



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

NOV 15 2011

REPLY TO THE ATTENTION OF:
WQ-16J

George Elmaraghy, Chief
Division of Surface Water
Ohio Environmental Protection Agency
PO Box 1049
Columbus, Ohio 43216-1049

Dear Mr. Elmaraghy:

The U.S. Environmental Protection Agency has reviewed the Ohio Environmental Protection Agency (Ohio EPA) Surface and Ground Waters Monitoring Strategy 2011-2015, provided to EPA on July 19, 2011. We recognize the hard work and dedication of your staff at the Ohio EPA in developing this strategy and incorporating EPA's Guidance *Elements of a State Water Monitoring and Assessment Program* (Elements Guidance). Your efforts have resulted in a detailed description of the monitoring activities currently conducted by Ohio EPA and plans for enhancing the monitoring program over time.

Ohio EPA's monitoring strategy is built upon the foundation of Ohio's long-term investment in developing, documenting, operating and maintaining a high-quality monitoring and assessment program. Because of the quality, rigor and transparency built into Ohio's program and the use and interpretation of the data it generates, Ohio EPA has been able to bring monitoring and assessment data to bear on issues and water quality management decisions in ways that other states cannot. Ohio's incorporation of biological data into its criteria to protect surface waters from adverse impacts of nutrients is an example of this as is EPA's regular approvals of revised designated uses for Ohio surface waters.

Enclosed please find our evaluation of Ohio EPA's monitoring strategy. This review is based on the Elements Guidance and a related tool developed by EPA to assist in the consistent evaluation of state monitoring strategies (also enclosed).

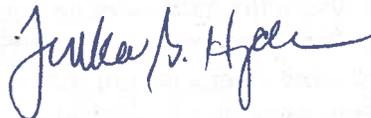
The Strategy addresses Clean Water Act objectives and provides a description of monitoring activities for all waterbody types including streams/rivers, lakes/reservoirs, Lake Erie, wetlands and groundwater. The Strategy reflects Ohio EPA's leadership in designing one of the premier monitoring and assessment programs in the Nation. Several program areas, including the use of an intensive watershed-based design for monitoring wadeable streams and large rivers, and designing and implementing a comprehensive monitoring program for wetlands, are exemplary programs that have been a model for other states. More recently, Ohio EPA has demonstrated continued initiative with the development of monitoring programs for primary headwater streams and nearshore areas of Lake Erie. Ohio EPA is also commended for establishing and

implementing a well-designed assessment methodology for the public drinking water supply beneficial use.

As we have done for the past several years, we anticipate that various activities to implement and upgrade the monitoring program will continue to be incorporated into the Environmental Performance Partnership Agreement (EnPPA) between the State and EPA. Each year, using the established EnPPA evaluation process, we will work with Ohio EPA to determine whether adequate progress is made to implement the strategy and whether that progress reflects commitments negotiated in the agreement. In addition, it is EPA's expectation that states will update their monitoring strategies at least every five years to reflect ongoing revisions to their monitoring programs and to serve as a basis for considering use of supplemental Section 106 funds to fill current strategy gaps.

Please feel free to contact me or have your staff contact Linda Holst at (312) 886-6758 or Pete Jackson at (312) 886-3894 to discuss these comments.

Sincerely,

A handwritten signature in blue ink, appearing to read "Tinka G. Hyde". The signature is fluid and cursive, with a long horizontal stroke at the end.

Tinka G. Hyde
Director, Water Division

Enclosures

cc: Jeff DeShon, Ohio EPA

**Ohio Environmental Protection Agency
Monitoring Strategy Evaluation
EPA Region 5**

Date: NOV 15 2011

1. Monitoring Strategy: *A comprehensive monitoring program strategy addresses all water quality management needs and all waters of the State, including all waterbody types (e.g., streams, rivers, lakes, Great Lakes, reservoirs, estuaries, coastal areas, wetlands, and groundwater).*

Evaluation:

Level of Development: 4

“Strategy addresses all water resource management needs including the need to support decisions at scales beyond state boundaries (e.g., inter-jurisdictional waters, ecoregions, national). Strategy includes plans for periodic updates every 3-5 years.” (Level 4)

