

MANIFOLD MAP FILES, PEACE RIVER COALFIELD (NTS 93P,I,O & 94B)

BC GEOLOGICAL SURVEY OPEN FILE 2006-13

by A. Legun

RELEASE NOTES

This interim release presents GIS files of Peace River coalfield geology in Manifold software "map" (.map) format. The components include maps, databases, isopach plots, orthophotos, and a composite shaded relief image. The files cover the coal district south of latitude 56 30' and the area east of the coalfield extending to the Alberta border. These files update some data presented in Geoscience Map GS2003-2. The updates include:

- Corrections to geologic contact linework. The linework has been closed and geologic polygons created under Manifold software. These are exportable into other formats such as Map Info "mif" or ESRI "shp".
- A current database of wells within the map area (adapted from B.C. Oil and Gas Commission download files).
- A formation top database for wells within the map area (adapted from B.C. Oil and Gas Commission download files). Formation tops have been picked and tabulated by individual well geologists over the years. The database is suitable for a quick view of depths to an interval of interest (see caveats below).

The .map files may be useful to individuals

- involved in surface coal and subsurface coalbed gas exploration
- assessing lithologic trends in the Gates formation
- assessing depths to coal-bearing formations immediately east of the coalfield
- pursuing coals at shallow depths with potential for underground mining.
- involved in land use planning relating to coal

Project components are organised around several Manifold digital map files:

Map PeaceR geo

This map shows bedrock geology and distribution of coal open pits. The pits are characterised as reclaimed, active, developing, or potential pits for coal extraction.

Map PeaceR ortho

This map provides 1:20k orthophoto coverage of the coalfield and immediate areas to the east. The images are in compressed (ecw) format and linked to the map (they may need to be relinked if copied to your own directory). Geologic linework can be "turned on" to relate it to the bedrock structural grain. A semi-transparent shaded relief image can also be "turned on" to accent topographic relief.

Map Falher C, Map Falher D

The Gates includes upward coarsening units of marine origin. These are known as Falher cycles in subsurface nomenclature and relevant to regional studies of gas reservoirs in the Alberta deep basin. Map Falher C and D are isopach plots derived from "clean sand" gamma log profiles. These isopachs illustrate buildups of nearshore sand and conglomerate in the Tumbler Ridge - Wolverine river area. The plots are local updates of the regional Falher C and D "clean sand" plots of Leckie (1986) and the Falher shoreline plots of Carmichael (1983). In the case of Falher C these nearshore units appear to merge with landward attached deposits of broad channels near the Shikano pit. A table of values derived from examination of gas well logs and coal

boreholes supports the plots.

The maps include a line of section showing the stratigraphic relation of Falher C and D to the middle Gates coal bearing section at Wolverine river.

CAVEATS

The coal borehole database has not been fully scanned for location errors. Not all potential coal pits are shown.

Many oil and gas wells are drilled to intersect deep stratigraphic intervals of interest and little attention paid to details of the near surface. The formation picks near surface are occasionally clearly in error and do not agree with nearby coal boreholes and stratigraphic section data. The formation top database should be supplemented by databases specific to each formation (for example Leckie, Hayes and Staniland 1995).

Local updates to the geology (eg. Wolverine river area, Legun 2007) are in progress.

ACKNOWLEDGEMENTS

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SELECTED GEOLOGIC REFERENCES, PEACE RIVER COALFIELD

B.C. Geological Survey (2006): Bedrock mapping index; *BC Ministry of Energy, Mines and Petroleum Resources*,
<http://www.em.gov.bc.ca/Mining/Geolsurv/bedrock/index/vmapweld.htm>

Carmichael, S.M. (1983): Sedimentology of the Lower Cretaceous Gates and Moosebar formations, northeast coalfields, British Columbia; unpublished PhD thesis, *University of British Columbia*, 285 pages.

