

Soil Profile Documentation

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OBJECTIVES

- Define and describe requirements for correct soil profile documentation for OSTDS permitting

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The Site Evaluation Form

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INSTRUCTIONS:

- PERMIT #: Permit tracking number assigned by County Health Department.
- APPLICANT: Property owner's full name.
- AGENT: Property owner's legally authorized representative.
- LOT, BLOCK, SUBDIVISION: Lot, block, and subdivision for lot.
- PROPERTY ID#: 27 character number for property (property appraiser ID # or section/township/range/parcel number).
- PROPERTY SIZE: Check if property size at site conforms to submitted site plan. Record net usable area available - lot area exclusive of all paved areas and prepared road beds within public rights-of-way or easements and exclusive of streams, lakes, normally wet drainage ditches, marshes, or other such bodies of water.
- SEWAGE FLOW: Record the estimated sewage flow for the establishment from Table 1 (residential) or Table 2 (non-residential), Chapter 64E-6, FAC. Record the authorized sewage flow for the lot based on net usable area and water supply (1500 gallons per day per acre for private water supplies and 2500 gallons per day per acre for public water supplies). If authorized sewage flow does not equal or exceed the estimated sewage flow, the application must be denied.
- UNOBSTRUCTED AREA: Record the square feet of unobstructed area available and the amount required. Unobstructed area must be at least 2 times as large as the drainfield absorption area and at least 75 percent of the unobstructed area must meet minimum setbacks in Chapter 64E-6, FAC. The unobstructed area must be contiguous to the drainfield.
- BENCHMARK INFORMATION: Record the location of the benchmark. If using a surveyor's benchmark record the actual elevation. Record the elevation of the proposed system site in relation (above or below) to the benchmark.
- MINIMUM SETBACKS: Record minimum setbacks which can be met to all listed features. Actual measurements must be recorded or "NA" for non applicable features. Features on site plan or within 75 feet of the applicant lot must be measured. The location of any public drinking well within 200 feet of the applicant's lot must also be verified.
- FLOOD INFORMATION: Record information on lot's subject to flooding. For lots subject to flooding record 10 year flood elevation for site and actual site elevation.
- SOIL PROFILE INFORMATION: Two soil profiles within the proposed absorption area to a minimum depth of 6 feet or refusal are required. Soil identification will use USDA Soil Classification methodology (Munsell colors and USDA soil textures). Refusals must be clearly documented. Provide USDA soil series if available, record "UNK" if the series cannot be determined.
- WATER TABLE: Record the depth of the observed water table at the time of the evaluation. Mark "perched" or "apparent" as appropriate. Record the estimated wet season water table elevation based on site evaluation, USDA soil maps, and historical information. Indicate if there is high water table vegetation present. Indicate if mottling is present and depth.
- SOIL TEXTURE: Record soil texture or loading rate for system sizing.
- DEPTH OF EXCAVATION: If applicable record depth of excavation required. Record "NA" if not applicable.
- DRAINFIELD CONFIGURATION: Check drainfield configuration required. If other, specify type.
- ADDITIONAL CRITERIA: Record any additional remarks pertinent to site or installation. Ex. Dosing required.
- SITE EVALUATED BY: Signature of evaluator, title, and date of evaluation. Professional engineers must seal all documentation submitted.

The Site Evaluation Form- Back side

ELEVATION WORKSHEET	ELEVATION OF BENCHMARK / REFERENCE POINT IS: _____						
BENCHMARK	_____	SITE 1	_____	SITE 2	_____	SITE 3	_____
[+] SHOT	_____	H.L.	_____	H.L.	_____	H.L.	_____
H.L.	_____	[-] SHOT	_____	[-] SHOT	_____	[-] SHOT	_____
	_____		_____		_____		_____

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Each column must be completed with correct information including information format

SOIL PROFILE INFORMATION SITE 1

MUNSELL #/COLOR	TEXTURE	DEPTH
10YR 4/2	Sand	0" TO 3"
		TO
USDA SOIL SERIES: _____		

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Soil Profile Documentation

- Everyone performing the work is required to follow the same procedures
- State form referenced in rule must be used (DH Form 4015, 08/09)
- The evaluator must use department approved/referenced methodologies

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**DUE TO RULE RESTRICTION,
USDA NRCS TEXTURES AND
METHODOLOGIES ARE THE
ONLY ONES THAT ARE
ACCEPTABLE FOR DOH USE**

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- The column with the heading "Texture," must be completed using the correct USDA NRCS texture for each horizon. The use of non-standard abbreviations cannot be accepted. The use of the term "fill" in this column should be used when necessary, along with the corresponding texture(s) of the fill material.