Explanation: The Ohio Environmental Protection Agency ((Ohio EPA) Surface and Ground Waters Monitoring Strategy 2011-2015 (Strategy) addresses each of the Elements identified in the U.S. Environmental Protection Agency’s *Elements of a Water Monitoring and Assessment Program* guidance (Elements Guidance). The Strategy addresses Clean Water Act (CWA) objectives and provides a description of monitoring activities for all waterbody types including streams/rivers, lakes/reservoirs, Lake Erie, wetlands and groundwater. Ohio EPA has been a national leader in several areas, including developing an intensive watershed-based design for monitoring wadeable streams and large rivers for a broad array of CWA objectives, and also in designing and implementing a comprehensive monitoring program for wetlands. More recently, Ohio EPA has demonstrated continued initiative with the development of monitoring programs for primary headwater streams and nearshore areas of Lake Erie. Ohio EPA is also commended for establishing and implementing a well-designed assessment methodology for the public drinking water supply beneficial use. The Strategy references Ohio River monitoring which is under the jurisdiction of ORSANCO, and also discusses partnerships with other monitoring organizations including EPA GLNPO and Environment Canada, both of which monitor open waters of Lake Erie. An explicit implementation timeline is not provided, however, in Ohio EPA’s case this is reasonable given the fact that the agency has already implemented much of what is included in its Strategy and describes in detail plans for further enhancements to the program. Ohio’s Strategy also includes an exemplary, detailed discussion on gaps in its monitoring strategy. This gap discussion rounds out Ohio’s clear vision for a comprehensive monitoring program that meets its needs well into the future.

2. Monitoring Objectives: *The State monitoring program is guided by clearly delineated objectives consistent with the requirements, goals, and intent of the CWA and relevant State laws.*

Evaluation:

Level of Development: 3.5

“The State has identified monitoring objectives critical to the design of a monitoring program that is efficient and effective in generating data that serve management decision needs. EPA expects the State to develop a strategy and implement a monitoring program that reflects a full range of State water quality management objectives including, but not limited to, Clean Water Act goals. Consistent with the CWA, monitoring objectives should reflect the decision needs relevant to all types of State waters.” (Level 3)

“State monitoring objectives reflect the need to collect data and support decisions at scales beyond State boundaries (e.g., inter-jurisdictional waters, ecoregions, national).” (Level 4)

Explanation: In its Strategy, Ohio EPA presents agency water monitoring objectives that reflect the need to address all waterbody types and all designated uses (aquatic life, recreation, public health). The Strategy includes a succinct summary of CWA monitoring objectives, and the following general monitoring objectives of the Ohio EPA water program are then presented: determine status and trends, identify causes and sources of impairments, identify existing and emerging problems, support water quality management, evaluate program effectiveness, respond to emergencies, and develop a better understanding of chemical, physical and biological process affecting environmental quality. Program-specific objectives are also presented in detail. For example, for wadeable streams and large rivers these objectives include: determine the appropriate beneficial use designations; determine beneficial use attainment; monitor previously unassessed waters; and assess change over time, especially after implementation of TMDLs or other pollution controls and best management practices. The Strategy then includes a discussion of more specific objectives of the stream and river monitoring program by use designation (aquatic life, recreation, public drinking water, and fish consumption). While the Strategy contains no tabular summary of the various monitoring objectives under each program, the detailed, program-by-program description of these monitoring objectives fully satisfies this element. It is exceptional that Ohio addresses monitoring objectives for all types of state waters, including primary headwater habitats.

3. Monitoring Design: *The State has a comprehensive monitoring program design and rationale for selection of monitoring sites that incorporate several approaches (e.g., fixed station, intensive and screening level monitoring, rotating basin, judgmental, and probability design) to meet the range of program objectives.*

Evaluation:

Level of Development: 3.5

“The State has a documented approach and rationale for selection of monitoring designs and sample sites that best serve its monitoring objectives. The State monitoring program will likely integrate several monitoring designs (e.g., fixed station, intensive and screening-level monitoring, rotating basin, judgmental and probability design) to meet the full range of decision needs. The State monitoring design should include a probability-based network for making statistically valid inferences about the condition of all State water types, over time. EPA expects the State to use the most efficient combination of monitoring designs to meet its objectives.” (Level 3)

