

Water Resources Center/Division of Geology and Land Survey Well Logs:

An Explanation of the Columns, Colors, & Symbols

This document explains the meanings of the columns, colors and symbols used on Water Resources Center/Division of Geology and Land Survey (WRC/DGLS) well logs, both hand-drawn and computer-generated. There are four columns on hand-drawn logs: the Residue Column, the Percentage Column, the Rock Column and the Description Column. The computer-generated logs contain three columns: the Residue Column, the Percentage Column, and the Description Column.. Figure 1 contains a sample computer-generated log and a sample hand-drawn log with all columns labeled.

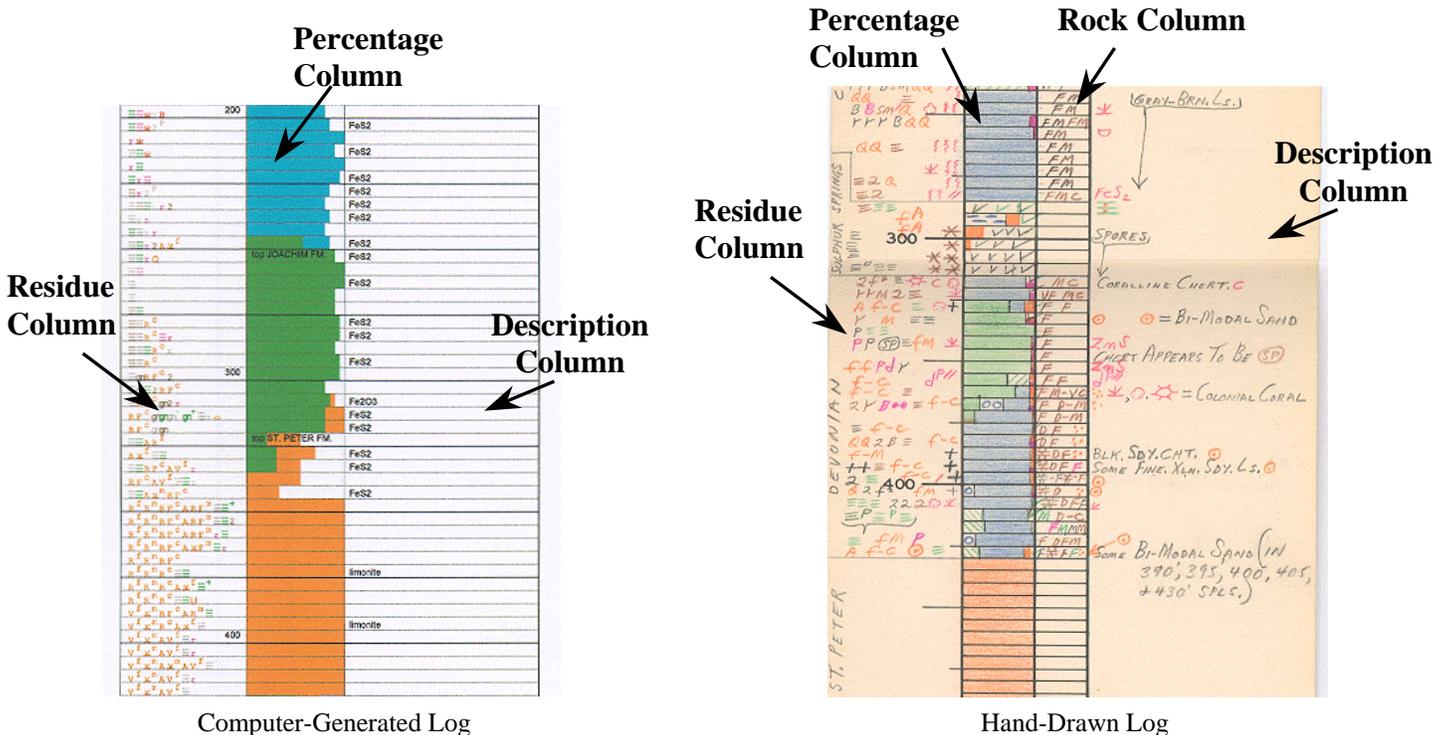


Figure 1. Photographs of sample WRC/DGLS computer-generated and hand-drawn well logs.