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- Note that ONLY the USDA NRCS particle sizes are used
- Textures given in any other particle size or texture classification system are not acceptable
- Some examples: Mucky Peat would be abbreviated as MK Peat. Note that the term "organic" is not listed
- Organic soils are listed as muck, mucky peat or peat

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Soil Profile Documentation

- All soil profiles must be completely and correctly documented
- Department required information must be presented by the evaluator
- CHD personnel reviewing information must use the information presented by the evaluator as basis for review
- CHD personnel can use personal knowledge during review

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Soil Profile Documentation

- The fully completed evaluation will be reviewed by the CHD using their knowledge of the area and required references to judge compliance of the information regarding the SHWT
- If information is not sufficient to validate the SHWT the CHD cannot presume other information

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Soil Profile Documentation

- Remember that each drainfield must have at least two profiles
- Example: 15,000 square feet total absorption area
- Designed for ten drainfields, each 1500 square feet
- Need minimum two profiles for each drainfield area, so 20 profiles minimum

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Each soil profile:

- Establishes facts (something determined by evidence) i.e. soil colors, textures, SHWT indicators, etc.
- Must be performed/documentated correctly
- Must use USDA NRCS methodology
- Indicated on site plan along with benchmark or reference point(s)
- Stands on its own (see next slide)

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Stands on it's own

- This means that each profile must be able to allow the system to be installed according to regulations when using the profile by itself
- Why? The system is being installed where the profiles are performed
- Most restrictive conditions *must be used*

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Point of Refusal

- Point of refusal (termination, etc.) indicates that the soil profile could not be advanced to the required 72” depth
- Once 72” is reached, point of refusal is not used due to required depth having been reached)
- Point of refusal must be clearly documented as to reason for said “refusal”

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Examples of Refusal

- Hole collapses due to: excessive water, ironstone, excessive roots, excessive debris, etc.
- “Didn’t want to dig” is not a reason
- In all cases, the evaluator must not be able to proceed further
- The reason must be given and clearly recorded on the profile information or remarks section

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Spatially Variability of Soil

- Cannot assume what lies below point of profile termination (Spodic, limestone, clay?)
- Termination point influences bottom of the drainfield due to the effective soil depth requirements
- Could raise the system more than the separation to SHWT requirement

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Example

- Soil profile one has FS down to 72”
- Soil profile two has FS down to 42”, refusal due to limestone
- Profile that goes down to 72” cannot be used to justify the effective soil depth in any other profile
- The profile with the 42” point of refusal is the more restrictive profile and therefore must be used to install the system

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- Spodic (Bh) horizons should be noted as such
- While a spodic layer contains organic matter that coats mineral soil particles, it is not an organic soil layer nor mucky mineral due to the small amount (<5%) of organic matter (carbon)

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Spodic example

- 10YR 2/1 FS Spodic 16-23 inches
- This entry indicates a horizon of black fine sand that exists as a spodic layer from 16 to 23 inches
- This is NOT an organic layer. Mucky mineral must have at least 5% organics and muck must have at least 12% organics, depending on texture
- A spodic contains <5% organic matter (carbon), generally 1-3%

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A word about spodic layers

- By definition, spodic layers are a sandy material
- They can be any texture sand. As long as it has the word “sand” and is a REAL texture, it can be used
- Proper Examples: LFS, S, FS, VFS
- UNACCEPTABLE Examples: Muck, SiL, SiFS, organics

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Particle Sizes Larger Than The Fine Earth Fraction (2mm)

- Must modify soil texture name when >15% of particles in the horizon are >2mm
- Don't forget to use proper nomenclature such as Gravelly (GR), etc.

