



December 13, 2023

SENT VIA EMAIL to Water.Permits@tn.gov

Tennessee Department of Environment and Conservation
Division of Water Resources
Water Based Systems Unit
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, TN 37243-1102

Re: Draft Aquatic Resource Alteration Permits for the Duck River Utility Commission (NRS22.201); Shelbyville Power (NRS21.274); Bedford County Utility (NRS22.320); Lewisburg (NRS19.148); Spring Hill (NRS22.288); Maury County Water System (NRS23.098)

To Whom It May Concern:

Harpeth Conservancy is pleased to comment on the Department's proposed water withdrawal permits for six communities and utilities—the Duck River Utility Commission,¹ Shelbyville Power, Water, and Sewerage Systems,² the Bedford County Utility District,³ Lewisburg Water & Wastewater,⁴ the City of Spring Hill,⁵ and Maury County Water Systems⁶ (collectively, the “applicants”)—that would authorize a substantial increase in the amount of water pulled from the Duck River, a river considered to be “one of the most biodiverse rivers,” whether measured on a national⁷ or global⁸ scale.

¹ TDEC DataViewer, DRUC ARAP No. NRS22.201 [Draft Permit, uploaded Sept. 26, 2023], https://dataviewers.tdec.tn.gov/dataviewers/f?p=2005:34051:4303759592339:::34051:P34051_PERMIT_NUMBER:NRS22.201 [hereafter “DRUC Draft ARAP”].

² TDEC DataViewer, Shelbyville ARAP No. NRS21.274 [Draft Permit, uploaded Sept. 26, 2023], https://dataviewers.tdec.tn.gov/dataviewers/f?p=2005:34051:4303759592339:::34051:P34051_PERMIT_NUMBER:NRS22.201 [hereafter “Shelbyvills Draft ARAP”].

³ TDEC DataViewer, Bedford ARAP No. NRS22.320 [Draft Permit, uploaded Sept. 26, 2023], https://dataviewers.tdec.tn.gov/dataviewers/f?p=9034:34051:::34051:P34051_PERMIT_NUMBER:NRS22.320.

⁴ TDEC DataViewer, Lewisburg ARAP No. NRS19.148 [Draft Permit, uploaded Sept. 26, 2023], https://dataviewers.tdec.tn.gov/dataviewers/f?p=2005:34051:13313581241365:::34051:P34051_PERMIT_NUMBER:NRS19.148 [hereafter “Lewisburg Draft ARAP”].

⁵ TDEC DataViewer, Spring Hill ARAP No. NRS22.288 [Draft Permit, uploaded Sept. 26, 2023], https://dataviewers.tdec.tn.gov/dataviewers/f?p=2005:34051:2393157737615:::34051:P34051_PERMIT_NUMBER:NRS22.288 [hereafter “Spring Hill Draft ARAP”].

⁶ TDEC DataViewer, MCWS ARAP No. NRS23.098 [Draft Permit, uploaded Sept. 26, 2023], https://dataviewers.tdec.tn.gov/dataviewers/f?p=2005:34051:2393157737615:::34051:P34051_PERMIT_NUMBER:NRS23.098 [hereafter “MCWS Draft ARAP”].

⁷ TDEC, *Duck Scenic River*, <https://www.tn.gov/environment/program-areas/na-natural-areas/na-sr-scenic-rivers-list/scenic-rivers-list/na-sr-duck.html>.

⁸ U.S. Army Corps of Engineers, *Duck River Watershed Plan: Final Watershed Assessment*, Executive Summary (May 2018), <https://erdc->

All these draft permits are clear and correct in that they convey neither property rights nor exclusive privileges.⁹ In practical terms, though, some applicants are already characterizing the permits as insufficient because approved and proposed developments purportedly show that current and future demand for water is higher, meaning the permits need to authorize *more* water. Harpeth Conservancy, as discussed below, takes the position that the permits need to authorize *less* water under more protective standards based on collaborative, science-based decision-making. We are concerned that, if TDEC issues these insufficiently protective permits or does not take steps now like conditioning the applicants' access to water on conservation measures, the "die will be cast" and the Duck will be taken beyond a point of no return.¹⁰

Harpeth Conservancy is interested in these permits as a science-based conservation organization working across Tennessee to advocate for clean water and healthy river ecosystems. We are concerned about the permits' impacts on the Duck River, individually and as part of the Department's larger multi-user management strategy. For example, the "grandfathered" amount of water withdrawn by four of the applicants is 18.38 MGD,¹¹ but TDEC has not analyzed whether withdrawing that much water from the Duck "adversely alter[ed] or affect[ed] the classified use of the source stream." See Tenn. Comp. R. & Regs. 0400-40-07-.02(4). Not only are three of these applicants' intakes sited in Exceptional Tennessee Waters, but together the grandfathered amount adds up to 1/5th of the 7Q10 flow when the Duck reaches Springhill.¹² In other words, troublingly, we don't have enough information about these historical and existing withdrawals, yet the draft permits want to take much more.

Despite its big reputation, the Duck River is actually a relatively small river, and it's a small river in an area of the state with seasonal low flows that is nonetheless tasked with meeting a wide range of uses: supplying drinking water for over 200,000 Tennesseans,¹³ fueling industrial agricultural operations,¹⁴ satisfying Tennesseans' appetite for outdoor recreational opportunities, and "provid[ing] habitat for 35 species listed as federally endangered, threatened, candidate or

library.erc.dren.mil/jspui/bitstream/11681/38401/1/Duck%20River%20Final%20Watershed%20Assessment_2018.pdf [hereafter "USACE, *Watershed Plan*"].

⁹ E.g., TDEC, City of Spring Hill Permit Draft ARAP, Part III.

¹⁰ "*Alea iacta est* ('The die is cast') is a variation of a Latin phrase (*iacta alea est* ['jakta 'a:le.a 'est]) attributed by Suetonius to Julius Caesar on 10 January 49 BCE, as he led his army across the Rubicon river in Northern Italy." Alea iacta est, Wikipedia, https://en.wikipedia.org/wiki/Alea_iacta_est.

¹¹ Duck River Utility Commission (7 MGD); Shelbyville (6.04 MGD); Bedford (1.7 MGD); Lewisburg (3.64 MGD).

¹² The 7Q10 at the Pottsville USGS Gage is 140.85 cfs/91.03 MGD. We recognize that the flow regime is not natural and is currently dependent on the TVA Normandy Dam. Even if TDEC were to look at the applicant's impacts separately, one or more of these withdrawals most certainly adversely altered or affected the Duck's classified uses. For example, TDEC considers 6.04 MGD of Shelbyville's withdrawal to be grandfathered, but that is equivalent to more than 6% of the 7Q10. The 7Q10 at the Shelbyville USGS Gage (near Shelbyville) is 90.76 MGD.

¹³ TENN. CODE ANN. § 64-1-609(a).

¹⁴ E.g., TDEC, Bedford County Utility District ARAP No. NRS22.320, 5 year projected demand, p. 2 [DataViewer Document Date July 20, 2022], https://dataviewers.tdec.tn.gov/dataviewers/f?p=9034:34051:::34051:P34051_PERMIT_NUMBER:NRS22.320 (identifying "Tyson Poultry Barn Upgrades/Additions" as a one of the "Projected Water User[s]").

species of concern,”¹⁵ along with 151 fish species, 56 freshwater mussel species, 22 aquatic snail species, and *at least* 225 species of aquatic insects, crustaceans, and worms.¹⁶

Aquatic Resource Alteration Permits are essential to ensure that waters tasked with meeting a range of uses maintain their value for the species that depend upon them. And, when the ARAP program is managed in conjunction with the Department’s duties under the Antidegradation Statement,¹⁷ Tennesseans can feel optimistic that the state’s stewardship of public resources has an appropriately long-term view.¹⁸ In the past, Harpeth Conservancy has worked successfully to find solutions when an applicant’s desire to withdraw water was not sufficiently protective, and we believe the ARAP program can provide a vehicle to do so again.