The Residue Column contains information describing the colors and textures of any shale, quartz, chert and silicified fossils that remain after the rock cuttings are digested in hydrochloric acid. The Percentage Column contains information describing the percentage and lithology of each rock type present in undigested rock cuttings. The Rock column is used to describe the color and crystalline texture of the carbonate rock (hand-drawn logs only). The Description Column on hand-drawn logs contains chemical formulas of any associated minerals and any additional information about the rock. The Description Column on computer-generated logs contains information about associated minerals and rock color and crystalline texture.

The colors and symbols on the following pages are categorized according to the column(s) in which they appear on the logs. The column in which a color or symbol resides defines the meaning of that color or symbol. On both types of logs, there are several instances in which a particular color or symbol is used in two different columns. For example, “d” is used in the Residue Column to indicate “dead,” but “d” is alternately used in the Rock Column to indicate “dense.” Therefore, one must be aware which column is being read in order to correctly interpret the meanings of the colors and symbols.

PERCENTAGE COLUMN LITHOLOGY & SYMBOLS

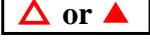
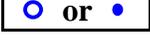
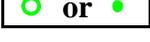
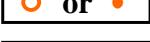
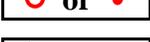
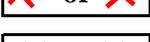
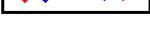
Lithologic Description

(Computer Generated & Hand Drawn)

	Chert
	Shale/Clay
	Dolomite
	Druse & Quartz xtls
	Metallics (computer)
	Sand or Sandstone
	Limestone
	Coal
	Igneous

Residuum/Glacial Drift Symbols

(Hand Drawn Only)

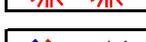
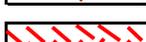
	Limestone Fragments (angular)
	Dolomite Fragments (angular)
	Chert Fragments (angular)
	Limestone Pebbles (rounded)
	Dolomite Pebbles (rounded)
	Gravel
	Igneous Boulders
	Granite Pebbles
	Siderite - massive

Other

	No Sample (hand drawn)
	No Sample (computer generated)

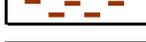
Lithologic Description

(Hand Drawn Only)

	Green Limestone
	Red Limestone
	Shaly Limestone
	Dolomitic Limestone
	Silty Dolomite
	Silty Dolomite
	Siltstone
	Felsite, Rhyolite
	Felsite, Rhyolite
	Siderite - massive
	Porphyry
	Porphyry

Shale Symbols

(Hand Drawn Only)

	Shale **
	Shale - black
	Shale - sandy
	Shale - limy
	Shale - dolomitic
	Soil or Loess
	Yellow clay or silt

** shale color indicated by check color

RESIDUE COLUMN COLORS & SYMBOLS

Insoluble Residue Colors

(Computer Generated & Hand Drawn)

	White
	Gray
	Brown
	Green
	Blue
	Quartz
	Fossils

Clay/Shale/Silt & Its Modifiers

(Computer Generated & Hand Drawn)

≡	Shale
▭	Dolomoldic
+	Sandy
gn	Siltstone/Silt
gn or gn̄	Shaly Silt (hand drawn)
P	Porous
≡+	Shaly sand (hand drawn)
+≡	Sandy shale (hand drawn)
≡ • ≡	Sandy shale (hand drawn)

Other

G	Glaucouite
PG	Pelletal Glaucouite
S.W.L.	Static Water Level (usually in "Remarks" section on hand drawn log)

Quartz Symbols (always orange)

(Computer Generated & Hand Drawn)

A	Sandstone (computer)
Q or *	Masses or Rosettes
∫	Druse
X	Dogtooth Fragments (computer)
◊ or ↔	Doubly Terminated
◊ or →	Singly Terminated
Q	Crystalline Quartz
R	Rounded
F	Frosted
V	Angular
V̄ or V̄	Subangular
Gn	Granular Silica
33	Banded
P	Porous
f or f	Fine

