Ohio 2010 Integrated Report

Section H

Evaluating Beneficial Use: Public Drinking Water Supply

H1. Background

The 2010 Integrated Report is the second reporting cycle to include assessment of the public drinking water supply (PDWS) beneficial use. Ohio continues to look for connections between Clean Water Act and Safe Drinking Water Act (SDWA) activities and leverage the programs to clean up and protect drinking water sources. Acknowledgement of the public water supply use and identification of impaired waters provides an effective issue in which to engage the public and stakeholders in watershed-wide planning and implementation activities. Conversely, the public water systems can be effective partners in these efforts and stand to benefit through reduced treatment costs, reduced risk to human health, and credits toward achieving compliance with new SDWA regulations via source water controls in the watershed.

Assessments included in this cycle are based primarily on treated water quality data and to a limited extent other source water quality data available from Ohio EPA and external sources. Assessments for each public water system were completed for the nitrate and pesticide indicators. Information on relevant public water system treatment information, intake locations, number of reservoirs and type, water quality data, and assessment determinations were collected and stored in a database. Assessments were completed for stream sources and on-stream impounded reservoir sources with active drinking water intakes. Any lakes that have been sampled through the Ohio's Inland Lakes Program were also evaluated for the PDWS beneficial use. Figure H-1 identifies Ohio watershed assessment units (WAUs) that contain surface waters currently utilized as drinking water sources by a public water system. While previous assessment cycles focused primarily on stream intakes, this report expands identification of PDWS waters to include all lakes and the associated WAUs.

Ohio is in the process of adopting additional water quality criteria for protection of the PDWS beneficial use and will expand assessments as criteria become finalized. Final adoption of the current rule package containing these rules was delayed but should be completed prior to the next reporting cycle. Within the next few years Ohio intends to reevaluate where the PDWS beneficial use is designated and how the criteria are applied and propose changes to the water quality standards if necessary.

To assist with future criteria development for protection against harmful algal blooms, Ohio EPA surveyed public water systems during autumn 2009 to obtain information on current treatment processes, algae control measures, and source water treatment costs. This information will also be used to assess the potential and occurrence of algal toxins in Ohio drinking water sources.

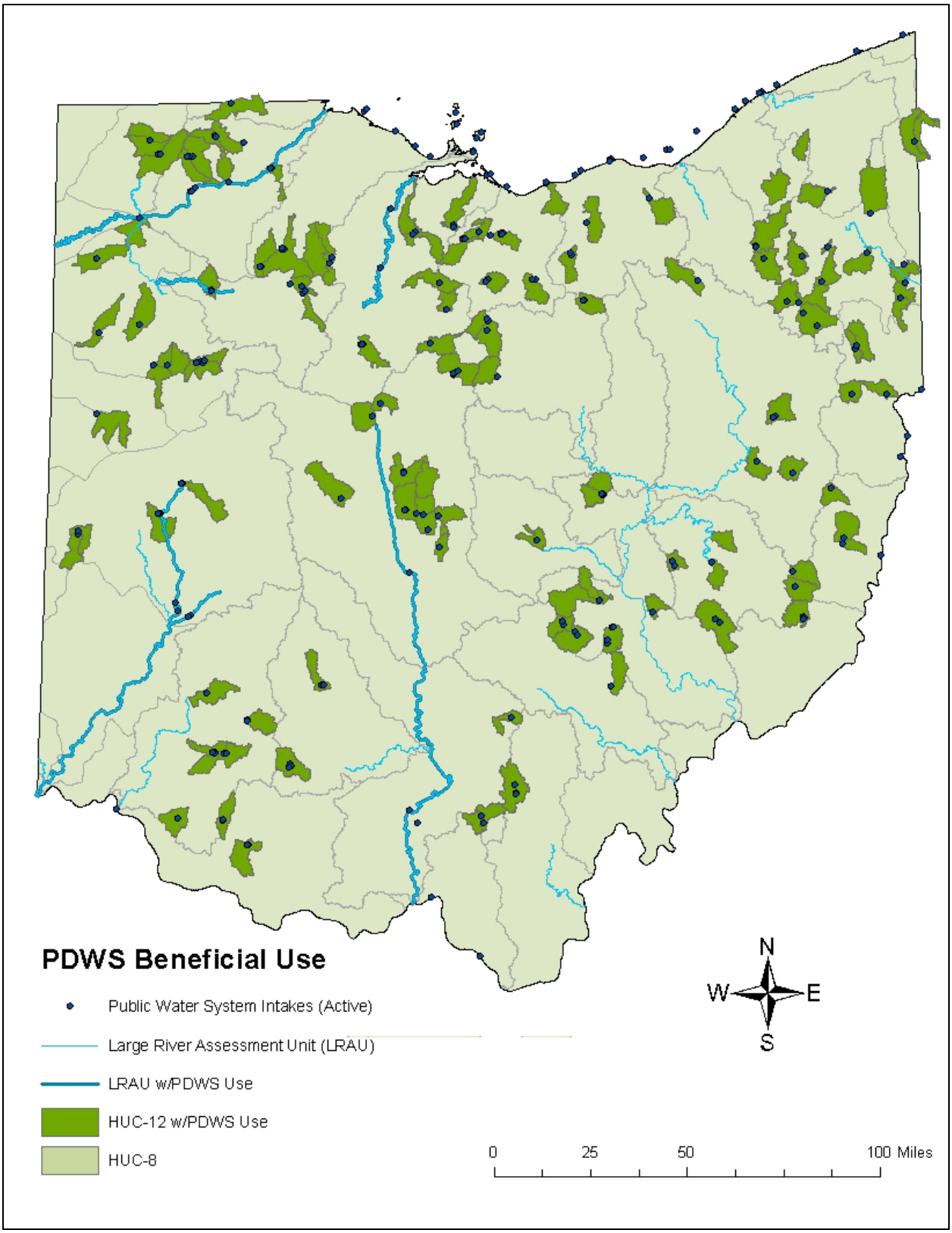

Figure H-1. Ohio watershed (HUC12) and large river assessment units that contain at least one active surface water drinking water intake.

H2. Evaluation Method

The 2010 PDWS use impairment list was developed using public water system compliance monitoring treated data and ambient water quality data from January 2004 through December 2008. Water quality data were requested and obtained from the Syngenta Crop Protection, Inc. Atrazine Monitoring Program (AMP; 2004-2008). Treated water quality data were obtained from the Safe Drinking Water Information System (SDWIS) database, which contains all SDWA compliance data submitted to the Division of Drinking and Ground Waters (DDAGW) by Ohio public water systems and their certified laboratories.