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Redox Feature Identification

- The site evaluation form asks for indications of "mottles." What is required here are SHWT indicators (including hydric soil indicators)
- Includes all redox features

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- Note that not all mottles are associated with the seasonal high water table (SHWT). Do not put the depth of non-redox features in the “mottling” depth location
- Redoximorphic features must be described in quantity, contrast and color
- Where present, must be described in all profiles

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- The department accepts the following abbreviations for quantity and visual contrast of redox features, which can be abbreviated as RF
- Quantity of feature:
Common - CMN; Many - write out
- Visual Contrast of feature:
Faint, write out (stripped matrix only);
Distinct - DST; Prominent - PRM

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The presence of the redoximorphic features (if existing) must be indicated in the soil profile or must be listed in the remarks section of the profile

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- 10YR 3/2 FS 0-5"
- 10YR 5/3 FS 5-14"
- 10YR 7/4 FS 14-20"
- 7.5YR 6/8 CMN/PRM RF 16-20"
- 10YR 8/1 FS 20-72"
- Alternately, the row with the redoximorphic information could be omitted in the soil profile information *if the information was placed in the remarks section*

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- Any indicator that is used to determine the SHWT is what goes in the blank
- Additional redox features, while documented as colors and depths in the profile, are not entered into the “mottle” area
- Can enter additional information in Remarks area

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- The information in the “mottling” blank must correspond with the information in the profile and remarks section

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- In the column heading "Depth", the beginning and ending depth of the soil horizon (layer) is recorded
- Requires soil profile description, not a soil log
- Soil logs are NOT acceptable (specified increments such as 0-6", 6-12", etc.)
- While soil profiles may on occasion match, one should expect differences in the depths, thicknesses and colors of each horizon in individual profiles

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- *Soil profile must contain all information to properly document and validate corresponding conclusions drawn from the profiles*
- *Includes estimated seasonal high water table determination, soil textures and effective soil depth*
- *Lack of or inconsistency between any required information is scientific basis to question the evaluation*

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- Example: a profile that indicates no SHWT indicators
- Mottling indicated as "no"
- Site evaluator indicates an estimated seasonal high water table at 10 inches
- Unacceptable by department standards as there is no scientific basis for the estimation of the seasonal high water table

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Another Improper Phrase

- Using a phrase such as “Seasonal high water table determined to be ___ inches above spodic layer” when no data is present to validate that claim is unacceptable
- Must validate all SHWT determinations

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**CAN A SOIL THAT IS NOT
MAPPED IN THE COUNTY
ACTUALLY OCCUR IN
THE COUNTY?**

YES

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Soils Mapped by Counties

- Just because a soil is not actually mapped in the county DOES NOT mean that the soil cannot be found there (assuming same temperature region)
- Therefore you may find a soil (or be given a soil name) that you do not recognize as mapped in the county
- Look name up using the Official Soils Series Description to find out more about the soil

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What to do when there is a lack of SHWT (REDOX) FEATURES

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- SHWT (redox) features need certain conditions in which to form
- In certain cases, these conditions will not be present and redox features will not be found
- This can happen in naturally occurring soils where there is very little organic matter or iron content, such as in beach areas, or in the situation where fill material has been moved on top of an otherwise natural soil

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- The fill material can be anywhere from a few inches to several feet thick, and have been in place for a few days to decades (anthropogenic soils), and can vary greatly in texture
- These soils can be very problematic
- The SHWT can still be higher in the profile, even within the fill material

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Contemporary Features

- Soil morphological features that reflect current hydrologic conditions of saturation and anaerobiosis
- *These are the features used to determine SHWT*

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Relict Features

- Soil morphological features that reflect *past* hydrologic conditions of saturation and anaerobiosis
- These would normally occur in natural conditions and *are NOT used to determine SHWT*
- Would also include any SHWT indicators that have been transported in fill material

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Absence of SHWT indicators

- Evaluator's experience and judgment comes into play
- Observed water table could be clue
- Where observed water table found compare when last significant rainfall occurred, including amount
- Three days or three weeks
- Longer without rain means water could have been higher

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Absence of SHWT indicators

- Amount of consideration based on the individual evaluator's experience and judgment
- Evaluator with years of experience in the physical area where the evaluation is being performed may have knowledge that water tables exist for several days or weeks at a time even though no redox features are present

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Absence of SHWT indicators

- An evaluator with less experience may not reach same conclusion
- Would have to fall back on their limited experience
- Use all sources required by rule, document same
- May need to ask for soil scientist assistance
- SHWT must still be validated using all available information

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Absence(?) of SHWT indicators

- Historically is not uncommon for some indicators to be missed or misused
- Common issue is not using USDA NRCS methodology
- Results in improper documentation and SHWT determinations

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VALIDATION OF SHWT

- Where no indicators are found still can have a SHWT within the soil profile
- Validation includes all sources required by rule along with the professional judgment of the evaluator to explain why the SHWT was determined to be at a specific level