Feldspathic Symbols

(Computer Generated & Hand Drawn)

•••	Arkose (computer)
•••	Arkose (hand drawn; may be red, gray, or brown)
< or >	Red Arkose

RESIDUE COLUMN COLORS & SYMBOLS

Chert Texture Symbols *

(Computer Generated & Hand Drawn)

Sm	Smooth
r	Rough
d	Dead
2	Quartzose
P	Porous
f or f	Fine
+	Sandy
Tr	Translucent
o	Oolitic
⊙	Ooid Zoned
⊙	Ooid Sand Nucleus
⊙	Ooid Zoned/Sandy
••	Ooids Cluster
∪	Oomoldic
▭	Dolomoldic
■	Cryptalgal
•••	Cryptalgal (hand-drawn)
••• or •••	Nodular
B	Beekite

Chert Modifier Symbols *

(Computer Generated & Hand Drawn)

2	Quartzose
P	Porous
f or f	Finely
+	Sandy
o	Oolitic
⊙	Ooid Zoned
⊙	Ooid Sand Nucleus
⊙	Ooid Zoned/Sandy
••	Ooids Cluster
∪	Oomoldic
▭	Dolomoldic
M	Mottled
~	Banded (2) (computer)
~	Banded (3) (computer)
†	Pelloid
■	Cryptalgal (computer)
•••	Cryptalgal (hand-drawn)
••• or •••	Nodular
//	With Spines

Chert Texture Symbols *

(Hand Drawn Only)

•••	Ooids, size varies
○	Pelletal Oolites
•	Pisolith
⊙ or ⊙	Chert w/ooids
F III	Finely porous spinose chert

III	Rough Spinose Chert
f^P	Finely Porous Chert (tripolitic)
}}	Banded
Sm	Color Differentiated
Sm	Gray chert surrounded by smooth blue chert

* color of symbol reflects color of chert

example

SP	Brown porous chert surrounded by smooth blue chert
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RESIDUE COLUMN COLORS & SYMBOLS

Fossil Symbols (always red)

(Computer Generated & Hand Drawn)

	Crinoids (computer)
B	Bryozoan
A	Graptolite
G	Gastropod
	Brachiopod
	Worm Cast
//	Spines
	Spine Masses
T	Trilobites
	Ozarkocoelia
	Hexagonella
	Cystoids
	Ostracods
U	Echinoderm
E	Endothyra

Fossil Symbols

(Hand Drawn Only)

	Crinoids
	Bryozoan
	Gastropods
//, // or //	Spines (matches color of spines)
	Spine Masses (matches color of spines)

ROCK COLUMN COLORS & SYMBOLS

<u>Lithologic Description *</u>	<u>Lithologic Description</u>
(Hand Drawn Only)	(Computer Generated Only)
xx	xx
Crystalline	Crystalline
fx	fx
Fine crystalline	Fine crystalline
vfx	vfx
Very fine crystalline	Very fine crystalline
MX or mx	mx
Medium crystalline	Medium crystalline
CX or cx	cx
Coarse crystalline	Coarse crystalline
VCX or vcx	vcx
Very Coarse crystalline	Very Coarse crystalline
X	X (blu)
Calcite crystals	Calcite crystals
d	d
Dense	Dense
# #	# #
Fire Clay	Fire Clay
	
Under clay	Under clay
	brn
	Brown **
	blu
	Blue **
	gry
	Gray **
	tan
	Tan **
	lt.
	Light
	dk.
	Dark
	ls
	Limestone
	ds
	Dolomite/Dolostone

DESCRIPTION COLUMN COLORS & SYMBOLS

(Hand Drawn Only)	
	Minerals (always written in red in "Description Column")
do	Means "same description as above"
T. D.	Total Depth

* color of symbol reflects color of rock

** color notation preceding cx, fx, vfx, and mx on computer-generated well logs describes color of rock