**Meeting Notes: Nutrient Scientific Advisory Board**

**October 7, 2022, 9:30 a.m. – 12:00 p.m.**

**Hybrid Meeting – In-person @TJCOG and on Teams**

**Attendees**

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| --- | --- | --- |
| Gannon, Rich | Trish D'Arconte | Anne Coan |
| Cooper, Kathryn | Wilbur, Sandra | Farkas, Jim J |
| Higgins, Karen | Zahorian, Molly | Forrest Westall |
| Drew Blake | Hoyt, Sally | Huisman, John |
| Dinwiddie, Alexandra | Robert Patterson | Buzun, Jennifer |
| Annette Lucas | Allison Weakley | Maya Cough-Schulze |
| Xu, Lin | Loperfido, John | Phlegar, David |
| Eric Kulz | Alix Matos | Michael Reed Burchell II |
| McDaniel, Andrew H. | Irwin, Michael | Wilbur, Sandra |
| Tiwari, Brajesh | Josh Johnson |  |

**Administrative**

The February & July 2022 meeting summaries were approved with no changes.

**Agenda**

**Segment 1: SCM Credit Document DRAFT Revisions – Trish D’Arconte**

**Segment 2: SCM Nutrient EMC Revisions – Trish D’Arconte**

**Segment 1: SCM Study Requirements**

* **Wholly transferred from Stormwater Design Manual**
* **NEST steps clarified, new vs existing SCM approvals**
* **Study requirements**

**Overview**

Trish D’Arconte reviewed DWR’s revisions of the SCM Credit Document. She notes: 2 different parts – technical analysis of what data we have, and revising the policy calls we take as an agency over what data we accept and use.

How to use this doc: DEMLR’s Stormwater Design Manual is about designing devices, while this document is about crediting them. However, the written description of DEMLR’s process for approving new SCMs credit-wise – “NEST” - was in their Design Manual. Thus with DEMLR’s consent we pulled it from there and brought it over into the Credit Doc.

That said, the NEST process was somewhat limited – it was only designed to evaluate new SCMs on new study sites for approval and credit via studies representative of NC conditions. It didn’t address making revisions to the credit of existing approved SCMs or for using existing study data that wasn’t originally used to revise SCM ratings. So we needed to revise the approval criteria to apply to both new and revised SCM crediting.

In addition, we saw the need for, and in the Credit Doc propose to establish, provisional minimum design criteria (MDC) and nutrient crediting for practices that don’t meet the credit approval criteria in one or more ways – e.g. number of studies, number of storm events – but that are either already approved or are worth approving provisionally. So we created this secondary reevaluation approach and provisional approval standards.

In building the credit standards proposed here, DWR obtained significant input from SMEs on study requirements. Some requirements pulled directly from the Charlotte-Mecklenburg program, the international BMP database, or through consultation with NCSU.

**Study Requirements**

As proposed here, there must be one study done in NC, and other studies must be done in an Omernik level 3 ecoregion and USDA plant hardiness zone in common with NC, as well as average annual rainfall comparable to any major population center in NC. There must be a minimum of two studies for initial/provisional approval; four studies is more favorable and needed for full approval as proposed. The monitoring should now be for a two year period (still for a minimum of 15 storm events.) Required influent concentrations for evaluation of nutrient reduction performance are clarified in the document.

Andy McDaniel: Why didn’t you include studies from OR and WA?

Trish: Their rainfall patterns and soils are very different from here. On the west side of those states, there is constant gentle rain from October to March. This rainfall pattern may favor different biological activity in SCMs where that is relevant to treatment. On the east side, it’s desert. In the west, they also have very fertile volcanic soils, different from ours.

Sally Hoyt: Why is there a requirement for one study to be in NC?

Trish: DEMLR reviewed it and thought it was important to retain this requirement.

Sally: Political boundaries are an artificial distinction impeding use of potentially good studies.

Trish: encourage you to submit that comment, we’ll consider it.

Annette: If someone had equipment that could continuously monitor nutrients and analyze onsite, could that be incorporated?

Trish: I don’t think technology exists yet to accurately analyze constituents continuously. For TSS, you might be able to use turbidity, but USGS folks don’t think those necessarily overlap all the time.

JV: Why the 6-hour antecedent drying requirement?

Trish: On the guidance of Bill Hunt; this is standard practice. You can send us the comment and we can answer it.

