



# CULVERT ANALYSIS

**PID :** 116570      **Date :** 06/15/2023      **Project :** ERI-6

**Location :** STA. 628+12.60

**Description :** Drive Pipe

**Designer :** BLC

**HEADWATER CONTROL CODES:**      INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

**Pipe Number :** 804

**Use HW :** 0

**Inlet Invert Elevation (ft.) :** 577.45

**Outlet Invert Elevation (ft.) :** 577.40

**Pipe Quantity :** 1

**Culvert Type :** Circular Smooth

**Pipe Length (ft.) :** 42.00

**Culvert Slope (ft./ft.) :** 0.0012

**Corrugation Type :**

**Pipe Size :** 12 in.

**Design Manning 'n' :** (default)

**Entrance Type :** No Headwall

**Loss Coef. Ke :** 0.2000

| FLOW<br>(cfs.) | HEAD<br>LOSS<br>(ft.) | HWI<br>(ft.) | HWO<br>(ft.) | FLOW<br>TYPE | VELOCITY<br>(fps.) | DN<br>(ft.) | DC<br>(ft.) | MANNING<br>N | HEADWATER<br>CONTROL | BURIED<br>DEPTH<br>(ft.) | TAILWATER<br>ELEVATION<br>(ft.) |
|----------------|-----------------------|--------------|--------------|--------------|--------------------|-------------|-------------|--------------|----------------------|--------------------------|---------------------------------|
| 2.05           | 0.43                  | 578.34       | 578.44       | 1 - A        | 4.08               | 0.91        | 0.61        | 0.0120       | OUTLET*              | 0.00                     | 577.40                          |
| 2.38           | 0.47                  | 578.43       | 578.53       | 1 - A        | 4.32               | 0.91        | 0.66        | 0.0120       | OUTLET*              | 0.00                     | 577.40                          |



# CULVERT ANALYSIS

**PID :** 116570      **Date :** 10/30/2024      **Project :** Erie 6

**Location :** US 6 Sta. 632+32

**Description :** Pr. Culvert Under SUP

**Designer :** BLS

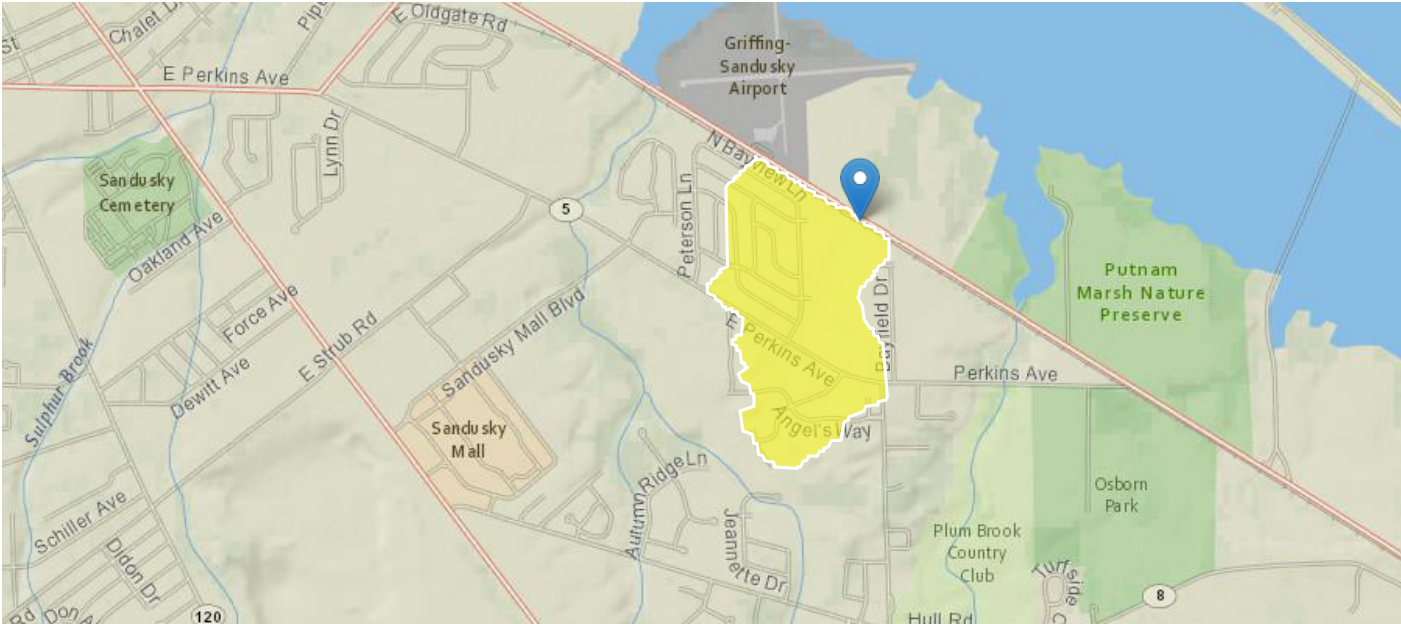
**HEADWATER CONTROL CODES:** INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

|                                                      |                                 |                                              |                                               |
|------------------------------------------------------|---------------------------------|----------------------------------------------|-----------------------------------------------|
| <b>Pipe Number :</b> 1                               | <b>Use HW :</b> 0               | <b>Inlet Invert Elevation (ft.) :</b> 572.70 | <b>Outlet Invert Elevation (ft.) :</b> 572.55 |
| <b>Pipe Quantity :</b> 1                             |                                 |                                              |                                               |
| <b>Culvert Type :</b> Box                            |                                 | <b>Pipe Length (ft.) :</b> 23.00             | <b>Culvert Slope (ft./ft.) :</b> 0.0065       |
| <b>Corrugation Type :</b>                            |                                 |                                              |                                               |
| <b>Pipe Size :</b> 9.0 x 4.0 ft.                     |                                 |                                              |                                               |
| <b>Design Manning 'n' :</b> (default)                | <b>Buried Manning 'n' :</b> N/A |                                              |                                               |
| <b>Entrance Type :</b> 0 degree (Extension of sides) |                                 | <b>Loss Coef. Ke :</b> 0.5000                | <b>K :</b> 0.0610                             |
|                                                      |                                 | <b>CD :</b> 0.6063                           | <b>c :</b> 0.0423                             |
|                                                      |                                 |                                              | <b>M :</b> 0.75                               |
|                                                      |                                 |                                              | <b>Y :</b> 0.8200                             |
|                                                      |                                 |                                              | <b>Max. Q :</b> 3.50                          |
|                                                      |                                 |                                              | <b>Min. Q :</b> 4.00                          |

|  | FLOW<br>(cfs.) | HEAD<br>LOSS<br>(ft.) | HWI<br>(ft.) | HWO<br>(ft.) | FLOW<br>TYPE | VELOCITY<br>(fps.) | DN<br>(ft.) | DC<br>(ft.) | MANNING<br>N | HEADWATER<br>CONTROL | BURIED<br>DEPTH<br>(ft.) | TAILWATER<br>ELEVATION<br>(ft.) |
|--|----------------|-----------------------|--------------|--------------|--------------|--------------------|-------------|-------------|--------------|----------------------|--------------------------|---------------------------------|
|  | 134.00         | 0.95                  | 576.95       | N/A          | 1 - C        | 10.51              | 1.42        | 1.90        | 0.0120       | INLET                | 1.00                     | 574.30                          |
|  | 201.00         | 2.20                  | 578.49       | 577.66       | 1 - C        | 12.01              | 1.86        | 2.49        | 0.0120       | INLET                | 1.00                     | 574.30                          |

# StreamStats Report - Culvert 1879258

Region ID: OH  
Workspace ID: OH20230503191053064000  
Clicked Point (Latitude, Longitude): 41.42717, -82.64844  
Time: 2023-05-03 15:11:13 -0400



