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NRCS 635 Vegetated Treatment Area Standard Team MEETING NOTES

Wednesday, August 2, 2023 ▲ 9:00am – 12:00pm ▲
Online Meeting

9:00 **Welcome** (Kate, Team)

Attendance: Kate Brunner, Steve Becker, Justin White, Travis Buckley, Bernard Michaud, Adam Moris, Chase Brouillette, Eric Young

Absent: Emily Micolichek
Guests: None

Notes Review (Kate & Team)
Goal: Review and approve 7/5/23 draft meeting notes.

Draft meeting notes from 7/5 meeting were emailed to the team for review. There were some action items, completed as part of topics expected to be discussed later in the meeting. No team comments or questions raised on the notes; Kate will finalize and post online.

Setback Simplification (Steve)
Goal: Review consolidated setbacks.

Bernie previously helped identify the source and history of setbacks in the previous standard. Setbacks in the current standard are numerous and add a lot of complication. The team had previously discussed how to adjust the setbacks and before this meeting Steve emailed the team a more simplified table of proposed setbacks for consideration.

		SB Proposed Siting Parameters (all VTAs)
Soil Depth	-	Delete
Soil Type	No sand, loamy sand, sandy loam	adopt agronomic properties for AWC and permeability
Separation to Bedrock	3	active rooting depth for most grass
›aration to Saturation	3	active rooting depth for most grass
Drainage tile	50	based on typical lateral effect spacing of production drain tile
Property lines & ROW	10' from side, 100' off the end	>= 10' Septic SPS 383.43, Table 383.43−1; >=300' NR 243.03(66) SWQMA
Floodplain	25 year	CAFO Rule
VTA Slope	0 to 6%	prevent tailwater on leveling coarse
Private well	50' (<12,000 gpd) or 250' (>12,000 gpd)	NR 812.08, Table A
Community well	1,000	public water system regulated under NR 811.02 (16), setback in NR 243.15(1)2
Conduits to groundwater	300	includes sinkholes, swallets, quarries
Wetlands and artificial ponds	100	
Nav. streams/rivers/classic gullies/surface inlets	300	>=300' NR 243.03(66) SWQMA
Nav. lakes and flowages	1,000	>=1,000' NR 243.03(66) SWQMA

Steve reviews and the team discusses clarifications and adjustments, including the following discussion topics:

- Soil depth requirement removed and soil type changed.
- The team discussion the use of the USDA soil textures or Unified Soil Classification System to define allowable soil types under the VTA. Engineering consultants typically use the USCS. NRCS uses the USDA soil textures when the design purpose is agronomic suitability, e.g. water holding capacity, permeability, and related soil properties for plant species selection. Team discusses whether soil classification would be from soil survey maps, field classification, or lab testing. The intent is not to bring in a certified soil scientist, and a lab test would not be necessary. A soil scientist may need to be involved in verifying the soil map units presented in the Web Soil Survey, but this would not typically be necessary. There are crossover tables the designer could use to translate their USCS soil description to the NRCS descriptions.
- There isn't great mapping statewide for 25 yr floodplain.
    - 100-year floodplain is regulatory and well mapped in some locations. This could be used as a guide in determining a 25-year floodplain boundary.
    - An at-station hydraulic computation using the estimated peak discharge and Manning's equation is typically satisfactory.
    - VTA setbacks from the 25-year floodplain would also apply to ephemeral watercourses also, not just rivers and streams.
- Property line – The standard should define a property line as a boundary between two different landowners. The setback would not apply to parcel boundaries with the same landowner on each side.
- Slope – below 1% slope will be tough to have sheet flow and is harder to construct and maintain.

Team will have a chance to look at the setbacks again; the modelling results and other criteria in the standard may provide some support for further changes.

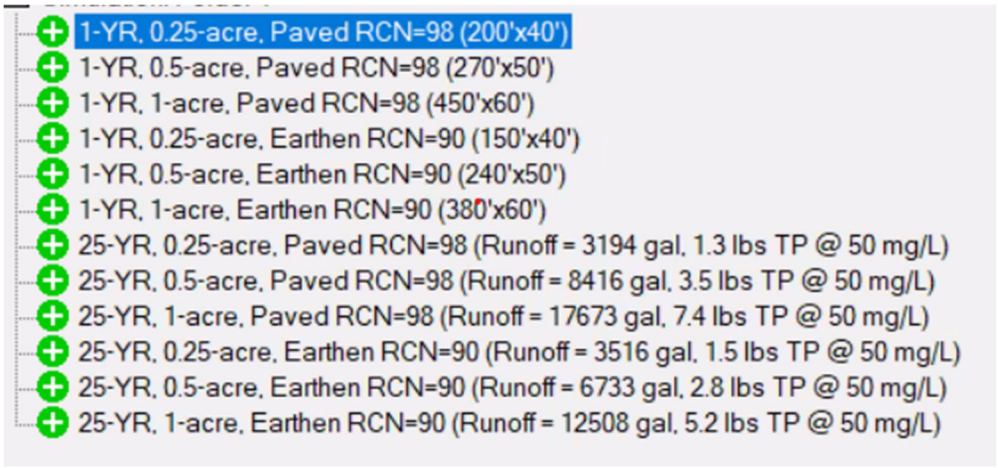
Adjusted WinSRFR Modeling (Adam)
Goal: Review revised infiltration/runoff results for modified VTA scenarios.