“Has a tiered monitoring design integrating probability sampling, landscape and other predictive tools, and targeted, special-issue approaches to cover all resource types, all uses and all programs. State monitoring designs reflect the need to collect data and support decisions at scales beyond State boundaries (e.g., inter-jurisdictional waters, ecoregions, national).”
(Level 4)

Explanation: The Strategy describes multiple designs for addressing objectives including rotating basin, geometric, fixed station and “sentinel site” designs for wadeable streams and large rivers, a targeted design for inland lakes and ambient groundwater, and a systematic design for wetlands. At this time primary headwater streams are being sampled on a site-specific basis based on regulatory needs. The nearshore monitoring program for Lake Erie is still being developed and a sampling design has not yet been selected. The sampling designs that are employed by Ohio EPA reflect the specific uses of the data for each program and also the scale at which the data are most urgently needed. While Ohio’s very intensive and comprehensive monitoring program generally provides the agency with sufficient data to meet its statewide reporting requirements without the need for a probabilistic design, in 2011 Ohio EPA initiated a statewide probability-based intensification study of wetlands centered around the 2011 National Wetland Condition Assessment. The Strategy includes a sampling design for all waterbody types within the state.

4. Indicators: *The monitoring strategy defines a core set of monitoring indicators (e.g., water quality parameters), including physical/habitat, chemical/toxicological, and biological/ecological endpoints that states use to assess attainment.*

Evaluation

Level of Development: 3.5

“The State uses a tiered approach to monitoring that includes core indicators selected to represent each applicable designated use, plus supplemental indicators selected according to site-specific or project-specific decision criteria. Core indicators for each water resource type include physical/habitat, chemical/toxicological, and biological/ecological endpoints as appropriate, and can be used routinely to assess attainment with applicable water quality standards throughout the State.” (Level 3)

“Applies indicators beyond the core, e.g., emerging issues, diagnostic indicators, microbial stressors, methods comparability studies, biological condition/human disturbance gradient. State indicators reflect the need to collect data and support decisions at scales beyond State boundaries (e.g., inter-jurisdictional waters, ecoregions, national).” (Level 4)

Explanation: Ohio EPA presents a concise list of core and supplemental indicators in Tables 3 and 4 of the Strategy, which reflects a tiered approach to monitoring in which core indicators are selected to assess attainment with each applicable designated use and supplemental indicators are selected according to site-specific or project-specific concerns. Multiple core biological indicators are typically employed for each waterbody type for aquatic life use assessments as recommended by EPA, with the exception of inland lakes, for which Ohio has no plans to develop biocriteria. Ohio’s tiered aquatic life biocriteria for rivers and streams complement Ohio’s system of tiered aquatic life uses and are a model for the Nation.

5. Quality Assurance: *Quality Management Plans and Quality Assurance Program/Project Plans are developed, maintained, and peer-reviewed in accordance with EPA policy to ensure the scientific validity of monitoring and laboratory activities.*

Evaluation:

Level of Development: 3

“Quality management plans and quality assurance program/project plans are established, maintained, and peer reviewed in accordance with EPA policy to ensure the scientific validity of monitoring and laboratory activities, and to ensure that State reporting requirements are met. State implements QA activities, as defined in plans.” (Level 3)

Explanation: Ohio’s current QMP was approved by EPA on August 31, 2005. Ohio is planning on submitting an agency-wide QMP by November 2011. The intent will be for the agency-wide QMP to replace the multiple Division-level QMPs. Since 2002, Ohio EPA has been authorized to review and approve all Division of Surface Water (DSW) QAPPs involving the collection of environmental data. QAPP review procedures and data quality personnel responsibilities are outlined in the Strategy. Some fifteen programs generate environmental data for DSW and thus require QAPPs and DSW QA/QC oversight. The key document for the Division of Drinking and Ground Waters is the Operating Procedures Document, which is currently being updated.