Carmichael, S.M. (1988): Linear estuarine conglomerate bodies formed during a mid-Albian marine transgression; "upper Gates" Formation, Rocky Mountain foothills of northeastern British Columbia; *in* Sequences, Stratigraphy, Sedimentology: Surface and Subsurface, James, D.P. and Leckie, D.A., Editors, *Canadian Society of Petroleum Geologists*, Memoir 15, pages 49–62.

COALFILE (2006): COALFILE BC Peace River NE BC coal assessment reports; *BC Ministry of Energy, Mines and Petroleum Resources*,
<http://webmap.em.gov.bc.ca/mapplace/terrain/reports_pr.htm> [December 2006].

Duff, P.McL.D. and Gilchrist, R.D. (1981): Correlation of Lower Cretaceous coal measures, Peace River Coalfield, British Columbia; *BC Ministry of Energy, Mines and Petroleum Resources*, Paper 1981-3, 31 pages.

Gibson, D.W. (1992): Stratigraphy, sedimentology, coal geology and depositional environments of the Lower Cretaceous Gething Formation, northeastern British Columbia and west-central Alberta; *Geological Survey of Canada*, Bulletin 431, 127 pages.

Gibson (1992): Stratigraphy and sedimentology of the Lower Cretaceous Hulcross and Boulder Creek formations, northeastern British Columbia; *Geological Survey of Canada*, Bulletin 440, 111 pages.

Gilchrist, R.D. and Flynn, B.P. (1978): Coal resources, Peace River coalfield, northeastern British Columbia; *BC Ministry of Energy, Mines and Petroleum Resources*, Preliminary Map 33.

Grieve, D.A., Holuszko, M.E. and Goodarzi, F. (1995): British Columbia Coal Quality Survey, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Bulletin 96.

Kalkreuth, W; Langenberg, W; McMechan, M. (1989): Regional Coalification Pattern of Lower Cretaceous Coal - Bearing Strata, Rocky Mountain Foothills and Foreland, Canada - Implications For Future Exploration; *International Journal of Coal Geology*, Volume 13, no. 1-4, 1989; pages 261-302.

Kalkreuth, W. and Leckie, D.A. (1989): Sedimentological and petrographical characteristics of Cretaceous strandplain coals: a model for coal accumulation from the North American western interior seaway; in Peat and Coal: Origin, Facies and Depositional Models, Lyons, P.C. and Alpern, B., Editors, *International Journal of Coal Geology*, Volume 12, pages 381-424.

Kilby, W.E. (1984): Tonstein and bentonite Correlations in northeast British Columbia; in Geological Fieldwork 1984; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Paper 1985-1, pages 257-277.

Lamberson, M.N., Bustin, R.M. and Kalkreuth, W. (1991): Lithotype (maceral) composition and variation as correlated with paleo-wetland environments, Gates Formation, northeastern British Columbia, Canada, *International Journal of Coal Geology*, vol.18, pages 87-124.

Leckie, D.A. (1983): Sedimentology of the Moosebar and Gates Formations (Lower Cretaceous), Ph.D. Thesis, *McMaster University*, Hamilton, Ontario, 515 pages (unpublished).

Leckie, D. A. (1986): Rates, controls, and sand-body geometries of transgressive-regressive cycles: Cretaceous Moosevale and Gates formations, British Columbia; *American Association of Petroleum Geologists Bulletin*, volume 70, pages 516-535.

Leckie, D.A., Hayes, B., and Staniland, M. (1995): Formation and member top database for the Peace River Formation in the Peace River arch area; *Geological Survey of Canada*, Open File 3096, 74 pages.

Legun, A. (1990): Stratigraphic trends in the Gething Formation; *BC Ministry of Energy, Mines and Petroleum Resources*, Open File 1990-33.

Legun, A.S. (2003): Coalbed methane geology of the Peace River district, northeastern BC (parts of 94A, 94B, 93I, 93O, 93P); *B.C. Ministry of Energy, Mines and Petroleum Resources*, Geoscience Map 2003-2, scale 1:200000.

Legun, A.S. (2007): Mapping and review of coal geology in the Wolverine river area, Peace River coalfield (NTS 93P/03), northeastern British Columbia, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Geological Fieldwork 2006, Paper 2007-1, pages 67-76.

