

SOUTHERN ENVIRONMENTAL LAW CENTER

Telephone 615-921-9470

1033 DEMONBREUN STREET, SUITE 205
NASHVILLE, TN 37203

Facsimile 615-921-8011

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Via U.S. Mail and Email Vojin.Janjic@tn.gov, Britton.Dotson@tn.gov

Vojin Janjić
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Ave, 11th Floor
Nashville, TN 37243

Britton Dotson
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Ave, 11th Floor
Nashville, TN 37243

Re: Proposed Changes to Chapters 0400-40-05 (Permits, Effluent Limitations and Standards), 0400-40-10 (National Pollutant Discharge Elimination System General Permits) and 0400-40-06 (State Operating Permits)

Dear Mr. Janjić and Mr. Dotson:

The Southern Environmental Law Center, Obed Watershed Community Association, Protect Our Aquifer, Tennessee Chapter Sierra Club, Tennessee Clean Water Network, Tennessee Conservation Voters, and Tennessee Environmental Council, submit the following comments regarding the proposed rule changes by Tennessee Department of Environment and Conservation (TDEC) to Chapters 0400-40-05 (Permits, Effluent Limitations and Standards), 0400-40-10 (National Pollutant Discharge Elimination System General Permits), and 0400-40-06 (State Operating Permits) (“Proposed Rules”).¹

The Proposed Rules span several chapters and include many changes to the rules and regulations implementing a cross-section of TDEC’s water program work. Our comments are not intended to be comprehensive, and instead focus on the following: proposed changes to the public participation and appeals provisions; proposed revisions to the industrial animal agriculture provisions; and the proposed addition of land application, pump and haul, collection system, and non-potable reuse provisions.

¹ In order to account for changes to the existing rules’ numbering system as a result of the Proposed Rules, except where expressly indicated, we will cite to the Proposed Rules for new rules, proposed amended rules, and unaffected rules.

I. Chapter 0400-40-05 and Chapter 0400-40-06: Public Participation and Appeals

A. Public notice of draft permits should identify waterways to which activity is adjacent.

Proposed Rule 0400-40-05-.06(10)(d) deletes the current requirement for public notice of draft National Pollutant Discharge Elimination System (NPDES) permits to include information about waterways adjacent to the permit activity.² We object to this change. Public notice of draft permits should include information about adjacent waterways. Although the permit may not expressly authorize discharge to those waterways, those waterways are at risk for unauthorized discharge due to their proximity to the permitted activity, because of potential overflows, spills, and other operational failures. Members of the public who have an interest in those particular waterways should have notice about these risks, and an opportunity to take part in the public participation process, to make sure those risks are addressed and minimized.

Proposed Rule 0400-40-06-.04(8) also does not contain any requirement for public notices of permit applications to include information about waterways adjacent to the permit activity. Although this provision is in the state operating permit (SOP) chapter, which is for non-discharging activities, permit applicants should still be required to disclose any surface waters near the permit activity, because those waters are at risk for unauthorized discharges. As with NPDES permits, members of the public may have a particular interest in these waterways, and they should be given full notice about permit actions that may affect them.

B. Mailing lists for public notice about SOPs should include people on “area lists,” as is the case for NPDES permits.

For both NPDES permits and SOPs, public notice of the proposed NPDES discharge or SOP activity is required. Notice is provided, in part, by circulating information about the proposed activity or discharge to persons on a mailing list developed by TDEC. For both NPDES permits and SOPs, this list will be developed by including people who have requested in writing to be on the list, and notification of the public through “periodic publication in the public press, newsletters, environmental bulletins, or state law journals.”³

However, for the NPDES permit mailing list, TDEC will also “[s]olicit[] persons for ‘area lists’ from participants in past permit proceedings in the area.”⁴ This provision is absent from the public notice section for SOPs. Facilities with SOPs, like facilities with NPDES permits, can have a large impact on the surrounding community, and many people are interested in all proceedings in their local area. Development of the public notice mailing list for SOP

² Tenn. Comp. R. & Regs. 0400-40-05-.06(10)(d).

³ Proposed Rule 0400-40-05-.06(9)(b)(7)(iii); 0400-40-06-.04(7)(a)(3). This is an existing requirement at Tenn. Comp. R. & Regs. 0400-40-05-.06(9)(b)(6)(iii).

⁴ Proposed Rule 0400-40-05-.06(9)(b)(7)(ii). *See also* Tenn. Comp. R. & Regs. 0400-40-05-.06(9)(b)(6)(ii).

activity should also include solicitation of “area lists,” to ensure full community involvement and public participation.

- C. Requiring interested persons to request a public hearing on any permit application “as soon as practicable” is not sufficiently specific to provide guidance to the public, and the subject of hearings should not be limited to water quality concerns.*

Currently, “interested persons” may request that TDEC hold a public hearing on a permit application, and they must do so within the period allowed for public comment.⁵ The Proposed Rules add two limitations that should be removed.

First, for both NPDES permits and SOPs, TDEC would add a requirement that interested persons request public hearings “as soon as practicable” within the time period allowed for public comment.⁶ This requirement does not provide any real guidance to persons interested in requesting a public hearing as to when they are obligated to do so. Additionally, the Proposed Rule appears to give TDEC discretion to avoid holding a public hearing even after one has been requested within the comment period if TDEC decides that the vague “as soon as practicable” time period has already passed. If TDEC wishes to shorten the time frame allowed to request public hearings to less than the time given for public comment, the time requirement should be clearly stated and definite deadlines given. Any such deadline should take into account the lag time between TDEC’s issuance of a draft permit and the public’s ability to review and evaluate the permit to determine whether a public hearing would contribute to the public’s awareness and understanding of issues arising from the permit.

Second, the Proposed Rule limits the subject of hearings to “address water quality concerns.”⁷ Although water quality is often a driving concern for NPDES permits and SOPs, hearings should not be arbitrarily limited to water quality concerns. Such limitation suggests that the Commissioner’s authority to review permit applications is limited to water quality concerns. Fortunately, that is not the case. For example, TDEC may deny a permit where the permittee has not appropriately considered alternatives, *see, e.g.*, Proposed Rule 0400-40-05-.05(3), and the NPDES application requires a host of additional information that should be available to be questioned by the public.

- D. TDEC should clarify that it will work with petitioners for appeal to ensure the standards for petitions for appeal are met.*

The Proposed Rule appears to significantly heighten the standard of pleading for appeal petitions for both NPDES permits and SOPs. Under the Proposed Rules, petitioners are required

⁵ Tenn. Comp. R. & Regs. 0400-40-05-.06(12).

⁶ *See* Proposed Rule 0400-40-05-.06(12); 0400-40-06-.04(10).

⁷ Proposed Rule 0400-40-05-.06(12). *See also* Proposed Rule 0400-40-06-.04(10) (requiring that interested persons “shall indicate the water quality interest of the party filing it and the water quality reasons why a hearing is warranted”).

to “state a claim for relief based on an alleged violation of the Act or the rules promulgated thereunder,” and must also “specify facts sufficient to satisfy the criteria of paragraph (3) of this rule and otherwise have standing to appeal.”⁸

Some members of the public may have valid reasons to appeal, as well as standing to do so, but may not frame their petition for appeal in exactly the right way to meet these standards. If TDEC rejects such petitions for appeal out of hand for formalistic reasons, these petitioners may not have time within the 30 days allotted for petitions for appeal to correct their petitions. TDEC should include a provision within the appeals section indicating that TDEC staff will work with petitioners to clarify these pleading standards, and potentially extend the time frame allowed for such petitions if they must be edited and resubmitted to meet these standards. This will ensure that all members of the public, no matter their background or previous degree of involvement with such petitions, will be able to participate fully in the permitting process.

II. Chapter 0400-40-05-.14 and Chapter 0400-40-06-.07: Animal Feeding Operations

A. Background.

Concentrated Animal Feeding Operations (CAFOs) confine large numbers of animals in small spaces and have the potential to severely degrade the surrounding environment and public health. These industrial operations produce significant quantities of waste; animal waste is associated with pollutants such as nutrients (like nitrogen and phosphorus), organic matter, odorous compounds, pathogens, metals, antibiotics, and hormones.⁹ These pollutants may enter the environment in a variety of ways, including through “surface runoff and erosion, overflows from lagoons, spills and other dry-weather discharges, leaching into soil and ground water, and volatilization of compounds (e.g., ammonia) and subsequent redeposition on the landscape.”¹⁰

One of the major public health and water quality issues with CAFOs is the risk of runoff from land application areas, where facilities apply manure, litter or wastewater onto fields. This animal waste, which is applied over large swaths of land, contains high amounts of nitrogen and phosphorus.¹¹ When these chemicals discharge into surface waters, they can lead to excess nutrients in the water, which causes an increase in algae in the water, depletes the oxygen and may harm or kill aquatic life.¹² According to TDEC’s 2015 Draft Nutrient Reduction Framework, of the streams that have been assessed, “approximately 3,375 river miles of stream

⁸ Proposed Rule 0400-40-05-.12(2); 0400-40-06-.13(2). The current rule does not contain these limits on petitioners. Tenn. Comp. R. & Regs. 0400-40-05-.12(2).