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VALIDATION OF SHWT

- No specific statements that have been used to cover all scenarios
- Trying to guard against the evaluator that is not using contemporary indicators (when present) and from stating a depth and "the call was based on my professional experience"

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Consider the following information

- 10YR 3/1; 5/4; 6/3 FS Fill 0-21”
- 10YR 4/1 FS 21-27”
- 10YR 4/1; 5/2 FS 27-35”
- 10YR 2/1 Spodic Material 35-50”
- REFUSAL REFUSAL 50”
- REMARKS: Observed water table at 34”, refusal due to hole caving in. No rain in 5 weeks. SHWT 21”.

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Example of WRONG reasoning for previous slide:

No clear indicators of seasonal high water could be observed. Due to filled nature of lot, 21” represents “natural grade.” Set SHWT at natural grade; this is conservative call for SHWT.

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Proper Statement

SHWT based on combination of following:

No specific redox features were observed, the several inches of generally grayer (low chroma) soils that exist in the upper part of the natural soils is normally indicative of SHWT being closer to the ground surface when viewed in relation to the spodic horizon, and considering the observed water table of 34" during this time of year, also no rainfall has occurred in the last 5 weeks

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Proper Statement continued

Landscape position was indicative of [make statement – was area fairly flat, no water outlets?]. The soils that are mapped in this area indicates that seasonal high water tables would normally be within a few inches of the natural soil surface. Using all available information, my professional judgment is that the SHWT is most likely to be at the top of what was determined to be the natural soil.

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Proper Statement

- *Preceding was example only*
- *Not the only format that could be approved*
- Note that using the soil profile stripped matrix could have been present, just not identified

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DOH PERSONNEL MUST REQUIRE FULL DOCUMENTATION AND VALIDATION OF SHWT DETERMINATIONS

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For example, the following statements DO NOT validate SHWT determinations:

- “Redox feature found at ___ inches”
(when no RF are documented in the evaluation)
- SHWT based on Florida Administrative Code rule 64E-6.004(2)(a)

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USDA NRCS Determinations

**What happens when a USDA
NRCS Soil Scientist reviews the
site**

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DOH USES MOST RESTRICTIVE SHWT DETERMINATION

- Get a report if at all possible
- Where the USDA NRCS Soil Scientist gives a range for the SHWT the more restrictive measurement must be used
- Example: “SHS at 7-10 inches below soil surface” would mean that a 7 inch SHWT would be used by DOH
- Cannot average the depths

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DEPTH TO INDICATORS

- Where SHWT indicators exist in a profile, depth to indicators must be shown for all profiles (should it be routine to only find them in one profile?)
- Can be identified in the soil profile
- Can be listed in the remarks section (e.g. stripped matrix)

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DEPTH TO INDICATORS

- Use proper methodology
- Document correctly and completely
- Verify soil color contrast is correct for indicator use
- If not correct must be fixed

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The Correct Soil Profile (Field Copy)

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EXAMPLE 1. HIGH CHROMA REDOXIMORPHIC FEATURE IN SAND

10YR 3/1	S	0-3"
10YR 4/4	S	3-9"
10YR 6/6	S	9-31"
7.5YR 6/8	CMN/DST RF	27-30"
10YR 7/2	S	31-54"
10YR 8/1	S	54-72"

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EXAMPLE 1

- Shows entry for redox feature within the soil profile
- RF entry follows the horizon in which it is located
- The 10YR 6/6 sandy soil matrix has common ($\geq 2\%$, but $< 20\%$) 7.5YR 6/8 mottles
- Mottles qualify as redox features based on RF criteria

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EXAMPLE 2A. STRIPPED MATRIX

2.5Y 2.5/1	FS	0-2”
2.5Y 4/1	FS	2-5”
2.5Y 5/1	FS	5-12”
2.5Y 7/2	FS	5-12”
2.5Y 8/1	FS	12-25”
N 8/	FS	25-72”

REMARKS: Splotchy colors with diffuse boundaries from 5-12” exist as faint soil color contrast and the lighter areas are at least 10% of the volume, meeting the definition of stripped matrix beginning at 5”.