Treated water quality data could only be used for the assessments if the water system did not blend with ground water, selectively pump from the stream source to an upground reservoir to avoid contamination, or use a nitrate or pesticide removal treatment process. A significant number of water systems use activated carbon during the water treatment process, which precludes use of the treated pesticide data for PDWS assessments and leads to a significant number of assessments completed with nitrate data only.

Water quality data for each indicator were compared to the numeric chemical water quality criteria for the protection of human health (OAC 3745-1-33 and 34). Criteria were applied per the methodology as annual average concentrations except for nitrate. At elevated levels, nitrate can cause acute health effects and the SDWA finished water standard applies as a maximum concentration not to be exceeded. Consequently, the water quality criteria for nitrate will be applied as a maximum value. Annual time-weighted mean pesticide concentrations were calculated by taking the annual average of the quarterly averages and comparing to the water quality criteria.

The PDWS zone includes waters where the PDWS beneficial use is designated (e.g., waters within 500 yards of an active intake or waters of a publically owned lake). An impairment determination was assessed for each indicator at each PDWS zone and then combined for an overall status (Full Support; Impaired; or Not Assessed, Insufficient Data) for each PDWS zone. For assessment units with multiple PDWS zones, the attainment statuses of all zones were combined and the lowest attainment status applied to determine the PDWS assessment status for the entire assessment unit. That is, the overall AU assessment status is considered "Impaired" if any of the PDWS zones have an impaired attainment status. Conversely, the overall assessment status for the AU could be listed as "Full Support" only if sufficient data for at least the nitrate indicator was available to determine the attainment status for all PDWS zones within the AU.

The table below displays some potential scenarios that might occur within an assessment unit, either with one PDWS zone or multiple zones. In each case, the reverse situation of what is shown might occur (e.g., for the first row, full support of the first indicator and insufficient data for the second indicator would result in an AU assessment status of insufficient data).

Nitrate Indicator	Pesticide or Other Indicator	AU Assessment Status
Full support	Full support/Insufficient data	Full support
Full support	Impaired	Impaired
Impaired	Insufficient data/Full Support/Insufficient data	Impaired
Insufficient data	Impaired	Impaired
Insufficient data	Insufficient data/Full Support	Insufficient data

Data were also assessed to identify waters that meet "watch list" conditions. Source waters were placed on the "watch list" where water quality was impacted but not at a level that indicates impairment. Waters may remain on the watch list based on historical data if current raw water data or applicable finished water quality data are not available. While these waters are still considered in full attainment of the PDWS use, they will be targeted for additional monitoring and more frequent assessment if resources are available. Table H-1 identifies impaired and "watch list" water quality conditions.

Table H-1. Public drinking water supply impairment determination.
Applies to in-stream ambient and treated water quality data from 2004 through December 2008.

Indicator	**Impaired Conditions**
Nitrate	☐ Two or more excursions[1] above the WQ criterion within the 5 year period
Pesticides	☐ Annual average exceeds WQ criteria
Other Contaminants	☐ Annual average exceeds WQ criteria
Cryptosporidium[2]	☐ Annual average exceeds WQ criterion (1.0 oocysts/L)
Indicator	**Full Attainment Conditions**
Nitrate	☐ No more than one excursion[1] above the WQ criteria within the 5 year period
Pesticides	☐ Annual average does not exceed the WQ criteria
Other Contaminants	☐ Annual average does not exceed the WQ criteria
Cryptosporidium	☐ Annual average does not exceed the WQ criterion
Indicator	**"Watch List" Conditions** *Source waters targeted for additional monitoring and assessment*
Nitrate	☐ Maximum instantaneous value > 8 mg/L (80% of WQ criterion)
Pesticides	☐ Running quarterly average ≥ WQ criteria ☐ Maximum instantaneous value ≥ 4x WQ criteria
Other Contaminants	☐ Maximum instantaneous value ≥ WQ criteria
Cryptosporidium	☐ Annual average ≥ 0.075 oocysts/L

[1] Excursions must be at least 30 days apart in order to capture separate or extended source water quality events.
[2] Impaired conditions for *Cryptosporidium* are based on water quality criteria that Ohio EPA intends to develop.
WQ Criteria - Water Quality Criteria defined in OAC Chapter 3745-1 established to protect in-stream water quality for the PDWS beneficial use (Human health - Drinking Water)

Most of the nitrate assessments were completed with sufficient samples and well over the recommended minimum sample counts described in the PDWS assessment methodology (http://www.epa.ohio.gov/portals/35/tmdl/2006IntReport/IR06_app_C_PDWSmethodology.pdf). Much lower sample counts for pesticides were available and several assessments were completed with only eight samples. Use of less than ten samples was allowed if the samples were collected from at least two separate years, the samples were all within the spring runoff period (typically March through June), and all results were well below (all results <50%) the water quality criteria. Exception to the ten sample minimum was allowed if the PDWS zone was in an area with minimal atrazine application, all samples were well below the criteria, and available samples were collected during the spring runoff period when occurrence is most likely.

To provide additional information within the "Not Assessed" reporting category 3, "i" was added to note when some water quality data were available but not enough to complete an assessment. A determination was also made to retain all impaired listings until sufficient valid data were obtained to justify delisting. For example, several of the Maumee River large river assessment units were listed in 2008 as impaired due to elevated nitrate with two or more excursions above the water quality criteria during the 5 year assessment window (2002-2006 for

the 2008 IR). For the 2010 reporting cycle, there was only one excursion within the 2004-2008 timeframe. The impaired status will remain until there are 5 consecutive years without any excursions and sufficient raw water data are obtained. This decision was also supported by ancillary water quality data on the Maumee that indicate nitrate levels have not dropped within the past 5 years and spikes above the water quality criteria continue to occur regularly.

For the 2010 assessment cycle, only the nitrate and pesticide indicators were evaluated in-depth. Other contaminants monitored by the public water systems for SDWA compliance and reported in the SDWIS database were also reviewed but no in-stream raw water data were evaluated for these contaminants. All available *Cryptosporidium* data from SDWA compliance monitoring were reviewed for this assessment cycle, but the water quality criteria have not yet been established and no impairment determinations could be made based on this parameter.

H3. Results

Using the PDWS assessment methodology and available water quality data, results for the PDWS beneficial use are presented here for all watershed, large river, and Lake Erie assessment units where the PDWS use applies. Applicable water quality data were evaluated to determine an impairment status for each key indicator in each assessment unit. In order to be considered "assessed," sufficient data were required for only the nitrate indicator. There are a total of 126 public water systems with 132 treatment plants using surface water (excluding Ohio River intakes) in 132 separate assessment units. The 132 assessment units with the PDWS beneficial use include the following: 120 water assessment units (HUC12 WAUs), nine large river assessment units (LRAUs), and all three Lake Erie assessment units. A summary of the nitrate and pesticide indicators for each public water system are presented in Section H4 and Table H-2 provides supporting information for each of the eight assessment units listed as impaired for the PDWS beneficial use. More detailed public drinking water supply statistics for all AUs are provided at http://www.epa.ohio.gov/dsw/tmdl/2010IntReport/index.aspx.