⁹ National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. 7176, 7181 (Feb. 12, 2003).

¹⁰ *Id.*

¹¹ *Id.* at 7180.

¹² EPA, *Nutrient Pollution: The Problem*, <https://www.epa.gov/nutrientpollution/issue>.

and 15,692 acres of lake in Tennessee are impaired due to nutrients.”¹³ When surface waters are impaired with nutrients, the resulting algal blooms and other effects can result in lost tourism, recreation, and fishing revenue, and can also cause “a variety of adverse health effects.”¹⁴

Runoff from CAFOs may also leach into groundwater, a water of the state, either through land application of manure or leakage of manure storage units.¹⁵ When groundwater is also a drinking water source, as it is for significant numbers of Tennesseans, this can pose serious health risks.¹⁶ Excess nitrate levels affect the ability of the blood to carry oxygen, particularly for infants, which can result in “blue baby syndrome” and possible death.¹⁷ Excess nutrients in source water for drinking, whether surface water or groundwater, “can result in increased costs associated with treatments for health risks and foul taste and odor.”¹⁸ Runoff from CAFOs also often contains pathogens such as *E. coli*, which can linger for years in groundwater after single pollution events from CAFOs, such as lagoon spills.¹⁹ Additionally, water resources in karst regions “are especially sensitive to contamination and pollution,” and much of the land in Tennessee is karstic.²⁰

Tennessee and federal law have developed definitions to categorize the largest industrial animal agricultural operations. Only the largest of the large are subject to any oversight, even

¹³ TDEC, *Draft Nutrient Reduction Framework*, 4, March 2015,

https://www.tn.gov/content/dam/tn/environment/water/tmdl-program/wr-ws_tennessee-draft-nutrient-reduction-framework_030315.pdf.

¹⁴ EPA, *A Compilation of Cost Data Associated with the Impacts and Control of Nutrient Pollution*, ES-2, May 2015, <https://www.epa.gov/sites/production/files/2015-04/documents/nutrient-economics-report-2015.pdf>.

¹⁵ JoAnn Burkholder et al., *Impacts of Waste from Concentrated Animal Feeding Operations on Water Quality*, Feb. 2007, *Environmental Health Perspectives* 115(2): 308–312, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1817674/>.

¹⁶ TDEC, *Tennessee Ground Water Monitoring and Management Ground Water 305(b) Report*, 3, 2016, https://www.tn.gov/content/dam/tn/environment/water/drinking-water-unit/wr_wq_report-groundwater-305b-2016.pdf (stating that over 1.5 million Tennessee citizens rely on public water systems using groundwater as a source).

¹⁷ National Association of Local Boards of Health, *Understanding Concentrated Animal Feeding Operations and Their Impact on Communities*, 4, 2010, https://www.cdc.gov/nceh/ehs/docs/understanding_cafos_nalboh.pdf.

¹⁸ *A Compilation of Cost Data Associated with the Impacts and Control of Nutrient Pollution* at ES-2.

¹⁹ *Understanding Concentrated Animal Feeding Operations and Their Impact on Communities* at 4.

²⁰ Ted W. Baker and Chris G. Groves, *Water Quality Impacts from Agricultural Land Use in Karst Drainage Basins of SW Kentucky and SW China*, 104, *The Third Interagency Conference on Research in the Watersheds*, Sept. 2008, <https://pubs.usgs.gov/sir/2009/5049/pdf/Baker.pdf>; Harry Moore and Eric C. Drumm, UT Extension, Institute of Agriculture, *Karst Geology in Tennessee*, W 453-C, Apr. 2018, <https://extension.tennessee.edu/publications/Documents/W453-C.pdf>.

though smaller operations can still generate enormous amounts of waste.²¹ The U.S. Environmental Protection Agency (EPA) defines an “animal feeding operation” (AFO) as a “lot or facility” where “[a]nimals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and... [c]rops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.”²² CAFOs are AFOs that meet particular size or discharge requirements, or which are designated as CAFOs.²³ For example, dry litter chicken operations which confine at least 125,000 broilers are classified as “Large CAFOs” based on their size.²⁴ Operations with between 37,500 and 124,999 broilers which directly discharge to waters of the United States, or where animals come into contact with such waters, are classified as “Medium CAFOs.”²⁵ The permitting authority (here, TDEC) may also designate an AFO as a CAFO “upon determining that it is a significant contributor of pollutants to waters of the United States.”²⁶

Until 2018, Tennessee law also classified a “medium” AFO as a CAFO if the AFO was adjacent to a nutrient or pathogen impaired waterbody, began operation on or after May 1, 1999, or expanded into the medium size range on or after July 21, 2004, which is still reflected in the current version of the rule.²⁷ Additionally, all CAFOs were required to obtain either an NPDES permit or an SOP.²⁸ A recent legislative change to Tenn. Code Ann. § 69-3-108 has directed TDEC to alter these regulations, so that only medium AFOs that directly discharge, or where animals come into contact with water, are automatically considered CAFOs.²⁹ Generally, permits are now only required for CAFOs that discharge, or for large CAFOs that utilize a liquid waste management system.³⁰

²¹ For example, USDA NRCS notes that “the manure from a dairy milking 200 cows produces as much nitrogen as is in the sewage from a community of 5,000-10,000 people...[and] the annual litter from a typical broiler house of 22,000 birds contains as much phosphorus as is in the sewage from a community of 6,000 people.” USDA NRCS, *Animal Manure Management RCA Issue Brief #7*, Dec. 1995, https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014211. Such a dairy operation would be on the threshold size between “small” and “medium,” and the broiler operation is well within the “small” category. 40 C.F.R. § 122.23.

²² 40 C.F.R. § 122.23(b).

²³ *Id.*

²⁴ 40 C.F.R. § 122.23(b)(4).

²⁵ 40 C.F.R. § 122.23(b)(6).

²⁶ 40 C.F.R. § 122.23(c)(3).

²⁷ Tenn. Comp. R. & Regs. 0400-40-05-.14.

²⁸ *Id.*

²⁹ 2018 Tennessee Laws Pub. Ch. 293 (effective 03/01/2018); Pub. Ch. 523 (effective 02/28/2018). Per federal regulations, TDEC still has the ability to designate small and medium AFOs as CAFOs under some circumstances. 40 C.F.R. § 122.23(c).

³⁰ Tenn. Code Ann. § 69-3-108(b)(7), (10).

Although TDEC is updating its regulations to be consistent with current state law, it still has the authority and the obligation to protect the waters of the state. TDEC must “adopt... and enforce rules and regulations... for the proper administration of this part, the prevention, control, and abatement of pollution.”³¹ By offering the comments below, we do not suggest that the legislative change was either prudent policy or consistent with the purpose and provisions of the Tennessee Water Quality Control Act.

B. Chapter 0400-40-05 (Permits, Effluent Limitations and Standards).

- a. The term “animal feeding operations” (AFOs) should not be used when referring to “concentrated animal feeding operations” (CAFOs).

The distinction between AFOs and CAFOs is legally significant. CAFOs are themselves point sources under the Clean Water Act and may not discharge to surface waters in any way without an NPDES permit.³² Some AFOs are by definition CAFOs (and therefore point sources).

The Proposed Rule modifies the term CAFO to AFO throughout. This clarifies that the regulation applies to any AFO that applies for an NPDES permit, not just CAFOs (e.g., Proposed Rule 0400-40-05-.14(8)). However, the modification may also cause some CAFOs to assume that their operation is an AFO and that they are therefore allowed to discharge through non-point source means. For example, in Proposed Rule 0400-40-05-.14(4)(b), “All other CAFOs” is changed to “Large AFOs, based on the animal numbers located in Table 0400-40-05-.14-1, which utilize liquid waste management systems,” reflecting the legislative change reducing the number of operations required to obtain SOPs.³³ However, AFOs which meet the Large CAFO size requirements are by definition CAFOs under federal regulations.³⁴ We suggest that this distinction be made clear in the final regulations.

- b. NPDES permits for CAFOs must comply with all relevant sections of this chapter.

Proposed Rule 0400-40-05-.14 deletes the first provision of the current rule, which notes that CAFO NPDES permits are also subject to applicable provisions of the rest of the NPDES chapter.³⁵ No justification is given for this deletion. Because CAFOs are, in fact, subject to all applicable provisions of the state NPDES scheme, this deletion may generate confusion as to the regulatory requirements for CAFO NPDES permits. For example, CAFO NPDES permits also include the duty to provide information, and allow inspection and entry, as detailed in Tenn.