Collapse All

## ➤ Basin Characteristics

| Parameter Code | Parameter Description                                                                                                                                | Value   | Unit            |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------|
| CSL1085LFP     | Change in elevation divided by length between points 10 and 85 percent of distance along the longest flow path to the basin divide, LFP from 2D grid | 21      | feet per mi     |
| DRNAREA        | Area that drains to a point on a stream                                                                                                              | 0.3     | square miles    |
| FOREST         | Percentage of area covered by forest                                                                                                                 | 0.54    | percent         |
| LAT_CENT       | Latitude of Basin Centroid                                                                                                                           | 41.4234 | decimal degrees |
| LC92STOR       | Percentage of water bodies and wetlands determined from the NLCD                                                                                     | 0.0894  | percent         |
| LONG_CENT      | Longitude Basin Centroid                                                                                                                             | 82.6517 | decimal degrees |
| OHREGA         | Ohio Region A Indicator                                                                                                                              | 1       | dimensionless   |
| OHREGC         | Ohio Region C Indicator                                                                                                                              | 0       | dimensionless   |
| PRECIPCENT     | Mean Annual Precip at Basin Centroid                                                                                                                 | 34.1    | inches          |
| STREAM_VARG    | Streamflow variability index as defined in WRIR 02-4068, computed from regional grid                                                                 | 0.62    | dimensionless   |

## ➤ Peak-Flow Statistics

### Peak-Flow Statistics Parameters [Peak Flow Full Model Reg A SIR2019 5018]

| Parameter Code | Parameter Name                           | Value  | Units         | Min Limit | Max Limit |
|----------------|------------------------------------------|--------|---------------|-----------|-----------|
| DRNAREA        | Drainage Area                            | 0.3    | square miles  | 0.04      | 5989      |
| OHREGC         | Ohio Region C Indicator 1 if in C else 0 | 0      | dimensionless | 0         | 1         |
| OHREGA         | Ohio Region A Indicator 1 if in A else 0 | 1      | dimensionless | 0         | 1         |
| CSL1085LFP     | Stream Slope 10 and 85 Longest Flow Path | 21     | feet per mi   | 1.53      | 516       |
| LC92STOR       | Percent Storage from NLCD1992            | 0.0894 | percent       | 0         | 25.35     |

### Peak-Flow Statistics Flow Report [Peak Flow Full Model Reg A SIR2019 5018]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic             | Value | Unit               | PII  | Plu  | ASEp |
|-----------------------|-------|--------------------|------|------|------|
| 50-percent AEP flood  | 39.4  | ft <sup>3</sup> /s | 20.7 | 75.1 | 40.1 |
| 20-percent AEP flood  | 70.7  | ft <sup>3</sup> /s | 38.8 | 129  | 37.2 |
| 10-percent AEP flood  | 96.4  | ft <sup>3</sup> /s | 52.5 | 177  | 37.6 |
| 4-percent AEP flood   | 134   | ft <sup>3</sup> /s | 72.4 | 248  | 38.1 |
| 2-percent AEP flood   | 166   | ft <sup>3</sup> /s | 88.7 | 311  | 37.8 |
| 1-percent AEP flood   | 201   | ft <sup>3</sup> /s | 106  | 381  | 39.6 |
| 0.2-percent AEP flood | 295   | ft <sup>3</sup> /s | 154  | 566  | 40.3 |

#### Peak-Flow Statistics Citations

Koltun, G.F.,2019, Flood-frequency estimates for Ohio streamgages based on data through water year 2015 and techniques for estimating flood-frequency characteristics of rural, unregulated Ohio streams: U.S. Geological Survey Scientific Investigations Report 2019–5018, 25 p. (<https://dx.doi.org/10.3133/sir20195018>)

## ➤ Low-Flow Statistics

### Low-Flow Statistics Parameters [Low Flow Region A 2012 5138]

| Parameter Code | Parameter Name                         | Value | Units         | Min Limit | Max Limit |
|----------------|----------------------------------------|-------|---------------|-----------|-----------|
| DRNAREA        | Drainage Area                          | 0.3   | square miles  | 1         | 1250      |
| STREAM_VARG    | Streamflow Variability Index from Grid | 0.62  | dimensionless | 0.24      | 1.12      |

### Low-Flow Statistics Disclaimers [Low Flow Region A 2012 5138]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

### Low-Flow Statistics Flow Report [Low Flow Region A 2012 5138]

| Statistic              | Value   | Unit               |
|------------------------|---------|--------------------|
| 1 Day 10 Year Low Flow | 0.00195 | ft <sup>3</sup> /s |
| 7 Day 10 Year Low Flow | 0.00269 | ft <sup>3</sup> /s |

| Statistic               | Value   | Unit               |
|-------------------------|---------|--------------------|
| 30 Day 10 Year Low Flow | 0.00456 | ft <sup>3</sup> /s |
| 90 Day 10 Year Low Flow | 0.0083  | ft <sup>3</sup> /s |

#### Low-Flow Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (<http://pubs.usgs.gov/sir/2012/5138/>)

## ➤ Flow-Duration Statistics

### Flow-Duration Statistics Parameters [Low Flow Region A 2012 5138]

| Parameter Code | Parameter Name                         | Value | Units         | Min Limit | Max Limit |
|----------------|----------------------------------------|-------|---------------|-----------|-----------|
| DRNAREA        | Drainage Area                          | 0.3   | square miles  | 1         | 1250      |
| STREAM_VARG    | Streamflow Variability Index from Grid | 0.62  | dimensionless | 0.24      | 1.12      |

### Flow-Duration Statistics Disclaimers [Low Flow Region A 2012 5138]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

### Flow-Duration Statistics Flow Report [Low Flow Region A 2012 5138]

| Statistic           | Value  | Unit               |
|---------------------|--------|--------------------|
| 80 Percent Duration | 0.0201 | ft <sup>3</sup> /s |

#### Flow-Duration Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (<http://pubs.usgs.gov/sir/2012/5138/>)

## ➤ Annual Flow Statistics

### Annual Flow Statistics Parameters [Low Flow LatGT 41.2 wri02 4068]

| Parameter Code | Parameter Name                       | Value   | Units           | Min Limit | Max Limit |
|----------------|--------------------------------------|---------|-----------------|-----------|-----------|
| DRNAREA        | Drainage Area                        | 0.3     | square miles    | 0.12      | 7422      |
| LAT_CENT       | Latitude of Basin Centroid           | 41.4234 | decimal degrees | 41.2      | 41.59     |
| PRECIPCENT     | Mean Annual Precip at Basin Centroid | 34.1    | inches          | 34        | 43.2      |

### Annual Flow Statistics Flow Report [Low Flow LatGT 41.2 wri02 4068]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic        | Value | Unit               | SE   | ASEp |
|------------------|-------|--------------------|------|------|
| Mean Annual Flow | 0.25  | ft <sup>3</sup> /s | 11.4 | 11.4 |

#### Annual Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (<https://pubs.er.usgs.gov/publication/wri024068>)

## ➤ Monthly Flow Statistics

### Monthly Flow Statistics Parameters [Low Flow LatGT 41.2 wri02 4068]

| Parameter Code | Parameter Name                         | Value   | Units           | Min Limit | Max Limit |
|----------------|----------------------------------------|---------|-----------------|-----------|-----------|
| DRNAREA        | Drainage Area                          | 0.3     | square miles    | 0.12      | 7422      |
| LC92STOR       | Percent Storage from NLCD1992          | 0.0894  | percent         | 0         | 19        |
| PRECIPCENT     | Mean Annual Precip at Basin Centroid   | 34.1    | inches          | 34        | 43.2      |
| FOREST         | Percent Forest                         | 0.54    | percent         | 0         | 99.1      |
| LAT_CENT       | Latitude of Basin Centroid             | 41.4234 | decimal degrees | 41.2      | 41.59     |
| STREAM_VARG    | Streamflow Variability Index from Grid | 0.62    | dimensionless   | 0.25      | 1.13      |