We also appreciate the Department’s work to bring all of the Duck River utilities into the ARAP program. Significantly, these communities and their utilities are seeking to increase the water they take from the Duck River. Setting aside the significant uses of the Duck River exempt from permitting like agricultural activities,¹⁹ the Department is proposing to issue seven ARAPs stretching from River Mile 100 (CPWS) to River Mile 255 (Duck River Utility Commission).²⁰

These seven ARAPs (with eight intakes) reflect uses of the Duck River that must be balanced against other uses in their area, as well as the needs of downstream communities. As the General Assembly has succinctly noted, “Increasing the use of the waters of the Duck River for human consumption and agricultural purposes may impact the health of the river and the ability of the river to support fish and aquatic life and to be a source of recreation for the citizens of the state.”²¹ Therefore, we ask the Department (1) to condition each ARAP on robust scientific studies conducted in coordination with governmental agencies and affected communities, (2) to provide more information to the public about the basis for specific permit terms, and (3) to pursue a more conservation-oriented approach to its water withdrawal permitting regime.

¹⁵ USACE, *Watershed Plan*, Executive Summary.

¹⁶ USACE, *Watershed Plan*, p. 12.

¹⁷ See TENN. COMP. R. & REGS. 0400-40-03-.06.

¹⁸ See TENN. CODE ANN. § 69-3-102(a) (noting that Tennessee’s waters are held in public trust).

¹⁹ “Tennessee currently lacks a comprehensive regulatory mechanism for understanding the scale and frequency of water withdrawals and their potential impact to water quantity.” TN H2O, Legal & Institutional Framework Working Group, p. 13 (2018), https://www.tn.gov/content/dam/tn/environment/water/tn-h2o/documents/plan-&-appendices/wr-tnh2o_plan-app_institutional-and-legal-framework-chapter.pdf.

Indeed, several categories of withdrawals are exempt from the Tennessee Water Quality Control Act and therefore will not be factored into the withdrawal regime. Two of the more significant exemptions are for agriculture and for pre-2000 withdrawals. At a public hearing in October 2023, TDEC staff indicated that the Tennessee Valley Authority might have information the scope of agricultural withdrawals on the Duck River.

²⁰ TDEC also recently permitted a new 3 million gallon per day withdrawal from the Duck River in Marshall County. See TDEC, Marshall County Board of Public Utilities, ARAP No. NRS20.177, May 2022-Revised Final Permit and Rationale, [DataViewer Document Date May 4, 2022], https://dataviewers.tdec.tn.gov/dataviewers/f?p=2005:34051:3109891928377:::34051:P34051_PERMIT_NUMBER:NRS20.177.

²¹ TENN. CODE ANN. § 64-1-609(a)(6).

I. The Duck River communities supplied by these six ARAP applicants' systems are situated in one of the fastest growing corridors in Tennessee, yet the Duck River cannot meet Middle Tennessee communities' endless thirst for more water.

Although Middle Tennessee communities are growing rapidly, our water supplies are relatively fixed. Our water supplies are also under stress from changing weather patterns and more frequent extreme weather events,²² which is often when water demand grows.²³ These stressors are not hypothetical. In October, for example, some Middle Tennessee communities were forced to issue voluntary water conservation notices to urge residents to avoid non-essential water use, including watering golf courses or refilling swimming pools.²⁴

Further, due to climate change, the U.S. Environmental Protection Agency projects a 2.5% to 5% reduction in rainwater recharge for Tennessee's rivers and groundwater, which could result in the loss of 51 to 104 cfs of the 2,084 cfs average daily discharge.²⁵

The Upper Duck River watershed is on an unsustainable trajectory to over-use. Fifteen years ago, the U.S. Geological Survey was already documenting a pattern of significantly increased rates of water withdrawals in the upper Duck River watershed between 1981 and 2000:

²² "Climate models forecast that increased warming will continue through the end of this century for all seasons with the greatest temperature increases in the summer months across the Southeast.... Because higher temperatures lead to more evaporation, drier soils, and water loss from streams, the frequency, duration, and intensity of droughts will likely continue to increase. Under this forecast of increasing temperatures, warmer water holds less dissolved oxygen; it is expected that dissolved oxygen in streams, lakes, and rivers will decline, potentially leading to fish kills and loss of other aquatic species." USACE, *Watershed Plan*, p. 10.

²³ "[W]ater-demand patterns, like weather patterns, are cyclic, usually with greater outdoor water use occurring during the summer season and that the duration of extremes (hot-dry or wet-cold) can amplify the seasonal change in water demand." USGS, *Estimated Use of Water in the Upper Duck River Watershed, Central Tennessee, and Water-Demand Projections through 2030*, p. 6 (2008), <https://pubs.usgs.gov/sir/2008/5058/pdf/sir2008-5058.pdf> [hereafter "USGS, *Estimated Use*"].

²⁴ See City of Franklin, *Franklin Residents Advised to Conserve Water as Drought Continues in the Region The City Declares Emergency Water Shortage* (Oct. 27, 2023), <https://www.franklintn.gov/Home/Components/News/News/11073/1354>; La Vergne, *Voluntary Water Conservation Notice, Burn Ban Issued for La Vergne* (Oct. 26, 2023), <https://www.lavergnetn.gov/civicalerts.aspx?AID=527>.

²⁵ "Annual precipitation in Tennessee has increased approximately 5 percent since the first half of the 20th century. But rising temperatures increase evaporation, which dries the soil and decreases the amount of rain that runs off into rivers. Although rainfall during spring is likely to increase during the next 40 to 50 years, the total amount of water running off into rivers or recharging ground water each year is likely to decline 2.5 to 5 percent, as increased evaporation offsets the greater rainfall. Droughts are likely to be more severe, because periods without rain will be longer and very hot days will be more frequent." U.S. EPA, *What Climate Change Means for Tennessee*, (Aug. 2016), <https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-tn.pdf>.

Table 2. Total surface-water and ground-water withdrawals for municipal-supply use in 1981, 1985, 1990, 1995, and 2000 for the upper Duck River watershed study area.

[Mgal/d, million gallons per day. Totals may not add to sums because of independent rounding. Population and water-use data are from Alexander and others (1981); population and water withdrawals for 1985–2000 are from U.S. Geological Survey (2004)]

Municipal supply	Water withdrawals, in Mgal/d					Rate of change in use from 1981 to 2000, in Mgal/d	Rate of change in use from 1981 to 2000, in percent
	1981	1985	1990	1995	2000		
Ground water	1.11	1.40	1.48	1.85	2.02	0.91	82
Surface water	16.9	20.4	19.5	22.3	24.3	7.40	44
Total water	18.0	21.8	21.0	24.1	26.3	8.3	46
	Population, in thousands						
Study area population ^a	138.33	142.80	147.10	166.94	181.87		32

^a Excludes population for southern Williamson County

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That study evaluated two scenarios to predict water demands in 2030. “Scenario 1 considered monthly water demand under typical weather conditions” and concluded that by 2030, the “total municipal water use could increase about 104 percent” to **51 million gallons per day**.²⁷ “Scenario 2 considered monthly water demand under drought conditions” and concluded that by 2023, the “total municipal water use could increase about 120 percent” to **55 million gallons per day**.²⁸

Unfortunately, these projections now look like conservative estimates. Some communities’ growing “needs” for water are on track to outpace earlier projections and, with them, our river systems’ capacity. The following charts show recent projections, potential alternative scenarios, and “baseline” needs that add up to nearly **75 million gallons per day**.