Nitrate Indicator. Sufficient data were available to complete nitrate evaluations for 45 (34.1%) of the 132 assessment units using data primarily from Ohio EPA's compliance database and Ohio EPA watershed surveys. Of all 132 assessment units, three (2.1%) were identified as impaired and 42 (31.8%) were in full support. The impaired waters included two Maumee River and one Sandusky River LRAUs. Most of the 26 waters placed on watch list (single detection >8 mg/L) for nitrate were located in the northwestern and central parts of the state (Figure H-2).

Pesticide Indicator. Sufficient data were available to complete atrazine evaluations for 17 (12.9%) of the 132 PDWS assessment units using data from Ohio EPA's compliance database (treated water), Ohio EPA water quality surveys, and Syngenta Crop Protection, Inc.'s Atrazine Monitoring Program. Five of the pesticide assessments resulted in impaired status while the remaining 12 were in full support. The two areas of impairment for pesticides initially listed in 2008 were in the southwestern portion of the state in Brown County (Mt. Orab PWS, Sterling Run) and in Miami County (Piqua PWS, Swift Run). The three assessment units associated with the Village of Blanchester were added to the list of atrazine impaired waters for the 2010 reporting cycle. The impairment listing at Blanchester was based on water quality results from the Syngenta atrazine monitoring program and since the data collection location was not specific to any of the three source waters the impairment listing was conservatively applied to all three assessment units. Ohio EPA will work with the water system to obtain additional water quality data in the future to fully characterize the atrazine levels in the three sources. Limited

data collected by Ohio EPA in 2008 during the critical spring runoff period indicate that significantly elevated atrazine levels are present in all three watersheds as levels ranged from 71 µg/L to 23 µg/L. A total of 14 waters were placed on the pesticide watch list because of elevated atrazine (single exceedance of 4 times the water quality criteria (WQC) or quarterly average > WQC). These areas of elevated atrazine coincide with the predominantly agricultural land use in western and northwestern Ohio (Figure H-3).

PDWS beneficial use status can also be evaluated by looking at the number of people served by full attainment, impaired and non-assessed source waters. Over 7.2 million people are served by Ohio public water systems using surface water sources. Many water systems draw from multiple stream or lake sources and it is difficult to assign populations for each assessment unit or PDWS zone. Therefore, population and attainment status were grouped by water system in order to approximate the population served by sources waters in each attainment status. Approximately 72% of the population served by these water systems (over 5.2 million) relies on source water designated in full attainment of the PDWS beneficial use as described in Section H2 above. Targeted water quality sampling over the next few years will begin to address the lack of data for the 27% of the population served by the non-assessed source waters. Ohio EPA will utilize the TMDL process to begin restoration of source waters identified as impaired for the PDWS use, serving over 84,000 people (1.2% of population served by the PWS).

***Cryptosporidium* Indicator.** Since Ohio EPA has not yet formalized water criteria for *cryptosporidium*, assessment of this indicator could not be included in this report nor used for Ohio's 2010 303(d) listings. Ohio EPA requested all available *cryptosporidium* data from U.S. EPA and summarized the results to demonstrate how the data would be evaluated using the PDWS assessment methodology previous described.

As of mid-2009, *cryptosporidium* data have been submitted to U.S. EPA by 54 Ohio public water systems. This dataset included samples collected from 2006 to 2009 in order to fulfill new SDWA regulations that require the water systems to submit 24 to 47 samples over a two year period. The highest average (oocysts/L) in any 12 consecutive months is compared to SDWA Bin classifications 1 through 4. Any water systems with an average *cryptosporidium* concentration between 0.075 and < 1.0 oocysts/L would be placed in Bin 2. Most Ohio PWS using surface water are already meeting the treatment levels required for this bin. Concentrations equal or greater than 1.0 oocysts/L place the system in Bin 3 or 4 and require additional treatment beyond conventional or source water controls in the watershed, resulting in significant expenditures for the community. Ohio EPA's proposed water quality criteria and watch list condition for *cryptosporidium* correlate to these trigger concentrations for the Bins.

A preliminary review of available data indicates that no water systems have exceeded the 1.0 oocysts/L 12-month average. Four water systems did have average concentrations above the 0.75 oocysts/L threshold for the watch list, although monitoring continues for several of these systems and the final outcome may change. Ohio EPA will present a more detailed assessment of this dataset in the 2012 IR as additional surface water systems will be required to collect *cryptosporidium* data and water quality criteria may be finalized at that time.