### Monthly Flow Statistics Flow Report [Low Flow LatGT 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic           | Value  | Unit               | SE   | ASEp |
|---------------------|--------|--------------------|------|------|
| January Mean Flow   | 0.316  | ft <sup>3</sup> /s | 16.6 | 16.6 |
| February Mean Flow  | 0.508  | ft <sup>3</sup> /s | 11.9 | 11.9 |
| March Mean Flow     | 0.537  | ft <sup>3</sup> /s | 14   | 14   |
| April Mean Flow     | 0.476  | ft <sup>3</sup> /s | 11.2 | 11.2 |
| May Mean Flow       | 0.323  | ft <sup>3</sup> /s | 19.5 | 19.5 |
| June Mean Flow      | 0.192  | ft <sup>3</sup> /s | 27   | 27   |
| July Mean Flow      | 0.126  | ft <sup>3</sup> /s | 28.2 | 28.2 |
| August Mean Flow    | 0.0567 | ft <sup>3</sup> /s | 36.8 | 36.8 |
| September Mean Flow | 0.0268 | ft <sup>3</sup> /s | 43.6 | 43.6 |
| October Mean Flow   | 0.136  | ft <sup>3</sup> /s | 50.8 | 50.8 |
| November Mean Flow  | 0.224  | ft <sup>3</sup> /s | 37.5 | 37.5 |
| December Mean Flow  | 0.34   | ft <sup>3</sup> /s | 21.8 | 21.8 |

#### Monthly Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (<https://pubs.er.usgs.gov/publication/wri024068>)

## ➤ General Flow Statistics

### General Flow Statistics Parameters [Low Flow LatGT 41.2 wri02 4068]

| Parameter Code | Parameter Name | Value | Units        | Min Limit | Max Limit |
|----------------|----------------|-------|--------------|-----------|-----------|
| DRNAREA        | Drainage Area  | 0.3   | square miles | 0.12      | 7422      |

| Parameter Code | Parameter Name                         | Value   | Units           | Min Limit | Max Limit |
|----------------|----------------------------------------|---------|-----------------|-----------|-----------|
| LC92STOR       | Percent Storage from NLCD1992          | 0.0894  | percent         | 0         | 19        |
| STREAM_VARG    | Streamflow Variability Index from Grid | 0.62    | dimensionless   | 0.25      | 1.13      |
| LAT_CENT       | Latitude of Basin Centroid             | 41.4234 | decimal degrees | 41.2      | 41.59     |

#### General Flow Statistics Flow Report [Low Flow LatGT 41.2 wri02 4068]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic                | Value  | Unit               | SE   | ASEp |
|--------------------------|--------|--------------------|------|------|
| Harmonic Mean Streamflow | 0.0149 | ft <sup>3</sup> /s | 65.9 | 65.9 |

#### General Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (<https://pubs.er.usgs.gov/publication/wri024068>)

### ➤ Flow Percentile Statistics

#### Flow Percentile Statistics Parameters [Low Flow LatGT 41.2 wri02 4068]

| Parameter Code | Parameter Name                         | Value   | Units           | Min Limit | Max Limit |
|----------------|----------------------------------------|---------|-----------------|-----------|-----------|
| DRNAREA        | Drainage Area                          | 0.3     | square miles    | 0.12      | 7422      |
| LC92STOR       | Percent Storage from NLCD1992          | 0.0894  | percent         | 0         | 19        |
| STREAM_VARG    | Streamflow Variability Index from Grid | 0.62    | dimensionless   | 0.25      | 1.13      |
| LAT_CENT       | Latitude of Basin Centroid             | 41.4234 | decimal degrees | 41.2      | 41.59     |
| LONG_CENT      | Longitude of Basin Centroid            | 82.6517 | decimal degrees | 80.53     | 84.6      |

#### Flow Percentile Statistics Flow Report [Low Flow LatGT 41.2 wri02 4068]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic                   | Value  | Unit               | SE   | ASEp |
|-----------------------------|--------|--------------------|------|------|
| 25th Percentile Flow        | 0.0341 | ft <sup>3</sup> /s | 29.2 | 29.2 |
| 50th Percentile Flow Median | 0.0872 | ft <sup>3</sup> /s | 40.3 | 40.3 |
| 75th Percentile Flow        | 0.209  | ft <sup>3</sup> /s | 47.9 | 47.9 |

#### Flow Percentile Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (<https://pubs.er.usgs.gov/publication/wri024068>)

## ➤ Bankfull Statistics

### Bankfull Statistics Parameters [Interior Plains D Bieger 2015]

| Parameter Code | Parameter Name | Value | Units        | Min Limit | Max Limit  |
|----------------|----------------|-------|--------------|-----------|------------|
| DRNAREA        | Drainage Area  | 0.3   | square miles | 0.19305   | 59927.7393 |

### Bankfull Statistics Parameters [Central Lowland P Bieger 2015]

| Parameter Code | Parameter Name | Value | Units        | Min Limit | Max Limit   |
|----------------|----------------|-------|--------------|-----------|-------------|
| DRNAREA        | Drainage Area  | 0.3   | square miles | 0.200772  | 59927.66594 |

### Bankfull Statistics Parameters [USA Bieger 2015]

| Parameter Code | Parameter Name | Value | Units        | Min Limit | Max Limit  |
|----------------|----------------|-------|--------------|-----------|------------|
| DRNAREA        | Drainage Area  | 0.3   | square miles | 0.07722   | 59927.7393 |

### Bankfull Statistics Flow Report [Interior Plains D Bieger 2015]

| Statistic                             | Value | Unit |
|---------------------------------------|-------|------|
| Bieger_D_channel_width                | 7.69  | ft   |
| Bieger_D_channel_depth                | 1.19  | ft   |
| Bieger_D_channel_cross_sectional_area | 12.2  | ft^2 |

### Bankfull Statistics Flow Report [Central Lowland P Bieger 2015]

| Statistic                             | Value | Unit |
|---------------------------------------|-------|------|
| Bieger_P_channel_width                | 8.97  | ft   |
| Bieger_P_channel_depth                | 1.51  | ft   |
| Bieger_P_channel_cross_sectional_area | 12    | ft^2 |

### Bankfull Statistics Flow Report [USA Bieger 2015]

| Statistic                               | Value | Unit |
|-----------------------------------------|-------|------|
| Bieger_USA_channel_width                | 8.11  | ft   |
| Bieger_USA_channel_depth                | 0.933 | ft   |
| Bieger_USA_channel_cross_sectional_area | 8.92  | ft^2 |

### Bankfull Statistics Flow Report [Area-Averaged]

| Statistic                             | Value | Unit |
|---------------------------------------|-------|------|
| Bieger_D_channel_width                | 7.69  | ft   |
| Bieger_D_channel_depth                | 1.19  | ft   |
| Bieger_D_channel_cross_sectional_area | 12.2  | ft^2 |
| Bieger_P_channel_width                | 8.97  | ft   |
| Bieger_P_channel_depth                | 1.51  | ft   |
| Bieger_P_channel_cross_sectional_area | 12    | ft^2 |

| Statistic                               | Value | Unit |
|-----------------------------------------|-------|------|
| Bieger_USA_channel_width                | 8.11  | ft   |
| Bieger_USA_channel_depth                | 0.933 | ft   |
| Bieger_USA_channel_cross_sectional_area | 8.92  | ft^2 |

#### Bankfull Statistics Citations

**Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. ([https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm\\_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm\\_medium=PDF&utm\\_campaign=PDFCoverPages](https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages))**