Adam previously showed some scenarios and results of WinSRFR hydraulic model and team had discussed some variations. Adam presents those revised models today.

A summary of the model inputs:

- Sized 6 VTAs for a ¼, ½, and 1-acre concrete and earthen feedlot using the 1-year, 24-hour storm, ensuring full infiltration with no deep percolation.

- He then evaluated those VTA geometries against the 25-year, 24-hour storm (taking an approximate average across the state.



- The median rainfall event came from Ed Hopkins at the State Climate Office with a statewide median of 0.16 inches per storm. It was a little more rain in the south, less in the north. Over the past 30 years, Madison had 3,200 events and about over 29% of these storms had 0.16 inches. Adam can forward Ed's email to the team.
- The model tracks infiltration vs time relationship for different soil types. This is based on NRCS in-field tests (100s of double ring infiltrometer tests) to develop the "Intake Family".

A summary of the results:

- Runoff – 25-yr event on ¼ acre paved lot has 13% runoff.
    - Setbacks are safety factors and we'd want to design for some room for a realistic storm.
    - The model assumes uniform flow for width and length of the design, which isn't realistic.
    - Direct precipitation onto the VTA takes up some of the infiltration capacity. Adam has not yet evaluated with direct precipitation but plans to soon.
    - Because VTAs are for production area runoff, it's not considered the same as agricultural stormwater runoff. A berm at the end may still be a good idea and models can be run with an endblock to compare those scenarios. In addition to the endblock, standard could also include an option for accumulated runoff to be pumped and recirculated or disposed of elsewhere. These may be necessary for use on CAFOs.
- Adam will also perform some modeling with a level step design, pooling just 2-4 inches. Design could also direct runoff to multiple cells to improve more uniform flow.
- If any team member wants to play with the WinSRFR model, it is publicly available and relatively easy to run. Adam could also help with model variations so Team should get in touch with him about different scenarios to run.
- WinSRFR model doesn't assess nutrient balance (P and N). The first 30' or so will have an accumulation of nutrients that can kill the grass or accumulate and remobilize during a big storm. Adam will work with Eric to adjust the nutrient values.

- **Adam** will make some further adjustments to the models (include direct precipitation, add a level step, evaluation with some nutrient variations [with **Eric**]).
- **Adam** will send Kate hydraulic summary charts of the simulations for inserting into these meeting minutes.

Although not specific to the model, the team discusses that the first flush collection will need more evaluation for how to include it in the standard.

Break as needed

11:50 Plan of Action (Kate, Steve)
Goal: Identify topics and goals for the next team meeting. Review Action Items.

Next meeting is September 6 and is in person 9:00 to 2:30 at NRCS state office in Madison.

Agenda will include review and discussion of additional refinements to the hydraulic model, including direct precipitation on the VTA and using a level step method with no slope. Steve will also develop other agenda items from parked topics and looking at the pre-team survey results.

Some parked topics:

1) Median rainfall – stick with the 1 yr rain event to set the design? Stays with concept of annualized discharges. At what rainfall depth does 90% of contamination come through—is the 1-yr event adequate? How frequently is the 1-year storm exceeded (when there would likely be runoff). Could also consider the annual rainfall total to understand the overall mass balance. **Adam** will reach out to Ed at state climate office to see if the additional data tallies are readily available.
2) Is it possible to meet a nutrient balance for VTAs, where grasses could uptake all of the phosphorous and nitrogen coming from a feedlot? Could VTA standard require soil testing (like that for NM) before construction and/or as a maintenance measure to determine is the baseline nutrient content of the soil?
    a) If there's already high P before construction or in early years of VTA, then what next? What is the threshold concentration and what is the corresponding response action?
    b) Not much phosphorus is getting used by the plants, but it also isn't necessarily getting mobilized (off the end of the VTA or to groundwater). P is adsorbed to soil particles and precipitated as minerals, though at some point the soil can't hold any more and would travel with the water.
    c) Nitrogen accumulation could also be an issue.
    d) **Bernie** will talk to Andrew Craig for DNR nonpoint program input on accumulating nutrients.
3) What level to treat to? For example, should we design for full infiltration without deep perc for 1 yr event (modest treatment on 25-yr storm)? Or full infiltration without deep percolation for 25-yr storm?
4) How to include end berm in the standard (general criteria, additional criteria for specific situation, or consideration).
5) Reviewing and refining technical details like uniform flow and leveling systems.