6. Data Management: *The State stores and manages data in a timely and accessible electronic system. EPA will require States to directly or indirectly (via the Central Data Exchange (CDX) and the Monitoring Data Standards) use the new STORET (STorage and RETrieval) system.*

Evaluation:

Level of Development: 3.5

“The State uses an accessible electronic data system for water quality, fish tissue, toxicity, sediment chemistry, habitat, biological data, with timely data entry (following appropriate metadata and State/Federal geo-locational standards) and public access. State is uploading data to STORET and using ADB and NHD (where available).” (Level 3)

“State works with other major data producers to get their data into STORET. State is uploading data to STORET more frequently than annual. State data management activities reflect the need to collect data and support decisions at scales beyond State boundaries (e.g., inter-jurisdictional waters, ecoregions, national).” (Level 4)

Explanation: Ohio EPA is replacing its existing Ohio ECOS database with a new electronic monitoring and assessment database called EA³. This new system will contain all of the data currently being stored in ECOS: biological data, fish tissue data, sediment chemistry, and habitat data for rivers and streams, inland lakes and wetlands. Surface water chemistry data are not currently in ECOS but will also be added. EA³ will support all of the surface water monitoring functions of the Ohio EPA and is compatible with EPA’s database structure. The new system will also calculate assessment indices and will be able to automatically determine attainment status when fully developed. The data will be stored in a format that can be shared externally;

however, the Strategy is unclear as to whether the new database will enable public access.

Ohio's work to convert from ECOS to EA³ has delayed progress on getting data into STORET, which has adversely affected public access to the data. Fortunately, Ohio EPA's website has an interactive mapping system (<http://www.epa.state.oh.us/dsw/gis/index.aspx>) which enables convenient public access to biological, water chemistry, sediment and other data for specific sites. Ohio continues to work on data transfer into STORET.

Ohio has also begun development of a parallel database to house ground water quality data, which was to be completed in 2011.

7. Data Analysis: *The State has a methodology for assessing water quality based on analysis of various types of data (chemical, physical, biological, land use) from various sources, including all waterbody types and all waters of the State.*

Evaluation:

Level of Development: 4

"Data management system supports/automates the assessment process. Documented methodology on how state performs cumulative effectiveness of water quality programs. Documented methods for assessing stressors (causes/sources) associated with impaired or vulnerable waters. Data analysis plans formulated to address other water program needs, e.g., NPDES program effectiveness and permitting, trend analyses, water effect ratios, TMDL calculations, etc. State monitoring objectives reflect the need to collect data and support decisions at scales beyond State boundaries (e.g., inter-jurisdictional waters, ecoregions, national)." (Level 4)

Explanation: In its Strategy, Ohio provides a general overview of its assessment methodologies, which are generally not documented directly in the Strategy but rather by reference to Ohio's Integrated Report and various other support documents. While referencing the Integrated Report or other documents is a reasonable approach, Strategy interpretation would be enhanced by incorporating concise summaries of how aquatic life and recreation designated uses are assessed for each major class of waterbody type. The Strategy should include enough detail that the reviewer understands in general what the data requirements are to support the assessment of each designated use. This could be done by way of an example for each designated use/waterbody type.

The work that Ohio has done to establish biocriteria and a tiered aquatic life use framework for assessing rivers and streams is commendable, as is the development of specialized indices for the primary headwaters, Great Lakes, and wetlands. For wadeable streams and large rivers, Ohio routinely conducts intensive biological and water quality surveys in 90-110 12-digit HUC watershed assessment units and 2-3 large river assessment units annually, for a total of 400-450 sites statewide. While the primary focus of these surveys is on the aquatic life use given that aquatic life criteria are generally the most protective, data are also collected for the assessment of recreation, drinking water, and fish consumption. Based on a review of the Strategy and Ohio's assessment methodology for wadeable streams and large rivers, it appears that most aquatic life impairment determinations in the state are based on biological data, with chemical data being

used to help determine causes and sources. It is unclear whether chemical data will be used to directly assess waters for aquatic life designated use attainment.

Ohio defines primary headwater streams as streams with less than 1 mi² drainage area. These streams are an important aquatic resource in Ohio given that many of these small streams exert a strong influence on the water quality of the larger downstream waters and are home to significant aquatic life forms. Accordingly, Ohio deserves much credit for having proposed the incorporation of the Primary Headwater Habitat (PHWH) aquatic life uses into the state water quality standards rules and working on developing biocriteria to be able to assess attainment of PHWH waters with water quality standards.

