

## Using Excel for NASIS Data Entry – Version 8

Revised – August 7, 2007

This is a set of instructions for using the Excel spreadsheet (NASIS\_ENTRY\_v8.xls) designed to record and develop basic soil data in preparation for input into NASIS.

### Opening the sheet:

1. Open the file named NASIS\_ENTRY\_v8.xls
2. Choose Enable Macros.
3. Make sure Analysis Toolpak and Analysis Toolpak-VBA are active. You can do this through the Tools menu > Add-Ins > check on the boxes next to Analysis Toolpak and Analysis Toolpak-VBA.
4. Do a file "Save As" e.g. ( "your component name"\_NASIS\_Entry\_v8.xls" )

### Before beginning to use this workbook one should know the following:

Four sheets of special interest within this workbook are "Input", "Kf Calculation", "Output" and "Complete." "Input" is the interactive sheet within the workbook, which is modified by the user. The "Kf Calculation" sheet is only slightly interactive like the "Input" sheet. You enter data in only two fields, "% very fine sand" and "Structure Code", the rest is filled in by what is entered on the "Input" sheet. The "Kf Calculation" and "Input" sheet are the only two sheets you will be entering data into. The "Output" sheet should be printed out after data entry in Excel is complete and is used for NASIS data entry. This sheet follows the NASIS data entry sequence and was designed as an aid for NASIS input. The "Complete" sheet shows the user all the data entries and was designed FYI.

All other worksheets (AWC+K, Percent Passing, Source Data, and LL & PI) are reference material used both by Excel and the user to obtain values for NASIS data entry. All worksheets are and should be protected. If for some reason the user needs to modify the data within a worksheet to accommodate their particular situation the sheet can be unprotected by going to "Tools", "Protection" and "Unprotect Sheet". If your office needs to modify data within this workbook for your area as a whole and not just a particular component or two it may be easier to modify and create a master copy for your office (but please retain the original, somewhere). After data modification is complete be sure to turn on the PROTECTION (found in the same place) to AVOID ACCIDENTALLY OVERWRITING SOURCE DATA. Always work within the Input and the Kf Calculation sheets, all other sheets in PROTECTED status!

Open the worksheet entitled "Input". Cells are color-coded according to their design and function.

White cells are those that the **user needs to populate**.

Yellow cells are automatically filled and protected.

Blue cells are informational and may help the user in data entry.

Green cells are interactive and provide links to tables and graphics.

The small red triangles located in the upper right-hand corner of certain cells (e.g. W6 – Rock Density and AJ6 - % Passing #40) are comment indicators. When the cursor is placed over these cells (without clicking in the cell) a comment will appear that will aid the user when entering data into these fields. These comment

indicators are also found within cells on the “Complete” and “Output” sheets and again, are there to give more information about that particular cell.

### **Some things the user should know about particular fields of entry or data columns:**

Texture, Textural Modifier, Clay Activity Group, and AWC & LL PI Type all have been set up with drop-down menus. (Notice that all of the above-mentioned fields except for AWC Type contain a dash in the row entitled “horizon”. All other fields, or columns of data, contain “L, RV, H” (Low, Representative Value, and High) in the row directly below the column heading. Paying attention to this detail may help to remind the user of those fields with drop down menus.) To access the menu simply click in the cell within the column that you wish to populate. The drop down ‘down arrow’ will appear and when clicked, the choices you can choose from will appear. The user can either click on one of the choices found within the menu or type in their own entry. All cells within the above-mentioned fields will only accept an entry typed exactly as is found in the drop down list (entries are not case sensitive). The user can decide if using the pull downs or typing in entries is their preferred method of populating those cells.

An AWC Type must be entered for each horizon in order for the AWC calculations to work correctly. The AWC Type is also required to calculate the liquid limit (LL) and plasticity index (PI).

The fragment volume (Frag. Vol) located in cell AG8 through AI16 is a total rock fragment volume ESTIMATION made by you, for both low and high volumes for each horizon. The RV is automatically summed from the Stone, Cobble and Gravel RV values entered in the columns to the left of the Frag. Vol. entry area. More will be said about the use of this data in the section “Begin Data Entry”.

### **Begin Data Entry:**

- Soil Name: (component name)
- Classification:
- MU#: (map unit number)
- Date:
- By:
- Pedon #: example (02-MPR-07) AKA; NASIS “user site ID”
  
- Horizon column is for designations, notice that you will only have to enter this once. Tier 2 and 3 are auto fill.
  
- Choose the drop down choice of inches or cm and enter the depth range of the first horizon. Notice the top of the next horizon is automatically entered.
  
- Enter the textures and the textural modifiers. Notice that with these columns the user has the opportunity to use either the drop down menu or manual data entry. For multiple modifiers you will need to enter the codes manually. You can do this on the output (the one used to print) sheet by unprotecting the worksheet.
  
- Enter the bulk density. The proposed collection of MO-1 guides for populating this field can be accessed by clicking on the green title cell.
  
- Enter rock fragment density.
  
- Enter the stone, cobble, and gravel volumes. The calculation to weight is done internally and can be viewed (if needed) on the “Complete” worksheet. Rock density and bulk density columns must be populated for the calculation to run.
  
