

RATIONALE

Water Authority of Dickson County
East Hickman Water Reclamation Facility
NPDES Permit No. TN0082376

1. PERMIT STATUS & PUBLIC PARTICIPATION

Permit Type:	Municipal
Classification:	Major
Previous Issuance Date:	n/a
Previous Expiration Date:	n/a
Previous Effective Date:	n/a

This notice allows 60 days for public comment on the proposed permit action, which includes 30 days provided under Rule 0400-40-05-.06, and an additional 30 days extension due to the degree of interest in this application. Absent extraordinary circumstances, no additional extension will be provided. The 60-day public comment period begins the date this permit is placed on public notice. The public notice document for this permit can be found at the Division's [Water Notices and Hearings website](#) under "Permit Public Notices".

Public Notice Date:	Wednesday, April 5, 2023
Comment Period Ends:	Monday, June 5, 2023

Those wishing to make a formal comment on the proposed permit may submit comments electronically to Water.Permits@tn.gov, or by mail to:

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

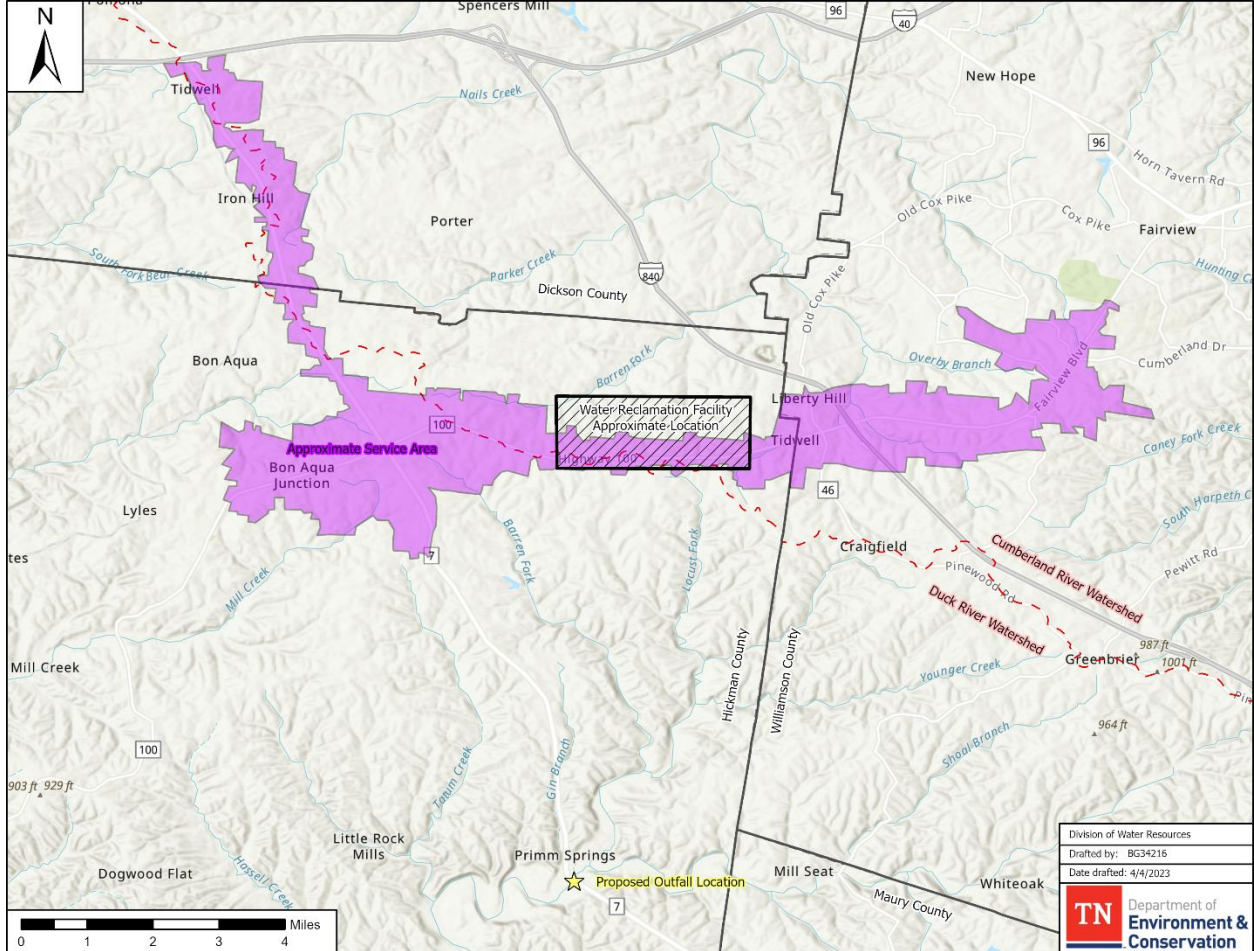
A public hearing has been scheduled for May 25, 2023 (see Appendix 1 for details).

