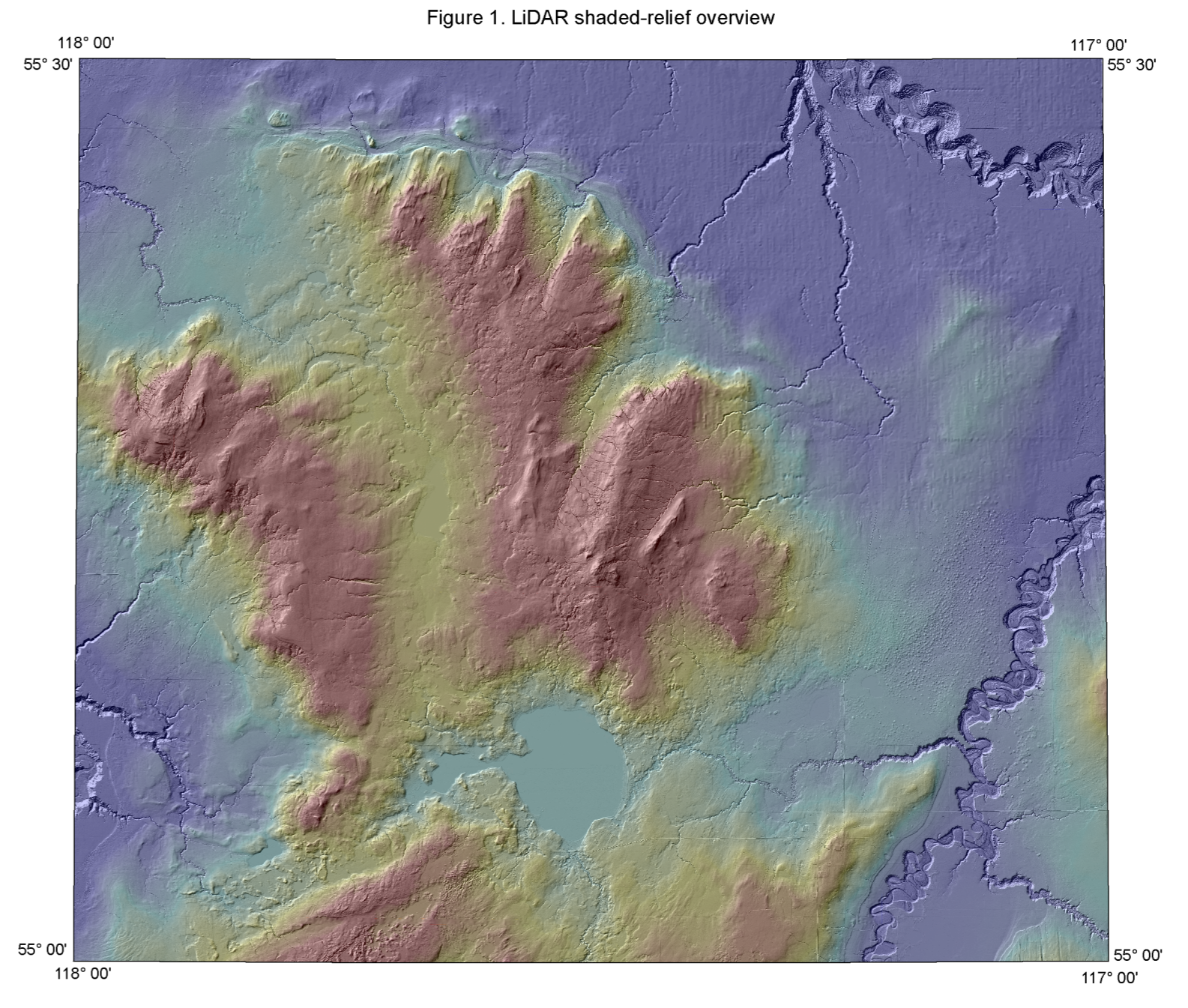


This is a common map legend for the surficial geology of northern Alberta. Coloured legend blocks indicate map units that appear on this map. Not all map symbols shown in the legend necessarily appear on this map.