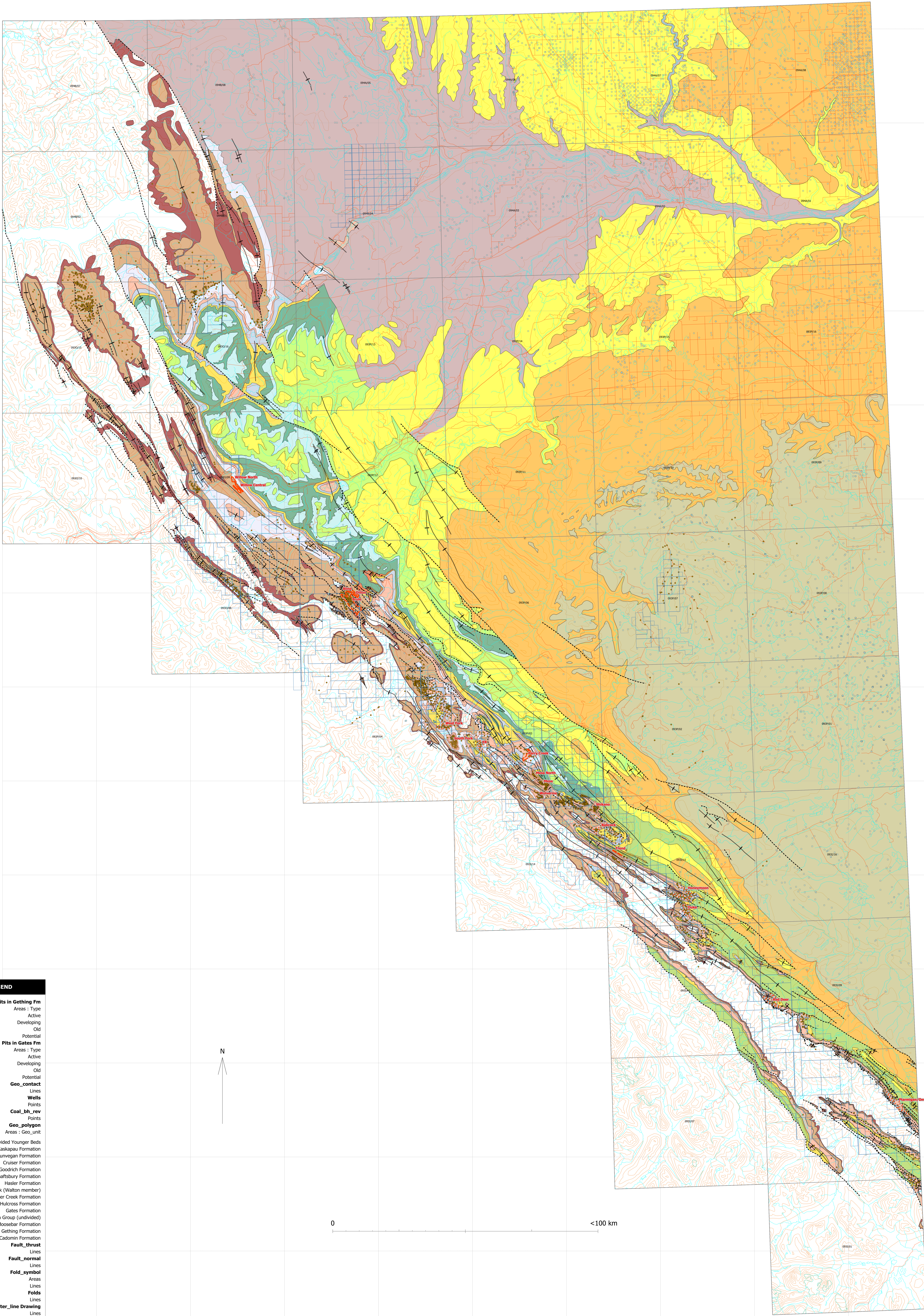
McMechan, M. E. (1994): Geology, Dawson Creek, west of the sixth meridian, British Columbia; *Geological Survey of Canada*, "A" Series Map, 1858A.