2. FACILITY INFORMATION/SUMMARY

Applicant Name:	Water Authority of Dickson County
Project Name:	East Hickman Water Reclamation Facility
Location:	Hickman County, Tennessee
Contact:	Mr. Michael Adams, P.E. (615) 441-4188 madams@wadc.us
Design Flow Rate:	4 MGD
Percentage Industrial Flow:	50% (2 MGD proposed to serve an industrial client)
Certified Operator Grades:	n/a
Treatment Description:	WADC proposed advanced biological treatment with UV disinfection.

In December 2021, the Water Authority of Dickson County (WADC) applied to the Department of Environment and Conservation (Department) for a national pollutant discharge elimination system (NPDES) permit to authorize a new 4.0 million gallon per day (MGD) discharge of treated municipal wastewater to Lick Creek, including 2.0 MGD to support a new industry. The application indicates this discharge could be expanded to 8 MGD and then 12 MGD. WADC proposes to build the new East Hickman Water Reclamation Facility (EHWRF) in northeast Hickman County near Highway 100. The proposed service area for the new EHWRF includes portions of northwest Williamson County, southeast Dickson County, and northeast Hickman County. To create this service area, WADC would construct a new sewer line to connect a portion of its existing Fairview sewer system to its existing Jones Creek sewer system south of I-40. The new sewer line would be located along Highway 100, primarily in Hickman County but with a portion in Williamson County. The proposed discharge would be conveyed from the EHWRF via an approximately 9-mile, 18" force main to Lick Creek at river mile 10.6 just upstream of Highway 7 in Primm Springs, in Hickman County. The proposed service area, EHWRF, and discharge location are depicted on the map on page R-3.

As discussed in detail below, the Department proposes to deny this permit on the grounds that WADC has not demonstrated that greater than *de minimis* degradation of Exceptional Tennessee Waters is necessary to accommodate important economic or social development in the area of the discharge and has not demonstrated that less-degrading alternatives are not practicable. Accordingly, the Department has not prepared a draft permit for review, but instead explains the grounds for its preliminary determinations in this Rationale.



3. RECEIVING STREAM INFORMATION

Receiving Waterbody:	Lick Creek			
Watershed Group:	Duck River			
Hydrocode:	0604003041_001			
Low Flow:	7Q10 = 8.53 MGD (13.2 CFS)			
Low Flow Reference:	USGS StreamStats			
Stream Designated Uses:	<i>Domestic Water Supply</i>	<i>Industrial</i>	<i>Fish & Aquatic Life</i>	<i>Recreation</i>
			X	X
	<i>Livestock & Wildlife</i>	<i>Irrigation</i>	<i>Navigation</i>	<i>Trout</i>
	X	X		

Low flows on unregulated streams are estimated using guidance from the EPA document [Low Flow Statistics Tools: A How-To Handbook for NPDES Permit Writers](#). When sufficient and representative USGS gage data is available, [USGS SWToolbox](#) is used to analyze the flow data and calculate 7Q10 and 30Q5 values. Using these low flow values at the gage, the permit writer then determines the flow at the point of discharge using the following equation:

$$Q_{outfall} = Q_{gage} \times \frac{A_{outfall}}{A_{gage}}$$

Where:

$Q_{outfall}$ = Low flow statistic at outfall location
 Q_{gage} = Low flow statistic at gage location
 $A_{outfall}$ = Area draining to outfall
 A_{gage} = Area draining to gage

In the absence of sufficient gage data, the Division relies on [USGS Streamstats](#) to calculate low flows statistics. In this case, no sufficient gage data is available to characterize the receiving stream. Thus, USGS Streamstats was used to delineate the critical low flow at the point of discharge. Appendix 2 shows the Streamstats output used for this estimation.

4. NEW PERMIT LIMITATIONS AND COMPLIANCE SCHEDULE SUMMARY

The Department has not developed effluent limitations because it does not propose to issue a permit. WADC proposed the following effluent limits:

Parameter	Units	4 MGD	8 MGD	12 MGD
CBOD5	mg/L	10	7	5
Total Suspended Solids	mg/L	10	10	10
Ammonia	mg/L	2.6	1.5	1
Nitrogen, total	mg/L	8	8	5

Phosphorus, total	mg/L	1	0.5	0.5
Dissolved Oxygen	mg/L	6	6	6

If the Department were to issue a permit, it would also limit, at a minimum, E. coli to ensure compliance with water quality criteria.

5. PREVIOUS PERMIT TERM REVIEW

N/A – the application is for a new permit.

6. COLLECTION SYSTEMS

WADC proposes to extend its existing collection system in Fairview by adding a sewer line along Highway 100 extending to Bon Aqua, and connecting to its existing sewer line on Highway 46 north to I-40.

7. ANTIDegradation

7.1. ANTIDegradation Statement / Water Quality Status

Tennessee’s Antidegradation Statement is found in the Rules of the Tennessee Department of Environment and Conservation, Rule [0400-40-03-.06](#). It is the purpose of Tennessee’s standards to fully protect existing uses of all surface waters as established under the Act.

Stream determinations for this permit action are associated with the waterbody segment identified by the Division as segment ID# TN06040003041_1000.

The Division has determined that Lick Creek from the Duck River to the confluence of Barren Fork constitutes Exceptional Tennessee Waters (ETW) due to the presence of the state-threatened Copperhead Darter. No degradation of water quality above the level of *de minimis* will be allowed unless the applicant demonstrates to the Division that there are no practicable alternatives to prevent or lessen degradation associated with the proposed activity, the degradation is necessary to accommodate important economic or social development in the area of the discharge, and the discharge will not violate the water quality criteria for uses existing in the receiving waters. The specific requirements for this demonstration are described in Rule 0400-40-03-.06.

Existing water quality in Lick Creek RM 10.6 fully supports its fish and aquatic life, irrigation, and livestock watering and wildlife designated uses. This segment is not assessed for recreation.

7.2. ALTERNATIVES ANALYSIS

In the alternatives analysis submitted in the December 2021 Preliminary Engineering Report (PER), WADC evaluated the following alternatives:

- No action,
- Increase or optimize capacity of existing treatment facilities,
- Land application,
- Water reuse,
- Decentralized systems, and
- New EHWRF.

The 2021 PER concludes that the new EHWRF would be the best alternative to enable growth and industrial development in the service area. Although WADC currently owns and operates three water reclamation facilities in the northern portion of WADC service area, Jones Creek WRF (JCWRF), Fairview WRF (FWRF) and White Bluff WRF, each one discharges to a low-flow stream with little available assimilative capacity. WADC asserts that NRCS soils data for the area identified no land within the service area that is “deemed not limited for slow rate land treatment.” WADC asserts there is no current demand for reused wastewater in the service area, and that decentralized systems are not economically efficient at this scale. The 2021 PER rejects the no action alternative, citing growth projections for the area.

