



## 2021 Final Modification to Big Walnut Creek Watershed Total Maximum Daily Load Report

### Overview

|                                                                            |                                                                                                                                                                                  |
|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TMDL Project Name                                                          | Big Walnut Creek Watershed TMDL<br><a href="https://epa.ohio.gov/dsw/tmdl/SciotoRiver#122466492-tmdl-report">https://epa.ohio.gov/dsw/tmdl/SciotoRiver#122466492-tmdl-report</a> |
| Date of U.S. EPA Region 5 TMDL Approval                                    | September 26, 2005                                                                                                                                                               |
| Modification Public Notice Dates                                           | April 5, 2021 – June 4, 2021                                                                                                                                                     |
| Date of U.S. EPA Region 5 Modification Approval                            | September 10, 2021                                                                                                                                                               |
| TMDL Watershed Assessment Unit and Pollutant(s) Which Require Modification | Alum Creek Headwaters to above West Branch Alum Creek (HUC-14 = 05060001-150-010)<br>Fecal Coliform, Total Phosphorus                                                            |
| TMDL Table in Final TMDL Document Being Modified                           | Table 5.3.E                                                                                                                                                                      |

### What is being changed from the final Total Maximum Daily Load (TMDL) to the modified TMDL?

Ohio Environmental Protection Agency (Ohio EPA) is adjusting nonpoint source load allocations (LAS) for fecal coliform and total phosphorus to account for a new wastewater treatment plant (WWTP) effluent discharge to the headwaters of Alum Creek.

The Morrow County Commissioners own and operate an existing 0.350 million gallon per day (MGD) SoMoCo WWTP. The current WWTP is a land application-based sewage treatment system which consists of a comminutor, followed by two aerated lagoon cells for biological treatment. After biological treatment, effluent is transferred into a storage lagoon that is sized to provide 120 days of storage. Effluent from the storage lagoon is directed through an ultraviolet disinfection unit before the treated wastewater is pumped to a dedicated field. A center pivot spray irrigation system land applies the treated wastewater. Over time, weather conditions and the local soils that make up the application field did not allow for a high infiltration rate. This has led to ponding, and ultimately, runoff of treated wastewater on to nearby properties. Additionally, the existing mechanical components of the irrigation system are beyond their useful life and have become a regular maintenance issue. To address the current issues with the WWTP and to accommodate local growth and development, the Morrow County Commissioners are proposing to upgrade the existing treatment system to improve effluent quality, eliminate the land application system, and have a direct discharge of treated effluent to Alum Creek. The proposed discharge will be to Alum Creek at approximately river mile (RM) 45.8.

### Explanation of modifications:

The Big Walnut Creek TMDL report contained zero wasteload allocation (WLA) for the Alum Creek Headwaters to above West Branch Alum Creek assessment unit (05060001-150-010). At the time of the TMDL development, there were no point source discharges in this assessment unit, therefore no WLA was included. This TMDL modification will assign the following WLAs for the SoMoCo WWTP (NPDES Permit 4PH00039\*AD) based upon a

design flow of 0.35 million gallons per day, 0.7 mg/L monthly total phosphorus limit and 126 colony forming units (cfu) per 100 mL monthly *E. coli* limit:

- Total Phosphorus WLA = 746 pounds per year
- Fecal Coliform WLA =  $0.04 \times 10^{13}$  cfu per recreation season (this equates to  $0.03 \times 10^{13}$  cfu per recreation season of *E. coli* and  $1.7 \times 10^9$  cfu per day of *E. coli*)

The nonpoint source (NPS) LAs for total phosphorus and fecal coliform will be decreased in this assessment unit to provide for the new WLAs. The modified LAs are as follows:

- Total Phosphorus LA = 6,524 pounds per year
- Fecal Coliform LA =  $9.36 \times 10^{13}$  cfu per recreation season

These revisions are depicted in the TMDL report tables below.

