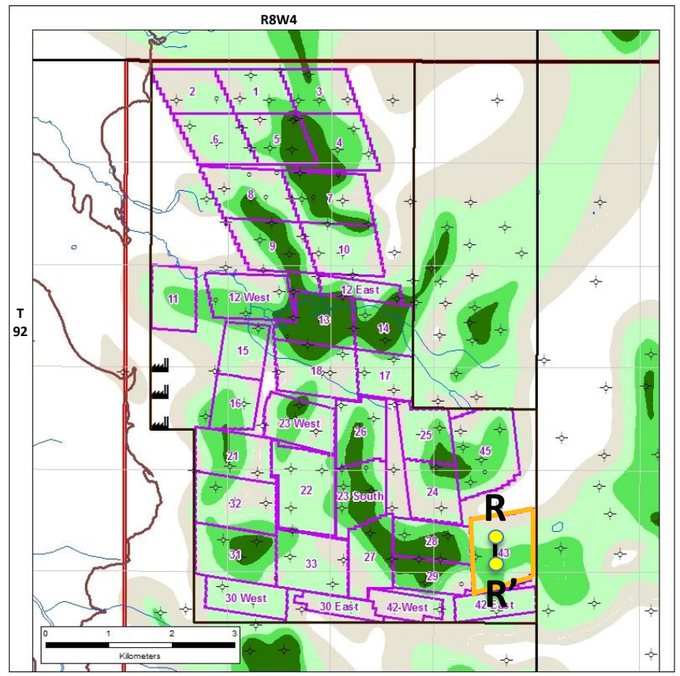

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 43
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**93**	
Average Net Pay m	**30**	
Net/Gross %	**81**	
Porosity %	**34**	
HC Saturation %	**80**	
IVIPDB	**e6 m3 7.57**	**e6 BLS 48**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 43

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 43

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Lewis Project

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Fig: Drainage Pattern 43

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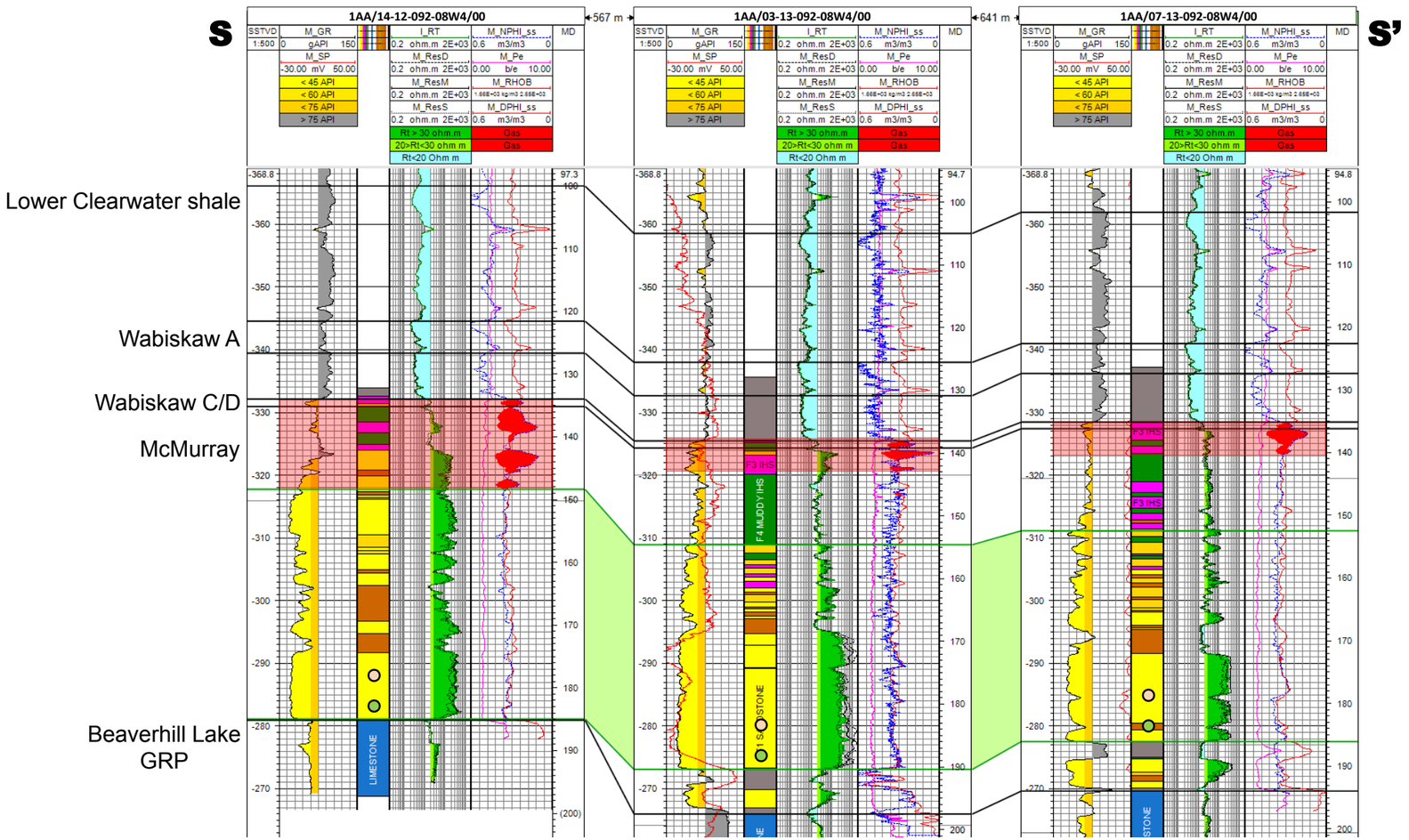