³¹ Tenn. Code Ann. § 69-3-105(4)(b).

³² 40 C.F.R. § 122.23(a).

³³ “All other CAFOs shall obtain coverage under a state permit.” Tenn. Comp. R. & Regs. 0400-40-05-.14(5)(b).

³⁴ 40 C.F.R. § 122.23(b)(4).

³⁵ Tenn. Comp. R. & Regs. 0400-40-05-.14(1).

Comp. R. & Regs. 0400-40-05-.07, and with the public notice provisions of Tenn. Comp. R. & Regs. 0400-40-05-.06. This provision should therefore not be deleted, or TDEC must explain why it should be deleted despite potentially generating confusion.

- c. The regulations should clarify that the “Nutrient Management Plan” is subject to public notice and comment, along with the rest of the NPDES permit.

Proposed Rule 0400-40-05-.14(5)(b) states that permittees are required to submit a Nutrient Management Plan (NMP), which TDEC must approve as part of the individual NPDES permitting process. However, it should be made explicit that the NMP is also subject to the public notice and comment requirements of the rest of the NPDES permit, because the terms of the NMP function as effluent limitations. The Proposed Rule 0400-40-05-.14(9)(c)(iv) already states that *changes* to an NMP, if significant, trigger an public notice and comment process, so a statement that this process is also required as an initial matter would only provide useful clarification.

C. Suggested Improvements to TDEC Proposals.

TDEC “has and shall exercise the power, duty, and responsibility to adopt... and enforce rules and regulations that the board deems necessary for the proper administration of this part, the prevention, control, and abatement of pollution.”³⁶ The recent changes to the Tennessee Water Quality Control Act do not obviate that duty. TDEC is, in part, constrained to the federal minimum in defining CAFOs and requiring NPDES permits, and may only require SOPs for particular operations. However, TDEC still has both the authority and the responsibility to do more to protect the state’s waters and public health from AFO pollution.

- a. NPDES permits can include stronger groundwater monitoring requirements, or more protective, specific BMPs.

Although the definition of “CAFO” has been purportedly scaled back to a federal minimum and only discharging CAFOs are required to apply for individual NPDES permits per recent state law changes, TDEC still has both the authority and the duty to ensure that the permits themselves are sufficiently protective of the waters of the state.³⁷ For example, as part of its exercise of best professional judgment, TDEC could require groundwater monitoring, or prohibitions on multiyear application of phosphorus.³⁸ These more stringent requirements are

³⁶ Tenn. Code Ann. § 69-3-105(4)(b).

³⁷ Tenn. Code Ann. § 69-3-105(h)(2)(C) (power and duty to promulgate and apply in permits “effluent standards and limitations, water quality standards, schedules of compliance, and such other terms and conditions as are necessary to implement this part”).

³⁸ EPA, *NPDES Permit Writers’ Manual for Concentrated Animal Feeding Operations*, 4-37, Feb. 2012, https://www3.epa.gov/npdes/pubs/cafo_permitmanual_entire.pdf.

even more necessary if so many other large facilities are operating without permits; the requirements on all point sources must be sufficient to prevent degradation of the state's waters.

- b. AFOs in the “medium size” range should be required to submit a notice of operation, with basic data (size, number of animals, waste system) every year, to better facilitate information gathering and enforcement.

Animal feeding operations of any size can create serious nutrient pollution problems. The recent legislative changes attempted to remove many operations in the “medium size” category from the state regulatory definition of CAFO, and therefore from permitting requirements. The potential for these facilities to discharge, however, has not decreased, and in fact will likely increase as these facilities no longer need to adhere to nutrient management plans and other best management practices to reduce their pollution impact.

Even if TDEC believes it may no longer require such facilities to apply for some permits, TDEC is still authorized to require these facilities to submit information about their size and location to facilitate monitoring and enforcement. TDEC has a duty to prevent pollution of the state's waters, and the authority to create and enforce regulations to that purpose. TDEC further has the authority to “[r]equire the submission of such plans, specifications, technical reports, and other information as deemed necessary to carry out this part or to carry out the rules and regulations adopted pursuant to this part.”³⁹ Without knowing where slightly smaller AFOs are located, these facilities (which are still *very* large) cannot be adequately monitored, or their pollution impacts studied. Requiring “medium” and other AFOs to submit notices of operation is fully consistent with TDEC's existing authority, and would allow TDEC to better protect the state's waters and public health. It would also allow TDEC to recognize regional clustering patterns, which have been found to often result in degraded water quality.⁴⁰

For example, in TDEC's FY2018/2019 Surface Water Monitoring & Assessment Program Plan, sampling downstream of “CAFOs with individual permits or others in which water quality based public complaints have been received” was identified as a priority in order to monitor biointegrity and for nutrient and pathogen sampling.⁴¹ Relying solely on water quality complaints by citizens is not an effective or proactive way of ensuring the safety and health of the state's waters. AFOs of a size which makes it reasonable to suspect pollutant impacts, such as those in the medium size range, should also be considered for such monitoring and sampling.

³⁹ Tenn. Code Ann. § 69-3-107(10).

⁴⁰ United States Government Accountability Office, *Report to Congressional Requesters: Concentrated Animal Feeding Operations - EPA Needs More Information and a Clearly Defined Strategy to Protect Air and Water Quality from Pollutants of Concern*, GAO-08-944, 21, Sept. 2008, <https://www.gao.gov/assets/290/280229.pdf>.

⁴¹ TDEC, *Fiscal Year 2018-2019 Surface Water Monitoring and Assessment Program Plan*, 15, July 2018, https://www.tn.gov/content/dam/tn/environment/water/planning-and-standards/wr_wq_monitoring-workplan-fy18-19.pdf.

Knowledge about where AFOs are located would also be helpful in calculating the quantity of non-point source pollution in particular waterbodies for the development of restoration goals (Total Maximum Daily Loads, or TMDLs).⁴² Without a database of where these facilities are located, this important work is not possible.

III. Chapter 0400-40-06-.05: General Terms and Conditions

Proposed Rule 0400-40-06-.05(3) states that “[p]ermits may require best management practices to carry out the purposes and intent of the Act.” TDEC should require best management practices in all permits as a matter of course. If there are circumstances in which best management practices would not be appropriate, TDEC should explain those.

IV. Chapter 0400-40-06-.06: Land Application

A. Background.

In the Proposed Rule, TDEC defines land application as “the intentional disposal of treated wastewater into a soil matrix having depth and structure sufficient to assimilate the designed hydraulic and pollutant loading rates.”⁴³ Land application has several purposes: it diverts wastewater from surface water discharge, which can help improve surface water quality; it can provide nutrient benefits to crops grown on the land disposal area; and it is less expensive than many other wastewater treatment options, since the soil itself provides an additional level of “treatment.”⁴⁴ For these reasons, Tennessee state law now requires applicants for NPDES permits to consider alternatives to discharge, such as land application and beneficial reuse of wastewater.⁴⁵

If poorly designed and managed, however, land application systems can be detrimental to both public health and water quality, leaking contaminants from sewage into groundwater aquifers, running off into surface water, or spraying those contaminants through the air. In the Preamble to the Proposed Rule, TDEC suggests that one of the motivations for the Proposed

⁴² EPA, *Developing Effective Nonpoint Source TMDLs: An Evaluation of the TMDL Development Process*, 3-2, Jan. 2007, <https://www.epa.gov/sites/production/files/2015-10/documents/developing-effective-nonpoint-source-tmdls.pdf> (summarizing research to state that “the availability and quality of data is of paramount importance during the TMDL development and implementation planning process,” with one survey respondent stating that “[g]ood non-point source and stormwater data is virtually non-existent”).

⁴³ Proposed Rule 0400-40-06-.02.

⁴⁴ EPA, *Process Design Manual: Land Treatment of Municipal Wastewater Effluents*, 1-1, Sept. 2006, https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NRMRL&dirEntryId=159124 (“EPA Land Treatment Manual”).

⁴⁵ Tenn. Code Ann. § 69-3-108(e).

Rule was to put a stop to these problems, including “illegal discharges to streams.”⁴⁶ Wastewater from municipal or domestic sewage systems can contain pathogens (such as E. coli, norovirus, and protozoans like giardia) and high levels of nitrogen and phosphorus (which can form nitrates that, in drinking water, can damage the ability of the blood to carry oxygen, and which can lead to eutrophication and toxic algal blooms in surface water).⁴⁷ Both industrial and domestic wastewater can contain many other non-conventional contaminants (contaminants of emerging concern), such as hormones, pharmaceuticals, and per- and polyfluoroalkyl substances (PFAS).⁴⁸ Wastewater designated for land application must be adequately pre-treated and applied at the correct rate, in the correct way, at the correct time, and at the correct site, in order to prevent these pollutants from harming Tennessee’s citizens or its waters.