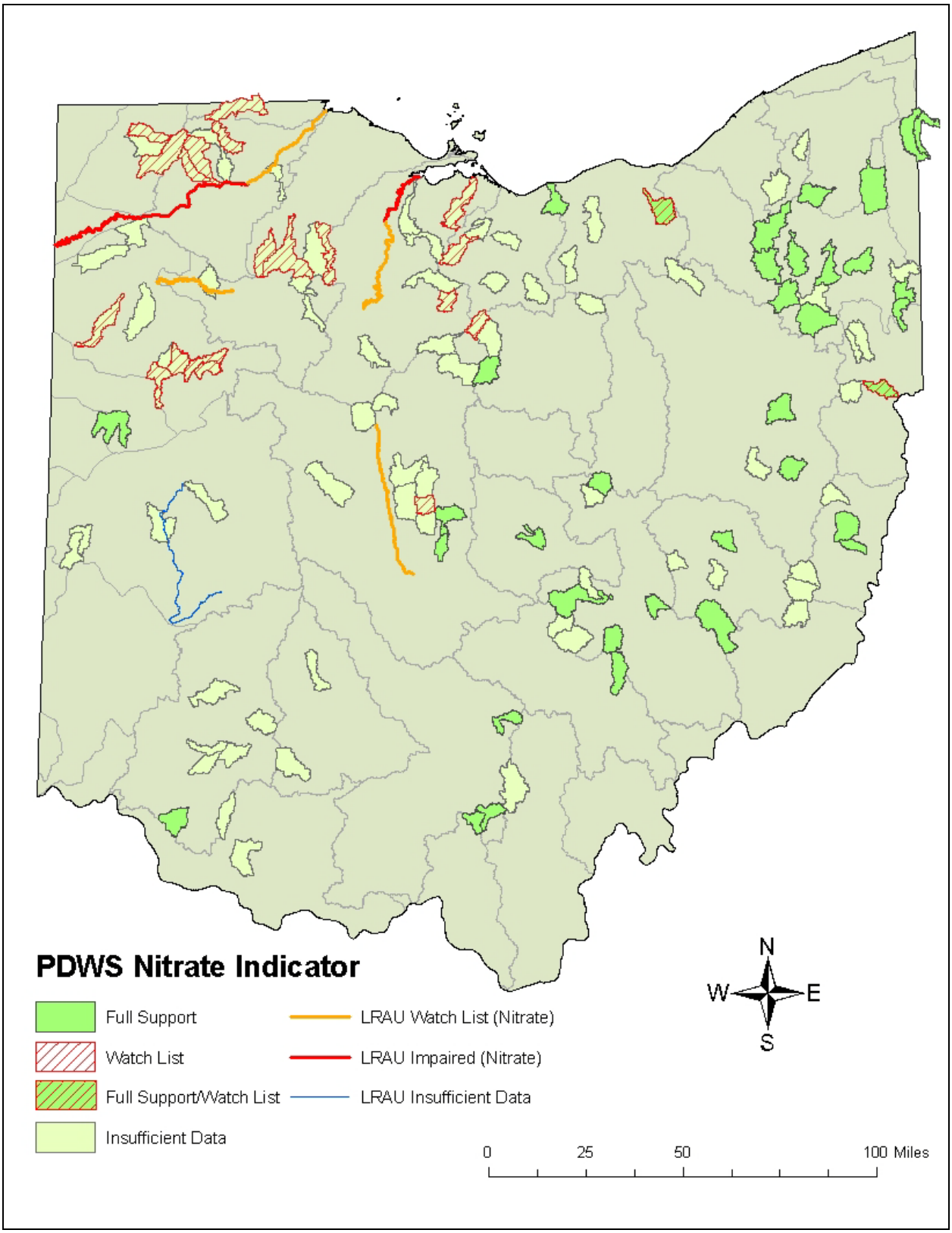

Figure H-2. Assessment units with nitrate indicator results.

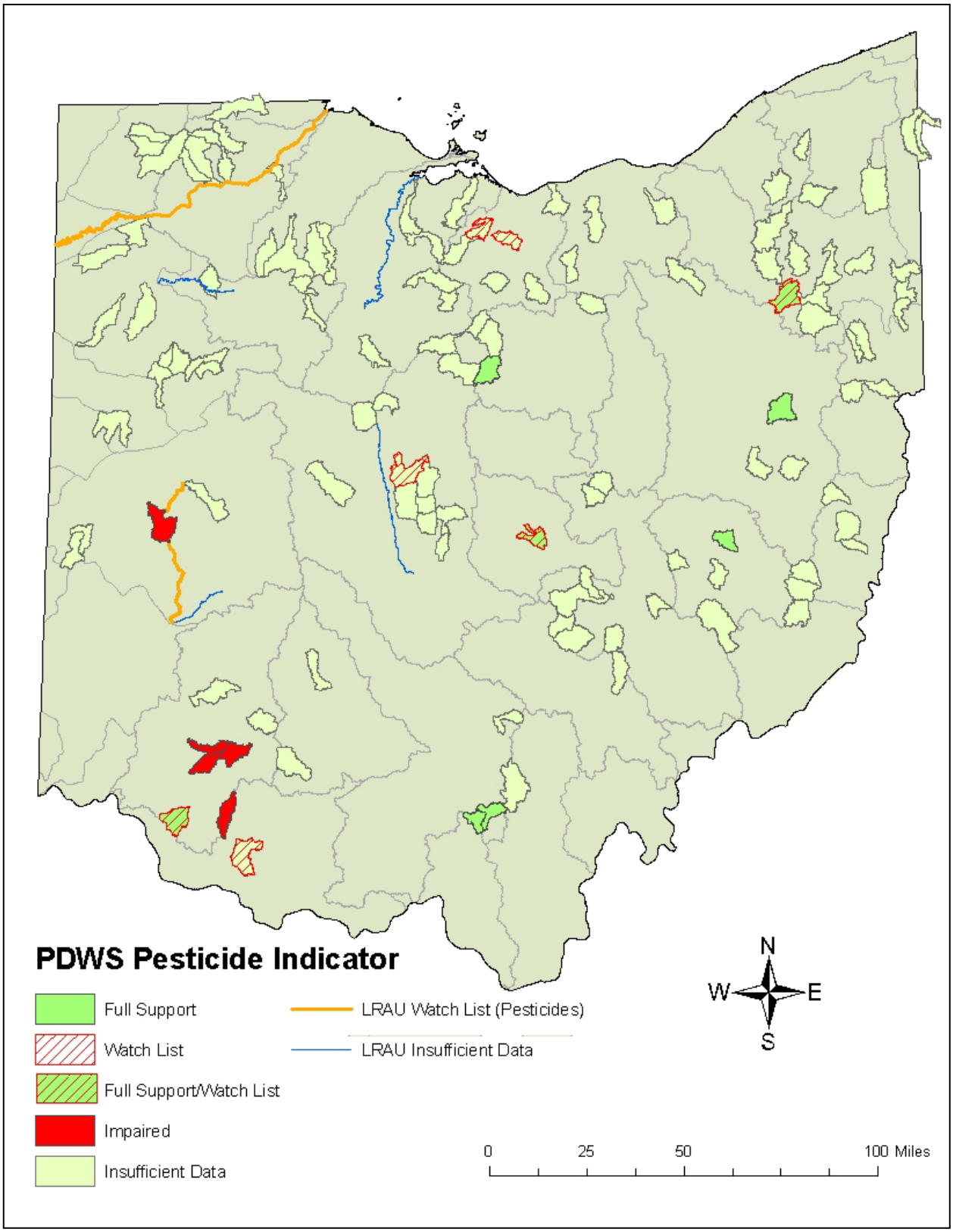

Figure H-3. Assessment units with pesticide indicator results.

Table H-2. Waters designated as impaired for PDWS beneficial use.