CHART PREPARED BY CONSULTANT FOR CPWS:

Table 2 2047 Water Demand (mgd)

Modeling Scenario	CPWS RM 133	CPWS RM 100	Spring Hill	Shelbyville	Tullahoma	Manchester	Bedford Co ^a	Lewisburg ^b	Marshall Co ^c	Maury Co ^d	Peak Water Demand
Option 1 (Baseline - 2023)	20.0	0.0	4.0	7.9	7.5	5.5	2.4	3.6	0.0	0.0	50.9
Option 2	0.0	32.0	6.0	9.9	7.7	5.6	4.7	5.0	3.0	3.0	76.8
Option 3	12.0	20.0	6.0	9.9	7.7	5.6	4.7	5.0	3.0	3.0	76.8
Option 4	20.0	12.0	6.0	9.9	7.7	5.6	4.7	5.0	3.0	3.0	76.8

^aBedford County requested a permit for 8 mgd with no basis. The OASIS model used the Boyd Center projections for Bedford County.

^bThe firm capacity of the raw water intake would be 5.0 MGD (2020 application)

^cThe proposed maximum day withdrawal for Marshall County in 2045 is projected to be 3 mgd (2020 ARAP application)

^dThe estimated maximum daily water withdrawal for MCWS is projected to reach approximately 3 mgd in 2045. (2022 ARAP application)

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²⁶ USGS, *Estimated Use*, p. 5.

²⁷ USGS, *Estimated Use*, p. 14 (emphasis added).

²⁸ USGS, *Estimated Use*, p. 14 (emphasis added).

²⁹ TDEC, Columbia Power & Water Systems ARAP No. NRS23.228, CPWS OASIS Model Update, p. 2

CHART PREPARED BY TDEC:

ARAP Calculations					
Utilities that withdraw from the Duck River from upstream to downstream	grandfather 2000 peak withdrawal mgd	baseline 2010-22 peak withdrawal mgd permitted	5-year Boyd Center growth projections as %	baseline including 5-year growth projections	% water loss
Duck River Utilities Commission	7.00	11.95	0.0313	12.32	15 & 12*
Shelbyville Power & Water	6.04	7.94	0.0514	8.35	12
Bedford County Utility District	1.70	3.87	0.0514	4.07	18
Lewisburg Water and Wastewater	3.64	4.37	0.0458	4.57	30
Marshall County Board of Public Utilities		3.00	0.0458	3.00	21
Spring Hill Water Department		6.00		6.00	12
Columbia Power and Water Systems	13.95	20.00	0.0696	20.00	12
proposed Maury County Water Systems		3.00		3.00	24
proposed Columbia Power and Water Systems			0.0696	12.00	12
Totals	32.33	60.13		73.31	30

At a public hearing in October 2023, some applicants' representatives challenged TDEC's proposed ARAP limits, arguing that such limits will stymie their communities' economic growth. These utility representatives explained their desire for higher permit limits by referencing, in part, the growing list of already-approved and pending requests for developments and water/sewer availability. However, the fact that a community has approved development requests does not mean there is enough water in the Duck to support them. There is also indication that the ARAPs' totals underestimate communities' asserted or projected needs:

The Duck River Utility Commission's draft permit is for 12.32 MGD, but its permit application references rapid overall growth, changes to electric power rates, and a proposed industrial megasite to support its assertion that "Conservative estimates indicate that the maximum withdrawal of 15.0 MGD will be required within five years with any one of the three issues impacting capacity alone."³¹

*"The [Shelbyville] Water System over the past eleven years has increased from 6464 customers to 7768..."*³²

https://dataviewers.tdec.tn.gov/dataviewers/f?p=2005:34051:2282563032609:::34051:P34051_PERMIT_NUMBER:NRS23.228 [hereafter "OASIS Update"].

³⁰ Screen capture from TDEC Presentation, Upper Duck River ARAPs Public Hearing (2023).

³¹ TDEC DataViewer, DRUC ["Permit Application," uploaded Aug. 1, 2022, p. 7].

³² Shelbyville Draft ARAP, p. 11.

The Bedford County Utility District draft permit is for 4.07 MGD, whereas the applicant submitted a document showing its projected five-year average peak water demands could be 5.07 MGD,³³ and the utility sought approval for 4.5 MGD.³⁴

Springhill, which also purchases water from Columbia, projects a peak need of 9.43 MGD in 2030: *“The population at the time facilities were brought online, during August 2003, was 11,500 while the current population is approximately 55,000. This represents a 378% increase over a 19-year period, or an annual growth rate of 8.59%... Population data, to be utilized in peak use projections, from 2010 and 2022 indicates an increase from 29,000 to 55,000. This represents a 90% increase, or an annual growth rate of 5.48%.”*³⁵

“[T]he City of Lewisburg total water sales have increased from approximately 1.74 MGD in 2013 to 2.14 MGD in 2019, which is a 23.0 percent increase in six years.”³⁶

TDEC must put the applicants on notice that they cannot continue to increase their withdrawals from the Duck. Just because the utilities are building greater capacity plants does not mean they should be permitted to seek higher permit limits continuously. TDEC must temper the applicants’ expectations that permits will be issued for greater and greater amounts of water. After all, the cumulative effects of such activities are likewise growing.³⁷ TDEC must also apply the antidegradation provisions of Tennessee’s laws to balance (a) keeping water in the river to protect existing uses and water quality standards with (b) the economic value of letting some utilities “use” it.

II. The permits should include more protective and specific low-flow conditions.

These ARAPs should be amended (1) to include more specific terms to guide the applicants’ obligations when the Duck River is experiencing low flow conditions and (2) to require the applicants to install gages immediately upstream from their respective intakes.

In other ARAPs, the Division has clarified that water may not be withdrawn based on instantaneous flows and that the withdrawal may not cause the flow to go below the protective cut-off. For example, the City of Franklin’s ARAP for its drinking water intake on the Harpeth River contains the following special conditions:

³³ TDEC DataViewer, Bedford [“5 year projected demand,” uploaded July 20, 2022].

³⁴ TDEC DataViewer, Bedford [“water needs analysis,” uploaded May 8, 2023].

³⁵ Spring Hill Draft ARAP, p. 11.

³⁶ TDEC DataViewer, Lewisburg ARAP [“NRS19.148 Revised Application”, uploaded Nov. 25, 2020, p. 3.]

³⁷ *Cf.* 16 U.S.C. § 1536(a)(2) (requiring federal agencies, in consultation with the Secretary of the Interior, to “insure” that their action are unlikely to result in destruction or adverse modification of critical habitat); 50 C.F.R. § 402.02 (stating environmental baseline “includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process); *American Rivers v. FERC*, 895 F.3d 32, 45 (D.C. Cir. 2018) (finding FERC’s re-licensing of a hydroelectric dam arbitrary and capricious where FERC refused to take into account historic, cumulative effects of dam in service since 1920).

1. River flow in the Harpeth River shall not be reduced below 10.0 cubic feet per second (cfs) as a result of the withdrawal, nor shall withdrawal proceed when the flow in the river is below 10.0 cfs as measured by the USGS gage 0343233905 HARPETH RIVER NEAR FRANKLIN.

