

# TECHNICAL NOTES

May 15, 1998

MO-1 Technical Note Number 1

Re: Laboratory Data - Rounding of Laboratory Data Values

The National Soil Survey Laboratory (NSSL) records laboratory data on the characterization data sheet to varying decimal places depending on the analysis.

Example: P-retention - whole number (30)  
Base saturation - whole number (70)  
Particle-size (clay, silt, sand) - tenths (10.5, 30.3, 59.2)  
15-bar water - tenths (10.1)  
Organic carbon - hundredths (1.23)  
Acid oxalate (Al, Fe) - hundredths (0.32, 0.15)

In using this data for classification, the rules used for rounding the data is important. The rule is: round the data to the decimal place of the taxonomic criteria being used!

Example 1 - For determining mollic epipedon, organic-carbon must be > 0.6 throughout its thickness. If the data on data sheet shows values of 0.71 o.c. for the 0-5 inch layer and 0.55 o.c. for the 5-12 inch layer, the data supports mollic. The organic-carbon values are rounded to the nearest tenth, since the criteria is tenths (0.6). Therefore, 0.71 is 0.7 and 0.55 is 0.6, the data support > 0.6 percent organic-carbon throughout the 0-12 inch depth.

Depth (in)	organic-carbon	rounded value
0-5	0.71	0.7
5-12	0.55	0.6

Example 2 - For determining andic soil properties (criteria 2), the acid oxalate amount (Al + 1/2 Fe) is variable depending on the amount of glass.

Criteria 2a - the amount is > 0.40; since the lab data is recorded to hundredths, no rounding is necessary.

Criteria 2b - the amount is > 2.0; since the lab data is recorded to hundredths, the data needs to be rounded to the nearest tenth, after "doing" the calculation.

Depth(in)	oxalate	Al oxalate	Fe	Al+1/2Fe	rounded value
0-5	1.38	1.58		1.38+0.79 = 2.18	2.2
5-15	1.34	1.21		1.34+0.61 = 1.95	2.0
15-20	1.10	0.95		1.10+0.48 = 1.58	1.6

This data supports andic soil properties of  $> 2.0 \text{ Al} + 1/2 \text{ Fe}$  throughout the upper 15 inches of mineral soil.

Criteria 2c - The amount is  $> 0.40$  and  $< 2.0$ ; no rounding is necessary.

Depth(in)	oxalate Al	oxalate Fe	Al+1/2Fe
0-4	0.63	0.75	$0.63+0.38 = 1.01$
4-10	0.32	0.44	$0.32+0.22 = 0.54$
10-18	0.28	0.20	$0.28+0.10 = 0.38$
18-25	0.33	0.18	$0.33+0.09 = 0.42$

This data supports andic soil properties in that there are 14 or more inches within the upper 24 inches that satisfy the criteria.

Example 3 - For determining Vitrands or Vitric greatgroups or subgroups, the 15-bar water retention of less than 15 percent on dry and less than 30 percent on moist samples is criteria. The data recorded on the data sheet is in tenths for 15-bar. Since the criteria (15 percent/30 percent) is a whole number, the data is rounded to the nearest whole number.

Depth	15-bar (dry)	rounded	15-bar (moist)	rounded
0-4	14.7	15	-	-
4-10	15.5	16	-	-
10-18	9.6	10	-	-
10-25	14.5	15	-	-

Based on only the above data, Vitrands is not supported because 8 inches meets Vitric criteria (10-18) and 16 inches does not (0-10, 18-24). Remember, the criteria is a cumulative thickness of 14 inches or more within the upper 24 inches of mineral soil. It states less than 15 percent 15-bar not 15 percent or less.

Rounding laboratory data to the appropriate decimal point can change a taxonomic placement. The precise wording of criteria (less than 15 percent vs. 15 percent or less) is also very important in evaluating data against criteria.