3D PGF v2 Model

Alberta Energy Regulator

AGS ALBERTA GEOLOGICAL SURVEY

Alberta Table of Formations

September 2015

Model Zones

01 sediment above bedrock (surficial deposits)
Bedrock topography
02 Paskapoo and Porcupine Hills formations
03 Scollard, Willow Creek, Ravenscrag, and Frenchman formations
04 Battle Formation
05 Wapiti and Brazeau formations
06 Horseshoe Canyon (excluding Strathmore Member), St. Mary River, Blood Reserve, Whitemud, and Eastend formations
07 undifferentiated Bearpaw Formation
08 upper Bearpaw Formation
09 lower Bearpaw Formation (A - outside of Strathmore Member and below Bearpaw maximum flooding surface)
10 Strathmore Member
11 lower Bearpaw Formation (B - below Strathmore Member)
12 undifferentiated Belly River Group (excluding Dinosaur Park, Oldman, and Foremost formations)
13 Dinosaur Park Formation
14 Oldman Formation
15 Foremost Formation
16 Lea Park Formation
17 Pakowki and upper Lea Park formations
18 Milk River Formation and Alderson Member
19 undifferentiated upper Smoky Group
20 Wapiabi and Niobrara formations
21 Carlile Formation
22 Kaskapau Formation (A - outside of Cardium Formation and above Second White Specks Formation)
23 Cardium Formation
24 Blackstone Formation
25 Kaskapau Formation (B - below Cardium Formation)
26 Second White Specks (above Belle Fourche Formation), Belle Fourche, and Fish Scales formations, and Barons Sand
27 Second White Specks and Kaskapau formations (above Dunvegan Formation or Doe Creek Member)
28 Doe Creek Member
29 Dunvegan Formation
30 upper Shaftesbury Formation (including Fish Scales zone)
31 Westgate and lower Shaftesbury formations
32 upper Loon River Formation
33 Viking, Bow Island, Pelican, and Peace River formations (excluding Harmon Member)
34 Joli Fou Formation (including Basal Colorado Sand Member) and Harmon Member of the Peace River Formation
35 Mannville Group (excluding Grand Rapids, Clearwater and McMurray formations), and Spirit River and lower Loon River formations
36 Grand Rapids Formation
37 Clearwater Formation (excluding Wabiskaw Member)
38 Wabiskaw Member, and Bluesky, Gething, and Cadomin formations
39 McMurray Formation
sub-Cretaceous unconformity
40 Nikanassin, Monteith, and Fernie formations
41 Schooler Creek Group
42 Doig Formation
43 upper Montney Formation (a.k.a., lower Doig siltstone)
44 middle and lower Montney Formation
45 La Glace sandstone member
46 lower Montney Formation (A - below La Glace sandstone member)
47 Anten coquina member
48 lower Montney Formation (B - below Anten coquina member)
49 Ellis, Ishbel, Stoddart, and Rundle groups
50 Banff and Exshaw formations
51 Wabamun Group and undifferentiated Devonian units on the Peace River Arch
52 Winterburn Group
53 Ireton, Fort Simpson, and Grosmont formations, and Grumbler Group
54 Duvernay and Muskwa formations
55 Leduc Formation
56 Cooking Lake Formation
57 Majeau Lake Formation
58 Waterways Formation
59 Swan Hills and Slave Point formations
60 Fort Vermilion Formation
61 interval of Elk Point Group, Silurian, Ordovician, and Cambrian strata down to the Precambrian top
Precambrian top
62 Precambrian top to an arbitrary model base depth of 6000 m below sea level

zone 1
zones 2-3
zones 4-15
zones 16-19
zone 20-25
zones 26-30
zones 31-34
zones 35-39
zones 40-49
zone 50
zone 51
zone 52
zones 53-57
zones 58-60
zone 61
zone 62

LITHOLOGY

- Till of distinct origin: (a) Cordilleran, (b) Laurentide
- Nonstratified interglacial sediments (clay, silt, sand)
- Gravel and sand
- Conglomerate and sandstone
- Sandstone, siltstone, and quartzite, commonly interbedded with shale or mudstone
- Shale and mudstone with subordinate siltstone
- Limestone and dolostone
- Limestone and dolostone interbedded with calcareous shale
- Halite ± anhydrite, carbonate, and shale
- Anhydrite ± gypsum, halite, carbonate, and shale
- Limestone and dolostone ± sandstone interbedded with anhydrite
- Volcanic and volcaniclastic rock