MINFILE (2006): MINFILE BC mineral deposits database; *BC Ministry of Energy, Mines and Petroleum Resources*, URL <<http://www.em.gov.bc.ca/Mining/Geosurv/Minfile/>> [December 2006]. McMechan, M. E. (1994): Geology, Dawson Creek, west of the sixth meridian, British Columbia; *Geological Survey of Canada*, "A" Series Map, 1858A.

Ryan, B.D. (1997): Coal quality variations in the Gething Formation, northeast British Columbia (93 O, J, I); in Geological Fieldwork 1996, *BC Ministry of Energy, Mines and Petroleum Resources*, Paper 1997-1, pages 373-397.

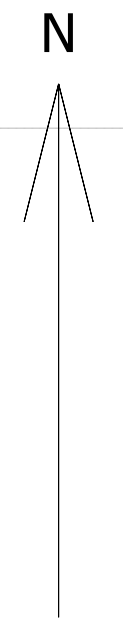
Stott, D.F. (1998): Fernie Formation and Minnes Group (Jurassic and lowermost Cretaceous), northern Rocky Mountain Foothills, Alberta and British Columbia; *Geological Survey of Canada, Bulletin 516*, 516 pages.

Wadsworth, J., Boyd, R., Diessel C., and Leckie, D. (2003): Stratigraphic style of coal and non-marine strata in a high accommodation setting: Falher Member and Gates Formation (Lower Cretaceous), western Canada; *Bulletin of Canadian Petroleum Geology 2003*, volume 51: 275-303

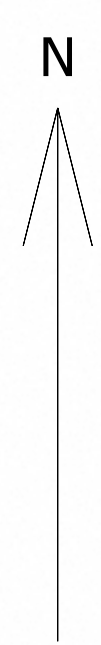
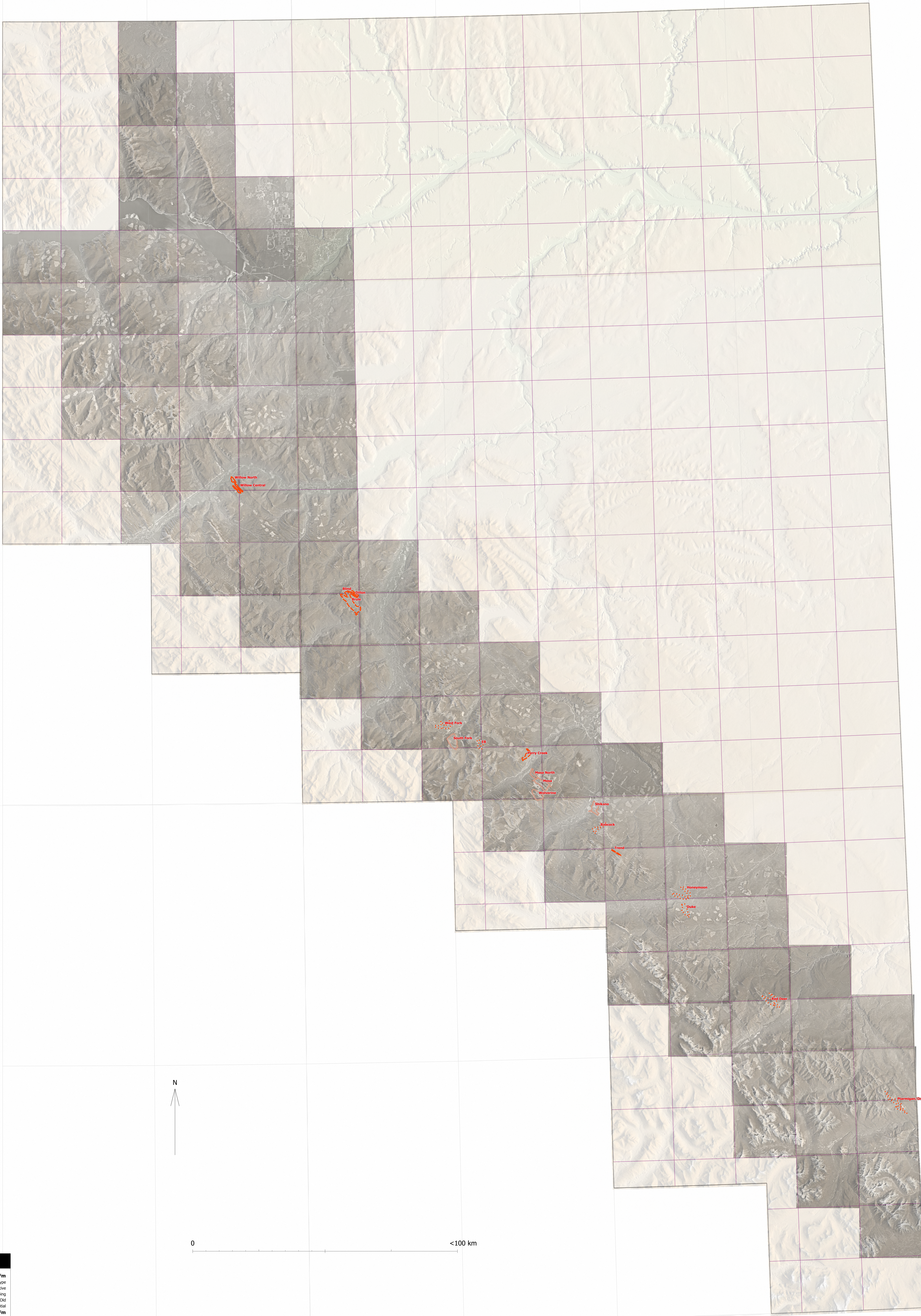