6) How/whether to include CAFOs.
7) Sizing adjustments, which may include:
   a) Adjustments for removing collected/stored volumes before runoff hits VTA (first flush collection) or collection (for recirculation or other disposal) at end of the VTA.
   b) Adjustments for amount of feed being stored.
   c) Adjustments for runoff from tarped (clean) vs untarped (leachate) feed.
8) Are there other substantive requirements in the current federal standard that are different from current WI standard?

Action Items developed today:

1. **Adam** will make some further adjustments to the models (include direct precipitation, add a level step, evaluation with some nutrient variations [coordinate with **Eric**]).
2. **Adam** will forward to the team the annual rainfall detail from state climate office, and reach out to Ed at State Climate Office for running total of rainfall volume to get an idea of frequency of 1-yr storms to see when it's exceeded (and there would likely be runoff). The 1-year storm statewide is 2.5 inches. Data from the eight weather stations over the timeframe of 1994 to 2023 was reviewed and summarized below:
   a. Madison: Median Rainfall Event Depth = **0.16 in**, event count for daily rainfall > 0.01 in = 3202 (29% of days over 30 years)
   50% of the volume was for events 0.72 in and less, 75% volume for events 1.36 in and less, 90% volume for events 2.14 in and less, maximum daily = 4.51 in
   b. Milwaukee: Median Rainfall Event Depth = **0.16 in**, event count for daily rainfall > 0.01 in = 3181 (29% of days over 30 years)
   50% volume for events 0.66 in and less, 75% volume for events 1.14 in and less, 90% volume for events 1.92 in and less, maximum daily = 5.61 in
   c. La Crosse: Median Rainfall Event Depth = **0.15 in**, event count for daily rainfall > 0.01 in = 3206 (29% of days over 30 years)
   50% volume for events 0.69 in and less, 75% volume for events 1.29 in and less, 90% volume for events 1.85 in and less, maximum daily = 5.59 in
   d. Eau Claire: Median Rainfall Event Depth = **0.14 in**, event count for daily rainfall > 0.01 in = 3242 (30% of days over 30 years)
   50% volume for events 0.63 in and less, 75% volume for events 1.11 in and less, 90% volume for events 1.84 in and less, maximum daily = 5.98 in
   e. Green Bay: Median Rainfall Event Depth = **0.15 in**, event count for daily rainfall > 0.01 in = 3225 (29% of days over 30 years)
   50% volume for events 0.60 in and less, 75% volume for events 1.05 in and less, 90% volume for events 1.58 in and less, maximum daily = 4.12 in
   f. Spooner: Median Rainfall Event Depth = **0.15 in**, event count for daily rainfall > 0.01 in = 2966 (27% of days over 30 years)
   50% volume for events 0.62 in and less, 75% volume for events 1.15 in and less, 90% volume for events 1.90 in and less, maximum daily = 3.88 in
   g. Hancock: Median Rainfall Event Depth = **0.16 in**, event count for daily rainfall > 0.01 in = 3060 (28% of days over 30 years)
   50% volume for events 0.66 in and less, 75% volume for events 1.17 in and less, 90% volume for events 1.98 in and less, maximum daily = 9.43 in

h. Lancaster: Median Rainfall Event Depth = **0.17 in**, event count for daily rainfall > 0.01 in = 3047 (28% of days over 30 years)
50% volume for events 0.80 in and less, 75% volume for events 1.54 in and less, 90% volume for events 2.41 in and less, maximum daily = 4.60 in

3. **Adam** will send Kate a snippet of the simulations for inserting into the minutes. (see file "VTA Scenario Model Summaries AJM (08-03-23).pdf")
4. **Bernie** will talk to Andrew Craig for DNR nonpoint program input on accumulating nutrients.
5. **Kate** will prepare draft meeting notes, then reviewed by full **Team**.
6. **Kate** and **Steve** will prepare agenda for Sept. 6. Kate will send to the full team at least 1 week in advance along with any reading materials.

12:00 End