



Standards Oversight Council (SOC)

Developing effective technical standards that protect Wisconsin's natural resources

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NRCS 590 Nutrient Management Standard Team

MEETING NOTES DRAFT

Thursday, September 26, 2024 ▲ 9:00am – 2:30pm ▲

NRCS, 5417 Clem's Way, Stevens Point, WI 54482 ▲ Conference Room B ▲

Agenda-In-Brief:

9:00 Welcome (Kate, Team)
9:05 Notes Review (Team)
9:25 P Risk Assessment (Mike, with Kyle, Aaron, Andrew, Andrea)
10:15 *Break*
10:30 Draft Language Edits for P Risk Assessment (Mike)
12:00 *Lunch, provided*
12:30 Language Clean Up (Mike, Kate)
Karst, Additional Criteria to Reduce Emissions, Additional Criteria to Improve or Maintain Organic Matter
Break as needed
1:30 Manure Irrigation (Mike, Kate)
2:15 Meeting Review (Kate)
2:30 *End*

9:00 Welcome (Kate, Team)

Goal: Attendance and review the meeting objective.

Attendance: Kate Brunner, Eric Hurley, Mike Stanek, Cody Calkins, Travis Engels, Kyle Much, Carl Hahn, Aaron O'Rourke, Andrew Craig, Andrea Topper, Dan Smith, Matt Ruark
Absent: Morgan Kepler, Sara Walling
Guests: None

9:05 Notes Review (Team)

Goal: Approve 8/22/24 meeting notes.

Some action items are being tracked as longer-term items. One is reported back on and discussed:

- Dan talked to a manure spreader in the Driftless area on what they think is more feasible for spreading rates on their slopes, and still waiting to hear from another one. The one he heard from said that not much dairy liquid manure there but 8,000-10,000 rate is typical on their slopes. Hauling manure on the slopes is not the typical preference (like for safety) but sometimes necessary. Storage is still the true issue so may be an alternate solution (e.g., temp stacking, composting). He'll update team if other hauler has different insight.

No questions or comments on the draft notes; Kate will finalize and post online.

9:25 P Risk Assessment (Mike, with Kyle, Aaron, Andrew, Andrea)

Goal: Review breakout group recommendations and work toward consensus for language related to phosphorus risk assessment ranking.

As a follow-up to the last team meeting, a subteam with Mike, Kyle, Aaron, and Andrew convened to develop and refine risk assessment language that was started in-meeting in August. Mike and Andrea also have received input at the recent NM regional meetings (about 250 people, including staff from DATCP, county LCDs and co-ops) over the past month. There was no clear consensus about risk thresholds in the more informal conversations on this in the NM meetings. Bigger challenge raised was general frustration that plans are not implemented.

This subgroup met to work through options to amend the new national language to define low, moderate, and high risk. Adjacent states took P Index numbers and applied them to the low, moderate and high risk categories and some states created a new category or two (like very low, excessively high). For details on WI PI resources: <http://wpindex.soils.wisc.edu/>

In WI, over course of rotation shouldn't plan over P Index of 6, with 12 in a single year. Planners also have choice of using soil test P strategies. Team discussed options for new standard keep both P Index and soil test P, or narrow down to one (like P Index only)?

The subgroup reviews their recommended language:

- All fields should have a P risk assessment and not just those with specific conditions. This is already required since NR151 cites a P Index of 6.
- NRCS national instruction language: A P-Index assessment will not be required when the State NRCS, with concurrence of the State water quality control authority, has determined specific conditions where the risk of P loss to local water is low. Fields excluded from a P risk assessment must have a documented agronomic need for P, based on soil test P (STP) and land grant university nutrient recommendations. States may use a prescreening tool to expedite the decision as to whether or not a P-Index is required.
- Subgroup has discussed the possibility of removing terms LOW, MODERATE, HIGH risk; This national language can't be deleted but can be amended.
- Applying to agronomic need isn't protecting water quality so A2809 is combined with P index.
- At the last meeting the Team discussed having the risk tied to soil test P labels in A2809 (optimum, high, excessively high). The subgroup revisited the idea of providing specific soil test P numbers for planners to use rather than crop specific terms like "optimum" and presented some options summarized below:
 - The numbers are a hybrid of current P test strategy. Low, high and excessively high demand levels for crops.
 - Soil test P of 0-37 ppm is the optimal range for majority of crops so this could be the low risk category. This is high on loamy soil.
 - 50 is highest range of optimal (besides potatoes). 50 ppm was also a breaking point as part of the P Index development (Larry Bundy's study).
 - >50 is all "excessively high" and that's when strategies for drawing down are needed.