2. The rate at which water is withdrawn from the river shall not exceed 20 percent of the river's instantaneous, pre-withdrawal flow.³⁸

These ARAPs should clarify that withdrawals cannot cause the Duck River to have insufficient flow. Further, like the City of Franklin's ARAP, these ARAPs should incorporate a percentage of flow above the floor to manage the applicants' withdrawals. *See* Section III.A below, for a more detailed discussion.

A. More specific terms are needed for the current intake.

As currently written, there are *no limits* on the amount of water that the applicants may withdraw in low flow conditions for the term of this permit. They are only limited by the general "volume" limit. In five years (that is, *after* the permits have expired), the applicants must not withdraw from their intakes as follows:

- Duck River Utility Commission (NRS22.201)
 - n/a because withdraws from the Normandy Reservoir
- Shelbyville Power, Water, and Sewerage Systems (NRS21.274)
 - 175 cfs, as measured at the Milltown USGS Gage (03599240)
- Bedford County Utility District (NRS22.320)
 - 175 cfs, as measured at the Milltown USGS Gage (03599240)
- Lewisburg Water & Wastewater (NRS19.148)
 - 175 cfs, as measured at the Milltown USGS Gage (03599240)
- City of Spring Hill (NRS22.288)
 - 175 cfs, as measured at the Milltown USGS Gage (03599240)
- Maury County Water System (NRS23.098)
 - 100 cfs, as measured at the Columbia USGS Gage (03599500)

Right now, not enough guidance is provided in the draft ARAPs about the trigger for the cubic-feet-per-second prohibition: When or how often should the permittee check the USGS gage? If the downstream gage reads slightly above the cfs cut-off, should the permittee have to stop withdrawing water in anticipation of causing the flow to dip below?

We therefore request the following revisions to the Special Conditions of the permits:

- *Withdrawal is prohibited when it will cause the instantaneous flow of the river to fall below 175* cubic feet per second, as gaged at the USGS gage for the Duck River at Milltown. ** After a new gage is installed upstream from the intake within*

³⁸ TDEC, City of Franklin ARAP No. NRS12.195-19, p. 3 [DataViewer Document Entry Aug. 14, 2020], https://dataviewers.tdec.tn.gov/dataviewers/f?p=2005:34051:17283860686440:::34051:P34051_PERMIT_NUMBE R:NRS12.195-19 [hereafter "*Franklin ARAP*"].

six months, the Department shall establish a new interim flow value within 30 days, below which withdrawals shall be prohibited.

** 100, for MCWS*

*** the Columbia USGS Gage for MCWS*

- *Gage measurements shall be reviewed every hour.*

Despite our suggested revision, we believe that, ultimately, neither 175 nor 100 cfs will prove to be a sufficiently protective cut-off. The Department will need to re-open the permits to adjust the flow prohibition once ecological flow and other studies have been completed. After all, even at the current withdrawal rates, there is evidence that mussel populations are being stranded.³⁹

B. Science-based limits are needed for all of the permits.

A different “floor” will likely be appropriate based on a comprehensive assessment of the river’s assimilative capacity and ecological flow needs in the Upper Duck. After all, the proposed intakes are in a location that is a critical habitat for several species.

Freshwater mussels are generally “among the most sensitive freshwater species to metals, ammonia, and ion constituents...”⁴⁰ They also have specific habitat needs. The salamander mussel, for example, “inhabits rivers and streams with fairly swift velocities but prefers shelter habitat . . . where there is stability from swift current...”⁴¹ Flows are adequate for the salamander mussel when they provide for “the exchange of nutrients and sediment,” “ensure the delivery of oxygen,” and “reduce contaminants and fine sediments from interstitial spaces,” among other qualities. Because adequate flows are necessary, based on current information, the U.S. Fish and Wildlife Service indicates that the Endangered Species Act would be violated by “[w]ithdrawal of surface or ground waters to the point at which baseflows in water courses occupied by the salamander mussel diminish and habitat becomes unsuitable for the species.”⁴² TDEC must place meaningful limits on the applicants’ withdrawals to avoid habitat diminishment.

It is important that any “floor” cut-offs for withdrawals account for the river’s seasonal low flows. Comparing the annual mean flow to the summer mean flow in the Upper Duck demonstrates why annual averages are inappropriate when establishing flow values:

USGS 03597860 DUCK RIVER AT SHELBYVILLE, TN – River Mile 221

• Mean Annual Flow	=	734 cfs	=	274,300 gal/min
• Summer Mean Flow	=	298 cfs	=	111,370 gal/min

³⁹ See Comments of Southern Environmental Law Center on draft Aquatic Resource Alteration Permit NRS23.228, Columbia Power & Water Systems, pp. 6, 9 (Nov. 16, 2023) (Memorandum from Don Hubbs, DJH Env’t Servs., to George Nolan & Stephanie Biggs, S. Env’t L. Ctr., *Re: Mussel shells collected during AST Duck River Mussel Survey 1–3* (Nov. 6, 2023); Letter from David McKinney, Tenn. Wildlife Res. Agency, to Duck River Interagency Project, *Re: Duck River Mussel Stranding Prior to August 16, 2008, Duck River Mile 165.8 – Lower Hardison Mill Dam 1* (Sept. 16, 2008)).

⁴⁰ 88 Fed. Reg. at 57229.

⁴¹ 88 Fed. Reg. at 57226, 57228-29.

⁴² 88 Fed. Reg. at 57235.

USGS 03598000 DUCK RIVER NEAR SHELBYVILLE, TN – River Mile 216

- Mean Annual Flow = 812 cfs = 303,500 gal/min
- Summer Mean Flow = 290 cfs = 108,380 gal/min

USGS 03598185 DUCK RIVER AT HALLS MILL BRIDGE, TN – River Mile 202

- Mean Annual Flow = 1000 cfs = 373,700 gal/min
- Summer Mean Flow = 384 cfs = 143,500 gal/min

USGS 03599240 DUCK RIVER ABOVE MILLTOWN, TN – River Mile 180

- Mean Annual Flow = 1400 cfs = 523,200 gal/min
- Summer Mean Flow = 384 cfs = 143,500 gal/min

USGS 03599500 Duck River at Columbia, TN — River Mile 133

- Mean Annual Flow = 2000 cfs = 747,500 gal/min
- Summer Mean Flow = 792 cfs = 295,994 gal/min

The relative abundance of water in the Duck River during the high-flow season suggests the Department should require the permittee to take a second look at off-site storage options. Failure to think longer term and anticipate future protective conditions and potentially lower flows means that choosing continuous withdrawal from the Duck will likely ultimately prove unsustainable and thus more costly.

C. New gages are needed to ensure protective conditions.

We request that the Department require the applicants to install new gages immediately upstream from their intakes within six months of the issuance of the ARAPs to ensure that they are accurately and timely ceasing to withdraw water during low-flow conditions.

To be sure, there are many gages on the Duck River already, as reflected in the following maps, but a gage immediately upstream from the intakes will provide the most accurate information and method to prevent excessive drawn-up. The existing gages should continue to be used for a holistic view of the health of the Duck River, or two of the existing gages could be moved to more appropriate locations.