## ➤ Probability Statistics

### Probability Statistics Parameters [P zero Flow 2012 5138]

| Parameter Code | Parameter Name                         | Value | Units         | Min Limit | Max Limit |
|----------------|----------------------------------------|-------|---------------|-----------|-----------|
| DRNAREA        | Drainage Area                          | 0.3   | square miles  | 1         | 1250      |
| STREAM_VARG    | Streamflow Variability Index from Grid | 0.62  | dimensionless | 0.24      | 1.12      |

### Probability Statistics Disclaimers [P zero Flow 2012 5138]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

### Probability Statistics Flow Report [P zero Flow 2012 5138]

| Statistic                   | Value   | Unit |
|-----------------------------|---------|------|
| Probability zero flow 1Day  | 0.0604  | dim  |
| Probability zero flow 7Day  | 0.0277  | dim  |
| Probability zero flow 30Day | 0.00135 | dim  |

#### Probability Statistics Citations

**Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (<http://pubs.usgs.gov/sir/2012/5138/>)**

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Application Version: 4.14.0

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1



# CULVERT ANALYSIS

**PID :** 116570      **Date :** 03/14/2025      **Project :** ERI-6

**Location :** STA. 641+50.14

**Description :** Drive Pipe

**Designer :** BLC

**HEADWATER CONTROL CODES:** INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

**Pipe Number :** 807      **Use HW :** 0      **Inlet Invert Elevation (ft.) :** 578.30      **Outlet Invert Elevation (ft.) :** 578.17  
**Pipe Quantity :** 1  
**Culvert Type :** Circular Smooth      **Pipe Length (ft.) :** 54.00      **Culvert Slope (ft./ft.) :** 0.0024  
**Corrugation Type :**  
**Pipe Size :** 18 in.  
**Design Manning 'n' :** (default)  
**Entrance Type :** No Headwall      **Loss Coef. Ke :** 0.2000

| FLOW<br>(cfs.) | HEAD<br>LOSS<br>(ft.) | HWI<br>(ft.) | HWO<br>(ft.) | FLOW<br>TYPE | VELOCITY<br>(fps.) | DN<br>(ft.) | DC<br>(ft.) | MANNING<br>N | HEADWATER<br>CONTROL | BURIED<br>DEPTH<br>(ft.) | TAILWATER<br>ELEVATION<br>(ft.) |
|----------------|-----------------------|--------------|--------------|--------------|--------------------|-------------|-------------|--------------|----------------------|--------------------------|---------------------------------|
| 6.04           | 0.65                  | 579.69       | 579.77       | 1 - A        | 5.12               | 1.37        | 0.95        | 0.0120       | OUTLET*              | 0.00                     | 578.17                          |
| 7.10           | 0.74                  | 579.85       | 579.94       | 1 - A        | 5.48               | 1.37        | 1.03        | 0.0120       | OUTLET*              | 0.00                     | 578.17                          |



# CULVERT ANALYSIS

**PID :** 116570      **Date :** 10/13/2025      **Project :** ERI-6

**Location :** STA. 645+36

**Description :** Drive Pipe

**Designer :** BLC

**HEADWATER CONTROL CODES:**      INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

**Pipe Number :** 808

**Use HW :** 0

**Inlet Invert Elevation (ft.) :** 578.85

**Outlet Invert Elevation (ft.) :** 578.50

**Pipe Quantity :** 1

**Culvert Type :** Circular Smooth

**Pipe Length (ft.) :** 87.00

**Culvert Slope (ft./ft.) :** 0.0040

**Corrugation Type :**

**Pipe Size :** 18 in.

**Design Manning 'n' :** (default)

**Entrance Type :** No Headwall

**Loss Coef. Ke :** 0.2000

| FLOW<br>(cfs.) | HEAD<br>LOSS<br>(ft.) | HWI<br>(ft.) | HWO<br>(ft.) | FLOW<br>TYPE | VELOCITY<br>(fps.) | DN<br>(ft.) | DC<br>(ft.) | MANNING<br>N | HEADWATER<br>CONTROL | BURIED<br>DEPTH<br>(ft.) | TAILWATER<br>ELEVATION<br>(ft.) |
|----------------|-----------------------|--------------|--------------|--------------|--------------------|-------------|-------------|--------------|----------------------|--------------------------|---------------------------------|
| 2.47           | 0.61                  | 579.68       | 579.71       | 1 - A        | 3.78               | 0.61        | 0.60        | 0.0120       | OUTLET*              | 0.00                     | 578.50                          |
| 2.68           | 0.63                  | 579.72       | 579.75       | 1 - A        | 3.88               | 0.63        | 0.62        | 0.0120       | OUTLET*              | 0.00                     | 578.50                          |



# CULVERT ANALYSIS

**PID :** 116570      **Date :** 10/13/2025      **Project :** ERI-6

**Location :** STA. 652+50

**Description :** Drive Pipe

**Designer :** BLC

**HEADWATER CONTROL CODES:**      INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

**Pipe Number :** 809      **Use HW :** 0      **Inlet Invert Elevation (ft.) :** 580.31      **Outlet Invert Elevation (ft.) :** 580.14  
**Pipe Quantity :** 1  
**Culvert Type :** Circular Smooth      **Pipe Length (ft.) :** 62.00      **Culvert Slope (ft./ft.) :** 0.0027  
**Corrugation Type :**  
**Pipe Size :** 18 in.  
**Design Manning 'n' :** (default)  
**Entrance Type :** No Headwall      **Loss Coef. Ke :** 0.2000

| FLOW<br>(cfs.) | HEAD<br>LOSS<br>(ft.) | HWI<br>(ft.) | HWO<br>(ft.) | FLOW<br>TYPE | VELOCITY<br>(fps.) | DN<br>(ft.) | DC<br>(ft.) | MANNING<br>N | HEADWATER<br>CONTROL | BURIED<br>DEPTH<br>(ft.) | TAILWATER<br>ELEVATION<br>(ft.) |
|----------------|-----------------------|--------------|--------------|--------------|--------------------|-------------|-------------|--------------|----------------------|--------------------------|---------------------------------|
| 1.02           | 0.32                  | 580.80       | 580.84       | 1 - A        | 2.93               | 0.42        | 0.38        | 0.0120       | OUTLET*              | 0.00                     | 580.14                          |
| 1.14           | 0.33                  | 580.83       | 580.87       | 1 - A        | 3.02               | 0.44        | 0.40        | 0.0120       | OUTLET*              | 0.00                     | 580.14                          |



# CULVERT ANALYSIS

**PID :** 116570      **Date :** 07/30/2025      **Project :** ERI-006

**Location :** 668+44.48

**Description :** Drive Pipe. Top of Drive El. 584.4

**Designer :** BLS

**HEADWATER CONTROL CODES:**      INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

**Pipe Number :** 1      **Use HW :** 0      **Inlet Invert Elevation (ft.) :** 580.32      **Outlet Invert Elevation (ft.) :** 580.11  
**Pipe Quantity :** 1  
**Culvert Type :** Circular Smooth      **Pipe Length (ft.) :** 30.00      **Culvert Slope (ft./ft.) :** 0.0070  
**Corrugation Type :**  
**Pipe Size :** 12 in.  
**Design Manning 'n' :** (default)  
**Entrance Type :** Half Headwall      **Loss Coef. Ke :** 0.2000

| FLOW<br>(cfs.) | HEAD<br>LOSS<br>(ft.) | HWI<br>(ft.) | HWO<br>(ft.) | FLOW<br>TYPE | VELOCITY<br>(fps.) | DN<br>(ft.) | DC<br>(ft.) | MANNING<br>N | HEADWATER<br>CONTROL | BURIED<br>DEPTH<br>(ft.) | TAILWATER<br>ELEVATION<br>(ft.) |
|----------------|-----------------------|--------------|--------------|--------------|--------------------|-------------|-------------|--------------|----------------------|--------------------------|---------------------------------|
| 1.10           | 0.12                  | 580.95       | N/A          | 1 - C        | 3.71               | 0.40        | 0.44        | 0.0120       | INLET                | 0.00                     | 580.11                          |
| 1.30           | 0.16                  | 581.01       | N/A          | 1 - C        | 3.88               | 0.44        | 0.48        | 0.0120       | INLET                | 0.00                     | 580.11                          |