Land application can be performed in several different ways, but the land application processes considered in the Proposed Rule appear to be slow-rate sprinkler and surface drip systems.⁴⁹ These systems have been permitted in Tennessee for many years, so TDEC’s decision to issue regulations to govern permitting, rather than solely relying on guidance documents, is a welcome one. Regulations create minimum standards that permits must adhere to, and allow for greater levels of transparency and uniformity, as well as providing additional avenues for public participation that can contribute to protecting our clean water for the benefit of all Tennesseans.

B. The provision prohibiting permits for land application using land with a high water table should be in the land application section.

Proposed Rule 0400-40-06-.03(9) (“Permit Application”) states that “[n]o land application system shall be approved or certified by the Commissioner which proposes to use land having a water table at an elevation which would preclude adequate treatment of the wastewater and which may result in surfacing of ground water pollution.” This provision is identical to the statutory prohibition set forth at Tenn. Code Ann. § 68-221-102(4). Because the provision deals exclusively with land application, placing it within the “Land Application” section, 0400-40-06-.06, would promote clarity.

⁴⁶ Preamble to Proposed New Rule Chapter 0400-40-6 (State Operating Permits).

⁴⁷ EPA, 2012 *Guidelines for Water Reuse*, 6-5, Sept. 2012, <https://nepis.epa.gov/Adobe/PDF/P100FS7K.pdf> (“EPA Reuse Guidelines”); *A Compilation of Cost Data Associated with the Impacts and Control of Nutrient Pollution* at III-10.

⁴⁸ Sarah Elliott et al., *Wastewater Indicators, Hormones, Sterols, Antibiotics, and Pharmaceuticals in Soil at an Agricultural Field Irrigated with Domestic Septage*, Central Minnesota, 1, USGS, Sept. 2014, <https://pubs.usgs.gov/sir/2018/5100/sir20185100.pdf>; Steven Verburg, *Wisconsin case shows how sewage plants spread unregulated toxins across landscape*, Jan. 2019, Wisconsin State Journal, https://madison.com/wsj/news/local/govt-and-politics/wisconsin-case-shows-how-sewage-plants-spread-unregulated-toxins-across/article_e9e50bb6-85b8-5377-95ab-736541129386.html.

⁴⁹ *EPA Land Treatment Manual* at 1-1.

Additionally, the prohibition on land application in areas with a high water table overlaps with the provision at Proposed Rule 0400-40-06-.06(2)(c), which states that “[t]here shall be a minimum soil depth of 20 inches above the restrictive horizon or seasonal water table.” A minimum soil depth of 20 inches is not sufficiently protective to prevent inadequate wastewater treatment and ground water contamination. TDEC is required by the Tennessee Water Quality Control Act to prevent the pollution of waters of the state.⁵⁰

TDEC should combine these two provisions, while also requiring a stricter minimum soil depth above the water table. For example: “No land application system shall be approved or certified by the Commissioner which proposes to use land having a water table at an elevation which would preclude adequate treatment of the wastewater and which may result in surfacing of ground water pollution. The minimum soil depth above the restrictive horizon or seasonal water table shall be 60⁵¹ inches.” This depth to water table represents a reasonable starting point to protecting public health from contaminants like nitrate and pathogens in potential drinking water supply, as well as protecting the waters of the state from further pollution. Because this would be a minimum standard, TDEC should reserve the right to increase this depth to the water table because of particular site characteristics, such as karst or unusual soil conditions. In calculating the high water table, TDEC should also require permit applicants take into consideration how unusual climate patterns, such as intense rainfall, may elevate that water table.⁵²

⁵⁰ See Tenn. Code Ann. § 69-3-102(b) (“the purpose of this part is... to prevent the future pollution of the waters”); Tenn. Code Ann. § 69-3-107(1) (“the commissioner has the power, duty, and responsibility to... [e]xercise general supervision and control over the quality of all state waters, [and] administer and enforce all laws relating to pollution of such waters”).

⁵¹ 60 inches (five feet) is the minimum depth to seasonal high water table required for surface land application systems in South Carolina, when the design application rate is 2 inches per week. S.C. Code Ann. Regs. 61-9.505.42(b)(4) (Attachment 1). If the design application rate is 1 inch per week, the minimum depth to the seasonal high water table is 48 inches (4 feet), and for 0.5 inches per week, 36 inches (3 feet). *Id.* Depths of less than 36 inches are only allowed if approved by the Department, and if much stricter effluent limit are used. *Id.* The suggested groundwater depth in the *EPA Land Treatment Manual* is 2 to 10 feet. *EPA Land Treatment Manual* at 1-2. We recognize that what is appropriate for the soil and geology of South Carolina may not be appropriate in all parts of Tennessee. Some parts of Tennessee have shallow soils and karst conditions which may not accommodate a soil depth of 60 inches. However, the onus is on TDEC to demonstrate that the proposed minimum soil depth is sufficiently protective of the waters of the state, and to make clear that the minimum standard may be increased for site-specific reasons such as local soil conditions and hydrogeology.

⁵² This is of particular importance because intense rainfall events are expected to become more frequent in Tennessee in the future. See EPA, *What Climate Change Means for Tennessee*, Aug. 2016, EPA 430-F-16-044, <https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-tn.pdf>.

C. “Treatment” Subsection 0400-40-06-.06(1)(a)

- a. The treatment categories “domestic and/or municipal wastewater,” “large community septic systems,” and “industrial dischargers” should be clearly defined.

The Proposed Rule repeatedly refers to the treatment categories “domestic and/or municipal wastewater,” “large community septic systems,” and “industrial dischargers.”⁵³ However, these terms are never defined in the Proposed Rule, or in the Tennessee Water Quality Control Act (Tenn. Code Ann. § 69-3-103). Additionally, in the context of a state operating permit, it may be advisable to use a term other than “industrial dischargers,” since a state operating permit for land application only applies to non-discharging systems. Because different effluent limits apply to these different categories in the Proposed Rule, TDEC must clarify the boundaries of these categories. Otherwise, permit applicants and the public may not understand the controlling set of effluent limits at any given treatment operation.

- b. The proposed effluent limits are inadequately protective of human health and water quality.

The proposed effluent limits for land application are not sufficiently protective. First, large community septic systems should be held to at least the same standards as municipal and/or domestic systems. No justification is given for the higher permitted BOD₅ and TSS for large community septic systems.

Parameter	Daily Maximum (mg/L)
BOD ₅ or CBOD ₅	45/40
TSS	45
pH	6-9
NH ₃ -N	22

Proposed Rule 0400-40-06-.06(1)(a)(1)
(standards for “domestic and/or municipal wastewater”)

Parameter	Daily Maximum (mg/L)
BOD ₅	200
TSS	100

Proposed Rule 0400-40-06-.06(1)(a)(2)
(standards for “large community septic systems”)

Industrial dischargers should also have clear effluent limitations. These systems, like the others, can also cause water quality impairments if the effluent being land-applied is not adequately pre-treated. In Proposed Rule 0400-40-06-.06(1)(a)(3), industrial dischargers are

⁵³ See, e.g., Proposed Rule 0400-40-06-.06(1)(a)(1).

required to comply with the standards of “subparagraph (a),” but subparagraph (a) includes (a)(3), so it is unclear what standards are meant to be required. If the intent was to require compliance with the standards for municipal and/or domestic systems, TDEC should clarify the requirement.

Second, even for municipal and/or domestic wastewater, the effluent limits should be strengthened. The Proposed Rule proposes the following daily maximum limits: BOD₅ 45 mg/L, TSS 45 mg/L, NH₃-N 22 mg/L. Similar systems in North Carolina require the following monthly averages for municipal, domestic, and commercial facilities: BOD₅ 30 mg/L, TSS 30 mg/L, ammonia (NH₃-N) 15 mg/L.⁵⁴ One option would be for TDEC to keep the Proposed Rule’s daily maximum limits, and add these monthly average limits.

Third, the proposed effluent limitations should also include limits on pathogens. Because access to land application areas is restricted, these standards need not be as strict as the standards for reclaimed water irrigation in places where humans might enter. However, some degree of protection from pathogens is still necessary. Unexpected discharge to surface or ground waters may occur, or animals may come into contact with the soil and carry out the pathogens. EPA guidelines suggest that, for reclaimed water to be used in areas where no direct public or work contact is expected, water “should be disinfected to achieve an average fecal coliform concentration not exceeding 200/100 mL.”⁵⁵ As with reclaimed water for irrigation in restricted areas, land application wastewater may also, at times, come into contact with humans or with waters. This guideline is therefore also appropriate as a starting point for land application effluent limits. EPA notes that achieving disinfection to this level is “readily achievable at minimal cost.”⁵⁶ 200 colony forming units per 100mL of fecal coliforms is the standard that both North Carolina and Virginia use for land application systems.⁵⁷

Fourth, more specificity should be given as to what additional limitations may be required for industrial dischargers and large community septic systems because of best professional judgment. The Proposed Rule states that large community septic systems must comply with “any other limitations established on a case-by-case basis through best professional judgment,” and that industrial dischargers must comply with “any other limitations established by the Division through best professional judgment.”⁵⁸ TDEC has a duty to ensure that permits, including land application permits, “impose such conditions, including effluent standards and

⁵⁴ 15A N.C. Admin. Code 02T.0505(b)(1) (**Attachment 2**). Facilities using older lagoon treatment systems have slightly less stringent requirements (BOD₅ 30 mg/L, TSS 90 mg/L). 15A N.C. Admin. Code 2T.0505(b)(2) (**Attachment 2**).