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EXAMPLE 2A

- The above example shows the entry for the redox feature in the soil profile occurring on two lines
- The redox feature is stripped matrix, documented/validated in remarks
- Compare with the following example

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EXAMPLE 2B. STRIPPED MATRIX

2.5Y 2.5/1	FS	0-2"
2.5Y 4/1	FS	2-5"
2.5Y 5/1; 7/2	FS	5-12"
2.5Y 8/1	FS	12-25"
N 8/	FS	25-72"

REMARKS: Splotchy colors with diffuse boundaries from 5-12" exist as faint soil color contrast and the lighter areas are at least 10% of the volume, meeting the definition of stripped matrix beginning at 5".

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EXAMPLE 2B

- Only difference from 2A is how the soil colors were written for the 5-12” horizon
- This example has one hue shown with 2 different colors on the same line
- Both colors therefore have a hue of 2.5Y (note this can't be done in EHD)
- The remarks are the same

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EXAMPLE 3. LOW CHROMA REDOX DEPLETIONS

7.5YR 3/1	FS	0-4"
7.5YR 4/2	LFS	4-9"
5YR 5/6	FSL	9-43"
5YR 5/8	FSL	43-72"
5YR 6/3	MANY/PRM RF	65-72"

REMARKS: SHWT at 65" due to low
chroma depletions as noted

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EXAMPLE 3

- Exemplifies entry for low chroma redox depletions in the soil profile
- The 5YR 5/8 FSL soil matrix has many (>20%) 5YR 6/3 redox depletions
- The indicated feature is acceptable in this soil at a depth of below one meter (39.37")

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EXAMPLE 4. LOW CHROMA REDOX AS A MATRIX

7.5YR 2.5/1	FS	0-3"
7.5YR 4/1	FS	3-7"
7.5YR 6/6	FSL	7-34"
7.5YR 7/1	FSL	34-72"

REMARKS: The horizon beginning at 34" is the redox feature in that the colors meet value ≥ 5 and chroma ≤ 2 above one meter

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EXAMPLE 5. MUCK SOIL SURFACE (SAMPLE IN LRR U)

N 2.5/	MUCK	0-0.25”
5Y 4/1	FS	0.25-6”
5Y 7/1;8/1	FS	6-15”
10BG 6/1	FS	15-22”
Refusal	Refusal	22-22”

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EXAMPLE 5. MUCK SOIL SURFACE (SAMPLE IN LRR U)

- REMARKS: Refusal due to hole caving in and filling with water. Muck is the SHWT indicator as it qualifies as a hydric soil indicator A8 (Muck Presence). Site is level, not depressional. Also of note is stripped matrix indicator is met beginning at 6", and gleyed matrix is met at 15"

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EXAMPLE 6: HYDROGEN SULFIDE SMELL

N 2.5/	FS	0-1”
5Y 4/1	FS	1-6”
5Y 7/1	FS	6-15”
10BG 6/1	SCL	15-22”

Refusal due to hole caving in and filling with water.

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EXAMPLE 6: HYDROGEN SULFIDE SMELL

REMARKS: Hydrogen sulfide smell observed at 2” which is hydric soil indicator A4, hydrogen sulfide. Also of note is gleyed matrix is met at 15”. Seasonal high water table is determined to be at 2”

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Anything wrong with the following profile?

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SOIL PROFILE INFORMATION SITE 1

MUNSELL #/COLOR	TEXTURE	DEPTH
10YR 5/2	FS & GRAVEL FILL	0 TO 8"
10YR 5/1	FS	8 TO 15"
10YR 7/3	FS	15 TO 24"
10YR 5/4	FS	24 TO 30"
10YR 6/2	*RF 10YR 5/6 FS	30 TO 35"
10YR 4/4	FS	35 TO 41"
10YR 5/8	SC	41 TO 53"
10YR 8/3	SAND & SHELL	53 TO 72"
		TO

USDA SOIL SERIES: Eau Gallie / Myakka FS
(Mapped as similar to)

SOIL PROFILE INFORMATION SITE 2

MUNSELL #/COLOR	TEXTURE	DEPTH
10YR 5/2	FS & GRAVEL (FILL)	0 TO 10"
10YR 5/1	FS	10 TO 17"
10YR 7/3	FS	17 TO 25"
10YR 5/4	FS	25 TO 29"
10YR 6/2	*RF 10YR 5/6 FS	29 TO 36"
10YR 4/4	FS	36 TO 42"
10YR 5/8	SC	42 TO 54"
10YR 8/3	SAND & SHELL	54 TO 72"
		TO

USDA SOIL SERIES: Eau Gallie / Myakka FS
(Mapped as similar to)