Location of USGS Stream Flow Gages Showing Duck River Watershed

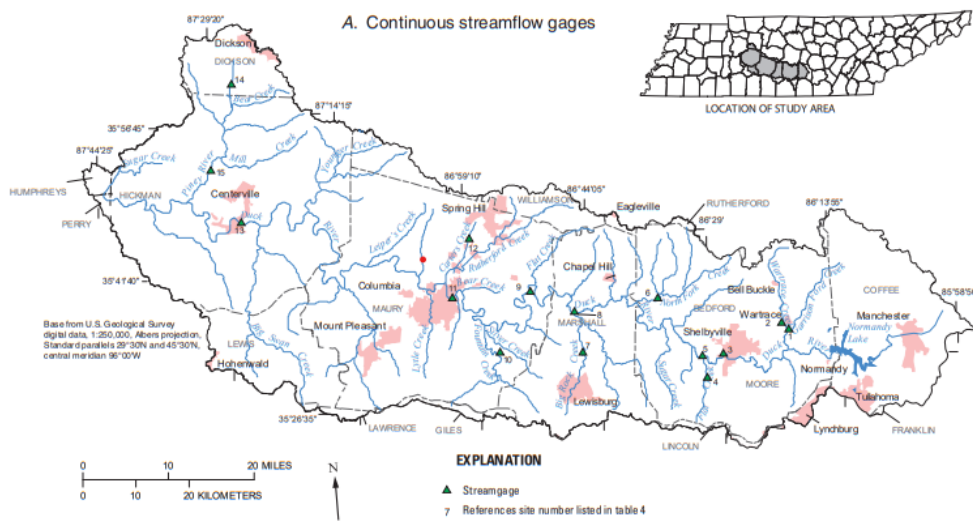


Figure 4. (A) Continuous streamflow gages and (B) base-flow synoptic measurement locations in the Duck River watershed, Tennessee.

We find it curious that TDEC has linked the Upper Duck ARAPs to a small fraction of available USGS gages:

- Milltown USGS Gage (03599240): Shelbyville, Bedford County, Lewisburg, Springhill
- Columbia USGS Gage (03599500): CPWS, Maury County

While using so few gages may make coordinating the permits’ terms easier in some ways, we are concerned that tying so many users to only a couple of points in the watershed—and doing so without including a tiered schedule of permissible withdrawals—may encourage over-use. For example, we know that TDEC proposes to allow Shelbyville, Bedford, Lewisburg, Marshall, and Spring Hill to rely on the Milltown USGS Gage low flow limit of 175 cfs. Combined, those utilities *could* withdraw up to 26 mgd (71 cfs) while the Milltown gage is above 175 cfs. When the Milltown gage drops to 175 cfs and below, the utilities will have to roll back their permitted withdrawal amount to their grandfathered amount to continue withdrawal a portion of allocated water. The grandfathered amount for these same utilities totals 11.4 mgd or 21 cfs. Thus, when the 175 cfs low flow limit occurs at the Milltown gage, three utilities will be able to continue to withdraw water, further reducing flow in the Duck River by approx. 21 cfs, resulting in a theoretical flow rate of 154 cfs. Without Normandy Dam intervention, this value will continue to drop during drought conditions.

The Department must take all measures to prevent creating a first-in-time incentive for upstream communities to maximize the water they withdraw from the Duck. We look forward to learning more about the game theory approach currently being studied with funds from the

⁴³ Knight & Kingsbury, *Water resources of the Duck River watershed, Tennessee*: U.S. Geological Survey Scientific Investigations Report 2007–5105, p. 12 (2007), <https://pubs.usgs.gov/sir/2007/5105/pdf/sir20075105.pdf> [hereafter “USGS, *Water resources*”].

National Science Foundation.⁴⁴ Perhaps it will include suggestions on how to disincentivize maxing-out permit limits.

As discussed below, additional studies should be developed to determine the flow levels that must remain in the river for all designated uses and as critical habitat for aquatic species. Additional gages would also support these efforts.

III. The applicants' ARAPs are premised on the assumption that keeping 100 or 175 cubic feet per second of water flowing through the Duck River is protective, but more standards and studies are needed.

These draft ARAPs must be amended to include more protective standards and more comprehensive studies during the permit term, or else the permits will contribute to the degradation of the Duck River.

First, in addition to a cubic-feet-per-second “floor,” the permits should be amended to include a percentage limit on the flow that may be withdrawn at both intakes to account for the ecological value of sufficient flow, not just assimilative capacity. Second, during the pendency of the permit term, to confirm that 100/175 cfs and/or the 7Q10 are sufficiently protective, TDEC should require scientific studies to be completed before the ARAPs expire.

A. The ARAPs must ensure ecologically protective flows remain in the river.

To avoid “flat lining” the river during low flows, TDEC must set a percentage of flow above the cfs floor to limit withdrawals and account for the Duck River’s ecological flow needs. Various state and federal agencies (*e.g.*, TDEC, USGS, Tennessee Wildlife Resource Agency, and U.S. Fish & Wildlife Service) have experience studying ecological flows and working together and with non-governmental entities (*e.g.*, The Nature Conservancy) on flow management, even developing presumptive flow standards to manage water withdrawals to maintain ecological flow conditions, rather than simply establishing a stream’s ability to either assimilate pollutant loads or provide a sustained source of water without off-site storage.⁴⁵ To account for ecological flows is to account for the differing habitat needs and other needs for diverse species.⁴⁶

Understanding ecological flows was the foundation of the approach applied during the analysis of the City of Franklin’s water withdrawal permit, which also included a stakeholder group of agencies, the Harpeth Conservancy and the Nature Conservancy. Harpeth Conservancy

⁴⁴ University of Maryland, *Gabriel, Brubaker developing game theory water market models for river users* (Apr. 28, 2021), <https://enme.umd.edu/news/story/gabriel-brubaker-developing-game-theory-water-market-models-for-river-users>.

⁴⁵ See Knight et al., *Ecological limit functions relating fish community response to hydrologic departures of the ecological flow regime in the Tennessee River basin, United States*, 7 *Ecohydrology* 1262-1280 (USGS 2013), <https://onlinelibrary.wiley.com/doi/epdf/10.1002/eco.1460> [hereafter “USGS, *Ecological limit functions*”]; Gain & Knight, *Stream Channels, Discharge Measurements, and Minimum Flows* (Nineteenth Tennessee Water Resources Symposium, Apr. 2009).

⁴⁶ USGS, *Ecological limit functions*, p. 1266 (identifying pool dwellers, riffle dwellers, natives, specialized insectivores, specialized insectivores, omnivores, top predators, lithophilic spawners, headwater intolerants, and intolerants).

also relied on such studies in its comments to the Department nearly a decade ago concerning the issuance of the ARAP to the City of Franklin.⁴⁷ Franklin's permit now contains a percentage limit in addition to its cfs floor.⁴⁸ TDEC started using this approach in 2007.

If no percentage limit of flow may be withdrawn in addition to the cfs floor, we expect to see the Duck River more frequently at the low flow threshold during low flow conditions. To counter that, the ARAPs along the Duck River also need to include a percentage of the flow allowed to be withdrawn when the river flow is above the low flow threshold. This percentage would apply until the utilities' pumps are maxed out.

Not all prior assessments of adequate minimum flow in the Duck River are relevant to species-specific ecological flow levels. In 1996, in response to questions about the Duck River's ability to meet additional water supply needs, TDEC's Division of Water Pollution Control evaluated the minimum instream flow required to maintain recreation and fish and aquatic life uses in the Duck River at Columbia. TDEC's analysis resulted in a requirement that the one-day average streamflow should not fall below 100 cfs at Duck River Mile 133, just downstream from the Columbia water supply intake (River Mile 134).⁴⁹ TDEC explained that "to ensure this section of the Duck River supports recreational use and protects habitat for fish and aquatic life, stream flow should be maintained such that the daily flow at river mile 132.8 (Columbia USGS gauge) does not fall below 100 cubic feet per second (cfs)."⁵⁰ The 100 cfs figure was based on a 15-year period, which led TDEC to conclude that the 7Q10 was 74 cfs, the 14Q2 was 99 cfs (rounded to 100), and the more conservative flow criterion would support uses under natural flow conditions.⁵¹ According to Columbia Power & Water Systems (a companion ARAP applicant within TDEC's Duck River management program), the Tennessee Valley Authority has calculated a lower "natural" flow number (i.e., that the "true historical statistical low flow of the river at Columbia (pre-Normandy) was 34 cfs (7Q10)."⁵²

To build from these statistical conclusions and determine the appropriate ecological flow values for the Duck River, TDEC should require CPWS and the other permit applicants to conduct studies to support a management strategy.