⁵⁵ *EPA Reuse Guidelines* at 4-13.

⁵⁶ *Id.*

⁵⁷ See 15A N.C. Admin. Code 02T .0505(b) (**Attachment 2**); 9 Va. Admin. Code 25-790-880(F) (**Attachment 3**).

⁵⁸ Proposed Rule 0400-40-06-.06(1)(a)(2), (3).

conditions... as are necessary to accomplish the purposes of this part.”⁵⁹ One of the purposes of the Tennessee Water Quality Act is to protect water quality (“the purpose of this part is... to prevent the future pollution of the waters”) and that can only be accomplished by a thorough consideration of all potential pollutants in the effluent.⁶⁰ TDEC should therefore include more detail on how the Division will formulate its best professional judgment, and what pollutants and contaminants it will consider in setting additional effluent limitations.

TDEC should include a requirement that all land application effluent be analyzed and characterized to determine pollutants of concern to establish limitations to protect human health and water quality. This is particularly true for effluent from industrial dischargers, which may contain a wide range of contaminants.⁶¹ Although this analysis and determination must be case by case, TDEC should still note some of the more common potential pollutants as ones permit writers are obligated to consider within the context of their best professional judgment. For example, industrial discharger effluent may contain high levels of phosphorus, which can be a factor for eutrophication if it migrates to surface waters.⁶² Industrial effluent may also have very high levels of salts and metals.⁶³ One way to frame this requirement would be to require the Division to reference the EPA *Process Design Manual for Land Treatment of Municipal Wastewater Effluents* when designating case-by-case additional effluent limitations.⁶⁴

- c. The proposed prohibitions on ponding are necessary to protect water quality, and prohibitions on land application when the site is frozen, snow-covered, or flooded should also be added.

The prohibition on dry-weather persistent ponding is appropriate. EPA’s manual on land application of municipal wastewater references ponding, like erosion, as something to be avoided.⁶⁵ Land application systems in North Carolina also prohibit ponding, and South Carolina prohibits land application when the ground is ponded.⁶⁶ Ponding may lead to discharges to surface water, particularly on steeper slopes. Additionally, ponding is symptomatic of land application of wastewater above the capacity of the soil to process it.⁶⁷ For the same reasons, TDEC should also add a provision prohibiting land application when the ground is frozen,

⁵⁹ Tenn. Code Ann. § 69-3-108(g)(1).

⁶⁰ Tenn. Code Ann. § 69-3-102(b).

⁶¹ North Carolina, for example, requires detailed chemical analysis of typical wastewater for industrial discharges to land irrigation wastewater systems. 15A N.C. Admin. Code 02T .0504(h) (**Attachment 4**).

⁶² EPA *Land Treatment Manual* at 2.8.

⁶³ *Id.* at 2.10, 2.6.2.

⁶⁴ See generally EPA *Land Treatment Manual*, Chapter 2.

⁶⁵ *Id.* at 11-7.

⁶⁶ 15A N.C. Admin. Code 02T .0507(c) (**Attachment 5**); S.C. Code Ann. Regs. 61-9.505.41(p)(2) (**Attachment 6**).

⁶⁷ EPA *Land Application Manual* at 3-12.

covered with snow, or flooded/saturated with water.⁶⁸ If a land application system has persistent problems with ponding, TDEC should investigate whether the system is applying wastewater in excess of the soil's hydraulic capacity.

- d. The proposed requirements for fencing and signage are appropriate, but should apply to sprayfields as well as dripfields.

The Proposed Rule states that “[a]ll dripfields shall be fenced sufficiently to prevent or impede unauthorized entry.”⁶⁹ Additionally, the permittee must “place a sign at the entrance to the land application area and at regularly spaced intervals not to exceed 200 feet on the fence surrounding the land application area.”⁷⁰ These proposed provisions are necessary to protect public health, but should also apply to sprayfields, since the same pathogen contamination concerns apply. Because wastewater applied to land application systems are not treated to the standards of reclaimed water which may come into contact with people, the system operators are obligated to ensure that no unauthorized entry occurs. This requirement is similar to those in other states.⁷¹

- e. Maintenance of a vegetative cover should be required year-round.

The Proposed Rule does not have any provisions requiring maintenance of a vegetative cover year-round on land application sites. Operators of land application systems should be required to maintain year-round vegetative cover to prevent erosion and ensure adequate nutrient uptake. Year-round maintenance of appropriate vegetation on irrigated land application areas is required in other states.⁷²

⁶⁸ Other states also forbid land application in many of these situations. For example, Virginia regulations refer to times when “the ground is frozen, surface saturation occurs during wet weather, the ground is covered with snow, or the irrigation site or field areas cannot otherwise be operated.” 9 Va. Admin. Code 25-790-880(F)(1) (**Attachment 3**). In South Carolina, effluent application is specifically prohibited “when the ground is frozen, ponded, there is standing water on the application site, or the ground is flooded.” S.C. Code Ann. Regs. 61-9.505.41(p)(2) (**Attachment 6**).

⁶⁹ Proposed Rule 0400-40-06-.06(1)(c).

⁷⁰ *Id.*

⁷¹ In Virginia, for example, fencing should be adequate “to prevent access to livestock and the public where necessary,” and signs must be posted at intervals of 100-300 feet around the entire perimeter. 9 Va. Admin. Code 25-790-880(H)(3) (**Attachment 3**).

⁷² In North Carolina, “[i]rrigation areas shall have a year-round vegetative cover. 15A N.C. Admin. Code 2T.0507(b) (**Attachment 5**).

D. “Land Application Area” Subsection 0400-40-06-.06(2)

- a. The requirement for new land application facilities to contain soil area of sufficient size to accommodate more than the daily design flow is an appropriate component of TDEC’s regime to protect water quality.

In the Proposed Rule, new facilities must contain land area with a safety margin of 50% above the daily design flow.⁷³ This requirement is an important step in protecting the waters of the state from contamination. If there is a sudden increase in the amount of wastewater generated, beyond what was initially planned, land application facilities must have enough land to safely dispose of that waste without causing discharges to ground or surface water. Additionally, more land area allows for a margin of error in calculating the soil profile and maximum hydraulic loading rate; if the maximum rate is calculated to be higher than it is in reality, then more land area will be needed to safely dispose of the wastewater. Other states also recognize in their regulations the need for some percentage of “reserve” land area.⁷⁴ TDEC should also consider requiring this land area to be capable of being used as land application area within a specific time frame.⁷⁵

- b. The Proposed Rules should require the soil profile and hydrogeological profile to be characterized in more detail and with more support.

The Proposed Rule requires soil suitability to “be demonstrated though an extra high-density soils map as defined in Rule 0400-48-01-.02 and supported by soil pedon descriptions...”⁷⁶ An extra high-intensity soils map, even one supported by soil pedon

⁷³ Proposed Rule 0400-40-06-.06(2).

⁷⁴ See 9 Va. Admin. Code 25-790-880(F)(4) (**Attachment 3**) (requiring an extra 25% reserve, with more required “if the general conditions of the field area are deemed marginal or in proximity of critical areas or waters).”