Inland lake assessment procedures are discussed in detail given the changes that are occurring to the inland lakes monitoring and assessment program. This program has evolved from an initial focus on trophic status, to a 14-parameter index called the Ohio Lake Condition Index (which did not comply with the newer credible data law), to the current focus on a basic suite of Ohio numeric criteria that address aquatic life, fish tissue, public water supply, and recreation beneficial uses. In 2010, Ohio formally incorporated harmful algal bloom (HAB) monitoring and algal toxin testing to the inland lakes monitoring program; the agency is currently considering how the HAB and algal toxin data will be used in making impairment decisions for recreation and public drinking water uses.

This current approach to the monitoring and assessment of inland lakes does not include biocriteria. EPA would like to see Ohio consider developing biocriteria for inland lakes, however; EPA appreciates that: a majority of Ohio's lakes are "artificial systems" (only 27 of 447 public lakes over 5 acres in size are "natural" lakes according to a state water resources report); Ohio EPA has identified several other priorities for the further development of its inland lakes monitoring program, including developing a more robust sampling program, expanding to a wider variety of lakes, exploring use of remote sensing, and tracking water quality changes due to 319 or other water quality improvement projects (p. 47); and Ohio has identified a number of other important priorities for further enhancements to its overall water monitoring program (pp. 83-104). While EPA would support the development of biocriteria for inland lakes, EPA understands that this is not a high priority for Ohio EPA at this time.

For Lake Erie, Ohio EPA has previously developed biocriteria (fish and macroinvertebrates) and biological assessment methods for the nearshore and river mouths. Long-term plans have also been developed by the Ohio Lake Erie Commission that are designed to ensure progress toward goals established under the Lake Erie Quality Index. No assessment procedure is documented or referenced for Lake Erie in the Strategy, however the Strategy does provide a description of a three-year GLRI sampling protocol for nearshore areas of Lake Erie that is assessing fish, macroinvertebrates, periphyton, habitat, nutrients, chlorophyll, metals, and other parameters; Ohio EPA hopes to continue biological and water quality monitoring for nearshore waters of Lake Erie pending sufficient funding availability.

Ohio has only one use designation for wetlands, however with the development of three wetland antidegradation categories and the analytical means to designate any wetland under these categories, Ohio has the capability to differentiate wetlands based on condition. Ohio currently

anticipates that this capability will be used primarily at the watershed scale as part of Ohio's intensive basin surveys. Ohio's work to integrate wetland monitoring with stream monitoring to assess watersheds is commendable.

8. Reporting: *The State produces useful reports on its findings - 305(b), 314, 303(d), and others.*

Evaluation:

Level of Development: 4

"Uses the Integrated Reporting format, including reporting results of randomized design and aggregating site-specific assessment finds for the whole state. Timely updates to the ADB to reflect changes based on final 303(d) lists. Provides the information on web-sites." (Level 4)

Explanation: Ohio EPA prepares and submits an Integrated Report (IR), containing both its 305(b) assessments and the state's 303(d) list, every two years in a timely fashion. The Ohio IR includes data from the last ten years of intensive watershed biosurveys. These watershed surveys are documented in biological and water quality Technical Support Documents (TSDs) that include fish, macroinvertebrate, chemical, physical, habitat and sediment data, and which present attainment results for aquatic life and recreation uses, and causes and sources of impairment for the waterbodies sampled. The data provided in these TSDs are then used as the basis for additional monitoring to support water quality modeling that provides the data used in the development of TMDL reports. The Ohio IR also includes reporting on groundwater, inland lake beneficial use impairments for recreation, public drinking water supply, and human health, and also introduced the procedures for aquatic life use assessment for lakes.

Wetlands have been included in the state's IR on a watershed basis. Ohio EPA plans on reporting wetlands as attaining or non-attaining relative to wetland tiered aquatic life uses, but to date wetlands have not been included on the 303(d) list. Ohio intends to continue reporting on wetlands on a watershed basis. Various other reports are described, for e.g. the biennial Integrated Water Quality Monitoring and Assessment Report used to present assessment results for the public drinking water supply use, fish consumption advisories, etc. Reporting associated with some water programs such as Beach Act and Section 319 are not mentioned.