UNIT	UNIT NAME	DESCRIPTION AND GENESIS
<b>QUATERNARY HOLOCENE</b>		
A	ANTHROPOGENIC MATERIALS:	Artificially made ground or geological materials that have been disturbed by human activity, such that their physical properties (e.g. structure, cohesion, compaction) have been drastically altered.
O	ORGANIC DEPOSITS:	Undifferentiated peat (woody to fibrous muck) occurring in wetlands, commonly underlain by fine-grained, poorly drained glaciolacustrine deposits; includes marshes, swamps, bogs and fens.
OB	Bog peat:	Occurs in a peatland with a fluctuating water table and commonly a raised surface; peatland surface is dominated by sphagnum mosses, heath shrubs and short, stunted trees.
OF	Fen peat:	Occurs in peatland which receives water from slowly flowing streams and groundwater, with the water table lying at the land surface; peatland surface is dominated by sedges, with grasses and reeds near local pools, and is sparsely treed.
C	COLLUVIAL DEPOSITS:	Materials that have reached their present position as a result of direct, gravity-induced movement; commonly occurs as slope and slump deposits confined to valley slopes and floors; includes pre-existing bedrock, till, glaciolacustrine, glaciofluvial and eolian sediments, generally poorly sorted.
F	FLUVIAL DEPOSITS:	Sediments transported and deposited by streams and rivers; synonymous with alluvium. Includes well-sorted stratified sand, gravel, silt, clay and organic sediments occurring in channel and overbank deposits (e.g., postglacial floodplains, terraces, fans and deltas).
L	LACUSTRINE DEPOSITS:	Sediments deposited in and adjacent to recent and modern lakes; includes offshore sand, silt and clay, minor organic deposits; may also include minor littoral (nearshore) beaches and bars composed of sand, silt and minor gravel.
E	EOLIAN DEPOSITS:	Wind deposited sediments, comprise well-sorted, medium- to fine-grained sand and minor silt; generally massive to locally cross-bedded or ripple-laminated; includes both active and vegetated dunes and sand sheets.
<b>PLEISTOCENE</b>		
LG	GLACIOLACUSTRINE DEPOSITS:	Primarily fine-grained, distal sediments deposited in or along the margins of glacial lakes, including sediments released by the melting of floating ice. Includes laminated (rhythmically bedded) to massive fine sand, silt and clay, and may contain ice-ratified debris.
LGL	Littoral and nearshore sediments:	Massive to stratified, well-sorted silty sand, pebbly sand and minor gravel; occurs in beaches, bars, spits and deltaic foresets deposited during regression and lowering of glacial lakes.
LGI	Ice-contact sediments:	Sediments deposited in ice-walled lake plains along the margins of stagnant glacier ice. Characterized by low to high-relief hummocky topography, including flat-topped hills. Typically comprise glaciolacustrine sediment, including laminated to massive fine sand, silt and clay in the central part of these features, and littoral sediments around their margins. Locally contain diamict resulting from the collapse, melt-out or slumping of supraglacial debris from the surrounding ice walls.
FG	GLACIOFLUVIAL DEPOSITS:	Sediments deposited by glacial meltwater streams as subaerial or subaqueous outwash. Includes sand and gravel, often stratified, minor silt, and may show evidence of ice melting (slumped structures). Features include meltwater channels, kettle holes, terraces and minor ice-contact sediments.
FGI	Ice-contact sediments:	Sediments deposited by meltwater streams flowing either in direct contact with the ice margin (kame terraces) or within and/or under glacial ice (eskers, crevasse ridges). Includes massive to stratified, poor to moderately sorted, coarse-grained sediments (predominantly pebble gravel and coarse-grained sand, locally till) and may show evidence of ice melting (slumped structures).
M	MORAINES:	Diamict (till) deposited directly by glacial ice and consisting of a mixture of clay, silt, sand and minor pebbles, cobbles and boulders. Locally, this unit may contain blocks of bedrock, pre-existing stratified sediment and till, or lenses of glaciolacustrine and/or glaciofluvial sediment.
MS	Stagnant ice moraine:	Material resulting from the collapse and slumping of glacial and supraglacial sediment in response to the melting of buried stagnant ice at the ice margin; sediment is mainly diamict, but locally includes stratified sediments of glaciolacustrine or glaciofluvial origin. Characterized by low to high-relief hummocky topography.
MT	Ice-thrust moraine:	Terrain formed from the glaciotectonic displacement of materials as blocks or rafts in a more or less intact state. Materials may include syngenetic till, as well as masses of pre-existing sediments and/or bedrock. Characterized by high to moderate relief and features include hill-hole pairs and glaciotectonic moraines.
MF	Fluted moraine:	Clacically streamlined terrain, varies from alternating furrows and ridges to nearly equidimensional smoothed hills; all landforms parallel the local ice flow direction; includes flutes, drumlins and drumlinoids.
FP	PREGLACIAL FLUVIAL DEPOSITS:	Sediments transported and deposited by streams and rivers prior to glaciation. This includes sand and gravel deposited in paleovalleys (i.e., preglacial floodplains, terraces, fans and deltas).
<b>PRE-QUATERNARY</b>		
RT	UNCONSOLIDATED FLUVIAL GRAVELS:	Predominantly well-sorted, quartzite and chert gravel and cobbles; Cordilleran source, Paleogene to Neogene.
R	BEDROCK	

SYMBOL LEGEND		BASEMAP LEGEND	
Eolian forms: dune ridges		Primary road, paved	
Beach or strandline		Primary road, gravel	
Wave-cut bench		Unimproved road	
Escarpment		Truck trail	
Meltwater channel (minor)		River	
Meltwater channel (major)		Lake	
Crevasse filling		UTM, Zone 11 Grid	
Ice thrust ridge		Contour, intervals 50 metres	
Esker (paleoflow direction unknown)		Town	
Drumlinoid or streamlined landform			
Buried drumlinoid or streamlined landform			
Minor moraine ridge			
Major moraine ridge			
Iceberg scour			