CONTACTS

- Formation or group boundary
- Member or unit boundary
- Boundary uncertain
- Boundary truncated by erosion
- Lapout boundary or facies change

ABBREVIATIONS

(GC) Grand Centre, (MC) Marie Creek, (B) Bonnyville, (BL) Bronson Lake — Laurentide till units

1WS	First White Speckled Shale
2WS	Second White Speckled Shale
CDMM	Coquinal Dolomite Middle Member
CK	Creek
GR	Graminia
LG	Lower Grosmont Carbonate
LK	Lake
MDL	Mackenzie Dolomite Lentil
MTN	Mountain
PK	Pakowki Formation
SLT	Siltstone
SST	Sandstone

COMMENTS

The eight columns shown in this chart represent typical stratigraphic relationships encountered across Alberta. The primary sources of input included AGS *Map 600: Bedrock Geology of Alberta* (Prior et al., 2013) and AGS *Map 560: Geology of the Rocky Mountains and Foothills* (Panà and Elgr, 2013). The coloured polygons in the small reference maps represent only the approximate area that each stratigraphic column represents and should not be taken as rigorous unit or terminology boundaries. For example, the northern limit of the Southern Plains column varies from about 50.5°N to 52°N. Blank gaps in the columns represent major unconformities due either to nondeposition or deposition and subsequent erosion. Minor unconformities are not shown. The vertical axis of the chart is scaled in time based upon chronostratigraphic divisions (system, series, and stage) with the absolute age of division boundaries given in millions of years before present. The chronostratigraphic divisions used and their numerical ages follow the international chronostratigraphic chart of the IUGS International Commission on Stratigraphy (ICS) version 2015/01 (Cohen et al., 2013 updated), with the exception of the Cambrian subdivisions, which follow the ICS chart of 2004 (Gradstein et al., 2004). The time scale is not linear. The Upper Devonian and Mississippian stratigraphic unit polygons are vertically exaggerated to display the stratigraphic and nomenclatural complexities. In areas of considerable paleotopographic relief (e.g., carbonate reefs), the representation of stratigraphic relationships may be a compromise between time and geometry. The stratigraphy of the late Eocene to Pleistocene gravel and sand deposits is not yet fully understood, thus their depiction is preliminary.

Stratigraphic unit polygons are coloured to represent the dominant lithology or combination of lithologies present. Group and supergroup names appear on a neutral background. Names in parentheses in the northeast Plains refer to outcrop equivalents of the respective subsurface stratigraphic units. Question marks denote considerable uncerainty in the stratigraphic position or naming of the unit.

This table should only be used as a guide and is not determinative of the ownership of Crown mineral rights.

REFERENCES

Cohen, K.M., Finney, S.C., Gibbard, P.L. and Fan, J-X. (2013 updated): The ICS International Chronostratigraphic Chart; Episodes 36, p. 199-204, URL <http://www.stratigraphy.org/ICSchart/ChronostratChart2015-01.pdf> [August 2015].

Gradstein, F.M., Ogg, J.G., Smith, A.G., et al. (2004): Geological Time Scale 2004; Cambridge University Press, 589 p.

Panà, D.I. and Elgr, R., comp. (2013): Geology of the Alberta Rocky Mountains and Foothills; Energy Resources Conservation Board, ERCB/AGS Map 560, scale 1:500 000, URL <http://www.ags.gov.ab.ca/publications/abstracts/MAP_560.html> [August 2015].

Prior, G. Hathway, B., Glombick, P., Panà, D.I., Banks, C.J., Hay, D.C., Schneider, C.L., Grobe, M., Elgr, R., Weiss, J. (2013): Bedrock Geology of Alberta; Alberta Energy Regulator; AER/AGS Map 600, scale 1:1 000 000, URL <http://www.ags.gov.ab.ca/publications/abstracts/MAP_600.html> [August 2015].

RECOMMENDED REFERENCE FORMAT

Alberta Geological Survey (2015): Alberta Table of Formations; Alberta Energy Regulator, URL <…> [ACESS DATE].