At the Department’s request, WADC submitted a revised PER in December 2022, which evaluated alternative discharge locations. WADC conducted preliminary screening to identify all relatively close streams in Dickson, Williamson, and Hickman Counties with a ten-year, seven-day low flow (7Q10) of at least 12 cubic feet per second. Based on flow, WADC eliminated all streams in Williamson County, and included three in Dickson County (Harpeth River, Turnbull Creek, Cumberland River) and nine in Hickman County for further consideration. WADC then eliminated discharge locations upstream of public water intakes (Turnbull Creek, Big Swan Creek).

WADC summarized its alternatives analysis in terms of net present value in its Table 7, copied below:

Alternate	Description	Construction Cost	Annual Operating Cost	Net Present Value	Ranking
1	No Action	<i>not feasible</i>			
2	Treat New Flows at Existing Treatment Facilities				
2A	Treat All New Flows at JCWRF and Discharge to Harpeth River	\$92,590,000	\$781,000	\$101,548,070	4
2B	Treat All New Flows at JCWRF and Discharge to Cumberland River	\$97,990,000	\$797,000	\$107,131,590	6
3	Land Application	<i>not feasible</i>			
4	Water Reuse	<i>not feasible</i>			
5	Decentralized Systems	<i>not feasible</i>			
6	New Water Reclamation Facility				
6A	EHWRF Discharge to Turnbull Creek	<i>not feasible</i>			
6B	EHWRF Discharge to Harpeth River	\$94,455,960	\$947,000	\$105,318,050	5
6C	EHWRF Discharge to Cumberland River	\$113,495,000	\$996,000	\$124,919,120	8
6D	EHWRF Discharge to Beaverdam Creek	\$100,835,000	\$963,000	\$111,880,610	7
6E	EHWRF Discharge to Big Swan Creek	<i>not feasible</i>			
6F	EHWRF Discharge to Cane Creek	\$123,755,000	\$1,029,000	\$135,557,630	9
6G	EHWRF Discharge to Duck River	\$73,915,000	\$897,000	\$84,203,590	3
6H	EHWRF Discharge to Lick Creek	\$53,075,000	\$930,000	\$63,742,100	1
6I	EHWRF Discharge to Piney River	\$70,995,000	\$930,000	\$81,662,100	2

The Department preliminarily determines that WADC has not demonstrated that alternatives to the proposed degradation of Lick Creek are not practicable. Specifically, WADC rejected the no action alternative out-of-hand, without demonstrating that new sewer service is necessary, as discussed below.

In addition, although WADC's analysis demonstrates that the Lick Creek discharge is the least expensive option, WADC has not demonstrated that other discharge options that would result in less degradation, including Option 2B to discharge to the Cumberland River, are not practicable. Rule 0400-40-03-.06(1)(b)3 provides, "An alternative to degradation is practicable if it is technologically possible, able to be put into practice, and economically viable." Moving the existing Jones Creek discharge, and adding the new service area, to discharge to the Cumberland River would result in significantly less degradation than the proposed discharge to Lick Creek. This option would also allow for future expansion.

Although the Department has not conducted an in-depth water quality analysis of this option, the Cumberland River in the Barkley Reservoir, segment TN05130205015_2000, has

a 1Q10 (the low flow used for permitting in regulated streams) in the range of 700 MGD and is fully supporting of all designated uses. Accordingly, there is significant available assimilative capacity for treated municipal wastewater at this location. It is likely that any WADC discharge to this segment would result in only *de minimis* degradation.

Expanding the JCWRF and building a discharge pipeline to the Cumberland River are both technologically possible and capable of being put into practice. WADC has not demonstrated that this option is not economically viable, particularly in light of increased availability of federal funding for wastewater infrastructure.

7.3. ECONOMIC OR SOCIAL NECESSITY

a. WADC's Position

WADC's 2022 PER discusses socioeconomic impacts, and includes a report titled "Proposed East Hickman County Water Reclamation Facility: Direct and Indirect Economic and Fiscal Impact" prepared by Dr. Steven Livingston and Dr. Murat Arik ("Economic Report"). In the 2022 PER, WADC asserts:

By almost any indicator, Hickman County falls behind its neighboring counties in terms of wealth, median home values, median household income, and significantly has a much higher rate of poverty. Dickson County has a slightly lower poverty rate than that of Williamson County. Property values in Hickman County are substantially lower than in Williamson and Dickson Counties.