Field Code Changed

- >200 ppm no P is in NR243.
- After further discussion, the Team decides to go back to referencing the A2809 terms and not specific soil test P concentrations. This provides research and details to back up the thresholds.
- Does 8-yr rotation include past years and future? If data is there incorporating a year or two is a good idea. Smaller farms don't have data from past years so this may need to be a consideration that if soil test data is available, include a previous year in the 8-yr rotation. NRCS is also planning implementation guidance/checklist that covers crop rotation planning and how to implement and revise (correct?) the NMP. Not all producers update plans, or update them accurately.
- The simplified P language does not apply the same for potatoes, which will need exception language; P Index of 6 still applies.
- Wind, sheet and rill erosion should be considered – national language indicates: “Use current NRCS-approved nitrogen, phosphorus, and soil erosion risk assessment tools to assess the site-specific risk of nutrient and soil loss.” Citations to SnapPlus, WEPS (and possibly other tools like something for sheet and rill erosion) should be added for more specificity. See Byron Shaw research which found there could be a lot of nutrient loss in wind erosion and deposition to drainage ditches where it could move. Another possibility: Laura Good could add WEPS into SnapPlus so it's all evaluated together in one system.
- Summary of updated standard text points agreed to by Team:
 - The planned average PI values for up to an 8-year rotation in each field shall be 6 or lower. Consideration: if previous soil test data avail, include previous year in the 8-yr rotation.
 - Add exception for starter fertilizer as the first 20 lbs P2O5 commercial fertilizer placed subsurface (not broadcast). See Starter fertilizer section on pg. 81 of A2809.
 - Add exception for potatoes; still PI of 6.
 - Team likes idea of standard reference sources for strategies how to reduce P Index: not on UW P Index website, need to confirm which source to use?
 - Perform soil test P by Bray P-1 and compare results to A2809 Table 1. References section of the standard will include the [Ruark paper](#) with info on converting Mehlich-Bray. May need updated article ref. since UW expected to have another related paper coming out in a few months. National standard has LOW, MODERATE and HIGH RISK categories; new WI standard may need additional categories, to be determined later, including with comparison to other states terminology.
 1. Soil test P categorized as Very low, Low or Optimum in A2809 Table 7.1 - Nutrient application rates allowed up to the N needs of the following crop or the N removal for the following legume crop.
[To fit into new national language, may be called LOW RISK]
 2. Soil test P High, capped at 50 ppm - P application shall not exceed the total crop P removal for crops to be grown over a maximum rotation length of 8 years.
[To fit into new national language = MODERATE RISK]
 3. Soil test P High and >50ppm; or Excessively high capped at 100ppm (see Larry Bundy's study) - Total P applications from all sources shall not exceed

guidelines from UWEX Pub. A2809. If manure P applications above these guidelines are necessary due to lack of suitable application sites, P applications shall be 25% less than the cumulative annual crop removal over a maximum rotation length of 8 years.

[To fit into new national language = HIGH RISK]

4. Soil test P Excessively high >100ppm - Calculate the planned average phosphorus index value for the crop rotation or for the next 4-year period or crop rotation, whichever time period is less. Total P applications from all sources shall not exceed guidelines from UWEX Pub. A2809. If manure P applications above these guidelines are necessary due to lack of suitable application sites, P applications shall be 50% less than the cumulative annual crop removal over a maximum rotation length of 4 years.
[To fit into new national language, could add category here as VERY HIGH RISK]

5. Soil test P 200 ppm or greater. No phosphorus applied unless an agronomic need identified in UWEX Pub. A2809.
[To fit into new national language, could add category here as EXCESSIVELY HIGH RISK]

- Next step is to test this updated P risk assessment on some fields across the state with this new risk assessment strategy and see real-world implications. **Mike, Travis, Kyle, and possibly Andrea** will test this out and see what this looks like and report back to the Team. Kate will send them the language developed today to use as a starting point.