⁴⁷ See Harpeth River Watershed Association, Comments on City of Franklin's Request for a Water Withdrawal Permit for Drinking Water Plant on the Harpeth River (Nov. 3, 2014).

⁴⁸ *Franklin ARAP*, p. 2 (Special Condition No. 3) ("The rate at which water is withdrawn from the river shall not exceed 20 percent of the river's instantaneous, pre-withdrawal flow.").

⁴⁹ Columbia Power & Water Systems, Drought Management Plan, p. 5 (July 2016), https://cpws.com/wp-content/uploads/2017/01/2016_DroughtManagementPlan_2.pdf (citing *Future Water Supply Needs in the Upper Duck River Basin: Environmental Impact Statement*) [hereafter CPWS, *Drought Management Plan*].

⁵⁰ CPWS *Drought Management Plan*, pp. 18-20.

⁵¹ *Id.*

⁵² *Id.*

B. Multi-agency, multi-disciplinary ecological studies should be completed during any permit term.

How to manage the Duck River as a water supply source has been the subject of study for decades.⁵³ We agree that pending further studies, requiring the applicants to leave at least 100 and/or 175 cfs of flow in the river is one part of a reasonable, temporary management strategy. However, as previously stated, more studies are needed to ensure that ecological flows remain in the Duck River after their withdrawals. Setting a permit limit based on the results of studies that establish ecological flow needs throughout the watershed would help make sure there is no “take” of threatened and endangered species.⁵⁴ Consequently, there can be no genuine dispute that studies are needed.

Some of the ARAPs have “special conditions” that require studies as “reasonable and appropriate,” while others do not require studies.

- Duck River Utility Commission (NRS22.201)
 - No special condition related to studies.
- Shelbyville Power, Water, and Sewerage Systems (NRS21.274)
 - Participate or perform studies “[a]s reasonable and appropriate”
- Bedford County Utility District (NRS22.320)
 - Participate or perform studies “[a]s reasonable and appropriate”
- Lewisburg Water & Wastewater (NRS19.148)
 - Participate or perform studies “[a]s reasonable and appropriate”
- City of Spring Hill (NRS22.288)
 - Participate or perform studies “[a]s reasonable and appropriate”
- Maury County Water System (NRS23.098)
 - Provide, participate or perform studies “[a]s reasonable and appropriate”

Qualifying language should be removed, and studies should be required for all of the applicants.

Studies to determine the Duck River’s ecological flow needs are critical. They should be conducted in coordination with, at minimum, the U.S. Fish and Wildlife Service, the Tennessee Wildlife Resources Agency, the U.S. Army Corps of Engineers, the U.S. Geological Survey, the Tennessee Valley Authority, and non-governmental experts like the Nature Conservancy, the

⁵³ See Tennessee Valley Authority, *Use of Lands Acquired for the Columbia Dam Component of the Duck River Project and Future Water Supply Needs in the Upper Duck River Basin*, 66 Fed. Reg. 33599 (June 22, 2001), <https://www.govinfo.gov/content/pkg/FR-2001-06-22/pdf/01-15729.pdf> (noting that, in 1968, TVA proposed two dams and reservoirs on the Duck River).

⁵⁴ Endangered Species Act, 16 U.S.C. § 1531 *et seq.*; 16 U.S.C. § 1532(19) (defining “take” to include harming, wounding, or killing); NMFS & NOAA, *Endangered and Threatened Wildlife and Plants; Definition of “Harm,”* 64 Fed. Reg. 60,727 (Nov. 8, 1999), <https://www.govinfo.gov/content/pkg/FR-1999-11-08/pdf/99-29216.pdf>. See also *House v. U.S. Forest Service, U.S. Dept. of Agriculture*, 974 F.Supp.1022, 1030 (E.D. Ky. 1997) (overturning U.S. Forest Service decision that timber harvest would not adversely impact habitat of endangered bat, finding project would cause adverse modification because it would reduce canopy cover to 30%, and bat’s optimal canopy range for foraging and roosting activities is 50-80%); *Nat’l Wildlife Fed’n v. Nat’l Marine Fisheries Servs.*, 524 F.3rd 917, 934 (9th Cir. 2008) (concluding NMRF’s habitat determination was arbitrary and capricious because did not account for the project’s short-term negative effects on endangered salmon).

Harpeth Conservancy, and others, including academics and water conservation scientists (e.g., Brian Richter: Sustainable Waters, formerly the director of TNC's global freshwater initiative).

Therefore, we request that TDEC amend or add a Special Condition related to studies for each applicant with specific timelines, inter-agency coordination, and public engagement. Something like:

- *Within two months from the issuance of this permit, the permittee shall coordinate with the other utilities along the Duck River that hold Aquatic Resource Alteration Permits to withdraw water to convene a technical group of agencies and third-party experts (including but not limited to USFWS, USGS, TWRA, USACE, private consultants, and non-governmental organizations) to develop proposed study designs necessary to determine the presence and extent of threatened and endangered mussels and other fish and aquatic life in the downstream portion of the Duck River impacted by the permittee's withdrawals, to include assessment of the flow requirements necessary to sustain these populations. These studies will include, but not be limited to, an evaluation of the efficacy of tapering the permittee's withdrawal rates gradually downward under drought conditions to reduce impacts on federally listed species. The study designs shall be completed within six months from the issuance of this permit and shall be published for public comment. TDEC shall approve the study designs within 30 days of the close of public comments. The studies shall be conducted with oversight from the technical group and completed six months before the permittee is required to submit an application to renew the ARAP.*

C. TDEC should require the utilities' waste streams to be evaluated in conjunction with its withdrawals.

TDEC should require each utility that removes flow from the Duck River to conduct studies to evaluate the impact of their respective wastewater systems' additions to the Duck River. TDEC cannot artificially segregate its impact analyses for drinking water withdrawals and wastewater discharges. Both regulatory requestions are inextricably intertwined. For example, as part of CPWS's application, a consultant described its model for assessed demand projections, noting that "Wastewater return flows are accounted for in the model as a percentage of the withdrawal using a pattern that varies by month, based on an analysis of historical withdrawal and return data."⁵⁵ In other words, the models for the Duck's ability to handle withdrawals at scale assume that a certain amount of the flow in the Duck River is treated wastewater that has been returned to the system through point source discharges.

CPWS is not alone in using the Duck River to assimilate its wastewater. The following map shows the "inputs" from wastewater treatment systems relative to the ARAPs in the Upper Duck River:

⁵⁵ TDEC, Columbia Power & Water Systems ARAP No. NRS23.228, CPWS OASIS Model Update, p. 1 [DataViewer Document Date June 9, 2023], https://dataviewers.tdec.tn.gov/dataviewers/f?p=2005:34051:2282563032609:::34051:P34051_PERMIT_NUMBER:NRS23.228 [hereafter "OASIS Update"].