Assessment Unit	Cause of Impairment	Summary of Key Water Quality Data
04100005 90 01 Maumee River Mainstem (IN border to Tiffin River)	*Nitrate* One PWS had at least one excursion above the nitrate WQC during the 5 year period and finished nitrate levels above the WQC. Original impairment listed in 2008.	* The City of Defiance exceeded the nitrate WQC in finished water during 3 events (12/24/02-1/28/03; 6/17/03-6/19/03; and 5/15/06-5/16/06). Only 1 Nitrate excursions during 2004-2008, but the impairment listing will remain until 5 yrs w/out any excursions.
04100009 90 01 Maumee River Mainstem (Tiffin R. to Beaver Ck)	*Nitrate* Four PWS had at least one excursion above the nitrate WQC during the 5 year period. All four PWS had finished nitrate levels above the WQC and received SDWA violations.	*The City of Napoleon exceeded the nitrate WQC in finished water during two events (11/26/02-12/12/02; and 11/29/05). * The Campbell Soup PWS exceeded the nitrate WQC in finished water during 3 events (12/23/02-2/5/03; 3/24/03-3/25/03; and 5/15/06-5/16/06). * The Village of McClure exceeded the nitrate WQC in finished water during 4 events (12/12/02-2/4/03; 3/24/03-4/14/03; 6/17/03-6/18/03; and 11/30/05). All three PWS had only 1 nitrate excursions during 2004-2008, but the impairment listing will remain until 5 yrs w/out any excursions.
04100011 90 02 Sandusky River Mainstem (Wolf Creek to Sandusky Bay)	*Nitrate* One PWS had more than one excursion above the nitrate WQC during the 5 year period in both raw and finished water. This PWS also received SDWA violations.	* The City of Fremont exceeded the nitrate WQC in finished water numerous time during past five years (12/12/02-1/31/03; 3/25/03-4/14/03; 6/18/03-6/20/03; 5/16/06-6/2/06; 6/13/07-6/18/07; 6/3/09-6/25/09) and in the raw source water (as indicated by Ohio Tributary Monitoring Program data collected just upstream of Fremont) during numerous events.
05080001 07 05 Garbry Creek-Great Miami River	*Pesticides* One PWS had the pesticide atrazine in source water where the annual average exceeded the WQC.	* The City of Piqua uses several surface water sources and participates in Syngenta Crop Protection's AMP[1]. Swift Run Lake (impounded section of Swift Run) is one of the three drinking water sources and the atrazine annual average[2] was 5.03 µg/L in 2005 and 3.62 µg/L in 2008. Both annual averages exceeded the WQC (3 µg/L).
05090201 10 01 Sterling Run	*Pesticides* One PWS had the pesticide atrazine in source water where the annual average exceeded the WQC.	* The Village of Mt. Orab draws surface water from Sterling Run and participates in Syngenta Crop Protection's AMP1. The annual average[2] exceeded the WQC in 2005 (7.92 µg/L) and 2006 (10.18 µg/L), Single maximum atrazine detection in 2006 was 227 µg/L.

Assessment Unit	Cause of Impairment	Summary of Key Water Quality Data
05090202 07 05 Second Creek 05090202 13 01 West Fork East Fork Little Miami River 05090202 13 01 Headwaters Stonelick Creek	*Pesticides* One PWS had the pesticide atrazine in source water where the annual average exceeded the WQC.	* The Village of Blanchester draws surface water from Whitacre Run, Stonelick Creek and the West Branch of the East Fork LMR and participates in Syngenta Crop Protection's AMP1. The raw and finished water sampling locations for this monitoring program do not differentiate between the three separate source waters. In 2005, the annual average of the AMP samples was 4.63 µg/L and exceeded the WQC for atrazine in finished water. Ohio EPA conducted two sampling runs in 2008 at the three separate sources and measured elevated atrazine levels ranging between 70 µg/L and 23 µg/L. Considering the 2008 atrazine levels, Ohio EPA has elected to conservatively apply to impairment listing to all three assessment units.

[1] The January 2003 Atrazine Interim Reregistration Eligibility Decision and subsequent Memorandum of Agreement between U.S. EPA and the atrazine registrants, including Syngenta Crop Protection, Inc., initiated an atrazine monitoring program at select community water systems.

[2] Annual average calculated as average of the quarterly means for calendar year.

H4. Supplemental Information

Table H-3 provides a summary of PDWS assessment results for the nitrate and pesticide indicators and is organized by assessment unit. A description of the PDWS use zone is also included.

Table H-3. Summary of public drinking water supply assessment results for the nitrate and pesticide indicators.

Assessment Unit	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator
04100001 03 04	Headwaters Tenmile Creek	Unnamed trib @RM 1.25 (Ten Mile Creek RM 16.92) [Metamora]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100005 90 01	Maumee River Mainstem (IN border to Tiffin River)	Maumee River @RM 65.84 [Defiance]	No	Impaired	Full Support, Watch List
04100006 03 01	Bates Creek-Tiffin River	Tiffin River @RM 47.54 [Archbold]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100006 03 03	Flat Run-Tiffin River	Archbold Upground Reservoirs [Archbold]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100006 05 02	Brush Creek	Brush Creek @RM 17.64 [Archbold]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100007 02 03	Sims Run-Auglaize River	Auglaize River @RM 64.58 (Agerter Rd) [Lima]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100007 03 05	Lost Creek	Ottawa River @RMs 42.60 (Roush Rd) and 43.45 (upstream of lowhead dam at Metzger Rd) [Lima]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100007 03 06	Lima Reservoir-Ottawa River	Lima Reservoir [Lima]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100007 04 02	Honey Run	Bresler Reservoir [Lima]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100007 06 04	Dry Fork-Little Auglaize River	Little Auglaize River @RM 23.40 [Delphos]	Unknown	Insufficient Data	Insufficient Data
04100007 08 04	Lower Town Creek	Town Creek @RM 18.35 [Van Wert]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100007 12 06	Big Run-Flatrock Creek	Flat Rock Creek @RM 14.13 [Paulding]	Unknown	Insufficient Data	Insufficient Data
04100008 02 03	Findlay Upground Reservoirs-Blanchard River	Findlay Upground Reservoirs [Findlay]	Unknown	Insufficient Data	Insufficient Data
04100008 02 05	City of Findlay Riverside Park-Blanchard River	Blanchard River @RMs 58.72, 62.43 and 65.20 [Findlay]	Unknown	Insufficient Data	Insufficient Data

Assessment Unit	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator
04100008 06 02	Pike Run-Blanchard River	Ottawa Upground Reservoirs [Ottawa]	Unknown	Insufficient Data	Insufficient Data
04100008 90 01	Blanchard River Mainstem (Dukes Run to mouth)	Blanchard River @RM 28.50 [Ottawa]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100009 03 02	Lower Bad Creek	Bad Creek @RM 17.0 [Delta]	Unknown	Insufficient Data	Insufficient Data
04100009 04 01	Konzen Ditch	Unnamed trib segments immediately adjacent to Wauseon Reservoir, Big Ditch Intake [Wauseon]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100009 04 02	North Turkeyfoot Creek	Stucky Ditch Intake and Reservoir [Wauseon]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100009 06 03	Haskins Road Ditch – Maumee River	Bowling Green Upground Reservoir [Bowling Green]	Unknown	Insufficient Data	Full Support, Watch List
04100009 07 02	Fewless Creek-Swan Creek	Swan Creek @RM 30.84 [Swanton]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100009 90 01	Maumee River Mainstem (Tiffin River to Beaver Creek)	Maumee River @RMs 35.91 [McClure], 45.88 and 47.10 [Campbell Soup], 47.13 [Napoleon and Wauseon]	No	Impaired	Full Support, Watch List
04100009 90 02	Maumee River Mainstem (Beaver Creek to Maumee Bay)	Maumee River @RMs 23.16 [Bowling Green]	Yes	Full Support Watch List	Insufficient Data, Watch List
04100010 01 01	Rader Creek	Rader Creek @RM 13.57 and upground reservoirs [McComb]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100010 01 03	Rocky Ford	Rocky Ford Creek @RMs 10.66 and 11.10 and Upground Reservoirs [North Baltimore]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100010 02 02	East Branch Portage River	East Branch Portage River @RMs 13.84 and 16.15 and Upground Reservoirs [Fostoria]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100011 01 03	Mills Creek	Snyders Ditch @RMs 5.0 and 5.5 and Upground Reservoirs [Bellevue]	Unknown	Insufficient Data, Watch List	Insufficient Data