- Enter your ESTIMATION of the total low and high rock fragment volumes in the column “Frag. Vol”. As these numbers are used to calculate AWC and estimate percent passing the #10 sieve it is important that you carefully consider these numbers. They were not internally calculated because in many instances, if this was done the numbers would be greater than 100. The entries made here should be based on the family

classification, the textural modifier ranges- i.e. gravelly (15 to <35), very gravelly (35 to <60), and extremely gravelly (60 to <90). Remember, this pedon is supposed to represent the central concept or modal characteristics for this component.

- Percent passing sieves:

Percent passing the #10 sieve has been internally calculated, the calculation will give you values found in NSSH exhibit 618-11. The result can be found on both the "Complete" and the "Output" sheet. Percent passing the #4 is also auto-calculated. It has a default setting of adding 5% to the percent passing the #10. If you feel your situation calls for a greater value passing the #4 (i.e. soils derived from granitics, granodiorite, etc) you can overwrite the default value. But remember, BY OVERWRITING YOU ARE REMOVING THE EQUATION FROM THE WORKBOOK. To get the equation that calculates the default value back you need to go to an original copy.

Percent passing the #40 sieve is entered by the user. Blewitt's table values (derived from texture and % passing the #10 sieve) are located in the blue cells to the right of data entry and are the values for the textures you entered previously. Low, RV and High values are grouped together to aid you in selection of your entry.

Percent passing the #200 sieve is also entered by the user in the same way as for the #40 sieve.

- Enter the low, representative value (RV) and high for percent clay, sand and silt for each horizon from the texture RV column (cell E6). This data is obtained from the standard textural triangle. RV silt is internally calculated so all RVs equal 100%.
- Enter the Organic Matter (OM) percent low, RV and high for each horizon.
- Enter the Clay Activity Group (this is a drop down menu). Use lab data if you have it (similar pedons are probably OK) or Local Guides to estimate group. See MO-1 NASIS Guides 12 & 15.
- Cation Exchange Capacity (CEC) values are auto estimated based on percent clay, OM content and clay activity group.
- Enter CaCO<sub>3</sub>, Gypsum, SAR, and EC L, RV, and H values. This data is obtained from laboratory analysis and/or field measurement.
- Enter pH values. Note the comment box as indicated by the small red triangle found in the upper left-hand corner of the pH header cell (AH19). Within this box is a reminder that the low and high value inputs for pH on this spreadsheet (as in NASIS) must meet the outer limits of the pH ranges as recorded in the Soil Survey Manual. The blue colored cells to the right of the pH data entry field are informational and contain the list of the pH ranges so that you don't have to look it up.
- Choose Horizon Characteristic from the drop down menu for each horizon. Select AWC type from drop down list(s). Criteria for each group are listed. Do not make adjustments for rock fragments for salt influenced soils (EC of 1 or more) in the Input sheet – the adjustments for rock fragments will automatically be made.
- The Kf value is calculated in the Kf calculation worksheet. After entering data in the Input worksheet, go to the Kf Calculation worksheet to enter '% very fine sand' and 'Structure Code'. You can use these fields to manipulate the Kf value if you are looking for a specific Kf value. The Kw value is calculated from fields already entered (texture, OM and rock fragment content) and there is no need for the user to populate this field. This field is internally calculated and the results can be found on both the "Complete" and "Output" worksheets.

- To enter the classification for AASHTO and Unified classification (refer to MO-1 NASIS guide 18a & 18b) values using the NSSH formula for estimating the Liquid Limit, Plasticity Index. Also the #200 sieve and the Unified gravel vs. sand fields) and the Atterberg Limits Graph are located below the blue colored cells to assist your classification. Points on the graph are color coded to correspond with the LL and PI values that were estimated.

- LL and PI are estimated using the formula in the NSSH Exhibit 618.07 for non andic property material, for andic property material a value is suggested from MO-1 NASIS guide #14

- LEP is estimated for you based on lab data analysis from MO-1. The values used in the calculation are what you have entered for clay activity group, percent clay, and rock fragment content.

- Enter Ksat data. Clicking on the green title cell will bring up the proposed MO guide for entering this data.

- For Component Data:

#### **For Component Data:**

For select component data, the heading is green –the user will be connected to data contained within another worksheet by clicking on the green header cell. This data was simply copied from the guides and is used just as you would use hardcopy.

For data title cells that are clear – T value, Wind C, Wind I, LCC (irr, non-irr), and Hydro. Group, the user will need to use hardcopy data (guides) to formulate answers and populate cells. Values that will populate in the blue cells are calculated from the T value, Wind C and Wind I and may help to determine LCC. For data title cells that are green – WEI; WEG, Drainage Class; Frost, Corr. concrete, and Corr. steel, – by clicking on these title cells the user will be connected to data contained within another worksheet. An example of this is the cells Wind Erodibility Index (WEI) and Wind Erodibility Group (WEG). Both are linked to the same table (worksheet WEG&I). This sheet is “Exhibit 618-16 Wind Erodibility Groups (WEG) and Index” copied into Excel as a worksheet so that the user does not have to search for the hardcopy to enter data into the corresponding cells. To exit from the WEG&I worksheet, simply use the back button at the end of the page to return to the cell (WEI or WEG) in the input sheet. Exiting from other worksheets may be slightly different but should be self explanatory.

The Total AWC (weighted) does not include AWC values for surface organic horizons with the in lieu textures of spm, mpm, or hpm (unsaturated organic horizons). This is estimated for you to make LCC or Farm Class determinations. Currently this value is not entered directly into NASIS.

The “Output” page is formatted to print landscape 11 x 17.

Remember to save the file with a new name so you don’t overwrite your original downloaded version.