**Study Data and Report Submittal Requirements**

Working with NCSU to generate one consistent file system. We are recommending use of International BMP Database data submittal spreadsheet form. Essential as part of that to characterize maintenance you have actually done on the studied practice.

**Review/Approval process**

* **QAPP approved**
* **Proposed Minimum Design Criteria**
* **Physical settings SCMs were studied in**

We propose that DEMLR/DWR assign **provisional MDCs** and associated credit for SCMs based on the specific physical settings in which they were studied (ie, low slope or given soil type), and then expand these SCMs’ approval for use in other settings when studies come in located in those settings so as to allow such approvals. Essentially we wanted to lower the level of effort needed for an SCM to be approved for use in some capacity, but also encourage continued study.

Sally Hoyt: One thing that really worked in establishing the original MDCs was that it was created by a committee of designers and reviewers. I would be concerned if the only folks who had input were the researchers and DEMLR staff.

Trish: We do make a distinction between provisional and final MDCs. I agree that we should follow the original process that includes public input for the final MDCs that involve rulemaking. Currently proprietary SCMs are established by researchers, proprietors and DEMLR staff (plus maybe DWR NPS staff if concerns.) Provisional MDCs – we could have a 30-day public comment period but would not have a whole committee. We want to make sure that we can go back and update the MDCs when there is more data, such as for floating wetland islands. DEMLR will ultimately run the rulemaking process.

Sally Hoyt: Somewhere it needs to be clear that the credit document is approved for things regulated not just by DEMLR, but also by things regulated by DWR, ie for meeting Neuse Rules, Falls Rule, etc.

**Segment 2: SCM Nutrient EMCs**

* **Approach for existing SCMs**
* **Decisions made about existing SCMs**
* **‘New’ SCMs – all ratings**

Aiming for max consistency when developing new EMCs. Previously there was a combination of methods. E.g., studies were included with very low influent concentrations that weren’t representative of conditions they’d be treating. Based on subcommittee discussions, in this draft we propose the 12.5th percentile as statistical minimum **influent screening threshold**. And submittals need at least 8 influent/effluent pairs per Bill Hunt’s best professional judgment. Other proposed changes to, or proposed explicit statements of, **EMC value-setting standards**:

* Want all SCMs to have EMCs assigned even if they are not currently in use.
* Have moved away from the term “variants” in favor of “alternative designs”.
* As proposed, alternative designs that perform the same get the same credit specifications.
* If there were only 2 or 3 studies, we propose to use the *highest study median* effluent EMC value for TN and TP assignments to encourage more studies. If 4+ studies, we would use the *median of all study medians*.
* Green roof and DIS don’t have sufficient data, so still using old EMCs.
* Excluded FWIs from document because there wasn’t enough data that passed screening. Doesn’t know of many folks installing FWIs for monitoring or credit. Really want to update design requirements. Not sure who’s studying them.

Mike Burchell: Have a student, Molly, studying several of these now. The only way you’ll see nutrient treatment in FWIs is if you force the water through them. Molly has the outlet ringed with FWIs so that they have to go through. One challenge of studying - hard to have a control scenario. Also, these need a couple growing seasons to get established. Also, you can see nutrients leaching from the starter fertilizer in the plugs within the mats during the first couple years! Finally – there has to be influent stormwater concentrations at a sufficiently high level where you’d see treatment statistically.

Trish: The FWIs we’ve studied are newly built ones in new developments. Maybe we need to be studying more established FWIs in established developments.

Existing SCMs that are already approved: StormFilter – waiting for EMC data from proprietor.

Trish: Per the subcommittee, we propose a screening threshold for influents so that studies with excessively clean influents are not used. From 100+ studies in hand, we’ve calculated median influent N and P values and are proposing the 12.5th percentile as the screening threshold for study influent medians. Every time we reissue this document, we will check the influents we get for screening values. At this point the 12.5th% values are pretty stable. When I take out half a dozen studies, I don’t see a change in screening values.

Sally: Is the 5 year screening threshold adjustment frequency for influents also used for effluent values?

Trish: Every 5 years is a minimum, or sooner when triggered by other processes.

Sally: Would like to make the case for not changing things when we don’t need to. New data and practices can show us that things are different. But if there’s say a <5% change in the value, I would suggest we don’t change the EMC. Also, I think there should be a statement that SCMs will continue to get the credit they were approved under, even if the data changes.

Trish: Our policy is that everything that’s permitted retains the credit it was approved with; none of this is retroactive. This should be stated in the document.