9. Program Evaluation: *The State, in consultation with its EPA Region, will conduct periodic reviews of each aspect of its monitoring program to determine how well the program serves its water quality decision needs for all navigable U.S. waters in the State, including all waterbody types.*

Evaluation:

Level of Development: 3

"The State, in consultation with its EPA Region, conducts periodic reviews of each aspect of its monitoring program to determine how well the program serves its water quality decision needs for all State waters, including all waterbody types. This should involve evaluating the monitoring program to determine how well each element is addressed and determining how needed changes and additions are incorporated into future monitoring cycles." (Level 3)

Explanation: In 2002 and 2003 Ohio held joint meetings with EPA to review the state's monitoring program. Other periodic consultations with EPA have also occurred, for example regarding fish consumption and wetland program development pursuant to grants from EPA. However, with the exception of groundwater, details in the area of programmatic evaluation are somewhat sparse. The detailed discussion of programmatic priorities in Section J and throughout the entire Strategy demonstrate that Ohio EPA routinely engages in a systematic and thorough internal review of its monitoring programs. Future strategy development would benefit from enhancing the discussion of the internal review of Ohio's monitoring programs. Additionally, the Strategy does not indicate that external parties are afforded an opportunity to participate in the monitoring program evaluation process.

Regarding groundwater, Ohio EPA's groundwater section evaluates its ambient monitoring program through issuance of an "End-of-Round" report at the end of each sampling round, which the section uses to evaluate the effectiveness of its procedures and to identify other issues such as changes in sampling stations or parameters. Semi-annual meetings are held to discuss any issues raised by these reports. Section 106 work plans, annual reports and grant program reviews provide input to U.S. EPA, and recommendations are incorporated as resources allow.

10. General Infrastructure and Resources: *States identify current and future monitoring infrastructure needs.*

Evaluation:

Level of Development: 3.5

"The State identifies current and future resources required to fully implement its monitoring program strategy. This needs assessment includes funding, staff, training, laboratory resources, and upcoming improvements." (Level 3)

"Plan for meeting resource needs includes use of other partners (e.g., other state agencies, volunteer organizations, academic institutions, local government, private organizations, etc.)" (Level 4)

Explanation: In its Strategy, Ohio provides a detailed assessment of programmatic and staff needs. Table 6 and the ensuing discussion of each program "deficiency" are excellent and provide a detailed description of the gaps in Ohio's monitoring program. The table is very thorough and appears to include in one place all of the programmatic needs that were previously discussed in the Strategy. EPA interprets this list of deficiencies to represent the pool of candidate 106 Monitoring Initiative projects from which future proposals would be drawn if funding remains available. This excellent discussion would be enhanced with the addition of a water monitoring program budget, and an estimate of the added financial resources that Ohio would need to fill the programmatic deficiencies identified.

EPA supports Ohio EPA's reference to the use of trained volunteers for lake, TMDL, and perhaps other monitoring objectives, as described on pages 96 and 97. Already, Ohio has several building blocks in place that will enable Ohio EPA to increase its reliance on trained volunteers, including the Credible Data Rule and established volunteer networks in the state, such as the Ohio Lake Management Society citizen lake monitoring program.

Attachment: Region 5 Questions and Detailed Comments on Ohio EPA Monitoring Strategy

Strategy:

1. Referring to page 12, Section A.1.3, are any NAWQMN fixed station data used in the development of reasonable potential analyses and/or water quality-based effluent limitations? If so, what are the criteria for ensuring data used from a NAWQMN site is close enough to a point source to be useful for these purposes?
2. On page 15 the following statement is made: "It is hoped that this training approach can be implemented in the spring of 2011." Was it implemented then?
3. Referring to the ORSANCO discussion on page 21, how does the current ongoing bacteria TMDL effort, including the specialized tributary sampling to support the modeling effort, fit within Ohio's Monitoring Strategy?
4. In several places of the Strategy (e.g. pp. 27 and 37), Ohio discusses the integral role that wetland monitoring will play in future watershed assessments, and that wetland monitoring data will be integrated into the TMDL process to evaluate overall watershed quality. Is Ohio EPA able to describe how wetland monitoring will be integrated into watershed-scale TMDL development/implementation?
5. Page 29 at the bottom, it would be helpful if Ohio EPA could provide some examples of ongoing special studies or references to more information.