Assessment Unit	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator
04100011 02 04	Raccoon Creek	Raccoon Creek Upground Reservoir [Clyde]	Yes	Full Support	Insufficient Data
04100011 04 03	Headwaters Middle Sandusky River	Sandusky River @RM 115.4 and Upground Reservoirs [Bucyrus]	Unknown	Insufficient Data	Insufficient Data
04100011 07 02	Town of Upper Sandusky-Sandusky River	Sandusky River @RMs 82.9 and 83.15 and Upground Reservoirs [Upper Sandusky]	Unknown	Insufficient Data	Insufficient Data
04100011 08 01	Brokenknife Creek	Unnamed tributary (Brokenknife Creek RM 5.50) @RM 2.15 and Upground Reservoirs [New Washington]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100011 08 05	Middle Honey Creek	Honey Creek @RM 28.35 and Upground Reservoirs [Attica]	Unknown	Insufficient Data	Insufficient Data
04100011 12 02	Beaver Creek	Beaver Creek @RM 2.88 and Beaver Creek Upground Reservoir [Clyde]	Unknown	Insufficient Data	Insufficient Data
04100011 12 03	Green Creek	Raccoon Creek Upground Reservoir [Clyde]	Unknown	Insufficient Data	Insufficient Data
04100011 90 01	Sandusky River Mainstem (Tymochtee Creek to Wolf Creek)	Sandusky River @ RM 41.08 [Tiffin-Ohio American Water]	Unknown	Insufficient Data, Watch List	Insufficient Data
04100011 90 02	Sandusky River Mainstem (Wolf Creek to Sandusky Bay)	Sandusky River @ RM 18.02 [Fremont]	No	Impaired	Insufficient Data
04100012 01 04	New London Upground Reservoir-Vermilion River	Vermilion River @RM 52.24 and Upground Reservoirs [New London]	Unknown	Insufficient Data	Insufficient Data
04100012 02 04	Mouth Vermilion River	Vermilion River @ RM 0.2 [Vermilion]	Yes	Full Support	Insufficient Data
04100012 04 03	Walnut Creek-West Branch Huron River	West Branch Huron River @RM 33.8 and Upground Reservoirs [Willard]	Unknown	Insufficient Data	Insufficient Data
04100012 05 03	Frink Run	Frink Run @RM 4.83 and Upground Reservoir #5 [Bellevue]	Unknown	Insufficient Data, Watch List	Insufficient Data

Assessment Unit	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator
04100012 05 06	Mouth West Branch Huron River	W. Branch Huron River @RM 8.52 and Upground Reservoirs [Monroeville]	Unknown	Insufficient Data	Insufficient Data, Watch List
04100012 06 03	Norwalk Creek	Norwalk Creek @RMs 0.11 and 4.02 [Norwalk]	Unknown	Insufficient Data	Insufficient Data, Watch List
04110001 02 02	Baldwin Creek-East Branch Rocky River	E. Branch Rocky River @RM 5.06, Baldwin Creek @RM 0.48, upstream boundaries of Rocky River reservation (RM 15.15) to West Branch [Berea]	Yes	Full Support, Watch List	Insufficient Data
04110001 05 01	Charlemont Creek	Charlemont Creek @RM 2.97 and Upground Reservoir [Wellington]	Unknown	Insufficient Data	Insufficient Data
04110001 05 06	Elk Creek-West Branch Black River	West Branch Black River @RM 14.42 [Oberlin]	Unknown	Insufficient Data	Insufficient Data
04110002 01 01	East Branch Reservoir – East Branch Cuyahoga River	East Branch Reservoir [Akron]	Unknown	Insufficient Data	Insufficient Data
04110002 01 04	LaDue Reservoir-Bridge Creek	LaDue Reservoir	Unknown	Insufficient Data	Insufficient Data
04110002 02 02	Feeder Canal-Breakneck Creek	Lake Hodgson (Breakneck Creek) [Ravenna]	Yes	Full Support	Insufficient Data
04110002 02 03	Lake Rockwell-Cuyahoga River	Lake Rockwell (Cuyahoga River RM 62.0 to 57.97) [Akron]	Yes	Full Support	Insufficient Data
04110004 01 02	Headwaters-Grand River	Grand River @RM 89.12 [West Farmington]	Yes	Full Support	Insufficient Data
05030101 04 03	Stone Mill Run-Middle Fork Little Beaver Creek	Salem Reservoir [Salem]	Unknown	Insufficient Data	Insufficient Data
05030101 05 01	Cold Run	Cold Run @RM 4.96, Salem Reservoir, Unnamed Tributary (Cold Run RM 4.97) @RM 1.42 [Salem]	Unknown	Insufficient Data	Insufficient Data
05030101 08 02	Headwaters North Fork Yellow Creek	Riley Run @RM 2.83 [Salineville]	Unknown	Insufficient Data	Insufficient Data