OBSERVED WATER TABLE: NOT FOUND INCHES [ABOVE / BELOW] EXISTING GRADE. TYPE: [PERCHED / APPARENT]
 ESTIMATED WET SEASON WATER TABLE ELEVATION: 32 INCHES [~~ABOVE~~ / BELOW] EXISTING GRADE
 HIGH WATER TABLE VEGETATION: [] YES [X] NO MOTTLING: [X] YES [] NO DEPTH: 32 & 35 INCHES

SOIL TEXTURE/LOADING RATE FOR SYSTEM SIZING: _____ DEPTH OF EXCAVATION: 53 INCHES
 DRAINFIELD CONFIGURATION: [] TRENCH [] BED [] OTHER (SPECIFY) _____
 REMARKS/ADDITIONAL CRITERIA: *RF - Redoximorphic features observed at 10YR 5/6 inclusions, common & distinct @ 32-35 inches

SITE EVALUATED BY: _____ DATE: _____

Problems

- RFs were prominent, not distinct
- What is actual depth to redox features-Inconsistent data presented
- FS and gravel fill – what is actual texture?

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Problems

- Sand and Shell? Need correct soil texture, may be severely limited
- Myakka or EauGallie required to have spodic, not identified here
- EauGallie has Btg horizon, Myakka doesn't

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SOIL PROFILE INFORMATION SITE 1

MUNSELL #/COLOR	TEXTURE	DEPTH
10YR 5/2	FS & GRAVEL FILL	0 TO 8"
10YR 5/1	FS	8 TO 15"
10YR 7/3	FS	15 TO 24"
10YR 5/4	FS	24 TO 30"
10YR 6/2	*RF 10YR 5/6 FS	30 TO 35"
10YR 4/4	FS	35 TO 41"
10YR 5/8	SC	41 TO 53"
10YR 8/3	SAND & SHELL	53 TO 72"
		TO
USDA SOIL SERIES: <u>Eau Gallie / Myakka FS</u> <i>(Mapped as & similar to)</i>		

SOIL PROFILE INFORMATION SITE 2

MUNSELL #/COLOR	TEXTURE	DEPTH
10YR 5/2	FS & GRAVEL (FILL)	0 TO 10"
10YR 5/1	FS	10 TO 17"
10YR 7/3	FS	17 TO 25"
10YR 5/4	FS	25 TO 29"
10YR 6/2	*RF 10YR 5/6 FS	29 TO 36"
10YR 4/4	FS	36 TO 42"
10YR 5/8	SC	42 TO 54"
10YR 8/3	SAND & SHELL	54 TO 72"
		TO
USDA SOIL SERIES: <u>Eau Gallie / Myakka FS</u> <i>(Mapped as & similar to)</i>		

OBSERVED WATER TABLE: NOT FOUND INCHES [ABOVE / BELOW] EXISTING GRADE. TYPE: [PERCHED / APPARENT]
 ESTIMATED WET SEASON WATER TABLE ELEVATION: 32 INCHES [ABOVE / BELOW] EXISTING GRADE
 HIGH WATER TABLE VEGETATION: [] YES [X] NO MOTTLING: [X] YES [] NO DEPTH: 32.5 INCHES
35

SOIL TEXTURE/LOADING RATE FOR SYSTEM SIZING: _____ DEPTH OF EXCAVATION: 53 INCHES
 DRAINFIELD CONFIGURATION: [] TRENCH [] BED [] OTHER (SPECIFY) _____
 REMARKS/ADDITIONAL CRITERIA: *RF - Redoximorphic features observed as 10YR 5/6 inclusions, common & distinct @ 32-35 inches

SITE EVALUATED BY: _____ DATE: _____



Documentation of Lamellae

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SOIL PROFILE INFORMATION SITE 1

MUNSELL #/COLOR	TEXTURE	DEPTH
10YR 4/2	LS	0 TO 8"
10YR 6/4	S	3 TO 31"
10YR 7/4	S	31 TO 42"
10YR 8/3	S	42 TO 68"
10YR 8/2	S	68 TO 72"
		TO
USDA SOIL SERIES: <u>Similar to Alpin</u>		

SOIL PROFILE INFORMATION SITE 2

MUNSELL #/COLOR	TEXTURE	DEPTH
10YR 4/2	LS	0 TO 8"
10YR 6/4	S	3 TO 30"
10YR 7/4	S	30 TO 43"
10YR 8/3	S	43 TO 69"
10YR 8/2	S	69 TO 72"
		TO
USDA SOIL SERIES: <u>Similar to Alpin</u>		