Should new standard consider what might be needed for **TMDL compliance**? In all fields, P index shall not exceed 6; however in TMDL watersheds, it should be less than P. Andrew presents a summary of information gathered for phosphorus TMDL areas:

- 590 requires completing a P risk assessment; the risk assessment needs to reflect TMDL areas – which ID surface waters that have too much P and are impaired.
- The PI of 6 risk assessment criteria does not reflect TMDLs, it was created before adoption of P based TMDLs. The PI of 6 is requirement in NR 151.04: “Croplands, pastures, and winter grazing areas shall average a phosphorus index of 6 or less over the accounting period and may not exceed a phosphorus index of 12 in any individual year within the accounting period.”
- TMDLs define P reduction goals for agriculture (nonpoint) to meet WQ standards. The reduction goal is expressed as a percent reduction.
- Most TMDL P reductions call for a 60-80% reduction from agricultural cropland.
- DNR used SNAP-Plus to estimate cropland rotational average P loss (lbs/ac/yr) within multiple TMDL areas. DNR ran fields for very cropland soil type in the TMDL area, using dominant rather than critical soil.
 - The average area-weighted rotational P loss from agricultural cropland falls within 3-4 lbs/ac/yr.
 - To define/translate what level of P loss is necessary to meet a TMDL P reduction goal, DNR applied the TMDL reduction goals to the TMDL average rotational P loss. If we stick with P Index of 6, there won't be a reduction.

- DNR analysis confirms agricultural cropland P loss, needs to be reduced to approximately 1 lb/ac/yr.
- To address the DNR modeling results, the TMDL P reduction goals could be met over time by requiring additional restrictions when a NM plan is within an area with TMDL for P. Some possible language is reviewed that could be added for fields in TMDL P Watersheds:
 - Calculate farm-wide average P-Index using SNAP 590 assessment report.
 - If farm-wide average P-Index is above 1 lb/ac/yr, adopt additional P reduction practices over a crop rotation to reduce the farm-wide average PI and minimize surface water quality impacts.
 - If farm wide average P-Index remains above 1 lb/ac/yr after one crop rotation, increase the types and extent of P reduction practices across the farm over the next crop rotation - to further reduce the farm-wide PI and minimize surface water quality impacts. .
 - Strategies for reducing the PI, algorithms, and software for calculating the Wisconsin PI can be found at <http://wpindex.soils.wisc.edu> . Would be helpful for standard to include specificity on which practices reduce PI, and emphasize those with cost sharing available.
 - Legacy P (stream sediments) is not addressed in the DNR modeling, but this would get at the cropland issue.
- Team discusses issues with implementation related to TMDLs. A new owner may not have access to old information to evaluate changes over time. Would be huge push back, especially related to NR243 language. This may be so difficult that producers would stop nutrient management planning. Standard could include this as Additional Criteria in TMDL P watersheds or other conservation alternative with details in Considerations.
- If standard doesn't include extra criteria for P TMDL areas, the standard isn't really moving toward resource protection and reducing environmental impacts from nutrients.
- Team decision not made regarding TMDL areas. Mike will evaluate how to fit some additional steps for TMDL P watersheds into the updated standard.

10:15 Break

10:30 Draft Language Edits for P Risk Assessment (Mike)

Goal: Complete draft language edits for phosphorus risk assessment ranking.

Notes included above.

12:00 Lunch, provided

12:30 Language Clean Up (Mike, Kate)

Goal: Review shorter sections of standard text and identify language to include in the updated standard: Karst, Additional Criteria to Reduce Emissions, Additional Criteria to Improve or Maintain Organic Matter.

Karst – New national standard has Additional Criteria to Minimize Nonpoint Source Pollution to Surface and Groundwater which mentions karst.

- Current language in 2015 590 specific to Silurian dolomite and not “karst” broadly, but 2015 does use several different terms (Silurian dolomite (SD) soils, Silurian carbonate bedrock, Silurian dolomite limestone, and karst). Current national language mentions karst. When used, Team wants to refer to Silurian Dolomite soils consistently and not other terms.
- Do not carry forward 2015 std Page 5, Criteria related to winter spreading and well comp fund on SD soils. Team previously discussed and decided to remove well comp language. ~~“Do not surface apply liquid manure and/or organic by products during February and March on areas depicted on the 590 spreading restriction maps as areas where DNR Well Compensation funds provided replacement water supplies for wells contaminated with livestock manure or Silurian dolomite (SD) soils.”~~
- Do not carry forward 2015 std Page 10 Consideration related to identifying karst features that are conduits to groundwater. The direct conduit to gw definition includes karst features and this is addressed elsewhere. ~~“Where cropland with less than 50’ soil depth overlays Silurian Carbonate Bedrock, identify karst land features that are direct conduits to groundwater and use management practices to minimize N loss to groundwater. See Technical Note WI-1 for a list of soils and/or map.”~~
- 2015 std Page 10 Consideration related to adjustments for liquid manure application on SD soils. Instead ref. NR 151. ~~“On Silurian dolomite (SD) soils in the spring, summer or fall and before crop planting or after crop harvest, implement at least one of the following if liquid manure is injected or surface applied:~~
 - ~~• Complete pre tillage prior to application~~
 - ~~• Immediately incorporate manure after application~~
 - ~~• Reduce application rate to 7,000 gallons per application; complete sequential applications to meet desired nutrient additions consistent with this standard. Wait a minimum of three days between sequential applications.”~~
- Carry forward reference to SD soils in Plans and Specs section of the 2015 std Page 10: “Areas prohibited from receiving nutrient applications to frozen or snow-covered soil: Silurian Dolomite soils;...”
- Instead of creating a separate definition such as that in 2015 std Page 16 Definitions for Silurian Dolomite (SD) Soils, reference NR151.075 Wisconsin Admin Code.