# CULVERT ANALYSIS

**PID :** 116570      **Date :** 10/13/2025      **Project :** ERI-6

**Location :** STA. 668+50

**Description :** Drive Pipe

**Designer :** BLC

**HEADWATER CONTROL CODES:**      INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

**Pipe Number :** 601      **Use HW :** 0      **Inlet Invert Elevation (ft.) :** 582.31      **Outlet Invert Elevation (ft.) :** 581.99  
**Pipe Quantity :** 1  
**Culvert Type :** Circular Smooth      **Pipe Length (ft.) :** 22.00      **Culvert Slope (ft./ft.) :** 0.0145  
**Corrugation Type :**  
**Pipe Size :** 12 in.  
**Design Manning 'n' :** (default)  
**Entrance Type :** No Headwall      **Loss Coef. Ke :** 0.2000

| FLOW<br>(cfs.) | HEAD<br>LOSS<br>(ft.) | HWI<br>(ft.) | HWO<br>(ft.) | FLOW<br>TYPE | VELOCITY<br>(fps.) | DN<br>(ft.) | DC<br>(ft.) | MANNING<br>N | HEADWATER<br>CONTROL | BURIED<br>DEPTH<br>(ft.) | TAILWATER<br>ELEVATION<br>(ft.) |
|----------------|-----------------------|--------------|--------------|--------------|--------------------|-------------|-------------|--------------|----------------------|--------------------------|---------------------------------|
| 1.43           | 0.29                  | 583.04       | N/A          | 1 - C        | 5.22               | 0.38        | 0.51        | 0.0120       | INLET                | 0.00                     | 581.99                          |
| 1.60           | 0.32                  | 583.08       | N/A          | 1 - C        | 5.36               | 0.41        | 0.54        | 0.0120       | INLET                | 0.00                     | 581.99                          |



# CULVERT ANALYSIS

**PID :** 116570      **Date :** 07/30/2025      **Project :** ERI-006

**Location :** 680+76.66

**Description :** Drive Pipe. Road El. 586.6

**Designer :** BLS

**HEADWATER CONTROL CODES:**      INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

**Pipe Number :** 1      **Use HW :** 0      **Inlet Invert Elevation (ft.) :** 583.16      **Outlet Invert Elevation (ft.) :** 582.81  
**Pipe Quantity :** 1  
**Culvert Type :** Circular Smooth      **Pipe Length (ft.) :** 49.00      **Culvert Slope (ft./ft.) :** 0.0071  
**Corrugation Type :**  
**Pipe Size :** 12 in.  
**Design Manning 'n' :** (default)  
**Entrance Type :** Half Headwall      **Loss Coef. Ke :** 0.2000

| FLOW<br>(cfs.) | HEAD<br>LOSS<br>(ft.) | HWI<br>(ft.) | HWO<br>(ft.) | FLOW<br>TYPE | VELOCITY<br>(fps.) | DN<br>(ft.) | DC<br>(ft.) | MANNING<br>N | HEADWATER<br>CONTROL | BURIED<br>DEPTH<br>(ft.) | TAILWATER<br>ELEVATION<br>(ft.) |
|----------------|-----------------------|--------------|--------------|--------------|--------------------|-------------|-------------|--------------|----------------------|--------------------------|---------------------------------|
| 4.10           | 1.06                  | 584.70       | 584.80       | 2 - F        | 5.73               | 1.00        | 0.86        | 0.0120       | OUTLET**             | 0.00                     | 582.81                          |
| 4.60           | 1.33                  | 584.92       | 585.09       | 2 - F        | 6.21               | 1.00        | 0.89        | 0.0120       | OUTLET**             | 0.00                     | 582.81                          |



# CULVERT ANALYSIS

**PID :** 116570      **Date :** 10/13/2025      **Project :** ERI-6

**Location :** Perkins RAB

**Description :** HW612-HW613 STA. 686+77

**Designer :** BLC

**HEADWATER CONTROL CODES:**      INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

**Pipe Number :** 610

**Use HW :** 0

**Inlet Invert Elevation (ft.) :** 579.48

**Outlet Invert Elevation (ft.) :** 578.81

**Pipe Quantity :** 1

**Culvert Type :** Circular Smooth

**Pipe Length (ft.) :** 45.00

**Culvert Slope (ft./ft.) :** 0.0149

**Corrugation Type :**

**Pipe Size :** 12 in.

**Design Manning 'n' :** (default)

**Entrance Type :** Half Headwall

**Loss Coef. Ke :** 0.2000

| FLOW<br>(cfs.) | HEAD<br>LOSS<br>(ft.) | HWI<br>(ft.) | HWO<br>(ft.) | FLOW<br>TYPE | VELOCITY<br>(fps.) | DN<br>(ft.) | DC<br>(ft.) | MANNING<br>N | HEADWATER<br>CONTROL | BURIED<br>DEPTH<br>(ft.) | TAILWATER<br>ELEVATION<br>(ft.) |
|----------------|-----------------------|--------------|--------------|--------------|--------------------|-------------|-------------|--------------|----------------------|--------------------------|---------------------------------|
| 0.89           | 0.53                  | 580.03       | N/A          | 1 - C        | 4.62               | 0.29        | 0.40        | 0.0120       | INLET                | 0.00                     | 578.81                          |
| 1.07           | 0.57                  | 580.10       | N/A          | 1 - C        | 4.87               | 0.32        | 0.43        | 0.0120       | INLET                | 0.00                     | 578.81                          |



# CULVERT ANALYSIS

**PID :** 116570      **Date :** 04/02/2025      **Project :** ERI-6

**Location :** Perkins RAB

**Description :** Road Crossing HW617 - HW618 STA. 50+12

**Designer :** BLC

**HEADWATER CONTROL CODES:**      INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

**Pipe Number :** 613      **Use HW :** 0      **Inlet Invert Elevation (ft.) :** 583.66      **Outlet Invert Elevation (ft.) :** 583.59  
**Pipe Quantity :** 1  
**Culvert Type :** Circular Smooth      **Pipe Length (ft.) :** 86.00      **Culvert Slope (ft./ft.) :** 0.0008  
**Corrugation Type :**  
**Pipe Size :** 15 in.  
**Design Manning 'n' :** (default)  
**Entrance Type :** Half Headwall      **Loss Coef. Ke :** 0.2000

| FLOW<br>(cfs.) | HEAD<br>LOSS<br>(ft.) | HWI<br>(ft.) | HWO<br>(ft.) | FLOW<br>TYPE | VELOCITY<br>(fps.) | DN<br>(ft.) | DC<br>(ft.) | MANNING<br>N | HEADWATER<br>CONTROL | BURIED<br>DEPTH<br>(ft.) | TAILWATER<br>ELEVATION<br>(ft.) |
|----------------|-----------------------|--------------|--------------|--------------|--------------------|-------------|-------------|--------------|----------------------|--------------------------|---------------------------------|
| 2.96           | 0.50                  | 584.66       | 584.78       | 1 - A        | 4.25               | 1.14        | 0.69        | 0.0120       | OUTLET*              | 0.00                     | 583.59                          |
| 3.34           | 0.56                  | 584.73       | 584.89       | 1 - A        | 4.44               | 1.14        | 0.74        | 0.0120       | OUTLET*              | 0.00                     | 583.59                          |