Sally: When a development adds new impervious (draining to an existing SCM), do we allow them to recalculate the existing SCM’s credit based on the new value?

Trish: This isn’t covered in this document, but we do in the nutrient catalog. This would be a good thing to have further discussion on - if you’re resizing or retrofitting a practice, but you already have buy-downs, do you recalculate for the whole catchment and project site?

Trish: We wanted to ensure max consistency, so didn’t make distinctions in requirements between proprietary SCMs and non-proprietary (and dropped the current number of studies distinction).

Trish: We had minimal guidance about evaluating TSS performance. I added the standard that all installations’ median influent TSS values must meet screening thresholds to be included in the review data for primary SCM consideration.

**Other Improvements**

* **Purposes clarified – document, NEST program**
* **Table A-2 – Credit assignments summary**
* **Table A-3 – Other Benefits**
* **Technical foundation explanations**
* **Organization, redundancies, streamlining**

Changes to **SCM Credit Table**: Updated to show hydrologic partitioning so that the constituent values are stated in the form that they directly sum to 100%.

**Other SCM Benefits Table** has been expanded to include maintenance cost/effort, carbon sequestration, and a column for multiple uses that lists all the other things that SCMs can provide (aesthetics, recreation, education, biodiversity, urban forestry, heat island reduction, erosion, etc.) This table is to be used as guidance when considering where to site SCMs.

Sally: I would advocate for replacing %TN and TP removal columns with High, Medium and Low – because to get at effectiveness, you have to also include hydrologic fate. If this was a qualitative suitability rating, this whole table could be a helpful reference for folks new in their career or for less-expert readers.

Jennifer Buzun: I would recommend putting all this summary info on one page, but make it landscape and 11x17. Trish: I agree – I like it all on one page.

Trish: Lastly, I reworked and added clarifications to a number of other existing technical foundation elements of the document, including the performance criteria for determining primary vs secondary SCMs, how the TSS assessment is applied, more detail on the design storm and determining percent sizing, and the description of the process for determining nutrient data screening and the general decision set for assigning nutrient EMCs. Also cleaned up a lot of repetitive elements, grouped similar SCM content that was addressed in several places.

Andy: Have you looked at whether there is any conflict with Gen Stat 133-3? Local governments must follow this on public land to ensure competitive bidding. Make sure there’s no conflict when installing proprietary practices, and include guidance on how to follow this statute. Not aware of any issue, just raising.

Sandi: Can you explain the process of how you evaluated the Streambank Protection rating in the Other Benefits table, and how it changed for those that changed?

Trish: I followed Bill Hunt’s guidance. He based it on how you limit the time streambanks are subject to bankfull flows. Fair = doesn’t make it better or worse; Poor = makes it worse.

Sandi: SilvaCell and Filterra function similarly but have different ratings. Why, what data was used?

Trish: Filterra is high throughput, SilvaCell is more like bioretention. Would like to see the numbers Bill referenced – can explore.

Forrest: Encourages as much public outreach about these changes as possible to the regulated community of local governments and their consultants – to make sure folks submit good projects the first time. Even though not regulation, has weight of it.

Michael Irwin: How many secondary SCMs could we put together to make a primary SCM for TSS? It seems like all the devices we would use for low-impact design for TSS are secondary.

Trish: We will have to get input from DEMLR on this. Part of low-impact design is preventing creation of impervious runoff to begin with, or catching it right away. The data we have on DIS is just from rooftops, not the larger approach of not having curb and gutter.

Michael: Engineers have contacted me about using DIS for roadways and parking lots.

**DWR Updates**

**Falls Nutrient Strategy - John Huisman:** Just had EMC approval of Existing Development programs, which was the IAIA for UNRBA and Roxboro as the lone individual program. They were submitted July 2021 and local governments began implementation then, September EMC just approved them. Excited about IAIA, innovative collaboration. First annual reports coming in now.

UNRBA is wrapping up watershed model, lake models, Bayesian statistical model to tie quality to uses. All will wrap end 2023, coincide with Collaboratory report, whereupon EMC will begin Falls rules readoption rulemaking.

**Neuse/Tar – Trish:** New Development – September EMC approved 13 of 19 initial cohort 1 programs (subject to original N/T rules) under new rule. Other 6 will be resolved over next 6 months. Now reviewing remaining 4 Cohort 1’s and all Cohort 2’s (newly subject to N/T rules). Next reuest to EMC probably March 2023.