Assessment Unit	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator
05030101 11 02	Little Yellow Creek	Little Yellow Creek@ RM 4.20 [Wellsville-Buckeye W.D.]	Yes	Full Support	Insufficient Data
05030102 01 04	Frontal Pymatuning Reservoir	Shenango River @RM 68.40 (Pymatuning Reservoir) [ODNR-Pymatuning S.P.]	Yes	Full Support	Insufficient Data
05030102 01 05	Pymatuning Reservoir	Shenango River @RM 68.40 (Pymatuning Reservoir) [ODNR-Pymatuning S.P.]	Yes	Full Support	Insufficient Data
05030103 01 03	Fish Creek-Mahoning River	Mahoning River @RMs 83.55 [Alliance] and 91.50 [Sebring]	Yes	Full Support	Insufficient Data
05030103 02 01	Deer Creek	Deer Creek @RM 0.54 (Walborn Reservoir) [Alliance]	Yes	Full Support	Full Support, Watch List
05030103 02 04	Island Creek-Mahoning River	Berlin Lake [MVSD]	Unknown	Insufficient Data	Insufficient Data
05030103 03 04	Kirwan Reservoir-West Branch Mahoning River	West Branch @RM 13.25 (W. Branch/Michael J. Kirwan Res) [ODNR-West Branch S.P.]	Yes	Full Support	Insufficient Data
05030103 03 06	Charley Run Creek-Mahoning River	Mahoning River @RMs 56.47 [Newton Falls]	Yes	Full Support	Insufficient Data
05030103 05 02	Middle Mosquito Creek	Mosquito Creek @RM 12.49 (Reservoir) [Warren]	Yes	Full Support	Insufficient Data
05030103 07 03	Lower Meander Creek	Meander Creek @RM 2.96 (Meander Cr Reservoir) [Mahoning Valley S.D.]	Yes	Full Support	Insufficient Data
05030103 08 05	Headwaters Yellow Creek	Yellow Creek @RM 8.40 (Lake Evans)[Struthers- Aqua Ohio]	Yes	Full Support	Insufficient Data
05030103 08 06	Burgess Run-Yellow Creek	Yellow Creek @RM 2.0 (Lake Hamilton) [Campbell]	Yes	Full Support	Insufficient Data
05030103 08 07	Dry Run-Mahoning River	Dry Run @RM 2.86 (Lake McKelvey) [Campbell]	Unknown	Insufficient Data	Insufficient Data
05030106 02 02	Middle Fork Short Creek	Unnamed trib (Liming Creek RM 1.90) @RM 0.35 (Sparrow/Cadiz Reservoir) [Cadiz]	Unknown	Insufficient Data	Insufficient Data

Assessment Unit	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator
05030106 03 03	Cox Run-Wheeling Creek	Jug Run @RM 3.18 (Provident Reservoir) [St. Clairsville]	Yes	Full Support	Insufficient Data
05030106 07 03	Little McMahon Creek	Little McMahon Creek @RM 6.6 (St. Clairsville Reservoir) [St. Clairsville]	Yes	Full Support	Insufficient Data
05030106 09 01	North Fork Captina Creek	Unnamed trib (North Fork RM 10.0) @RM 0.55 (Res #1 and #3) [Barnesville]	Unknown	Insufficient Data	Insufficient Data
05030106 09 02	South Fork Captina Creek	Slope Creek @RM 1.85 Slope Creek Res) [Barnesville]	Unknown	Insufficient Data	Insufficient Data
05030201 01 01	Upper Sunfish Creek	Sunfish Creek @ RM 25.50, Unnamed trib (Sunfish Creek RM 24.55) @RM 0.15 and 0.80 [Woodsfield]	Unknown	Insufficient Data	Insufficient Data
05030201 09 01	Headwaters West Fork Duck Creek	Wolf Run @RM 0.7 (Wolf Run Lake) , Dog Run @RM 1.35 (Caldwell Lake) [Caldwell]	Yes	Full Support	Insufficient Data
05030204 01 01	Center Branch	Center Branch Rush Creek @RM 5.45, Unnamed Tributary (Somerset Creek RM 1.84) @RM 0.89 [Somerset]	Unknown	Insufficient Data	Insufficient Data
05030204 01 02	Headwaters Rush Creek	Yeager Creek (Rush Creek RM 28.46) @RM 1.0; New Lexington Reservoir [New Lexington]	Unknown	Insufficient Data	Insufficient Data
05030204 07 01	East Branch Sunday Creek	East Branch Sunday Creek @RM 0.23 [Burr Oak Regional]	Yes	Full Support	Insufficient Data
05040001 01 04	Wolf Creek	Wolf Creek @RM 5.12 (Reservoir) [Barberton]	Unknown	Insufficient Data	Insufficient Data
05040001 08 02	Pleasant Valley Run-Indian Fork	Indian Fork @RM 3.0 and 3.7 (Atwood Lake) [Atwood Park and Resort]	Yes	Full Support	Full Support
05040001 15 03	Upper Stillwater Creek	Tappan Lake [Cadiz]	Yes	Full Support	Insufficient Data
05040001 16 04	Town of Uhrichsville-Stillwater Creek	Stillwater Creek @RM 7.05 [Twin City W&S]	Unknown	Insufficient Data	Insufficient Data

Assessment Unit	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator
05040002 01 01	Marsh Run	Marsh Run Creek @RM 0.05 [Shelby]	Unknown	Insufficient Data, Watch List	Insufficient Data
05040002 01 02	Headwaters Black Fork Mohican River	Black Fork River @RMs 50.82, 53.88 [Shelby]	Unknown	Insufficient Data	Insufficient Data
05040002 03 01	Headwaters Clear Fork Mohican River	Clear Fork River @RM 30.6 (Clear Fork Reservoir) [Mansfield]	Yes	Full Support	Full Support
05040002 05 01	Upper Muddy Fork Mohican River	Muddy Fork (Cinnamon Lake -impounded) [Cinnamon Lake]	Unknown	Insufficient Data	Insufficient Data
05040003 09 01	Mohawk Creek	No identifiable associated stream (dug reservoirs) [Echoing Hills]	Yes	Full Support	Insufficient Data
05040004 01 02	Winding Fork	Shalimar Lake [Echoing Hills]	Unknown	Insufficient Data	Insufficient Data
05040004 04 05	Kent Run	Kent Run @RM 1.3 [Maysville]	Unknown	Insufficient Data	Insufficient Data
05040004 04 07	Painter Creek-Jonathon Creek	Frazier's Run (Fraziers Quarry) [Maysville]	Yes	Full Support	Insufficient Data
05040004 05 01	Black Fork	Dry Run @RM 2.23 (Resv 1 and 2), Black Fork @RM 4.69 (Resv. 3,4,5) [Crooksville]	Yes	Full Support	Insufficient Data
05040004 06 05	Manns Fork Salt Creek	Manns Fork Salt Creek @RM 6.77 (Cutler Lake) [ODNR-Blue Rock S.P.]	Yes	Full Support	Insufficient Data
05040005 02 07	Trail Run-Wills Creek	Wills Creek (Cambridge Reservoir) [Cambridge]	Unknown	Insufficient Data	Insufficient Data
05040005 04 06	Beeham Run-Salt Fork	E. Branch Salt Fork Lake [ODNR-Salt Fork S.P.]	Yes	Full Support	Full Support
05040005 05 01	North Crooked Creek	North Crooked Creek [New Concord]	Unknown	Insufficient Data	Insufficient Data
05040006 02 05	Log Pond Run-North Fork Licking River	North Fork Licking River @ RM 3.0 [Newark]	Yes	Full Support	Full Support, Watch List
05060001 03 03	City of Marion-Little Scioto River	Little Scioto River @RM 7.1 [Marion-Ohio American Water]	Unknown	Insufficient Data	Insufficient Data