# CULVERT ANALYSIS

PID : 116570      Date : 02/01/2024      Project : ERI-6

Location : STA. 675+15

Description : HW001-HW002 CULVERT

Designer : BLC

**HEADWATER CONTROL CODES:**      INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

Pipe Number : 1      Use HW : 0      Inlet Invert Elevation (ft.) : 579.10      Outlet Invert Elevation (ft.) : 578.40  
Pipe Quantity : 1  
Culvert Type : Elliptical      Pipe Length (ft.) : 86.33      Culvert Slope (ft./ft.) : 0.0081  
Corrugation Type :  
Pipe Size : 29 x 45 in.  
Design Manning 'n' : (default)  
Entrance Type : Half Headwall      Loss Coef. Ke : 0.2000

| FLOW<br>(cfs.) | HEAD<br>LOSS<br>(ft.) | HWI<br>(ft.) | HWO<br>(ft.) | FLOW<br>TYPE | VELOCITY<br>(fps.) | DN<br>(ft.) | DC<br>(ft.) | MANNING<br>N | HEADWATER<br>CONTROL | BURIED<br>DEPTH<br>(ft.) | TAILWATER<br>ELEVATION<br>(ft.) |
|----------------|-----------------------|--------------|--------------|--------------|--------------------|-------------|-------------|--------------|----------------------|--------------------------|---------------------------------|
| 24.83          | 0.74                  | 581.02       | N/A          | 1 - C        | 8.33               | 1.02        | 1.34        | 0.0120       | INLET                | 0.00                     | 578.40                          |
| 30.26          | 0.92                  | 581.27       | N/A          | 1 - C        | 8.83               | 1.14        | 1.49        | 0.0120       | INLET                | 0.00                     | 578.40                          |



# CULVERT ANALYSIS

**PID :** 116570      **Date :** 07/30/2025      **Project :** Erie 6

**Location :** New Culvert Perkins RAB

**Description :** US 6 Sta. 687+48.23

**Designer :** BLS

**HEADWATER CONTROL CODES:** INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

**Pipe Number :** 1      **Use HW :** 0      **Inlet Invert Elevation (ft.) :** 574.95      **Outlet Invert Elevation (ft.) :** 574.45  
**Pipe Quantity :** 1  
**Culvert Type :** Circular Smooth      **Pipe Length (ft.) :** 108.00      **Culvert Slope (ft./ft.) :** 0.0046  
**Corrugation Type :**  
**Pipe Size :** 72 in.  
**Design Manning 'n' :** (default)  
**Entrance Type :** Full Headwall      **Loss Coef. Ke :** 0.2000

| FLOW<br>(cfs.) | HEAD<br>LOSS<br>(ft.) | HWI<br>(ft.) | HWO<br>(ft.) | FLOW<br>TYPE | VELOCITY<br>(fps.) | DN<br>(ft.) | DC<br>(ft.) | MANNING<br>N | HEADWATER<br>CONTROL | BURIED<br>DEPTH<br>(ft.) | TAILWATER<br>ELEVATION<br>(ft.) |
|----------------|-----------------------|--------------|--------------|--------------|--------------------|-------------|-------------|--------------|----------------------|--------------------------|---------------------------------|
| 153.00         | 0.67                  | 579.78       | N/A          | 1 - C        | 9.39               | 2.97        | 3.36        | 0.0120       | INLET                | 0.00                     | 576.50                          |
| 227.00         | 1.59                  | 581.10       | N/A          | 1 - C        | 12.04              | 3.79        | 4.12        | 0.0120       | INLET                | 0.00                     | 576.50                          |

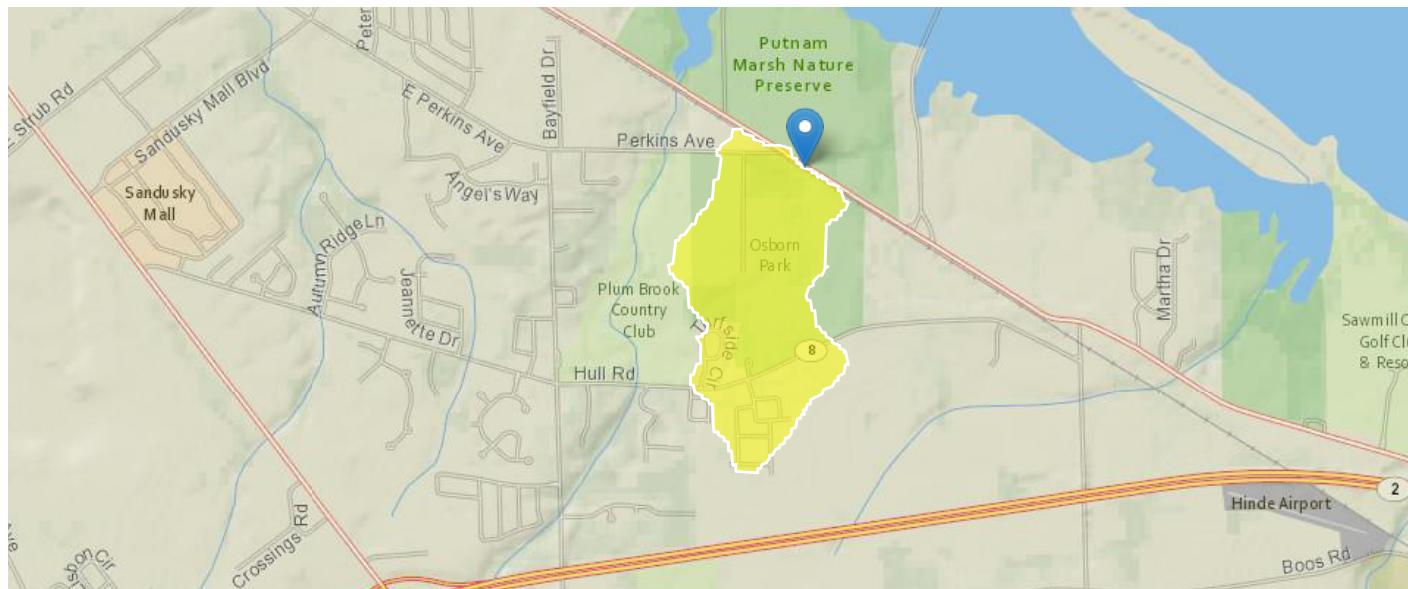
# StreamStats Report - 1879259

Region ID: OH

Workspace ID: OH20230503192931116000

Clicked Point (Latitude, Longitude): 41.41967, -82.63221

Time: 2023-05-03 15:29:54 -0400



[+ Collapse All](#)

## Basin Characteristics

| Parameter Code | Parameter Description                                                                                                                                | Value   | Unit            |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------|
| CSL1085LFP     | Change in elevation divided by length between points 10 and 85 percent of distance along the longest flow path to the basin divide, LFP from 2D grid | 37.2    | feet per mi     |
| DRNAREA        | Area that drains to a point on a stream                                                                                                              | 0.35    | square miles    |
| FOREST         | Percentage of area covered by forest                                                                                                                 | 12.3    | percent         |
| LAT_CENT       | Latitude of Basin Centroid                                                                                                                           | 41.414  | decimal degrees |
| LC92STOR       | Percentage of water bodies and wetlands determined from the NLCD                                                                                     | 0.9     | percent         |
| LONG_CENT      | Longitude Basin Centroid                                                                                                                             | 82.6348 | decimal degrees |
| OHREGA         | Ohio Region A Indicator                                                                                                                              | 1       | dimensionless   |
| OHREGC         | Ohio Region C Indicator                                                                                                                              | 0       | dimensionless   |
| PRECIPCENT     | Mean Annual Precip at Basin Centroid                                                                                                                 | 34.2    | inches          |
| STREAM_VARG    | Streamflow variability index as defined in WRIR 02-4068, computed from regional grid                                                                 | 0.62    | dimensionless   |