Additional Criteria to Reduce Emissions – Team reviews current 2015 WI language along with new national language to decide what to include from current state standard. New national standard may not include this as a purpose. This is used in cost sharing for air quality issues so removing it may have impact to CSP projects. Team would like to wait discussion on this until we see if national keeps this purpose.

The language in 2015 590 was adjusted for new version:

1. “Apply one or more of the following management strategies that minimizes nutrient volatilization and particulate losses while maintaining tolerable soil erosion levels for wind and water:
 - a. Slow or controlled release fertilizers

- b. Nitrification inhibitors
 - c. Urease inhibitors
 - d. Nutrient enhancement technologies
 - e. Immediate incorporation or injection
 - f. Stabilized nitrogen fertilizers
 - ~~g. Residue and tillage management~~
 - ~~h. No till or strip till [removed because covered in other standards]~~
 - ~~i. In field and edge of field windbreaks~~
 - j. NRCS Wind Erosion Prediction System (WEPS) to confirm fields meet tolerable soil loss [may move this elsewhere – this list is “management strategies”]
 - k. Other technologies that minimize the impact of these emissions
2. Do not apply poultry litter, manure, or organic by-products of similar dryness/density when there is a high probability that wind will blow the material off-site.”

Additional Criteria to Improve or Maintain Organic Matter – Team reviews current WI language compared with new national language and decides on merged edits on-screen. SCI not mentioned in 2015 standard; however, the current NRCS planning threshold is SCI >0.2 to improve soil organic matter so that is added.

1:30 Manure Irrigation (Mike, Kate)

Goal: Discuss manure irrigation practices and identify changes for the technical standard.

3 docs were emailed to the Team by Travis and Andrew and again sent to team with the agenda:

- Kewaunee County's [Agricultural Waste and Process Wastewater Irrigation Ordinance](#)
 - USDA Dairy Forage Research Center Fact Sheet on [Airborne pathogens from dairy manure aerial irrigation and the human health risk](#) by Mark Borchardt and Tucker Burch.
 - [Considerations for the Use of Manure Irrigation Practices Report](#) from the Wisconsin Manure Irrigation Workgroup.
- Current 2015 590 has Considerations related to irrigation: “For liquid and slurry manure, consider using a nitrification inhibitor to limit the potential risk for N loss” and “Use irrigation strategies (ex. irrigation scheduling, reduced-pressure drop nozzles for center pivots, etc.) to minimize N leaching losses, improve crop water use efficiency, and not exceed intake/infiltration capacity of the soil.”
 - Team agrees to include some criteria for manure irrigation. Standard will identify strategies to minimize pathogen loss and odor by referencing 2016 report Considerations for the Use of Manure Irrigation Practices.
 - NRCS does not have pathogens in air as a resource concern although it is problematic; pathogens added to list of air quality concerns.

Break as needed

2:15 Meeting Review (Kate)

Goal: Review Action Items and prepare for the next meeting.

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Next meeting is scheduled for October 26 from 9:00-2:30, again at the NRCS's Stevens Point USDA Rural Development Office. Mike will be working on distilling notes and preparing text and will develop the agenda of any outstanding topics that come up in writing.

ACTION ITEMS

- **Mike, Travis, Kyle**, and possibly **Andrea** will test out applying the P risk assessment language and see what this looks like and report back to the Team. Kate will send the updated language to the group.
- Carried forward from previous meeting: **Dan** will continue to pursue input from a 2nd manure spreaders in the Driftless area on what they think is more feasible for spreading rates on their slopes.
- **Kate** will draft notes from today's meeting for Team review.
- **Kate** will publish final August meeting notes.
- **Kate** and **Mike** will develop agenda for next meeting and send it to team along with any reading materials one week prior.

2:30 End