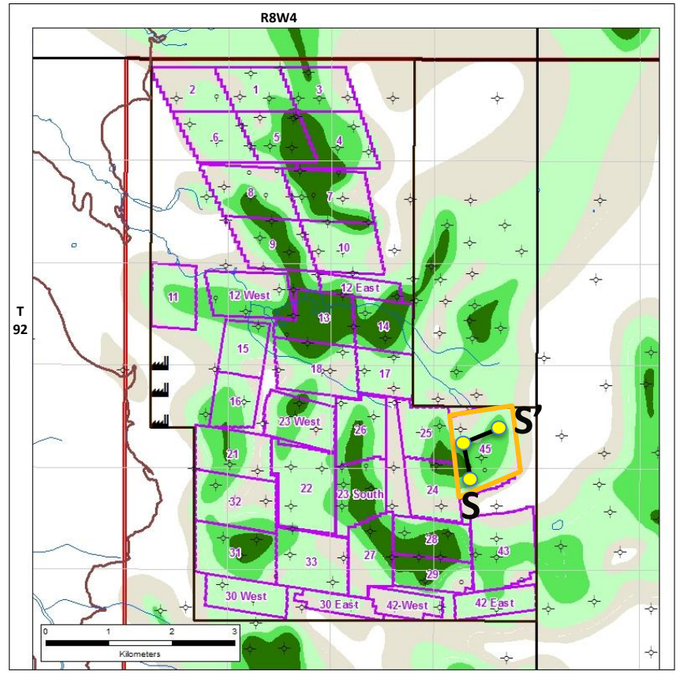

Continuous Bitumen Pay

- <10m
- 10-20m
- 20-30m
- 30-40m
- 40m and Greater
- Lewis West CPF
- Drainage Pattern 45
- Drainage Patterns
- Project Area
- Development Area
- Suncor Oil Sand Lease

Area Ha	**111**	
Average Net Pay m	**32**	
Net/Gross %	**82**	
Porosity %	**32**	
HC Saturation %	**73**	
IVIPDB	**e6 m3 8.21**	**e6 BLS 52**

- injector
- producer
- Gas Saturated Zone
- Bitumen Saturated Zone
- Lean Zone

Core Lithology

- Sand (0-5% mud)
- Sandy IHS (>5-15% mud)
- IHS (>15-30% mud)
- Muddy IHS (>30-70% mud)
- Mudstone (>70% mud)
- Breccia

Montage of Drainage Pattern 45

Graphics: Completed by Suncor Energy

Structural Cross Section Drainage Pattern 45

SUNCOR

Lewis Project

September 2018

Fig: Drainage Pattern 45

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