⁷⁵ *Id.* Note that less reserve area may be needed if there is an alternate source of discharge/disposal for excess wastewater. *Id.*

⁷⁶ Proposed Rule 0400-40-06-.06(2). A soil map “means a map showing the size, shape and distribution of the various kinds of soil in relation to other physical and cultural features on the earth’s surface.” Tenn. Comp. R. & Regs. 0400-48-01-.02. An extra-high intensity soil map “is the same as a high intensity soil map except the scale may be one (1) inch equals one hundred (100) feet or one (1) inch equals fifty (50) feet.” *Id.* A high intensity soil map is “[a] first order survey as defined in the “Soil Survey Manual,” United States Department of Agriculture, October 1993. These surveys are made for very intensive land use that requires very detailed soils information that requires very precise knowledge of soils and their variability such as individual building sites. Field procedures require observation of soil boundaries throughout their length...” *Id.* A pedon “is a three-dimensional body of soil that has sufficient area (roughly 1 to 10 m²) and depth (up to 200 cm) to be used in describing the internal arrangement of horizons and in collecting representative samples for laboratory analysis...” USDA NRCS, *Soil Survey Manual Chapter 3: Examination and Description of Soil Profiles*, 2017, https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_054253.

descriptions, does not by itself give an adequate level of detail to appropriately determine maximum hydraulic and pollutant loading rates. For example, if the effluent contains a high concentration of salts (as many industrial effluents do), this reduces the hydraulic conductivity of the soil.⁷⁷ Maximum hydraulic and pollutant loading rates should thus also be analyzed in the context of the specific effluent's characteristics.⁷⁸

Additionally, a greater number of soil pedon descriptions per acre should be used to ensure the soil is accurately characterized and prevent discharge to surface or ground waters. Characterization of the soil should also include the presence of soil fissures when conditions are dry. The sites selected for the pedons should be a "representative sample of the overall soil body in the landscape."⁷⁹ For example, the soil could be described to a depth of 60 inches, rather than 36 (or to rock or fragipan), which is more consistent with the protective standards of other states, e.g., Virginia, which requires the soil to be characterized to a minimum depth of five feet, and for the soil characteristics of the land application site "to be described by a qualified technical specialist knowledgeable in the principles of soil science, agronomy, and nutrient management."⁸⁰ North Carolina requires soil characterization up to seven feet or bedrock.⁸¹

Along similar lines, the hydrogeology of the area (such as the characteristics of groundwater in the area, the location and present/planned usage of aquifers, and the presence of karst) should be described and considered in setting maximum loading rates. Without knowledge of how groundwater moves under the land application site, preventing contamination of those waters is much more difficult, and preventing contamination of the state's waters is TDEC's statutory obligation.⁸² North Carolina requires these hydrogeological reports for any system treating industrial waste, or any system with a design flow over 25,000 gallons per day; they must also be prepared by a "Licensed Geologist, Licensed Soil Scientist, or Professional Engineer."⁸³ Virginia regulations require "a geologist or other technical specialist, or specialists, knowledgeable in geohydrologic principles" to prepare "[d]etailed information on the geologic conditions of the proposed site" for all systems.⁸⁴ TDEC should require that a detailed report on hydrogeological conditions be prepared by a Licensed Geologist, Licensed Soil Scientist, or Professional Engineer, in order to ensure the accuracy of the report.

⁷⁷ Simon Toze, *Reuse of effluent water – benefits and risks*, 6, CSIRO Land and Water, CSIRO Centre for Environment and Life Sciences, http://agronomyaustraliaproceedings.org/images/sampledata/2004/symposia/1/5/2086_toze.pdf.

⁷⁸ *EPA Land Treatment Manual* at 11-2.

⁷⁹ *Soil Survey Manual Chapter 3: Examination and Description of Soil Profiles*.

⁸⁰ 9 Va. Admin. Code 25-790-880(C) (**Attachment 3**).

⁸¹ 15A N.C. Admin. Code 02T .0504(b)(1) (**Attachment 4**).

⁸² Tenn. Code Ann. § 69-3-102(b).

⁸³ 15A N.C. Admin. Code 02T .0504(e) (**Attachment 4**).

⁸⁴ 9 Va. Admin. Code 25-790-880(c)(5) (**Attachment 3**).

c. Nutrient management plans should be required to prevent water contamination.

An application for a land application permit should include a nutrient management plan. This is already implicitly recognized in the Proposed Rule, which requires a maximum nutrient loading rate based on nitrogen to prevent groundwater contamination.⁸⁵ This nutrient management plan should include information about the vegetation intended for the land application area and its nutrient requirements, as well as information about the soil relevant to nutrient uptake.

The nutrient management plan requirements for Animal Feeding Operations at Tenn. Comp. R. & Regs. 0400-40-05-.14 could be used as guidelines. Alternately, TDEC could specify that wastewater application will be in accordance with agronomic rates, which is the approach North Carolina uses.⁸⁶ In either case, wastewater application must be limited by plant uptake to ensure groundwater does not become contaminated with excess nitrates. TDEC should also require that a Standard Soil Fertility Analysis be conducted on each land application site, as is required in North Carolina, to ensure the accuracy of the nutrient management plan.⁸⁷ Any agronomic rate used should be adjusted according to this soil fertility analysis. TDEC should also require that the permittee submit an updated Standard Soil Fertility Analysis at regular intervals, such as once a year; again, this ensures the accuracy of the nutrient management plans and helps to prevent water contamination.

d. More monitoring should be required to ensure water quality is not being compromised.

The Proposed Rule does not contain any requirements for monitoring to ensure compliance and protection of water quality. At least one definitively upgradient monitoring well and at least two appropriately placed downgradient groundwater monitoring wells should be required, and testing should be done regularly and reported out to TDEC to ensure that the pollutant loading rates were accurately calculated during plan development to protect groundwater quality.⁸⁸ Effluent should also be regularly tested, in case the pollutant profile changes and loading rates must therefore be adjusted.

Additionally, the Proposed Rule should include consequences for the permittee if ground water monitoring indicates problems. For example, South Carolina land application regulations state that, if ground water monitoring levels show exceedances of effluent limits or an adverse trend, “it will be the obligation of the permittee as directed by the Department to conduct an

⁸⁵ Proposed Rule 0400-40-06-.06(2)(b).

⁸⁶ 15A N.C. Admin. Code 02T .0505(c) (**Attachment 2**). North Carolina also allows application in excess of agronomic rates if “predictive calculations are provided that demonstrate State groundwater standards will be protected.” *Id.*

⁸⁷ 15A N.C. Admin. Code 02T .0504(b)(4) (**Attachment 4**).

⁸⁸ This is the system used in Virginia. 9 Va. Admin. Code 25-790-880(H)(4) (**Attachment 3**).

investigation to determine the vertical and horizontal extent of groundwater impact,” and that the Department may then require remediation of the groundwater.⁸⁹ This model would work for Tennessee as well, as a way of strengthening protection for the state’s waters.

- e. The maximum slope for non-forested land should be significantly lower than 30% to adequately protect against discharges to surface and ground water.

EPA guidelines describe the maximum slope for slow-rate irrigation systems (sprinkler, surface, and drip) as 20% for cultivated sites.⁹⁰ South Carolina uses the more conservative standard of a maximum of 10% for spray fields, and Virginia uses an absolute maximum slope of 12% for low intensity irrigation, including sprinkler systems with low trajectory nozzles.⁹¹ Steeper slopes are more likely to lead to runoff and ponding, which can lead to discharges to surface water and excess infiltration in particular areas, negatively affecting groundwater quality.

- f. “Adequate storage” should be clearly defined.

The Proposed Rule states that “adequate storage” must be provided to allow for crop management, system operation, emergency storage, and routine maintenance.⁹² This term should be more clearly defined. For example, similar regulations in Virginia require storage to be calculated based on climatic conditions data (how often the ground is frozen, saturated, and so on) as well as the nutrient management requirements of the crop.⁹³ If climatic data is not available, a minimum holding period of 120 days is required.⁹⁴ EPA’s guidelines for Tennessee estimate a requirement for at least 40 days of storage for climatic factors alone, with additional days added to account for harvesting and planting time for crops if appropriate.⁹⁵ TDEC should adopt similar, quantifiable standards.

- g. The land application area setbacks should be increased to protect human health and water quality.

The land application area setbacks should be increased, particularly for spray irrigation methods. For example, setbacks for residences and places of business should be at least 400 feet, which is the standard used in North Carolina.⁹⁶ Additionally, there should be mandatory setbacks

⁸⁹ S.C. Code Ann. Regs. 61-9.505.5(d) (**Attachment 7**).

⁹⁰ *EPA Land Treatment Manual* at 1-2.

⁹¹ S.C. Code Ann. Regs. 61-9.505.42(b)(1) (**Attachment 1**); 9 Va. Admin. Code 25-790-880(I) (**Attachment 3**).

⁹² Proposed Rule 0400-40-06-.06(4)(c).

⁹³ 9 Va. Admin. Code 25-790-880(F) (**Attachment 3**).

⁹⁴ *Id.*

⁹⁵ *EPA Land Treatment Manual* at 5.1.3.