## ➤ Peak-Flow Statistics

### Peak-Flow Statistics Parameters [Peak Flow Full Model Reg A SIR2019 5018]

| Parameter Code | Parameter Name                           | Value | Units         | Min Limit | Max Limit |
|----------------|------------------------------------------|-------|---------------|-----------|-----------|
| DRNAREA        | Drainage Area                            | 0.35  | square miles  | 0.04      | 5989      |
| OHREGC         | Ohio Region C Indicator 1 if in C else 0 | 0     | dimensionless | 0         | 1         |
| OHREGA         | Ohio Region A Indicator 1 if in A else 0 | 1     | dimensionless | 0         | 1         |
| CSL1085LFP     | Stream Slope 10 and 85 Longest Flow Path | 37.2  | feet per mi   | 1.53      | 516       |
| LC92STOR       | Percent Storage from NLCD1992            | 0.9   | percent       | 0         | 25.35     |

### Peak-Flow Statistics Flow Report [Peak Flow Full Model Reg A SIR2019 5018]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic             | Value | Unit               | PII  | PIu  | ASEp |
|-----------------------|-------|--------------------|------|------|------|
| 50-percent AEP flood  | 45.4  | ft <sup>3</sup> /s | 23.9 | 86.1 | 40.1 |
| 20-percent AEP flood  | 81.1  | ft <sup>3</sup> /s | 44.7 | 147  | 37.2 |
| 10-percent AEP flood  | 110   | ft <sup>3</sup> /s | 60.2 | 201  | 37.6 |
| 4-percent AEP flood   | 153   | ft <sup>3</sup> /s | 83.1 | 282  | 38.1 |
| 2-percent AEP flood   | 189   | ft <sup>3</sup> /s | 102  | 352  | 37.8 |
| 1-percent AEP flood   | 227   | ft <sup>3</sup> /s | 121  | 427  | 39.6 |
| 0.2-percent AEP flood | 331   | ft <sup>3</sup> /s | 174  | 630  | 40.3 |

#### Peak-Flow Statistics Citations

Koltun, G.F.,2019, Flood-frequency estimates for Ohio streamgages based on data through water year 2015 and techniques for estimating flood-frequency characteristics of rural, unregulated Ohio streams: U.S. Geological Survey Scientific Investigations Report 2019–5018, 25 p. (<https://dx.doi.org/10.3133/sir20195018>)

## ➤ Low-Flow Statistics

### Low-Flow Statistics Parameters [Low Flow Region A 2012 5138]

| Parameter Code | Parameter Name                         | Value | Units         | Min Limit | Max Limit |
|----------------|----------------------------------------|-------|---------------|-----------|-----------|
| DRNAREA        | Drainage Area                          | 0.35  | square miles  | 1         | 1250      |
| STREAM_VARG    | Streamflow Variability Index from Grid | 0.62  | dimensionless | 0.24      | 1.12      |

### Low-Flow Statistics Disclaimers [Low Flow Region A 2012 5138]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

### Low-Flow Statistics Flow Report [Low Flow Region A 2012 5138]

| Statistic               | Value   | Unit               |
|-------------------------|---------|--------------------|
| 1 Day 10 Year Low Flow  | 0.00228 | ft <sup>3</sup> /s |
| 7 Day 10 Year Low Flow  | 0.00313 | ft <sup>3</sup> /s |
| 30 Day 10 Year Low Flow | 0.00532 | ft <sup>3</sup> /s |
| 90 Day 10 Year Low Flow | 0.00968 | ft <sup>3</sup> /s |

#### Low-Flow Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (<http://pubs.usgs.gov/sir/2012/5138/>)

### ➤ Flow-Duration Statistics

#### Flow-Duration Statistics Parameters [Low Flow Region A 2012 5138]

| Parameter Code | Parameter Name                         | Value | Units         | Min Limit | Max Limit |
|----------------|----------------------------------------|-------|---------------|-----------|-----------|
| DRNAREA        | Drainage Area                          | 0.35  | square miles  | 1         | 1250      |
| STREAM_VARG    | Streamflow Variability Index from Grid | 0.62  | dimensionless | 0.24      | 1.12      |

#### Flow-Duration Statistics Disclaimers [Low Flow Region A 2012 5138]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

#### Flow-Duration Statistics Flow Report [Low Flow Region A 2012 5138]

| Statistic           | Value  | Unit               |
|---------------------|--------|--------------------|
| 80 Percent Duration | 0.0235 | ft <sup>3</sup> /s |

#### Flow-Duration Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (<http://pubs.usgs.gov/sir/2012/5138/>)

### ➤ Annual Flow Statistics

#### Annual Flow Statistics Parameters [Low Flow LatGT 41.2 wri02 4068]

| Parameter Code | Parameter Name                       | Value  | Units           | Min Limit | Max Limit |
|----------------|--------------------------------------|--------|-----------------|-----------|-----------|
| DRNAREA        | Drainage Area                        | 0.35   | square miles    | 0.12      | 7422      |
| LAT_CENT       | Latitude of Basin Centroid           | 41.414 | decimal degrees | 41.2      | 41.59     |
| PRECIPCENT     | Mean Annual Precip at Basin Centroid | 34.2   | inches          | 34        | 43.2      |

#### Annual Flow Statistics Flow Report [Low Flow LatGT 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic        | Value | Unit               | SE   | ASEp |
|------------------|-------|--------------------|------|------|
| Mean Annual Flow | 0.295 | ft <sup>3</sup> /s | 11.4 | 11.4 |

#### Annual Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (<https://pubs.er.usgs.gov/publication/wri024068>)

## ➤ Monthly Flow Statistics

### Monthly Flow Statistics Parameters [Low Flow LatGT 41.2 wri02 4068]

| Parameter Code | Parameter Name                         | Value  | Units           | Min Limit | Max Limit |
|----------------|----------------------------------------|--------|-----------------|-----------|-----------|
| DRNAREA        | Drainage Area                          | 0.35   | square miles    | 0.12      | 7422      |
| LC92STOR       | Percent Storage from NLCD1992          | 0.9    | percent         | 0         | 19        |
| PRECIPCENT     | Mean Annual Precip at Basin Centroid   | 34.2   | inches          | 34        | 43.2      |
| FOREST         | Percent Forest                         | 12.3   | percent         | 0         | 99.1      |
| LAT_CENT       | Latitude of Basin Centroid             | 41.414 | decimal degrees | 41.2      | 41.59     |
| STREAM_VARG    | Streamflow Variability Index from Grid | 0.62   | dimensionless   | 0.25      | 1.13      |

### Monthly Flow Statistics Flow Report [Low Flow LatGT 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic           | Value  | Unit   | SE   | ASEp |
|---------------------|--------|--------|------|------|
| January Mean Flow   | 0.394  | ft^3/s | 16.6 | 16.6 |
| February Mean Flow  | 0.649  | ft^3/s | 11.9 | 11.9 |
| March Mean Flow     | 0.702  | ft^3/s | 14   | 14   |
| April Mean Flow     | 0.607  | ft^3/s | 11.2 | 11.2 |
| May Mean Flow       | 0.429  | ft^3/s | 19.5 | 19.5 |
| June Mean Flow      | 0.224  | ft^3/s | 27   | 27   |
| July Mean Flow      | 0.14   | ft^3/s | 28.2 | 28.2 |
| August Mean Flow    | 0.0672 | ft^3/s | 36.8 | 36.8 |
| September Mean Flow | 0.0395 | ft^3/s | 43.6 | 43.6 |
| October Mean Flow   | 0.16   | ft^3/s | 50.8 | 50.8 |
| November Mean Flow  | 0.265  | ft^3/s | 37.5 | 37.5 |
| December Mean Flow  | 0.454  | ft^3/s | 21.8 | 21.8 |