Location of Wastewater Point Sources Throughout Duck River Watershed

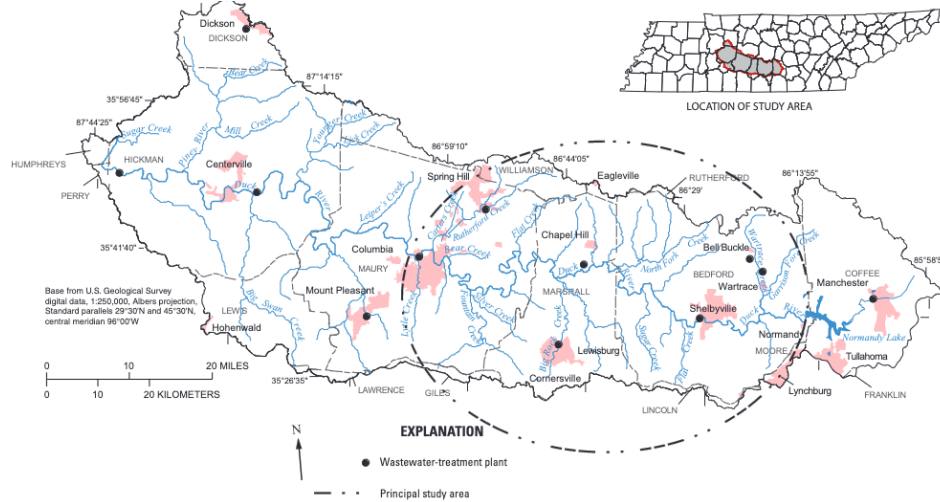


Figure 3. Wastewater treatment plants discharging to the Duck River watershed, Tennessee.

Therefore, because flow models like the one used by CPWS depend on wastewater flows, TDEC should require the applicants to study the impact of their waste stream on protected species, as well as more general considerations about whether water quality standards are being met.

Given existing regulatory regime gaps concerning industrial activities' environmental impacts, there is much to learn about utilities' waste streams. For example, Tennessee does not yet directly regulate PFAS chemicals (also known as “forever” chemicals or emerging contaminants),⁵⁷ yet such chemicals and similar pollutants are likely in the utilities’ wastewater. What is the impact on protected species when a large portion of the flow is recycled wastewater, and a portion of that flow contains “forever” chemicals?

Some of what we do know, though, is that “forever” chemicals are a problem: in June 2023, Tennessee’s Attorney General sued more than 20 manufacturers of PFAS (including 3M, DuPont, and Chemours) for allegedly being aware of the dangers of PFAS chemicals, while continuing to “advertise, market, manufacture for sale, offer for sale, and sell” PFAS containing products.⁵⁸ According to the State of Tennessee’s allegations: “3M has known for decades that the PFAS...are toxic and adversely affect the environment and human health.”⁵⁹

⁵⁶ USGS, *Water resources*, p. 7

⁵⁷ *PFAS*, Tennessee Department of Environment and Conservation (last visited Nov. 10, 2023), <https://www.tn.gov/environment/policy/pfas.html>. In 2021, the Tennessee Department of Environment and Conservation (TDEC) announced its plan to conduct a statewide PFAS sampling initiative that would sample public drinking water system sources to better understand the presence and concentration of PFAS. *Id.*

⁵⁸ Complaint, *Tennessee v. 3M et al.*, No. 23C1259 (Davidson Co. Cir. Ct., May 31, 2023), <https://www.wate.com/wp-content/uploads/sites/42/2023/06/2023.05.31-E-Filed-Complaint-PFAS-AFFF-1.pdf>. See also TN Attorney General Jonathan Skrmetti Sues More Than 20 PFAS Manufacturers (June 29, 2023), <https://www.tn.gov/attorneygeneral/news/2023/6/29/pr23-22.html>.

⁵⁹ *Id.*

Until there is better information about the impact of emerging contaminants on Tennessee’s waters, wildlife, and population, permits that depend—in whole or in part—on assimilated wastewater should be required to study their activities’ impacts on the environment.

Moreover, several segments of the Duck are already listed on Tennessee's 303(d) list pursuant to the Clean Water Act because they are impaired for their designated uses: below the Normandy Dam, the Duck's impairments are flow alteration from the dam, temperature and manganese; below Shelbyville, it's impaired for E. coli; below Columbia, it's impaired for E. coli, dissolved oxygen, and nutrients; and below Centerville, both the Duck and Buffalo rivers are impaired for mercury.⁶⁰

IV. TDEC has the authority to require more protective conservation measures, and TDEC should condition ARAPs on requiring conservation measures.

ARAPs are governed, in significant part, by the Tennessee Water Quality Control Act of 1977 and the Aquatic Resource Alteration Rule 0400-40-07. Both laws demonstrate that the Commissioner may condition ARAPs on conservation measures.

A. The Tennessee Water Quality Control Act of 1977 and its implementing regulations grant TDEC authority to require more protective measures.

The Act states that the Commissioner may grant permits authorizing aquatic resource alteration, but in granting such permits, “shall impose conditions...as are necessary to accomplish the purposes of the Act.”⁶¹ The purposes of the Act are to “prevent the future pollution of state waters and to plan for the future use of such waters so that the water resources of Tennessee might be used and enjoyed to the fullest extent consistent with the maintenance of unpolluted waters.”⁶² Requiring conservation measures as a condition of receiving a permit undoubtedly serves this purpose. Therefore, conditioning permits on conservation measures fall squarely within the authority granted to the Commissioner.

B. Examples from across the nation show ways to link conservation with water use.

TDEC should use its authority to condition the grant of water withdrawal permits on conservation requirements. Many states have taken this approach to permitting and currently require applicants to develop, submit, and implement conservation plans as part of the application process for surface and/or groundwater, including:

- Texas requires certain applicants to develop a “Water Conservation Plan” before a withdrawal permit may be granted. The water conservation plan must include specific, quantified five-year and ten-year targets for water savings. Plans also must include (1) a program for meter testing, repair, and replacement; (2) measures to determine and control

⁶⁰ EPA Approved Lists of Impaired and Threatened Waters (Apr. 2022), *Water Quality Assessments and Publications*, TDEC, <https://www.tn.gov/environment/program-areas/wr-water-resources/water-quality/water-quality-reports---publications.html>.

⁶¹ TENN. CODE ANN. § 69-3-108(g)(1) (2023).

⁶² TENN. CODE ANN. § 69-3-102(b) (2012). *See also* TENN. COMP. R. & REGS. 0400-40-07.01(1) (2019).

water loss (for example, monthly audit of the water system); (3) a description of a program of continuing public education on water conservation; and (4) a description of a program for leak detection, repair, and water loss.⁶³

- North Carolina requires public supply systems to develop implement a water conservation plan with a timetable for implementing: (1) adoption of a water conservation-based rate structure; (2) implementation of a water loss reduction program if unaccounted for water is greater than 15 percent of the total amount produced, as documented annually using a water audit; (3) in-field leak detection and leak repair; (3) adoption of a water conservation ordinance for irrigation; (4) implementation of a retrofit program that makes available indoor water conservation devices to customers; (5) implementation of a public education program, such as water bill inserts, school and civic presentations, water treatment plant tours, and public services announcements; and (6) evaluation of the feasibility of water reuse as a means of conservation.⁶⁴
- Virginia requires political subdivisions seeking permits to have water conservation plans that include: (1) use of water saving plumbing fixtures in new and renovated plumbing; (2) a water loss reduction program; (3) a water use education program; and (4) ordinances prohibiting waste of water generally and providing for mandatory water use restrictions.⁶⁵

This list is not an exhaustive survey of states requiring conservation measures as a condition of permit receipt. Still, it does demonstrate the kinds of measures that are important to ensuring a successful water withdrawal system. Notably, almost all these states require a plan for frequent meter auditing and leak detection and education initiatives for consumers. Many of them require plans for recycling and reuse of water as well as auditing programs to detect and remedy unaccounted-for water loss. Tennessee should follow these states' lead in conditioning permits on these requirements that detect, prevent, and remedy water loss and inefficient water use.