OBSERVED WATER TABLE: 772 INCHES [~~ABOVE~~ / BELOW] EXISTING GRADE. TYPE: [~~PERCHED~~ / APPARENT]
 ESTIMATED WET SEASON WATER TABLE ELEVATION: 772 INCHES [~~ABOVE~~ / BELOW] EXISTING GRADE
 HIGH WATER TABLE VEGETATION: [] YES [X] NO MOTTLING: [] YES [X] NO DEPTH: _____ INCHES

SOIL TEXTURE/LOADING RATE FOR SYSTEM SIZING: 0.8 DEPTH OF EXCAVATION: 0 INCHES
 DRAINFIELD CONFIGURATION: [X] TRENCH [] BED [] OTHER (SPECIFY)

REMARKS/ADDITIONAL CRITERIA: 42-68" has few 10YR 5/8 LFS lamellae about 1/8" thick (as well as 43-69" on SP2); 68-72" on SP1 & 69-72" on SP2 have common 10YR 5/8 LFS lamellae, also about 1/8" thick.

SITE EVALUATED BY: James Young, CEHP 11-0213 DATE: 05/11/11



SHWT features documented after completed soil profile

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SOIL PROFILE INFORMATION SITE 1

MUNSELL #/COLOR	TEXTURE	DEPTH
2.5Y 4/2	S	0 TO 8"
2.5Y 5/2	S	8 TO 31"
2.5Y 8/2	S	31 TO 48"
10YR 6/4	S	48 TO 72
		TO
10YR 6/8 RF	CMW/PRM	46 TO 72"
		TO
		TO
		TO
USDA SOIL SERIES: <u>Unknown</u>		

SOIL PROFILE INFORMATION SITE 2

MUNSELL #/COLOR	TEXTURE	DEPTH
10YR 4/5	S	0 TO 9"
10YR 5/3	S	9 TO 32"
10YR 7/2	S	32 TO 46"
10YR 8/4	S	46 TO 72
		TO
10YR 6/8 RF	MANV/PRM	44 TO 72"
		TO
		TO
		TO
USDA SOIL SERIES: <u>Unknown</u>		

OBSERVED WATER TABLE: 68 INCHES [~~ABOVE~~ BELOW] EXISTING GRADE. TYPE: [~~PERCHED~~ / APPARENT]
 ESTIMATED WET SEASON WATER TABLE ELEVATION: 44 INCHES [~~ABOVE~~ / BELOW] EXISTING GRADE
 HIGH WATER TABLE VEGETATION: [] YES [X] NO MOTTLING: [X] YES [] NO DEPTH: 44 INCHES

SOIL TEXTURE/LOADING RATE FOR SYSTEM SIZING: 0.8 DEPTH OF EXCAVATION: -0- INCHES

DRAINFIELD CONFIGURATION: [X] TRENCH [] BED [] OTHER (SPECIFY)

REMARKS/ADDITIONAL CRITERIA: Bottom of df not lower than 42.5" below BM. Soil profile & BM marked on site plan. Site evaluation VOID if location moves. No easements known; 1.5% slope from West to East.

SITE EVALUATED BY: JAMES YOUNG LEHP 11-0213 DATE: 9/1/11

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Example of SHWT above the ground surface

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SOIL PROFILE INFORMATION SITE 1

MUNSELL #/COLOR	TEXTURE	DEPTH
N 2.5/	MUCK	0 TO 27"
5YR 2/1 w/ 10YR 3/1	MK FSL	27 TO
STREAKS		TO 35"
10YR 4/1 w/ 10YR 3/1	LFS	35 TO
STREAKS		TO 41"
10YR 6/1; 4/1; 3/1	FS	41 TO 47"
10YR 4/1; 3/1; 8/1	FS	47 TO 72"
		TO
		TO
USDA SOIL SERIES: <u>DIREGO-LIKE</u>		

SOIL PROFILE INFORMATION SITE 2

MUNSELL #/COLOR	TEXTURE	DEPTH
N 2.5/	MUCK	0 TO 28"
5YR 2/1 w/		28 TO
10YR 3/1 streaks	MK FSL	TO 36"
10YR 4/1 w/		36 TO
10YR 3/1 streaks	FS	TO 42"
10YR 6/1; 4/1; 3/1	FS	42 TO 44"
10YR 4/1; 3/1; 8/1	FS	44 TO 72"
		TO
		TO
USDA SOIL SERIES: <u>DIREGO-LIKE</u>		

