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Reference List For Describing Cuttings And Cores Of Sediments And Sedimentary Rocks In Nebraska

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University of Nebraska Lincoln

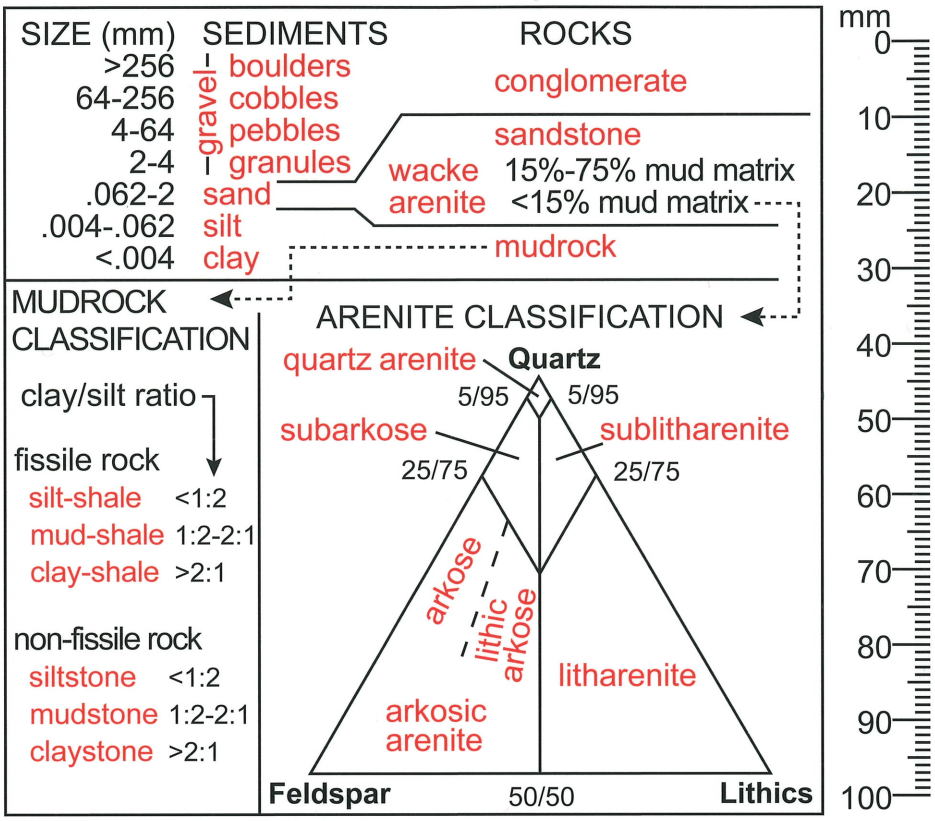
EC-21

1 Indicate PRIMARY LITHOLOGY

Go to 1a, 1b, or 1c.

1a. Clastic sediments and sedimentary rocks

SIZE (mm)	SEDIMENTS	ROCKS
>256	gravel – boulders	conglomerate
64-256	gravel – cobbles	conglomerate
4-64	gravel – pebbles	conglomerate
2-4	gravel – granules	conglomerate
.062-2	sand	sandstone: wacke 15%-75% mud matrix; arenite <15% mud matrix
.004-.062	silt	mudrock
<.004	clay	mudrock



1b. Carbonate sedimentary rocks

NAME	% DOLOMITE
limestone	0-10
dolomitic limestone	10-50
calcitic dolomite	50-90
dolomite (dolostone)	90-100

mudstone	mud supported carbonates with <10% grains
wackestone	mud supported carbonates with >10% grains
packstone	grain supported carbonates with interstitial mud
grainstone	grain supported,mud-free carbonates
boundstone	components bound together during deposition
crystalline	depositional texture not recognizable

1c. Other sediments and sed. rocks that may be encountered in Nebraska

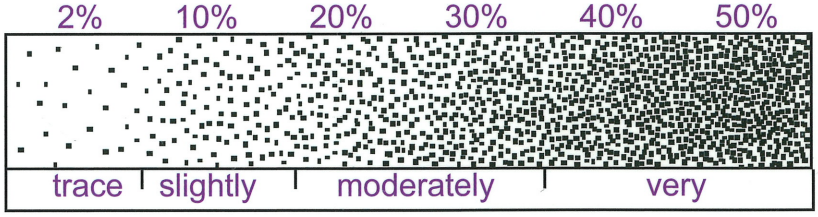
peat	dk. brown to black organic sediment *in Quaternary sediments*
coal	lignite and bituminous, rare *in Pennsylvanian, Permian, & Cretaceous rocks*
chert	hard, nodular to bedded siliceous sedimentary rock *in Permian & older rocks*
gypsum	soft, hydrated calcium sulfate *in some deeply buried pre-Cenozoic rocks*
volcanic ash	weakly cohesive pyroclastic material *in Paleogene, Neogene, & Quaternary sediments*
bentonite	volcanic ash altered to lt. gray to white, plastic, smectitic clay *thin beds in Cretaceous (Graneros Sh. through Pierre Sh.)*
till	unsorted/poorly sorted glacial sedimentary clay & silt with sand & coarser sediment -- *in Pleistocene*

2 Indicate SECONDARY LITHOLOGY (use same terms as in 1 above) and ABUNDANCE

2a. Estimate the abundance of clay by extruding a ribbon of wet kneaded sample between thumb and index finger:

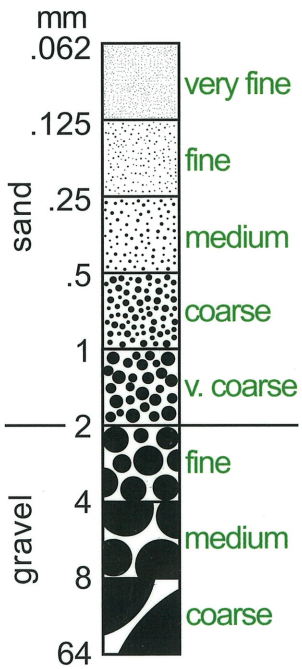
RIBBON LENGTH	% CLAY	ABUNDANCE
<1”	<27	clayey
1”-2.5”	27-40	very clayey

2b. Estimate the abundance of visible grains using this chart:



3 Indicate GRAIN SIZE, SORTING, and ROUNDNESS for sands/sandstones and gravels/conglomerates

3a. Grain size



3b. Sorting

3c. Roundness

4 Indicate COLOR using standardized soil color charts (use colors below for field estimation only)

- light gray
- dark gray
- reddish brown
- brown
- olive
- yellow
- light brown
- white
- black

5 Indicate COMPOSITION of grains visible to naked eye or under low mag. (≤ 20x)

5a. Clastic sediments and sedimentary rocks

Quartz

Feldspars
- K-feldspar
  - orthoclase
  - microcline
- plagioclase
  - albite
  - anorthite

Lithic Grains
- chert
- sandstone
- shale/mudrock
- limestone
- metamorphic: gneiss, quartzite, schist, greenstone, etc.
- volcanic
- plutonic: granite, anorthosite, etc.

Accessory Minerals
- mica
- magnetite
- zircon
- garnet

Biogenic Grains
- shells
- bones
- rootlets
- plants
- pellets

5b. Carbonate sed. rocks

Skeletal Grains

algal oncolites	echinoderms
bivalves	forams
brachiopods	fusilinids
bryozoans	gastropods
crinoids	ostracods
corals	sponges
diatoms	trilobites

Non-skeletal Grains

ooids peloids
intraclasts pellets

6 Indicate CALCIUM CARBONATE CONTENT based on effervescence in dilute HCl

Description	$CaCO_3$%	Reaction
non-calcareous	~ <0.1	no bubbles
very slightly calcareous	~ 0.5	few bubbles
slightly calcareous	~ 1-2	many bubbles
calcareous	~ 5	thin foam
very calcareous	~ >10	thick foam

NB: Calcite reacts readily with dilute HCl. Dolomite rock reacts only after it is ground to a powder; fine particles of dolomite in soil or sediment may react slowly without grinding.

7 Indicate DIAGENETIC FEATURES (post-depositional features)

7a. Redoximorphic features (redox concentrations)

Mottles, stains, nodules, & concretions:
- Fe oxide/hydrous oxide -- red to yellow
- Mn oxides -- black or metallic black

7b. Authigenic minerals (as crystals, grains, nodules, or concretions)

calcite, iron oxides/hydrous oxides, manganese oxide, opal, pyrite, glauconite, siderite, etc.

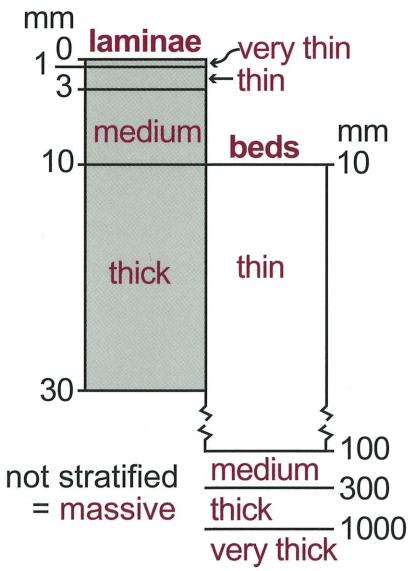
7c. Cementation

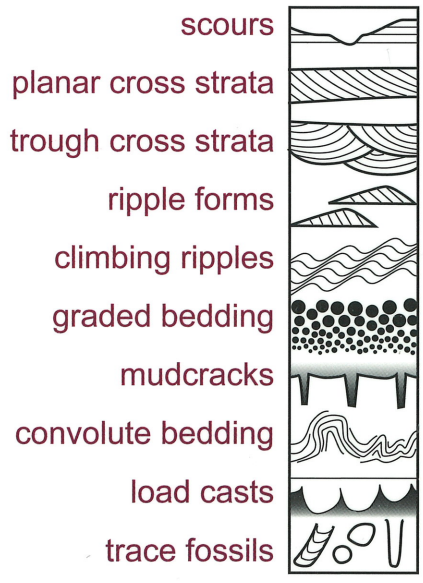
Degree of Cementation	Sample Breaks Under:
weakly cemented	finger pressure
moderately cemented	moderate hand pressure
strongly cemented	foot pressure or weak hammer blow
indurated	strong hammer blow

Cementing Agents

calcite, silica (opal), iron oxides/hydrous oxides, gypsum, authigenic clay, manganese oxides

8 Indicate SEDIMENTARY STRUCTURES (cores only)





9 Indicate POROSITY (cores only)

Describe type if possible:

Primary Porosity

intergranular = between grains
framework, fenestral, &
geopetal -- *only in carbonates*

Secondary Porosity

intercrystalline	moldic
vuggy/vugular	cavernous
fracture	piping & conduit

Cite as: Reference list for describing cuttings and cores of sediments and sedimentary rocks in Nebraska

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