LEGEND

- Pits in Gething Fm**
- Areas : Type
- Active
- Developing
- Old
- Potential
- Pits in Gates Fm**
- Areas : Type
- Active
- Developing
- Old
- Potential
- Geo_contact**
- Lines
- Wells**
- Points
- Coal_bh_rev**
- Points
- Geo_polygon**
- Areas : Geo_unit
- Undivided Younger Beds
- Kaskapu Formation
- Dunvegan Formation
- Cruiser Formation
- Goodrich Formation
- Shaftsbury Formation
- Hasler Formation
- Boulder Creek (Walton member)
- Boulder Creek Formation
- Hulcross Formation
- Gates Formation
- Fort St. John Group (undivided)
- Moosebar Formation
- Gething Formation
- Cadomin Formation
- Fault_thrust**
- Lines
- Fault_normal**
- Lines
- Fold_symbol**
- Areas
- Lines
- Folds**
- Lines
- 250k_water_line** Drawing
- Lines
- 250k_trnsi** Drawing
- Lines
- Map_border**
- Areas
- Lines
- 250k_contour** Drawing
- Lines



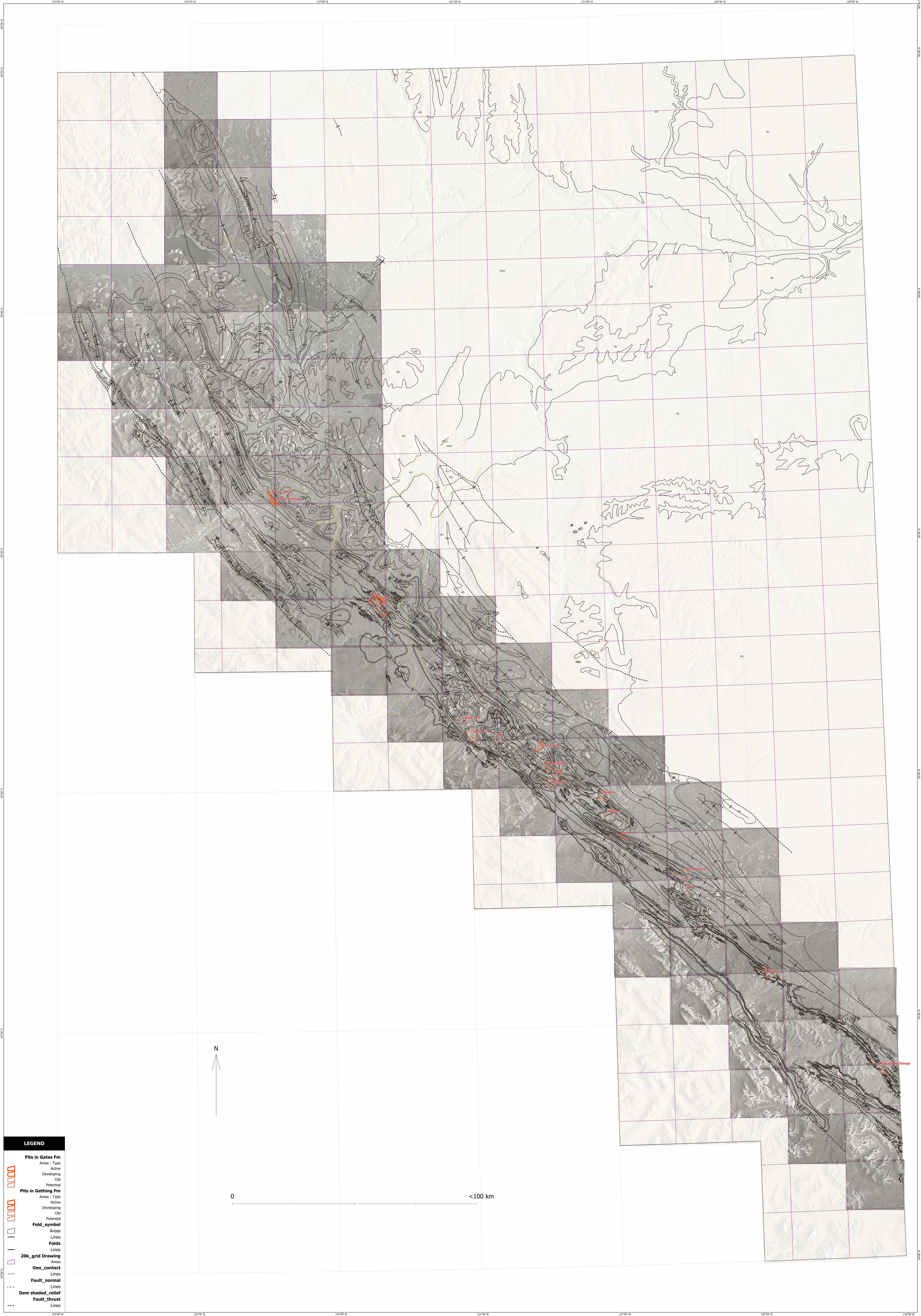
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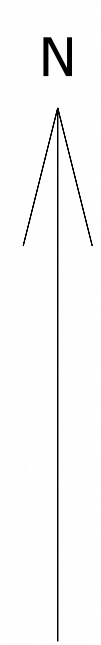
LEGEND

- Pits in Gates Fm**
- Areas : Type
- Active
- Developing
- Potential
- Old
- Pits in Gething Fm**
- Areas : Type
- Active
- Developing
- Potential
- Old
- 20k_grid Drawing**
- Areas
- Dem shaded_relief**