WADC argues that looking at the poverty rate alone, portions of the service area could be considered an environmental justice community. These rural areas are often left out and have not been included in major projects for infrastructure, negatively affecting those residents.

WADC argues that the proposed service area is attractive to residential, commercial, and industrial growth due to proximity to I-840. WADC notes, "[i]t is anticipated that most of the growth will occur within the City of Dickson, the City of Fairview, and the area bounded by Interstate 40, Highway 46, Interstate 840, and Highway 100." WADC argues, "The availability of sewer service will promote commercial and industrial growth and is expected to result in between 100 and 500 new jobs in the next five to ten years." Finally, WADC cites projections from the Economic Report, and concludes:

This new revenue will have a significant positive impact for Environmental Justice by bringing a means of additional tax and personal revenue to the

community. It is not designed to help one county over another as the WADC serves the entire three county service area.

The key findings of the Economic Report are:

- Construction of the new treatment facility is expected to generate a direct impact of 938 new jobs with wages of \$41,911,614, business revenue of \$84,946,149, and state and local taxes of \$2,379,898.
- Population growth is expected to generate, by the year 2045, a direct, indirect, and induced economic impact of 1,117 new jobs with wages of \$63,535,603, business revenue of \$170,214,216, and state and local taxes of \$9,739,200. By county:
 - o Dickson County: 471 jobs, \$15,274,827 in wages, \$51,704,622 in business revenue, and \$3,771,700 in state and local taxes (\$70.75 million)
 - o Hickman County: 88 jobs, \$3,167,523 in wages, \$12,937,130 in business revenue, and \$929,500 in state and local taxes (\$17 million)
 - o Williamson County: 558 jobs, \$45,093,253 in wages, \$105,572,464 in business revenue, and \$5,038,000 in state and local taxes (\$155.7 million).

The Economic Report also evaluates three possible new industries that could in theory be attracted to East Hickman County due to the availability of public sewer: a food manufacturer, a metal stamping plant, or an auto parts manufacturer. WADC estimates these would have a long-term (20-year) impact of 134 to 177 jobs and \$865,000 to \$1,431,000 in state and local taxes.

b. Friends of Lick Creek

On August 22, 2022, Friends of Lick Creek submitted a report to Governor Lee that compiled survey results, copies of letters opposing the project, quotes from elected officials and candidates, and newspaper articles. Key quotes from this report include:

- The path along the existing sewage line managed by Hickman County for the East Hickman High was deemed an industrial zone when installed. To date, only 3 industrial hookups have occurred in over seventeen years.
- Friends of Lick Creek supports smart growth that will benefit Hickman County, not urban sprawl that will leave our community with consequences of overdevelopment. In addition, we support Hickman County's sovereignty to control its own economic development destiny, and not have decisions forced upon its citizens.

c. Hickman County

Because WADC is a utility provider from Dickson County, not an entity of Hickman County government, the Department sought additional input from Hickman County officials concerning whether the proposed sewer service is necessary for important socioeconomic development in the area of the discharge. Deputy Commissioner Young met with Hickman County Mayor Jim Bates, ECD Director Brenda Brock, and County Commissioners from the affected districts. The Department also reviewed documents provided during these meetings, including the 2005 interlocal agreement between WADC and Hickman County¹ and the 2008-2025 Land Use and Transportation Policy Plan for Hickman County.