Assessment Unit	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator
05060001 04 06	Glade Run-Scioto River	Scioto River @RM 180.04 [Marion-Ohio American Water]	Unknown	Insufficient Data	Insufficient Data
05060001 06 02	Middle Mill Creek	Mill Creek @RM 19.45 [Marysville]	Unknown	Insufficient Data	Insufficient Data
05060001 08 01	Headwaters Olentangy River	Rocky Fork (Olentangy River RM 84.84)@RM 0.6 [Galion]	Unknown	Insufficient Data	Insufficient Data
05060001 10 07	Delaware Run-Olentangy River	Olentangy River @RMs 31.23 and 31.02 [Delaware]	Unknown	Insufficient Data	Insufficient Data, Watch List
05060001 11 01	Deep Run-Olentangy River	Olentangy River @RM 18.19 [Del-Co]	Unknown	Insufficient Data	Insufficient Data
05060001 13 08	Hoover Reservoir-Big Walnut Creek	Hoover Reservoir, Duncan Run @RM 0.68 [Lake of the Woods] [Columbus]	Yes	Full Support	Insufficient Data
05060001 14 04	Alum Creek Dam-Alum Creek	Alum Creek Reservoir and Alum Creek @RM 26.74 [Del-Co]	Unknown	Insufficient Data, Watch list	Insufficient Data
05060001 15 02	City of Gahanna-Big Walnut Creek	Big Walnut Creek @RM 32.64 [Columbus]	Yes	Full Support	Insufficient Data
05060001 16 01	Westerville Reservoir-Alum Creek	Alum Creek @RM 21.20 (@lowhead dam) [Westerville]	Unknown	Insufficient Data	Insufficient Data
05060001 90 01	Scioto River Mainstem (Little Scioto R. to Olentangy R.); excluding O'Shaughnessy and Griggs reservoirs	Scioto River at O'Shaughnessy dam (RM 148.8) to Dublin Road WTP dam [Columbus]	Yes	Full Support, Watch List	Insufficient Data
05060002 08 02	Buckeye Creek	Buckeye Creek/Hammertown Lake [Jackson]	Yes	Full Support	Full Support
05060002 08 03	Horse Creek-Little Salt Creek	Jisco Lake [Jackson]	Yes	Full Support	Full Support
05060002 09 02	Queer Creek	Rose Lake [ODNR-Hocking Hills S.P.]	Yes	Full Support	Insufficient Data

Assessment Unit	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator
05060003 01 03	Town of Washington Court House-Paint Creek	Paint Creek @RM 71.4 [Washington Court House]	Unknown	Insufficient Data	Insufficient Data
05060003 05 02	Clear Creek	Clear Creek (Rocky Fork) @RM 7.4 [Hillsboro]	Unknown	Insufficient Data	Insufficient Data
05080001 07 02	Mosquito Creek	Tawawa Creek @RM 0.14 [Sidney]	Unknown	Insufficient Data	Insufficient Data
05080001 07 05	Garbry Creek-Great Miami River	Piqua Hydraulic System (Swift Run Lake) and Ernst Gravel Pit [Piqua]	No	Insufficient Data	Impaired
05080001 11 01	Mud Creek	Mud Creek @RM 0.88 [Greenville]	Unknown	Insufficient Data	Insufficient Data
05080001 11 02	Bridge Creek-Greenville Creek	Greenville Creek @RM 22.3 [Greenville]	Unknown	Insufficient Data	Insufficient Data
05080001 90 01	Great Miami River Mainstem (Tawawa Creek to Mad River)	Great Miami River @RMs 86.6 and 90.3 [Dayton], 118.3 [Piqua] and 130.2 [Sidney]	Unknown	Insufficient Data	Insufficient Data, Watch List
05080001 90 03	Mad River Mainstem (Donnels Creek to mouth)	Mad River @RMs 5.2 and 5.6 [Dayton]	Unknown	Insufficient Data	Insufficient Data
05090101 04 01	Headwaters Little Raccoon Creek	Little Raccoon Creek @RM 30, Lake Rupert, Alma Lake [Wellston]	Unknown	Insufficient Data	Insufficient Data
05090201 08 02	Headwaters Straight Creek	Sycamore Run @RM 0.97 (Reservoir), and Straight Creek (Lake Waynoka) [Waynoka Regional]	Unknown	Insufficient Data	Insufficient Data, Watch List
05090201 10 01	Sterling Run	Sterling Run @RM 6.47 [Mt. Orab]	No	Insufficient Data	Impaired
05090202 04 06	Lower Caesar Creek	Caesar Creek Lake [Wilmington]	Unknown	Insufficient Data	Insufficient Data
05090202 06 04	Headwaters Cowan Creek	Cowan Creek @RM 11.7 [Wilmington]	Unknown	Insufficient Data	Insufficient Data
05090202 07 02	Second Creek	Whitacre Run @RM 1.4 [Blanchester]	No	Insufficient Data	Impaired

Assessment Unit	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator
05090202 10 05	West Fork East Fork Little Miami River	West Branch of the East Fork LMR @RM 4.6 and Westboro Reservoir [Blanchester]	No	Insufficient Data	Impaired
05090202 12 03	Lucy Run-East Fork Little Miami River	Harsha Lake - Impounded E. Fork LMR [Clermont County]	Yes	Full Support	Full Support, Watch List
05090202 13 01	Headwaters Stonelick Creek	Stonelick Creek @RM 23.4 [Blanchester]	No	Insufficient Data	Impaired
05120101 02 04	Grand Lake-St Marys	Grand Lake St. Marys [Celina]	Yes	Full Support	Insufficient Data
24001 001	Lake Erie Western Basin Shoreline (including Maumee Bay and Sandusky Bay)	[Sandusky, Marblehead, Ottawa County Regional, Erie Industrial Park, Carrol Water & Sewer, Oregon, Toledo]	Yes	Full Support	Insufficient Data, Watch List
24001 002	Lake Erie Central Basin Shoreline	[Conneaut, Ashtabula-Ohio American Water, Lake County East, Lake County West, Painesville, Fairport Harbor, Mentor-Aqua Ohio, Cleveland, Avon Lake, Elyria, Lorain, Vermilion, Huron]	Yes	Full Support	Insufficient Data
24001 003	Lake Erie Islands Shoreline	[Kelleys Island, Camp Patmos, Lake Erie Utility Co., Put-in-Bay]	Yes	Full Support	Insufficient Data

Note: "Use Support" reports on the PDWS beneficial use status for each assessment unit and is described as follows:
"Unknown" = insufficient data to complete the assessment for the PDWS zones within the assessment unit
"No" = Impairment of at least one PDWS zone within the assessment unit
"Yes" = Full support of the PDWS use within the assessment unit