#### Monthly Flow Statistics Citations

**Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (<https://pubs.er.usgs.gov/publication/wri024068>)**

## ➤ General Flow Statistics

### General Flow Statistics Parameters [Low Flow LatGT 41.2 wri02 4068]

| Parameter Code | Parameter Name                         | Value  | Units           | Min Limit | Max Limit |
|----------------|----------------------------------------|--------|-----------------|-----------|-----------|
| DRNAREA        | Drainage Area                          | 0.35   | square miles    | 0.12      | 7422      |
| LC92STOR       | Percent Storage from NLCD1992          | 0.9    | percent         | 0         | 19        |
| STREAM_VARG    | Streamflow Variability Index from Grid | 0.62   | dimensionless   | 0.25      | 1.13      |
| LAT_CENT       | Latitude of Basin Centroid             | 41.414 | decimal degrees | 41.2      | 41.59     |

## General Flow Statistics Flow Report [Low Flow LatGT 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic                | Value  | Unit   | SE   | ASEp |
|--------------------------|--------|--------|------|------|
| Harmonic Mean Streamflow | 0.0227 | ft^3/s | 65.9 | 65.9 |

### General Flow Statistics Citations

**Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (<https://pubs.er.usgs.gov/publication/wri024068>)**

## ➤ Flow Percentile Statistics

### Flow Percentile Statistics Parameters [Low Flow LatGT 41.2 wri02 4068]

| Parameter Code | Parameter Name                         | Value   | Units           | Min Limit | Max Limit |
|----------------|----------------------------------------|---------|-----------------|-----------|-----------|
| DRNAREA        | Drainage Area                          | 0.35    | square miles    | 0.12      | 7422      |
| LC92STOR       | Percent Storage from NLCD1992          | 0.9     | percent         | 0         | 19        |
| STREAM_VARG    | Streamflow Variability Index from Grid | 0.62    | dimensionless   | 0.25      | 1.13      |
| LAT_CENT       | Latitude of Basin Centroid             | 41.414  | decimal degrees | 41.2      | 41.59     |
| LONG_CENT      | Longitude of Basin Centroid            | 82.6348 | decimal degrees | 80.53     | 84.6      |

### Flow Percentile Statistics Flow Report [Low Flow LatGT 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic                   | Value  | Unit   | SE   | ASEp |
|-----------------------------|--------|--------|------|------|
| 25th Percentile Flow        | 0.0481 | ft^3/s | 29.2 | 29.2 |
| 50th Percentile Flow Median | 0.115  | ft^3/s | 40.3 | 40.3 |
| 75th Percentile Flow        | 0.276  | ft^3/s | 47.9 | 47.9 |

### Flow Percentile Statistics Citations

**Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (<https://pubs.er.usgs.gov/publication/wri024068>)**

## ➤ Bankfull Statistics

### Bankfull Statistics Parameters [Interior Plains D Bieger 2015]

| Parameter Code | Parameter Name | Value | Units        | Min Limit | Max Limit  |
|----------------|----------------|-------|--------------|-----------|------------|
| DRNAREA        | Drainage Area  | 0.35  | square miles | 0.19305   | 59927.7393 |

### Bankfull Statistics Parameters [Central Lowland P Bieger 2015]

| Parameter Code | Parameter Name | Value | Units        | Min Limit | Max Limit   |
|----------------|----------------|-------|--------------|-----------|-------------|
| DRNAREA        | Drainage Area  | 0.35  | square miles | 0.200772  | 59927.66594 |

## Bankfull Statistics Parameters [USA Bieger 2015]

| Parameter Code | Parameter Name | Value | Units        | Min Limit | Max Limit  |
|----------------|----------------|-------|--------------|-----------|------------|
| DRNAREA        | Drainage Area  | 0.35  | square miles | 0.07722   | 59927.7393 |

## Bankfull Statistics Flow Report [Interior Plains D Bieger 2015]

| Statistic                             | Value | Unit |
|---------------------------------------|-------|------|
| Bieger_D_channel_width                | 8.11  | ft   |
| Bieger_D_channel_depth                | 1.22  | ft   |
| Bieger_D_channel_cross_sectional_area | 13.1  | ft^2 |

## Bankfull Statistics Flow Report [Central Lowland P Bieger 2015]

| Statistic                             | Value | Unit |
|---------------------------------------|-------|------|
| Bieger_P_channel_width                | 9.46  | ft   |
| Bieger_P_channel_depth                | 1.55  | ft   |
| Bieger_P_channel_cross_sectional_area | 12.9  | ft^2 |

## Bankfull Statistics Flow Report [USA Bieger 2015]

| Statistic                               | Value | Unit |
|-----------------------------------------|-------|------|
| Bieger_USA_channel_width                | 8.56  | ft   |
| Bieger_USA_channel_depth                | 0.964 | ft   |
| Bieger_USA_channel_cross_sectional_area | 9.69  | ft^2 |

## Bankfull Statistics Flow Report [Area-Averaged]

| Statistic                               | Value | Unit |
|-----------------------------------------|-------|------|
| Bieger_D_channel_width                  | 8.11  | ft   |
| Bieger_D_channel_depth                  | 1.22  | ft   |
| Bieger_D_channel_cross_sectional_area   | 13.1  | ft^2 |
| Bieger_P_channel_width                  | 9.46  | ft   |
| Bieger_P_channel_depth                  | 1.55  | ft   |
| Bieger_P_channel_cross_sectional_area   | 12.9  | ft^2 |
| Bieger_USA_channel_width                | 8.56  | ft   |
| Bieger_USA_channel_depth                | 0.964 | ft   |
| Bieger_USA_channel_cross_sectional_area | 9.69  | ft^2 |

### *Bankfull Statistics Citations*

**Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. ([https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm\\_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm\\_medium=PDF&utm\\_campaign=PDFCoverPages](https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages))**

## ➤ Probability Statistics

### Probability Statistics Parameters [P zero Flow 2012 5138]

| Parameter Code | Parameter Name                         | Value | Units         | Min Limit | Max Limit |
|----------------|----------------------------------------|-------|---------------|-----------|-----------|
| DRNAREA        | Drainage Area                          | 0.35  | square miles  | 1         | 1250      |
| STREAM_VARG    | Streamflow Variability Index from Grid | 0.62  | dimensionless | 0.24      | 1.12      |

### Probability Statistics Disclaimers [P zero Flow 2012 5138]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

### Probability Statistics Flow Report [P zero Flow 2012 5138]

| Statistic                   | Value   | Unit |
|-----------------------------|---------|------|
| Probability zero flow 1Day  | 0.0604  | dim  |
| Probability zero flow 7Day  | 0.0277  | dim  |
| Probability zero flow 30Day | 0.00135 | dim  |

#### *Probability Statistics Citations*

**Koltun, G.F., and Kula, S.P., 2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (<http://pubs.usgs.gov/sir/2012/5138/>)**

## ➤ Maximum Probable Flood Statistics

### Maximum Probable Flood Statistics Parameters [2.3 Percent (0.00795 square miles) Crippen Bue Region 6]

| Parameter Code | Parameter Name | Value | Units        | Min Limit | Max Limit |
|----------------|----------------|-------|--------------|-----------|-----------|
| DRNAREA        | Drainage Area  | 0.35  | square miles | 0.1       | 10000     |

### Maximum Probable Flood Statistics Disclaimers [2.3 Percent (0.00795 square miles) Crippen Bue Region 6]

Weighted flows were not calculated. Users should be careful to evaluate the applicability of the provided estimates. Percentage of area falls outside where region is undefined. Whole estimates have been provided using available regional equations.

### Maximum Probable Flood Statistics Flow Report [2.3 Percent (0.00795 square miles) Crippen Bue Region 6]

| Statistic                          | Value | Unit               |
|------------------------------------|-------|--------------------|
| Maximum Flood Crippen Bue Regional | 2830  | ft <sup>3</sup> /s |

#### *Maximum Probable Flood Statistics Citations*

**Crippen, J.R. and Bue, Conrad D. 1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (<https://pubs.usgs.gov/wsp/1887/report.pdf>)**

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StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1