⁹⁶ 15A N.C. Admin. Code 02T .0506(a) (**Attachment 8**).

from wetlands of at least 100 feet, and public roads of at least 50 feet.⁹⁷ Drip irrigation setbacks should also be substantially increased to, at minimum: 100 feet for residences, 100 feet for surface waters, including wetlands, 50 feet for property lines, and 50 feet for public roads.⁹⁸

Setbacks ensure that partially treated effluent does not drift into public spaces or people's homes on the air, as well as creating a buffer between the public and any odors or airborne pathogens. These setback requirements are necessary in order to fulfill the provisions of Proposed Rule at 0400-40-06-.05(4)(b)-(d), prohibiting discharges to waters and the creation of a health hazard or nuisance. TDEC should also require a dike or a berm around spray field perimeters to prevent potential surface runoff, or a demonstration of alternate means of runoff control by the applicant.⁹⁹

V. Chapter 0400-40-06-.08: Pump and Haul

A. "Pump and haul sewerage system" should be defined.

"Pump and haul sewerage system" is not defined in either Proposed Rule 0400-40-06-.08 or the "Definitions" section at Proposed Rule 0400-40-06-.02. TDEC should supply the definition for these systems for added clarity. Pump and haul systems are referenced but not defined on TDEC's website.¹⁰⁰ Pump and haul systems appear to be systems which collect, hold, and transport wastewater, based on the website's inclusion of systems that "collect[]" and temporarily hold[]" wastewater within the category of systems requiring permits.¹⁰¹

B. More recordkeeping and reporting should be required.

In addition to the facility name where the wastewater is disposed, the permittee log should also contain a signature from the person responsible for the wastewater treatment facility.¹⁰² This requirement ensures greater accountability on the part of the permittee and the wastewater treatment facility, and protects against unauthorized discharges.

TDEC should also require that a report be submitted with the initial permit application containing an assurance from a wastewater treatment facility that they will accept the waste from

⁹⁷ *Id.*

⁹⁸ *Id.*

⁹⁹ A dike or a berm may be required in South Carolina to prevent surface runoff. S.C. Code Ann. Regs. 61-9.505.42(b)(9) (**Attachment 1**).

¹⁰⁰ TDEC, *Water Quality State Operation Permit*, <https://www.tn.gov/environment/permit-permits/water-permits1/water-quality-state-operation-permit.html>.

¹⁰¹ *Id.*

¹⁰² This is the recordkeeping system used by South Carolina for pump and haul operations. S.C. Code Ann. Regs. 61-67.300(G)(1)(b) (**Attachment 9**).

this pump and haul operator, a discussion of how leaks and spills will be prevented, and other best management practices.¹⁰³

VI. Chapter 0400-40-06-.09: Collection Systems

A. “Collection systems” should be defined.

“Collection system” is not defined in either Proposed Rule 0400-40-06-.08 or the “Definitions” section at Proposed Rule 0400-40-06-.02. TDEC should supply the definition for such systems for added clarity. TDEC’s website states that “the operation of a municipal sewage collection system which discharges into a collection system owned by another entity may require a permit.”¹⁰⁴ Defining exactly what a “collection system” is allows operators to know if they are required to obtain permit coverage.

B. Monitoring, inspections, and reporting should be required.

The proposed regulations do not contain any provisions to ensure that collection systems are regularly inspected or effectively maintained. TDEC should add inspection and maintenance requirements. In particular, pump stations must be regularly inspected. Facilities should also maintain an up-to-date map of their system, a preventative maintenance schedule, a log of all inspections and maintenance, and an overflow response plan.¹⁰⁵ These should all be regularly submitted to TDEC. These provisions are necessary to ensure that no unauthorized discharges occur to waters, and the public health not put at risk by blockages, overflows, or street collapse.¹⁰⁶

VII. Chapter 0400-40-06-.10: Non-Potable Reuse

A. Background.

TDEC defines “[n]on-potable reuse of reclaimed wastewater” as “the planned and intentional reuse of reclaimed wastewater that does not involve production of potable water.”¹⁰⁷ “Reuse of reclaimed wastewater” is defined as “the application of reclaimed wastewater effluent in quantities such that that the minimum amount [of] water is applied to meet, but not exceed, the

¹⁰³ *Id.*

¹⁰⁴ TDEC, *Water Quality State Operation Permit*, <https://www.tn.gov/environment/permit-permits/water-permits/1/water-quality-state-operation-permit.html>.

¹⁰⁵ These provisions are similar to the collection system regulations in North Carolina. 15A N.C. Admin. Code 02T .0403 (Attachment 10).

¹⁰⁶ TDEC and Fleming Training Center, *Collection Systems Grade 1-2: Course #1203*, 28, https://www.tn.gov/content/dam/tn/environment/water/documents/study_1203.pdf.

¹⁰⁷ Proposed Rule 0400-40-06-.02.

agronomic need or uptake of a crop, landscaping, athletic field, or other beneficial sites.”¹⁰⁸ Water reuse has become more and more common throughout the country, because it reduces the amount of fresh water that must be drawn from surface waters and aquifers, as well as providing useful nutrients to vegetation grown on the application sites.¹⁰⁹ Tennessee state law now requires that applicants for NPDES permits consider alternatives to discharge, such as land application and beneficial reuse of wastewater.¹¹⁰

In water reuse systems, the operator of the treatment facility supplies the reclaimed wastewater to an end user, who then applies the water on their land.¹¹¹ Like land application systems, water reuse systems have been permitted in Tennessee for some time, and so TDEC’s decision to issue regulations rather than relying on internal guidance is a positive step forward. Regulations increase uniformity among permits and create minimum floors for their terms, as well as increasing transparency and opportunities for public input about the contents of the permits.

Despite its benefits, the usage of reclaimed water also has many risks. Municipal or domestic sewage can contain many microbial pathogens, such as *E. coli*, salmonella, rotavirus, norovirus, and giardia.¹¹² In the context of land application, the primary transmission routes are through ingestion or contact with contaminated food or inhaling aerosolized particles containing pathogens.¹¹³ Treatment technologies can remove these pathogens below detection limits, and so any system for reclaimed wastewater must require strict limits on pathogens to ensure sufficient treatment. Wastewater reclaimed from industrial dischargers can contain metals and salts, which can negatively affect water quality if they filter down to groundwater or there is an unplanned surface water discharge.¹¹⁴ Nutrients such as nitrogen and phosphorus exist in both municipal and industrial wastewater, and excess nutrients can overload aquatic ecosystems and be harmful to human health.¹¹⁵

Reclaimed wastewater must therefore be treated to a level appropriate for the intended use in order to protect human health and water quality.¹¹⁶ Additionally, there must be strong regulations in place to ensure that non-potable reclaimed wastewater does not become mixed

¹⁰⁸ *Id.*

¹⁰⁹ *EPA Reuse Guidelines* at 1-5; Toze at 2.

¹¹⁰ Tenn. Code Ann. § 69-3-108(e).

¹¹¹ Reclaimed water can also be used to fill impoundments, but this usage was prohibited in Proposed Rule 0400-40-06.10(1)(c).

¹¹² *EPA Reuse Guidelines* at 6-5.

¹¹³ *Id.* at 6-6.

¹¹⁴ *Id.* at 6-10.

¹¹⁵ *Id.* at 6-22.

¹¹⁶ *See id.* at Chapter 3, Types of Reuse Applications.

with the drinking water supply, and stringent monitoring programs to make sure that the reclaimed wastewater is consistently being treated properly to remove pollutants.¹¹⁷

B. The effluent limitations should be more stringent to protect human health and water quality.

In the “Scope” subsection, the Proposed Rule states that non-potable reuse is “not intended to be applied in excess of the uptake rate of vegetation in the immediate distribution area.”¹¹⁸ However, there are no provisions in the non-potable reuse rule that prevent application in excess of the uptake rate, and studies have shown that end users do sometimes apply reclaimed wastewater in excess of that rate.¹¹⁹ End users of reclaimed wastewater do not need to apply for permits, and so TDEC cannot require a nutrient management plan from them. Wastewater reclamation system operators should require end users to submit nutrient management plans in their contracts or TDEC should impose effluent limits on nitrogen for all non-potable reuse, such as the ammonia limit for land application in Proposed Rule 0400-40-06-.06. Additionally, TDEC should require system operators to educate end users on the nutrient content of the reclaimed wastewater, and the consequences of over-application of nutrients (such as eutrophication and algal blooms in nearby surface water, such as ponds in golf courses).¹²⁰ This could be incorporated into end user agreements in the section for the end user’s “responsibilities with respect to the appropriate and legal use of the reclaimed wastewater.”¹²¹

Additionally, some of the effluent limitations should be more stringent. EPA guidance suggests that for urban unrestricted reuse or agricultural food crops reuse: NTU maximum should be 2; there should be no detectable fecal coliform; and chlorine residual monitoring should be continuous, not daily.¹²² If the reuse system accepts wastewater from industrial sources, additional effluent limitations may be necessary to ensure public health is protected.¹²³ The process for monitoring, sampling, and analysis should also be described.

C. Volume of reuse should be evaluated to ensure that water quality is not adversely affected in receiving streams.

The Proposed Rule states that TDEC “reserves the right to limit non-potable reuse of reclaimed wastewater that causes a greater than five percent reduction of the 7Q10 flow of the

¹¹⁷ *Id.* at 2-6; 2-26.