V. More information should be made available to the public regarding the applicants' assessment and the Department's justifications.

Model assumptions and inputs control how effectively a model represents an environmental system. Knowing this information is necessary for the public to comment or make suggestions based on stated model results. For example, does the model consider how changing climate patterns in Middle Tennessee could impact water availability? Does the OASIS Model attempt to factor in unpermitted withdrawals for agriculture? Answers to these questions (along with others) could help the public understand the intent and results of the models as well as give opportunities to make suggestions based on academic experience or personal observations of the Duck River.

⁶³ 30 TEXAS ADMIN. CODE § 295.9 (2002) (Water Conservation and Drought Contingency Plans). *See also* Title 30, Texas Administrative Code, Chapter 288.5.

⁶⁴ 15A N.C. ADMIN. CODE 02E. 0502 (2022) (Withdrawal Permits).

⁶⁵ 9 VA. ADMIN. CODE § 25-220-140 (2022) (Permit Requirements, Application and Issue).

VI. TDEC cannot require a less stringent water loss standard based on an industry-created standard.

TDEC must require the applicants to do better, not worse, regarding water loss. Most are already doing better than TDEC is proposing. Columbia has a “rolling average annual water loss that ranges between 10% and 15%”;⁶⁶ Spring Hill and Shelbyville may have a 12% loss rate;⁶⁷ and Bedford County may have an 18% loss rate.⁶⁸ On the other side of the equation, Lewisburg may have a 30% loss rate.⁶⁹ The ARAPs need to hold the line and require improvement, not effectively backslide, as reflected in the following list summarizing the draft permits’ “limits” on water loss:

- Duck River Utility Commission (NRS22.201)
 - No special condition related to water loss. In the alternatives analysis of the rationale, we learn, “*Water loss rates of the two largest DRUC supplied systems are well below typical industry averages. Some of the smaller systems supplied by DRUC do have high water losses. However, reduction of these small system losses is not enough to significantly impact the total peak withdrawal levels of the DRUC. Water conservation measures by area systems have reduced DRUC demand per tap **approximately 25%** over the last two decades. Further reduction from conservation programs is possible but limited. The total saving generated by additional conservation programs will not be significant enough to offset the need for the requested additional permitted water withdrawal.*”⁷⁰
- Shelbyville Power, Water, and Sewerage Systems (NRS21.274)
 - “water loss of not more than 25% of the total withdrawal”⁷¹
- Bedford County Utility District (NRS22.320)
 - “water loss of not more than 25% of the total withdrawal”⁷²
- Lewisburg Water & Wastewater (NRS19.148)
 - “water loss of not more than 25% of the total withdrawal”⁷³
- City of Spring Hill (NRS22.288)
 - “water loss of not more than 25% of the total withdrawal”⁷⁴
- Maury County Water System (NRS23.098)
 - “water loss of not more than 25% of the total withdrawal”⁷⁵

The Department relies on “the American Water Works Association M36 Water Audits and Loss Control Programs audit procedures” to justify allowing the applicants to backslide or allow up to 25% water loss. Still, even if 25% were a generally appropriate industry standard,

⁶⁶ Columbia Draft ARAP, p. 14.

⁶⁷ SELC Comments re Draft ARAP NRS22.288, City of Spring Hill, p. 25; SELC Comments re Draft ARAP NRS21.274, Shelbyville, p. 28.

⁶⁸ SELC Comments re Draft ARAP NRS22.320, Bedford County, p. 27.

⁶⁹ SELC Comments re Draft ARAP NRS19.148, Lewisburg, p. 26.

⁷⁰ DRUC Draft ARAP, p. 11 (emphasis added).

⁷¹ Shelbyville Draft ARAP, p. 3.

⁷² Bedford Draft ARAP, p. 4.

⁷³ Lewisburg Draft ARAP, p. 4.

⁷⁴ Spring Hill Draft ARAP, p. 4.

⁷⁵ MCWS Draft ARAP, p. 4.

Tennessee's waters should not have a one-size-fits-all approach. The Department must consider factors like the size of the waterway, the exceptional nature of the waterway, and whether the loss could result in an inter-basin transfer.

If the seven utilities on the Duck River that have draft water withdrawal permits under review right now were capped at 15% rather than 25% water loss, that would keep the equivalent of 15 Olympic-sized swimming pools of water in the river.⁷⁶

Notably, the recent Marshall County Board of Public Utilities' ARAP for the Duck River contains a special condition that the utility must "develop reasonable goals for leakage reduction to consist of lowering leakage approximately one percent per year with the goal of reduction to 15 percent volumetric treated water loss."⁷⁷ Just because some utilities have more work to achieve 15 percent or less loss doesn't mean others should be held to a less protective standard. We request that TDEC add in a special condition limiting water loss to 15% or less.

VII. Miscellaneous comments.

- Unlike the other applicants' draft permits, the Duck River Utility Commission permit does not require a drought management plan.⁷⁸ TDEC should require the DRUC to develop and then quickly implement a drought management plan.
- There is a discrepancy in the Bedford permit about whether it authorizes 4.25 MGD or 4.07 MGD.⁷⁹
- The non-compliance provisions of these permits are written in terms of "discharges" rather than withdrawals.⁸⁰ TDEC should clarify that withdrawals of water from the Duck River are violations of the permit when the applicants (1) withdraw in excess of the permitted amount or (2) otherwise do not comply with the special or general conditions. TDEC should also take care to reference withdrawals rather than discharges throughout the permits, as appropriate.

VIII. Conclusion.

We appreciate TDEC's work to bring all of the Duck River utilities' activities within the Aquatic Resource Alternation Permit program, and we look forward to a regionalized and coordinated approach to managing the Duck River for multiple uses, including as critical habitat.

In addition to our comments, Harpeth Conservancy supports and adopts by incorporation the comments of the Southern Environmental Law Center with respect to the proposed draft

⁷⁶ Calculation assumes 10% of combined total 73.31 MGD proposed permit design flow (baseline and new permitted withdrawal amounts).

⁷⁷ See TDEC, Marshall County Board of Public Utilities, ARAP No. NRS20.177, May 2022-Revised Final Permit and Rationale, p. 5 (Special Condition No. 7) [DataViewer Document Date May 4, 2022], https://dataviewers.tdec.tn.gov/dataviewers/f?p=2005:34051:3109891928377:::34051:P34051_PERMIT_NUMBER:NRS20.177.

⁷⁸ See DRUC Draft ARAP, p. 3.

⁷⁹ See Bedford Draft ARAP, p. 1, 3.

⁸⁰ *E.g.*, DRUC Draft ARAP, p. 7 ("All discharges shall be consistent with the terms and conditions of this permit.").

Harpeth Conservancy comments re: Draft ARAP Nos. NRS22.201; NRS21.274; NRS22.320;
NRS19.148; NRS22.288; NRS23.098

December 13, 2023

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ARAPs for the Duck River Utility Commission; Shelbyville Power, Water, and Sewerage Systems; Bedford County Utility District; Lewisburg Water & Wastewater; the City of Springhill; and the Maury County Water Systems.

Sincerely,

Dorene Bolze, President & Founder

Grace Stranch, CEO

Anne Passino, Director of Clean Water Protection

Ryan Jackwood, Director of Science

cc: U.S. Fish & Wildlife Service c/o Daniel Elbert and Steve Alexander
Tennessee Wildlife Resources Agency
U.S. Geological Survey c/o Rodney Knight