While local officials shared differing views with the Department,² the predominant opinion expressed by local officials is that the proposed sewer line is not necessary to support the type of economic development their constituents want. Specifically, several local officials shared the opinion that their constituents appreciate the rural character of Hickman County, and that people live there to get away from city life. Their constituents prefer to see growth that is similar in character to what Hickman County has now, large-lot homes and small-scale commercial enterprises employing 25-50 people. Minimal interest was expressed in recruiting larger industry. Several local officials explained that Hickman County residents do not mind driving to other counties for jobs and shopping, and that they want to come home to a quiet, less crowded place to live. Several officials expressed concerns about the cost of development in terms of increased demands on local infrastructures such as roads and schools. Some officials noted that the existing WADC sewer line in Hickman County only has about 32 customers, and has not been a source of significant economic growth.

Mayor Bates and others noted that the 2008-2025 land use and transportation plan is in the process of being updated. However, the plan currently identifies the corridor along Highway 100 in northeast Hickman County where WADC proposes to extend sewer service as a proposed growth area. The plan also states, "Where central sewage is available, most of this area can be used for residential and industrial development." The plan concludes that the Dickson soils in this area are not suitable for septic due to a restrictive layer at 20-30 inches. However, a Department soils scientist who works in the SSDS program states that northeast

¹ The 2005 Interlocal Agreement does not appear to authorize WADC to install a new sewer line, wastewater treatment plant, discharge pipeline, or outfall in Hickman County. WADC's private act requires that it obtain permission from local government prior to providing service outside of Dickson County. While this issue is beyond the scope of the Department's determination, it appears unlikely that Hickman County would give WADC the required permission to expand its service area.

² There was agreement, however, that WADC has failed to reach out to Hickman County officials in any meaningful way regarding its sewer plans for the area.

Hickman County has soils that are very suitable for septic, an opinion that is bolstered by the fact that there are numerous homes in the area served by septic. Local zoning currently requires a minimum one-acre lot size for homes, a density that can be supported by septic.³

d. Environmental Justice Data

Department personnel used EPA’s EJ Screen tool, using the location of the discharge point to evaluate four different areas: one-mile radius, five-mile radius, 10-mile radius, and an approximation of the EHWRP potential service area at maximum build-out. The demographic data do not support an EJ community classification, and belie WADC’s assertions regarding income and unemployment. In sum, these EJ Screen reports show:

	1-mile radius	5-mile radius	10-mile radius	Potential service area	Statewide Average
People of Color	0%	6%	6%	6%	27%
Low Income	19%	28%	33%	30%	34%
Unemployment Rate	3%	2%	2%	2%	5%
Limited English Speaking Households	3%	2%	0%	0%	1%

For people of color, percent of low-income residents, and unemployment, this area is measurably below statewide averages. There are marginally more limited English-speaking households within a one-mile radius of the discharge than the statewide average. Nothing in these data suggest an urgent need for economic development in the area of the discharge.

e. Department’s Preliminary Determination of Economic or Social Necessity

The Department preliminarily determines that WADC has not demonstrated that the proposed degradation of Lick Creek is necessary for important social or economic development in the area of the discharge, for the following reasons:

- 1. Expanded sewer service is not necessary to support important local development goals.**

³ The Hickman County Commission is considering increasing the minimum lot size to five acres, but this change has not yet been made.

WADC's proposed sewer line along Highway 100 in Hickman County is not necessary for important economic development in the area. Residential and small-scale commercial development in northeast Hickman can continue to be supported by private septic systems. While the lack of public sewer would limit the density of future growth in this area, that limit is consistent with local zoning (currently no more than one home per acre) and development goals. Therefore, higher density development supported by public sewer is not important to local development goals.

2. Industrial development is speculative.

WADC has requested an initial 4 MGD discharge, but 2 MGD of this initial request is intended to support unidentified, hypothetical industrial development in northeast Hickman County. Greater than *de minimis* degradation is not justified by purely speculative development. WADC has no role in recruiting industry to Hickman County. While Hickman County's ECD agrees with WADC that the lack of sewer service is an impediment to recruiting an industry to northeast Hickman County, it does not have a specific prospective tenant. Moreover, there is an evident difference of opinion among Hickman County officials regarding whether industrial development is wanted in this area.

Although there are situations in which the Department has issued permits for state-sponsored economic development opportunities prior to having a specific tenant (e.g., Blue Oval City), these have been for projects that result in only *de minimis* degradation.