**SNAP Tool** is being revised in time for these first approvals to have it available when they implement in 6 months from September – April 2023.

* The new SNAP tool will be somewhat simplified from the current. For those needing more complicated features, we may release a special edition later. The new simpler tool will be more like the Tar-Pam tool in complexity.
* Schedule: Will release it for beta review December, then hold local government training Feb/Mar, then a short intro training for consultants. All will be recorded and put online for anytime access.

We are also completing a state of the watershed report on the Neuse and Tar-Pamlico basins per rule requirement, reviewing the last 20 years of implementation, estuary status and trends, watershed changes, making adaptive recommendations. To be completed by April 2023.

Rich: This 20-year report is to the Director/ourselves, but we will engage with stakeholders and share it out when it’s done.

**High Rock Nutrient Strategy – Rich:**

* We have launched the High Rock Lake NMS rulemaking stakeholder process. This will be a 15-18 month process including a hiatus where we draft rule text and take it back to stakeholders. The wrap-up will be a report including the input from stakeholders. This is different from previous nutrient strategy developments – hopefully mashing up the best parts of previous ones. There will be periodic all-stakeholder meetings and a steering committee of stakeholders with experience, and technical advisory groups by subject. Joey Hester is leading all this.
* Independently the 35 geomean chla standard was approved by July EMC and August RRC, just needs EPA approval at this point to go into effect. However, the lake nutrient reduction needs are sufficiently similar under both current and newly adopted standards that we can commence the regulatory needs discussions now and plug in the numbers when they are settled.

Mike Burchell: For High Rock, will there be any focus on looking at how wastewater dischargers contribute?

Rich: Yes, as usual point sources have to figure into the strategy. We have been engaged with the Association, who proposed a strategy in a white paper in 2018.

Mike: Minor dischargers, less than 1 MGD, often don’t have very stringent nutrient criteria for their permits – particularly for package plants, which are pumping out nitrate. I would suggest that someone take a look at that. I don’t know how significant that source is, but that seems important to establish. If it’s important, might need advanced treatment technology in those areas.

**Jordan Nutrient Strategy - Rich:**

* We are still in the process of hiring a replacement for departed nutrient strategy coordinator Patrick Beggs. At the same time, the bigger delay has to do with the lake model. The lake model was mandated by the General Assembly and given one year to complete, but for regulatory purposes more refinements were needed. A round of refinements was completed by Jim Bowen, and we are now on a follow-on contract that runs until summer 2023 to finish it. A product will be shared in spring 2023, and released for external review then through summer 2023. Stakeholder process will start somewhere in that timeframe.
* The Dispute Settlement Center is facilitating the Jordan process as well as High Rock.

**NCDP Process – Rich:**

* After High Rock approval, they have moved on to Albemarle Sound. They are focusing on a clarity standard (for protection of SAV) with the SAC researchers, that effort is progressing well. The intent is to move on to the mid-lower Cape Fear after that for the flowing stream pilot.

**Member Updates**

Many thanks to Trish from all members!

Westall: Thanks John Huisman and all UNRBA members for their help getting the IAIA to where it is.

Andy McDaniel: Thanks DWR for continued openness to alternative/One Water efforts through IAIA, Jordan Lake One Water, and nascent efforts in High Rock.

Mike Burchell: Proposal in to WRRI to evaluate multi-step alternative to wastewater treatment and polishing using duckweed and biochar and with wetland plants and aeration. Trying to be proactive to explore an ecological alternative if a nitrogen standard pops up, that these small WWTPs won’t be put out of business. If get proposal funded, will do a pilot.

Andy: DOT has a biochar research project looking at sources across the state. Contact me if interested.

Mike: We plan to make our own but this could be an emerging market.

Sandi Wilbur: Just submitted first annual IAIA report; exciting to have one of the existing development rules moving forward with a more expansive list of projects. This is helpful for me when assessing projects beyond the traditional SCMs. Looking forward to working with Jordan Lake stakeholders group to see what we could put together that’s similar.

Sally Hoyt: Invite folks to an upcoming City of Raleigh meeting for the Pidgeon House Branch watershed – Weds Nov 2nd from 3-7pm. Location details coming!

**Updates from Others**

Maya: Jordan Lake One Water won a national award for Outstanding Cross-Sector Partnership given by the US Water Alliance. JLOW has also incorporated as a North Carolina nonprofit, and much of this year has involved creating organizational structure that can enable the existing JLOW effort to meet some of the same goals as other groups here.