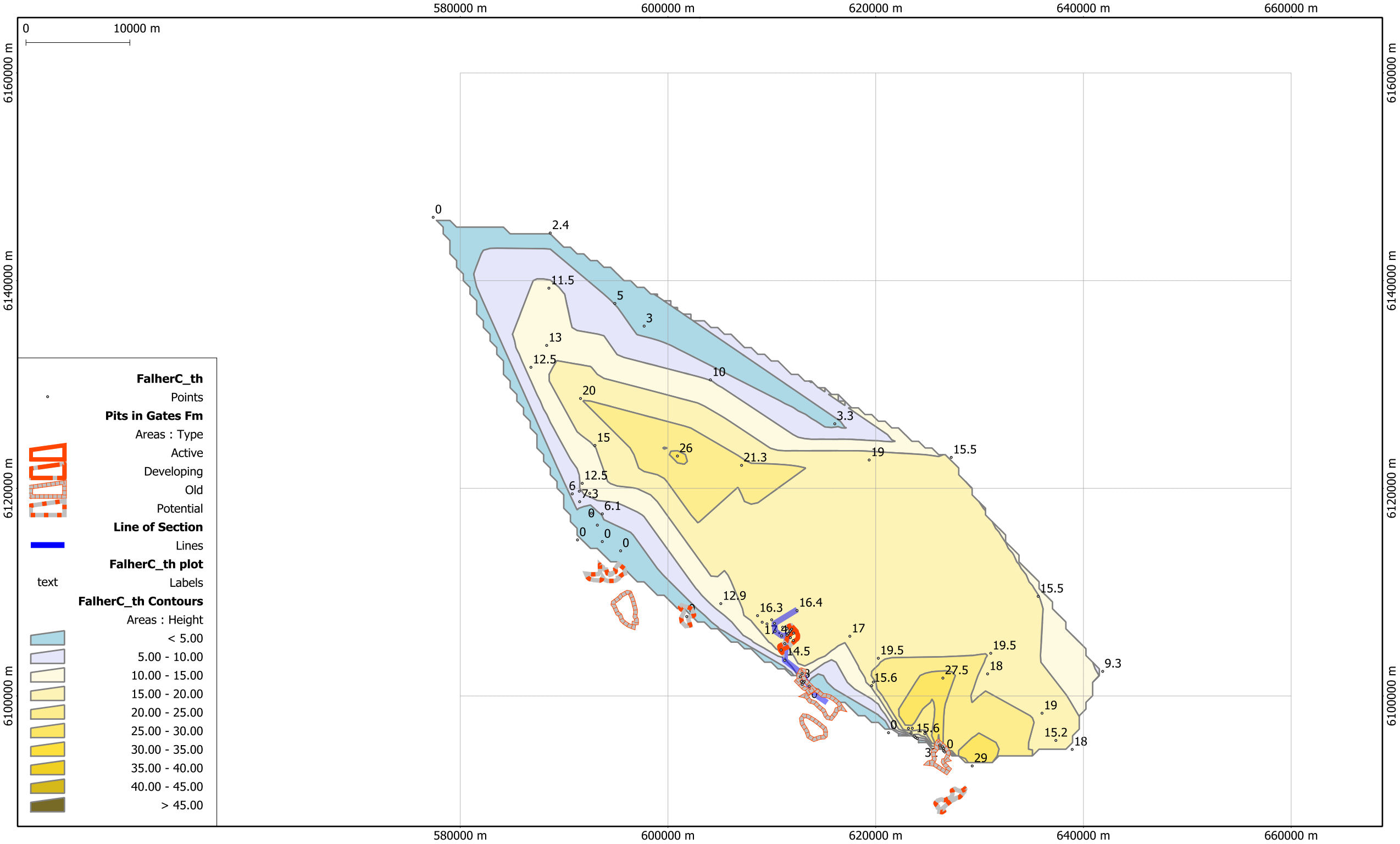


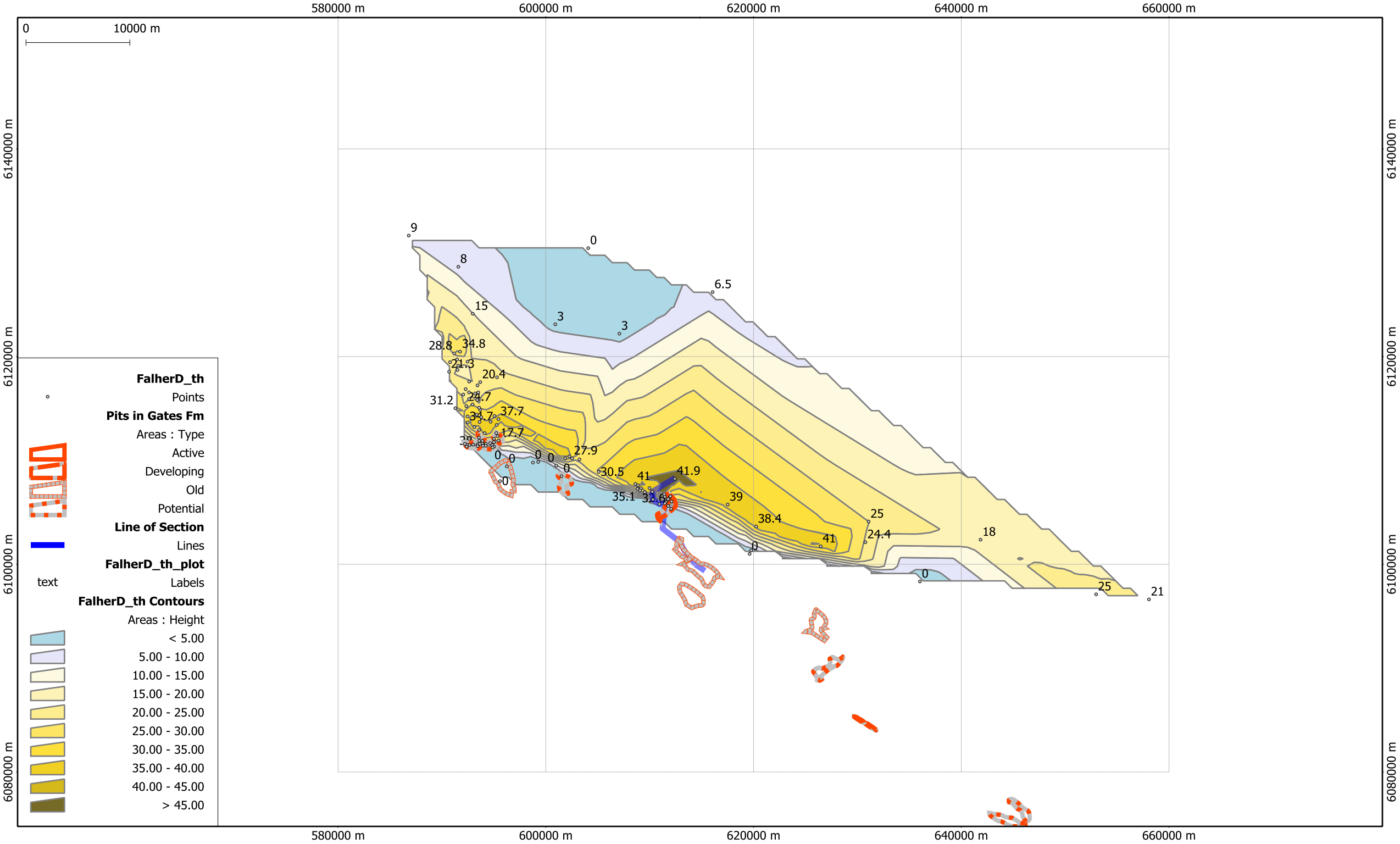
LEGEND

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- Areas : Type
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- Fold_symbol**
- Areas
- Lines
- Folds**
- Lines
- 20k_grid Drawing**
- Lines
- Geo_contact**
- Areas
- Lines
- Fault_normal**
- Lines
- Dem shaded_relief**
- Lines
- Fault_thrust**
- Lines



0 <100 km





0 10000 m

580000 m 600000 m 620000 m 640000 m 660000 m

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580000 m 600000 m 620000 m 640000 m 660000 m

FalherD_th
Points

Pits in Gates Fm
Areas : Type
Active
Developing
Old
Potential

Line of Section
Lines

FalherD_th_plot
Labels

FalherD_th Contours
Areas : Height
<math>< 5.00</math>
5.00 - 10.00
10.00 - 15.00
15.00 - 20.00
20.00 - 25.00
25.00 - 30.00
30.00 - 35.00
35.00 - 40.00
40.00 - 45.00
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