3. WADC does not address how Hickman County would fund other infrastructure.

WADC's proposed sewer service is just one element of the infrastructure that would be required to support high density growth in northeast Hickman County. The Bon Aqua & Lyles Utility District provides public water in this area, and is approaching the limits of its design capacity (approximately 74%). Higher density development would also require transportation improvements, additional school capacity, and other public infrastructure. WADC has not demonstrated that the modest potential increase in Hickman County tax revenue would be sufficient to support these public infrastructure needs. Nor has WADC demonstrated where the water supply to support higher density housing, commercial facilities, or industry would come from.

4. WADC's estimated economic benefits are geographically separated from the discharge location and degradation of water quality.

The Antidegradation Statement provides:

Where the quality of Tennessee waters is better than the level necessary to support propagation of fish, shellfish, and wildlife, or recreation in and on the water, that quality will be maintained and protected unless the Department finds, after intergovernmental coordination and public participation, that lowering water quality is necessary to accommodate important economic or social development ***in the area in which the waters are located*** as established herein.⁴

This provision derives from EPA's antidegradation rule, 40 C.F.R. § 131.12(a)(2), which requires a demonstration that degradation is "necessary to accommodate important economic or social development in the area in which the waters are located."

WADC's Economic Report shows that nearly 93% of the long-term economic benefit of its proposal would inure to Dickson County (\$70.75 million) and Williamson County (\$155.7 million). Comparatively little of WADC's asserted economic benefit would occur in Hickman County (\$17 million). Moreover, the area of Hickman County that WADC will serve (along Highway 100) would be separated by roughly nine miles from the area of the discharge, where the degradation of water quality begins.⁵ The degradation of Lick Creek would extend downstream and further away from WADC's proposed service area.

WADC has not demonstrated that its proposal would result in important social or economic development at or downstream from the discharge location, where the degradation of water quality will occur. Although the Department recognizes, and considers, the overall regional economic benefits WADC asserts in its application materials, in the Department's judgment these benefits are outweighed by the localized, greater than *de minimis* degradation of an ETW stream in a rural area.

f. Conclusion and Next Steps

Although the Department has not made a final determination, it proposes to deny NPDES permit on the grounds that WADC has failed to demonstrate that the proposed degradation is necessary for important economic or social development in the area of the discharge. The

⁴ Tenn. Comp. R. & Regs. 0400-40-03-.06(1)(a) (emphasis added).

⁵ In its 2002 PER, WADC included a map (Figure 2) showing a "potential service area" that extends near the proposed discharge location. However, this map does not accurately reflect WADC's proposed service area, which is limited to the area along Highway 100, Bon Aqua, and north along Highway 46. Nothing in WADC's application materials suggests that it would extend sewer service south from Highway 100 along Highway 7 to the Lick Creek discharge location, nor is there a demonstrated demand for sewer service in that area.

Department also preliminarily determines that WADC has failed to demonstrate a lack of practicable alternatives to the proposed degradation of Lick Creek.

The Department preliminarily determines, however, that at the proposed 2 MGD discharge,⁶ it could establish effluent limitations sufficient to protect water quality and prevent pollution if it were to issue a permit. WADC's proposed advanced biological treatment with UV disinfection would be sufficient to comply with such limits.

The Department is accepting comments regarding all aspects of the decision during the public notice period, including at the public hearing. After the close of the public comment period, the Department will review all comments received and issue a determination of economic or social necessity. Once that determination has been issued, the applicant or any affected person could file a petition for declaratory order regarding that determination in accordance with the Antidegradation Statement. Rule 0400-40-03-.06(4)(d).

⁶ Even if the Department could approve the 2 MGD discharge at this time, it is highly questionable that it could approve the additional 2 MGD discharge WADC proposes to accommodate a hypothetical industrial customer. Future water quality impacts at higher volumes would need to be addressed separately in future permitting decisions.

Appendix 1

Notice of Public Hearing

Appendix 2

StreamStats Report