

**Supplementary Table 1.** lithology units and their descriptions in the study area

G	Unit	Description
	Cm	Dark grey to black fossiliferous limestone with subordinate black shale
A	Cl	Dark red meddium - grained arkosic to subarkosic sandstone and micaceous siltstone
B	Dp	light red to white, thick bedded quartzarenite with dolomite intercalations and gypsum
	DCkh	dark grey limestone, greenish marl and shale, locally includin gypsum
	Ekh	Olive - green shale and sandstone
C	E1m	Marl, gypsiferous marl and limestone
	Jsc	Conglomerate
	Jd	greenish - grey argillaceous limestone with intercalations of calcareous shale
D	Jl	Light grey, thin - bedded to massive limestone
	Jmz	Grey thick - bedded limestone and dolomite
	Jch	Dark grey argillaceous limestone and marl
	Kat	Olive green glauconitic sandstone and shale
	Ksn	Grey to block shal and thin layers of siltstone and sandstone
	Ksr	Ammonite bearing shale with intercation of orbitolin limestone
	Ku	Upper cretaceous, undifferentiated rocks
E	Kad-ab	Undifferentiated unit including argillaceous limestone, marl and shale
	Kl	Lower Cretaceous undifferentiated rocks
	K	Cretaceous rocks ingeneral
	Ktr	Grey oolitic and bioclastic orbitolina limestone
	Murm	Ligth - red to brown marl and gypsiferous marl with sandstone intercalations
F	Murm	Gypsiferous marl
	g	
	PlQc	Fluvial conglomerate, Piedmont conglomerate and sandstone.
	Pz	Undifferentiated lower Paleozoic rocks
	pC-C	Late proterozoic - early Cambrian undifferentialed rocks
	Pr	Dark grey medium - bedded to massive limestone
	Pz1a.b	
G	v	Andesitic basaltic volcanic
	Pd	Red sandstone and shale with subordinate sandy limestone
	pCmt2	Low - grade, regional metamorphic rocks (Green Schist Facies)
	Plc	Polymictic conglomerate and sandstone
	P	Undifferentiated Permian rocks
	Qsw	Swamp
	Qft2	Low level piedment fan and vally terrace deposits
	Qm	Swamp and marsh
H	Qft1	High level piedmont fan and vally terrace deposits
	Qs,d	Unconsolidated wind blown sand deposite including sand dunes
	Qal	Stream channel, braided channel and flood plain deposites

	TRe	thick bedded grey o'olitic limestone ; thin - platy, yellow to pinkish shaly limestone
J	TRe2	Thick bedded dolomite
	TRJs	Dark grey shale and sandstone