UNIT NOTATION	
Example: sandy GLACIOLACUSTRINE plain	
Textural modifier	s
Genetic unit	LG
Geomorphic modifier	p
<b>Textural Modifier</b>	
Textural characteristics may be applied to the terrain classification as a prefix based on field observations or by inference from distinctive genesis and/or morphology. When two modifiers are given, the second letter is the dominant texture, with the first letter indicating the secondary texture; i.e., sc for sandy clay.	
p = pebble	
g = gravel	
s = sand	
Si = silt	
c = clay	
a = sand-silt-clay	
<b>GENETIC &amp; GEOMORPHOLOGICAL MODIFIERS</b>	
d	doughnut rings and ridges
e	eroded
f	fan
g	gullied
h	hummock
k	collapse
m	meander
p	plain
r	ridged
s	slumped
t	terrace
u	undulating
v	veneer
y	dissected
z	delta
<b>Complex</b>	
Where two or more classes of terrain are interspersed in a mosaic or repeating pattern on a scale too small to warrant meaningful differentiation, the proportion of each component in the combination is given in a two or three-position designation set off by slashes denoting arbitrary percentage limits. Examples are:	
'MplGv'	indicates the area is underlain by approximately 60% morainal plain and up to 40% glaciolacustrine veneer
'MvLgGvFg'	indicates at least 60% of the area is underlain by morainal veneer, with up to 40% glaciolacustrine veneer and less than 15% glaciofluvial plain
'LgplM'	indicates more than 60% of the area is underlain by a glaciolacustrine plain, with less than 15% moraine
<b>Stratigraphic Sequence</b>	
Where materials of different origins or textures are known to be superimposed or can be confidently inferred, the sequence is indicated in conventional order using vertical separators, such as:	
'sLgV   Mp'	indicates sandy glaciolacustrine veneer deposited on morainal plain
<b>Transitional Association</b>	
Locally, two or more terrain units are juxtaposed by reason of related origin, temporal sequence or ambiguous geomorphological distinction. In the last case, both components may or may not be present. Such situations are identified by a compound designation marked by a hyphen. Examples are:	
'FGz-LGz'	indicates ice-contact delta indistinguishable from glaciolacustrine delta
'LG-LGL'	indicates glaciolacustrine indistinguishable from littoral and nearshore glaciolacustrine sediment
<b>Morphological Overprint</b>	
Where a sequence of geomorphological processes has produced a multi-aspect or compound terrain fabric, the geomorphological modifier suffixes are appended in the inferred order of superposition. 'Mpry' indicates a morainal plain has been moulded into ridges and finally dissected by streams. 'FGpr' indicates a glaciofluvial plain that includes discontinuous hummocks and ridges.	
<b>Methodology</b>	
The Alberta Geological Survey conducted surficial geology field mapping in the area during 2012. Observations made during field mapping were combined with the interpretation of Light Detection and Ranging (LiDAR) bare-earth data (Figure 1) and image classification of peatlands from Landsat 8 multispectral data. The LiDAR digital elevation model was used to delineate landforms through shaded-relief images created from three illumination directions. The shaded relief shown as an underlay on the main map was produced by fusing shaded-relief (315° illumination azimuth, 45° declination) and slope-gradient images.	
<b>Acknowledgements</b>	
N. Atkinson and S. Pawley performed the fieldwork, and were assisted by B. Hogberg and C. Heikkinen. K. McKay completed the digital cartography and GIS. Government of Alberta provided the base data. D. Utting provided comments that improved this map.	
<b>References</b>	
Atkinson, N., Utting, D.J. and Pawley, S.M. (2014). Glacial landforms of Alberta, Canada (GIS data, line features); Alberta Energy Regulator, AER/AGS DIG 2014-0022.	
Fenton, M.M., Waters, E.J., Pawley, S.M., Atkinson, N., Utting, D.J. and McKay, K. (2013). Surficial geology of Alberta: Ungeneralized digital mosaic (GIS data, polygon features); Alberta Energy Regulator, AER/AGS DIG 2013-0001.	
Pawley, S.M. and Atkinson, N. (2013). Surficial geology of the Little Smoky area (NTS 83K/NW); Energy Resources Conservation Board, ERCB/AGS Map 564, scale 1:100 000.	
Shipman, T.C., Atkinson, N. and Pawley, S.M. (2011). Surficial geology of the Falher area (NTS 83N/NW); Energy Resources Conservation Board, ERCB/AGS Map 556, scale 1:100 000.	



**Map 577**

**Surficial Geology of the Sturgeon Lake Area (NTS 83N/SW)**

Geology by: N. Atkinson and S.M. Pawley