¹¹⁸ Proposed Rule 0400-40-06-.10(1)(a).

¹¹⁹ *Id.* at 3-4.

¹²⁰ Toze at 2.

¹²¹ Proposed Rule 0400-40-06-.10(3)(c).

¹²² *EPA Reuse Guidelines* at 4-9.

¹²³ See *id.* at 6-10 to 6-17 for a discussion of the various chemical constituents in reclaimed wastewater.

receiving stream.”¹²⁴ Operation of a reuse system that causes large instream flow reductions can impact water rights and damage water quality and aquatic ecosystems.¹²⁵ The Proposed Rule does not create a strict requirement, and instead creates space for TDEC and the permit applicant to consider the potential impact of stream flow reductions; because this is a valid concern, this provision in the Proposed Rule should remain.

D. TDEC should clarify the meaning of “environmental reuse” of non-potable reclaimed wastewater.

The Proposed Rule appears to prohibit “environmental reuse.”¹²⁶ Environmental reuse is defined as “[t]he use of reclaimed wastewater to create, enhance, sustain or augment water bodies including wetlands, aquatic habitats, or stream flow; receiving waters included in the NPDES provisions of Chapter 0400-40-05 are not eligible for coverage under this rule.”¹²⁷ TDEC should clarify what constitutes environmental reuse, including the exclusion of receiving waters included in the NPDES provisions from coverage. TDEC should also explain its concerns about environmental reuse, as those concerns might be relevant in evaluating other uses.

E. The requirement that permit renewal applicants submit an updated Reclaimed Wastewater Management Plan (RWMP) if there is a “material change in end user requirements” should be clarified.

Proposed Rule 0400-40-06-.10(3)(b) requires permit renewal applicants to submit an updated RWMP if there is a “material change in end user requirements.” This requirement leaves too much discretion to permit applicants in determining what constitutes a “material change.” TDEC should specify what this term means in the final rule.

F. End users should be educated as to best management practices to protect cross-contamination and improper use, including setbacks, and compliance should be monitored.

The Proposed Rule contains a provision requiring end user service agreements to contain an “[a]cknowledgement by the end user of its responsibilities with respect to the appropriate and legal use of the reclaimed wastewater.”¹²⁸ The Proposed Rule also contains a requirement that the RWMP include “[c]omponents of an education program for end users to contribute to the safe use of the system...”¹²⁹

¹²⁴ Proposed Rule 0400-40-06-.10(1)(a).

¹²⁵ *Id.* at 2-38; 2-39.

¹²⁶ Proposed Rule 0400-40-06-.10(1)(c)(5).

¹²⁷ Proposed Rule 0400-40-06-.10(2)(g).

¹²⁸ Proposed Rule 0400-40-06.10(3)(c).

¹²⁹ Proposed Rule 0400-40-06-.10(3)(b).

These responsibilities and education program components should be clarified. The 2012 *EPA Guidelines for Water Reuse* (“*EPA Reuse Guidelines*”) state that “requirements for generators or providers of reclaimed water to educate end users of appropriate handling and use of the water” and “requirements for proper use of reclaimed water by end users to ensure protection of the environment and human health (e.g., setbacks, physical barriers or practices to prevent reclaimed water from leaving the site of use, etc.)” are “[f]undamental components of a water reuse regulatory framework for states.”¹³⁰

Models for many of these requirements are also given in the *EPA Reuse Guidelines*. For example, the *EPA Reuse Guidelines* suggest that there should be 50-100 foot setbacks to potable water supply wells for unrestricted urban reuse and agricultural food crop reuse.¹³¹ For restricted urban reuse and other agricultural reuse, there should be a 300 foot setback to potable water supply wells, and, for spray irrigation, a 100 foot setback to areas accessible to the public.¹³² Some end users must also maintain fences and signs to keep out the public, such as those in the restricted urban reuse category, in order to continue to fit into that category.¹³³ TDEC should adopt these models in the Proposed Rule in order to protect the health of the citizens of Tennessee.¹³⁴

G. The requirement for alternatives for reuse to be demonstrably available is necessary to protect water quality.

The Proposed Rule states that “[n]o new or expanded reuse of reclaimed wastewater will be permitted unless the applicant demonstrates that sufficient alternatives are available in case the permitted activity becomes unavailable during the permit term.”¹³⁵ Alternatives can include “land application permitted by a SOP and/or an NPDES-permitted discharge to surface waters.”¹³⁶

This requirement is necessary to ensure no unplanned discharges occur in the event that an end user is no longer able to take water from the facility. The *EPA Reuse Guidelines* suggest that state regulatory programs should include “requirements for the transfer of reclaimed water

¹³⁰ *Id.* at 4-4.

¹³¹ *Id.* at 4-9.

¹³² *Id.*

¹³³ *Id.*

¹³⁴ Virginia also requires the permit applicant to develop an education and notification program, to be implemented by the applicant, that educates the end users and the public likely to have contact with reclaimed water on “the origin, nature, and characteristics of the reclaimed water; the manner in which the reclaimed water can be used safely; and uses for which the reclaimed water is prohibited or limited.” 9 Va. Admin. Code 25-740-170(1)(a) (**Attachment 11**).

¹³⁵ Proposed Rule 0400-40-06-.10(3)(d)(1).

¹³⁶ *Id.*

and its alternative disposal if unsuitable or not required by target user.”¹³⁷ Virginia regulations on reuse also require permit applicants to have the ability to implement at least one of the following: storing reclaimed water, discharging to another reuse system, discharging to surface waters through an NPDES permit, suspending water reclamation, or discharging into a sewage collection system.¹³⁸ TDEC should keep a requirement for a demonstrated alternative discharge option in the final rule.

H. Construction standards should be clarified to prevent cross-contamination between non-potable reuse water and drinking water.

The proposed standard requiring 10 feet of horizontal separation or 18 inches vertical separation between potable and non-potable water pipes is consistent with EPA guidance on water reuse.¹³⁹ However, the phrase “if practicable” should be deleted, as it is inconsistent with maintaining water quality standards and preventing drinking water contamination.¹⁴⁰ In addition, TDEC should specify that if potable and non-potable pipes cross each other vertically, the pipe containing non-potable water should be below the potable water pipe (and, if applicable, the lowest pipe should be the sanitary sewer pipe).¹⁴¹ This prevents contamination of drinking water if leakage occurs.

TDEC should also consider adopting a standard labeling practice for non-potable pipes, such as a purple color scheme. Many places use such a system, with purple pipes, purple caps on irrigation sprinklers, and so on, in addition to written labeling.¹⁴² Adopting a single system promotes clarity.

VIII. Conclusion

Thank you for the opportunity to comment on the Proposed Rules. Should TDEC decide to further revise the Proposed Rules before issuing Final Rules, those revisions should also be circulated for public review and comment.

Sincerely,



Chelsea Bowling
Tennessee Bar Applicant



Anne Passino

¹³⁷ EPA Reuse Guidelines at 4-3.

¹³⁸ 9 Va. Admin. Code 25-740-110(C)(1) (**Attachment 12**).

¹³⁹ *Id.* at 2-8.

¹⁴⁰ Proposed Rule 0400-40-06-.10(3)(a).

¹⁴¹ *Id.*

¹⁴² *Id.* at 2-7 to 2-9.

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Amanda Garcia

Dennis Gregg
Obed Watershed Community Association

Ward Archer
Protect Our Aquifer

Axel C. Ringe
Tennessee Chapter Sierra Club

Kathy Hawes
Tennessee Clean Water Network

Darlene Panvini
Tennessee Conservation Voters

Jeff Barrie
Tennessee Environmental Council

cc: Jenny Howard (via Jenny.Howard@tn.gov)
Stephanie Durman (via Stephanie.Durman@tn.gov)
Patrick Parker (via Patrick.Parker@tn.gov)

Enclosures Sent via ShareFile and CD

<https://southernenvironment.sharefile.com/share/getinfo/s2bd7ce9001646faa>

Attachment 1 - S.C. Code Ann. Regs. 61-9.505.42
Attachment 2 - 15A N.C. Admin. Code 02T.0505
Attachment 3 - 9 Va. Admin. Code 25-790-880
Attachment 4 - 15A N.C. Admin. Code 02T .0504
Attachment 5 - 15A N.C. Admin. Code 02T .0507
Attachment 6 - S.C. Code Ann. Regs. 61-9.505.41
Attachment 7 - S.C. Code Ann. Regs. 61-9.505.5
Attachment 8 - 15A N.C. Admin. Code 02T .0506
Attachment 9 - S.C. Code Ann. Regs. 61-67.300(G)
Attachment 10 - 15A N.C. Admin. Code 02T .0403
Attachment 11 - 9 Va. Admin. Code 25-740-170
Attachment 12 - 9 Va. Admin. Code 25-740-110