## Big Walnut Creek TMDL Report Tables

**Original Table 5.3.E** Total Existing Load, TMDL, Allocations For HUC 05060001 150

| 14-Digit HUC <sup>1</sup> | Sub-Watershed          | Sub-Watershed Extent (Upper RM-Lower RM) | Parameter (units)                            | Existing Loads |        |        | % Reduction | TMDL | Allocations |      |     |
|---------------------------|------------------------|------------------------------------------|----------------------------------------------|----------------|--------|--------|-------------|------|-------------|------|-----|
|                           |                        |                                          |                                              | PS             | NPS    | Total  |             |      | WLA         | LA   | MOS |
| 150-010                   | Alum Creek             | 59.6 – 42.8                              | FC (cfu • $10^{13}$ • season <sup>-1</sup> ) | 0              | 145    | 145    | 94          | 9.4  | 0           | 9.4  | --- |
|                           |                        |                                          | TP (lbs • year <sup>-1</sup> )               | 0              | 22,125 | 22,125 | 66          | 7428 | 0           | 7056 | 371 |
| 150-020                   | West Branch Alum Creek | entirety (except Turkey Run)             | FC (cfu • $10^{13}$ • season <sup>-1</sup> ) | 0.04           | 61     | 61     | 92          | 5.0  | 0.13        | 4.9  | --- |
|                           |                        |                                          | TP (lbs • year <sup>-1</sup> )               | 1471           | 13,703 | 15,173 | 68          | 4873 | 1471        | 3158 | 244 |
| 150-030                   | Turkey Run             | entirety                                 | FC (cfu • $10^{13}$ • season <sup>-1</sup> ) | 0              | 48     | 48     | 93          | 3.2  | 0           | 3.2  | --- |
|                           |                        |                                          | TP (lbs • year <sup>-1</sup> )               | 0              | 9,540  | 9,540  | 83          | 1621 | 0           | 1540 | 81  |
| 150-040                   | Alum Creek             | 42.8 - 31.7                              | FC (cfu • $10^{13}$ • season <sup>-1</sup> ) | 0.001          | 36     | 36     | 93          | 2.5  | 0.01        | 2.5  | --- |
|                           |                        |                                          | TP (lbs • year <sup>-1</sup> )               | 43             | 13,509 | 13,551 | 76          | 3292 | 43          | 3137 | 164 |
| 150-050                   | Big Run                | entirety                                 | FC (cfu • $10^{13}$ • season <sup>-1</sup> ) | 0              | 17     | 17     | 79          | 3.5  | 0           | 3.5  | --- |
|                           |                        |                                          | TP (lbs • year <sup>-1</sup> )               | 0              | 9,946  | 9,946  | 82          | 1768 | 0           | 1699 | 88  |

<sup>1</sup>All presented 14-digit HUCs are within the 8-digit HUC 05060001. The complete HUC identifier is the 8-digit stem followed by the 14-digit extension.

**Modified Table 5.3.E** Total Existing Load, TMDL, Allocations For HUC 05060001 150  
(Modified values are bolded and underlined)