OBSERVED WATER TABLE: 68 INCHES [~~ABOVE~~ / BELOW] EXISTING GRADE. TYPE: [~~PERCHED~~ / APPARENT]
 ESTIMATED WET SEASON WATER TABLE ELEVATION: 8 INCHES [ABOVE / ~~BELOW~~] EXISTING GRADE
 HIGH WATER TABLE VEGETATION: [] YES [] NO MOTTLING: [] YES [] NO DEPTH: _____ INCHES
TITI; BAM; CYPRESS; WAX MYRTLE
 SOIL TEXTURE/LOADING RATE FOR SYSTEM SIZING: _____ DEPTH OF EXCAVATION: 36 INCHES
 DRAINFIELD CONFIGURATION: [] TRENCH [] BED [] OTHER (SPECIFY) _____
 REMARKS/ADDITIONAL CRITERIA: SHWT based on water stains & lichen lines in immediate area color muck. DEP jurisdiction? Check if surface water. HYDRIK SOIL - A9 1cm muck. Muck is indicator, area is depressional, accounts for "+" SHWT.

SITE EVALUATED BY: _____ DATE: _____



DID PRECEDING SLIDE MEET A DIFFERENT HSI?

**What about A1, Histosol? There was
more than 16” of organic soil material**

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WHAT ABOUT SOIL TEXTURE DETERMINED BY A LAB ANALYSIS?

SHOULD YOU CALL THE LAB?

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CAUTIONS ON LAB ANALYSIS

- Make sure the results are understood
- Define methods that were used
- Sieve analysis using correct sieve stack must be included
- *The results must account for the sand gradation as well as the silt/clay content of the soil texture*

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Lab Analysis Example

- CHD sends sample to lab for texture determination
- Sample comes back with percent Sand/Silt/Clay so results are read on soil textural triangle
- Result is Sandy Loam
- *Sand fraction size was not determined*
- Possible textures: *COSL, SL, FSL, VFSL*

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Lab Analysis Example

- The actual sand fragments would determine proper soil texture
- Actual soil texture would determine drainfield size
- This could also be done in the field
- Accepting this lab report at face value would be a mistake

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Results if CHD accepted the soil as sandy loam?

- No effect on redox features, so SHWT determination is unaffected
- If the soil type was actually FSL the drainfield would be undersized by 23% in a trench system and >71% in a bed system

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LAB RESULTS

- Lab results will give you a soil texture without a differential sand gradation
- Result will read Sandy loam, but could actually be COSL, SL, FSL or VFSL
- Sieve analysis provides correct sand gradation and must be performed as part of the texture determination for DOH use
- Must put the information from both analyses together for ultimate answer

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LAB RESULTS

- Where the overall texture of the soil is sand, a sieve analysis is all that is necessary to properly grade the sand texture
- Lab can do this, but should request sieve analysis for sand gradation, not a soil texture analysis

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Lab Analysis continued

- If particles $>2\text{mm}$ are present in sufficient quantities to require a “gravelly” or other modifier, ensure that the lab analysis provides this data
- CHD personnel should make every effort to get a sample for their use and determine if the sample has particles larger than soil sizes, as well as the correct sand size

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Lab Analysis continued

- If CHD is unsure if the lab analysis is consistent with what is on the site:
- Contact the lab
- Take your own sample and send it to the lab

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Note Special Requirements in Remarks Section

- Requirements such as specific percentages of features
- 70% masked criterion
- Amount of stripped matrix, must be at least 10%
- Any other comments necessary

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Where No Observable SHWT Features:

- Other factual information must be used to validate the SHWT where determined to be at or above 72 inches (or the termination of the profile)

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Water Tables

- Observed: the actual observed water in the auger hole after the water level has had time to equilibrate, measured from top of profile
- Seasonal: the point at which water will stay for at least 30 days during a year
- Either can be below or above existing grade

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USDA Soil Series

- Input name of soil series immediately below the soil profiles using “like” or “similar to”, e.g. “Lakeland-like” or “Similar to Myakka”
- Can put Unknown
- Can be transitional
- What soil is mapped as is not as important as what you find

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End of Presentation

QUESTIONS?

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