| 14-Digit HUC <sup>1</sup> | Sub-Watershed          | Sub-Watershed Extent (Upper RM-Lower RM) | Parameter (units)                                   | Existing Loads     |        |                      | % Reduction      | TMDL | Allocations        |                    |     |
|---------------------------|------------------------|------------------------------------------|-----------------------------------------------------|--------------------|--------|----------------------|------------------|------|--------------------|--------------------|-----|
|                           |                        |                                          |                                                     | PS                 | NPS    | Total                |                  |      | WLA                | LA                 | MOS |
| 150-010                   | Alum Creek             | 59.6 – 42.8                              | FC (cfu • 10 <sup>13</sup> • season <sup>-1</sup> ) | <b><u>0.04</u></b> | 145    | 145                  | 94               | 9.4  | <b><u>0.04</u></b> | <b><u>9.36</u></b> | --- |
|                           |                        |                                          | TP (lbs • year <sup>-1</sup> )                      | <b><u>746</u></b>  | 22,125 | <b><u>22,871</u></b> | <b><u>68</u></b> | 7428 | <b><u>746</u></b>  | <b><u>6524</u></b> | 371 |
| 150-020                   | West Branch Alum Creek | entirety (except Turkey Run)             | FC (cfu • 10 <sup>13</sup> • season <sup>-1</sup> ) | 0.04               | 61     | 61                   | 92               | 5.0  | 0.13               | 4.9                | --- |
|                           |                        |                                          | TP (lbs • year <sup>-1</sup> )                      | 1471               | 13,703 | 15,173               | 68               | 4873 | 1471               | 3158               | 244 |
| 150-030                   | Turkey Run             | entirety                                 | FC (cfu • 10 <sup>13</sup> • season <sup>-1</sup> ) | 0                  | 48     | 48                   | 93               | 3.2  | 0                  | 3.2                | --- |
|                           |                        |                                          | TP (lbs • year <sup>-1</sup> )                      | 0                  | 9,540  | 9,540                | 83               | 1621 | 0                  | 1540               | 81  |
| 150-040                   | Alum Creek             | 42.8 - 31.7                              | FC (cfu • 10 <sup>13</sup> • season <sup>-1</sup> ) | 0.001              | 36     | 36                   | 93               | 2.5  | 0.01               | 2.5                | --- |
|                           |                        |                                          | TP (lbs • year <sup>-1</sup> )                      | 43                 | 13,509 | 13,551               | 76               | 3292 | 43                 | 3137               | 164 |
| 150-050                   | Big Run                | entirety                                 | FC (cfu • 10 <sup>13</sup> • season <sup>-1</sup> ) | 0                  | 17     | 17                   | 79               | 3.5  | 0                  | 3.5                | --- |
|                           |                        |                                          | TP (lbs • year <sup>-1</sup> )                      | 0                  | 9,946  | 9,946                | 82               | 1768 | 0                  | 1699               | 88  |

<sup>1</sup>All presented 14-digit HUCs are within the 8-digit HUC 05060001. The complete HUC identifier is the 8-digit stem followed by the 14-digit extension.

## Implementation and Reasonable Assurances

### Point Source

The WLAs for the new discharge will be implemented into an NPDES permit when it is issued. Since the proposed discharge is a new source, the TMDL will be met immediately as a monthly average limit of 0.7 mg/L and a weekly average of 1.0 mg/L for total phosphorus. Operationally to achieve these limits, the effluent will reflect a long-term average concentration lower than the monthly limit. This will result in a reduced impact on the instream phosphorus concentrations as influenced by the discharge and additional assurance that the TMDL will be met. The fecal coliform WLA will be implemented through an NPDES permit limit of 126 cfu/100 mL as a monthly average during the recreation season, which is the water quality criterion. As with the total phosphorus limit, the effluent will likely contain a bacteria concentration well below the monthly limit.

## Nonpoint Source

The existing wastewater treatment plant effluent is irrigated onto an agricultural field. This contribution to the nonpoint source load will be eliminated with the new direct discharge to Alum Creek. Further, the proposed land use for the irrigation field is expected to shift to a non-agricultural use with a perennial cover established. The land use will not be restricted to that use, but it will result, at a minimum, in an interim load reduction while watershed planning efforts evaluate projects to further mitigate nonpoint source loads.

To date, TMDL and water quality restoration implementation activities in the Alum Creek watershed have mostly occurred further downstream in the portions below Alum Creek Lake, where more impairments were documented. The Friends of Alum Creek and Tributaries (FACT) is an active watershed group that published a Watershed Action Plan for Lower Alum Creek in 2005 that is now being used in development of 9-Element Nonpoint Source Implementation Strategies in Delaware County. FACT also received Section 319 grant funding from Ohio EPA in 2008 for two low head dam removals on Alum Creek near Bexley and Columbus.

To extend the focus on nonpoint source reduction activities into the upper portions of the watershed, Morrow County Commissioners have committed to developing a 9-Element Nonpoint Source Implementation Strategy for the headwaters of Alum Creek watershed unit where the new WWTP discharge will be located. This plan will identify critical areas to target total phosphorus and bacteria reductions along with projects in those areas to make progress on the TMDL reductions. These projects may be eligible for local, state and federal funding.

Ohio EPA will continue to utilize the adaptive management approach to the Big Walnut Creek TMDL implementation. Upon resurvey of the watershed, Ohio EPA will determine if progress has been made in achieving water quality standards and the goals of the TMDL. At that point, a decision will be made as to whether a new TMDL is warranted or if revisions to the existing TMDL report or implementation recommendations are necessary.