Objectives:

1. Does Ohio envision that nutrients are key parameters in Ohio's Lake Erie monitoring program (including the near shore)? Is there a measure against which Ohio can assess Lake Erie nutrient data?
2. Please define what "conventional" treatment means on page 25 (section A.8) of the monitoring strategy, where it says: "Development of PDWS water quality standards are based on the objective of public water systems using only *conventional* treatment to meet the finished water standards established by the Safe Drinking Water Act."
3. Referring to section B.1.3 on pages 32-33, EPA Region 5 agrees that the addition of criteria to determine impacts of harmful algal blooms would be a good addition to the monitoring and assessment program.
4. Referring to the Lake Erie sampling programs described on pages 35-36, do any of these programs include monitoring of Lake Erie drinking water intake areas?

Design:

1. Under the new inland lakes sampling program described on pp. 16-17, 34-35 and elsewhere in the Strategy, does Ohio EPA include all inland lakes and reservoirs used as drinking water

sources? These waterbodies (along with all public drinking water intakes) should be a priority for sampling.

2. On page 44 a discussion is presented concerning public drinking water supply (PDWS) use monitoring. Are all public drinking water intakes monitored for the PDWS use? Are these sites a part of the fixed stations networks described on page 12?

3. On page 38, the first paragraph (section B.7) a statement is made that: “[Ambient Ground Water Quality Monitoring Program (AGWQMP)] sampling includes deeper, more productive aquifers used by public water systems. However these aquifers are not necessarily representative of the shallow, most vulnerable or sensitive portion of the major aquifers in the state.”

Questions follow:

- a. On page 50, section C.7 a statement is made that the “AGWMP Operation Procedures Document, currently being updated, includes a section on the selection criteria for new wells.” Could this document be updated to include shallow, sensitive wells in the selection criteria?
- b. The “ground water probabilistic monitoring design” paragraph in section J.2.7 on page 101 says: “A strong case can be made to include more shallow wells located in sensitive aquifers by expanding the number of transient non-community (TNC) wells included in the AGWMP. A probabilistic design could be used in selecting the TNC wells using the statewide knowledge developed about sensitive aquifers.” Could the AGWMP operation procedures document be updated to include this recommendation as part of the selection criteria for new monitoring wells, or are there plans to implement this recommendation?
- c. On page 50 again, it would be helpful to include a brief summary of the selection criteria for new wells in the monitoring strategy just for ease of understanding and then one can go to the referenced document for more detail. Considering that this document is currently being revised we understand that this may not be possible at this time.

Indicators:

1. Referring to page 52, Table 3, for Primary Headwater Habitat Streams, does Ohio see a way to assess headwaters for nutrient impacts (e.g., through algal communities or biomass)?

2. Referring to section D.1.2.3 on page 54, EPA recommends that Ohio consider bromide as a supplemental indicator for PWS.

3. Referring to page 55, Table 4:

- a. Inland lakes and reservoirs: Has Ohio considered including nutrients as core indicators, given that Ohio is planning on adopting nutrient criteria for inland lakes?
- b. Lake Erie, Open Lake, Nearshore, and Lacustuaries: Has Ohio considered including

nutrients as core indicators, given the nutrient related impacts on Lake Erie?

4. The lack of pesticide and nitrate data prevents the state from evaluating the public drinking water supply (PDWS) use of surface water bodies. For example:

- page 33 (section B.1.3) says: "The 2008 and 2010 PDWS assessments also identified a lack of pesticide data at or near public water supply intakes,"

- the last paragraph on page 44 (section C.1.5) says: "... until the lack of pesticide data is addressed, it will be difficult to fully evaluate Ohio waters for the PDWS beneficial use," and;

- page 94 (section J.2.1.4) says: "As reported in Ohio's 2010 Integrated Report, sufficient data were available to complete evaluation of the nitrate indicator in 34% of the assessment units and for the pesticide indicator in only 13% of the assessment units ...

Without additional funding dedicated to collection of monitoring data at PDWS locations, it will be difficult to obtain the data necessary to complete assessments for all locations where the PDWS use applies." Does Ohio EPA use treatment and finished water quality data to try to help fill data gaps related to nitrate and/or pesticides? If the state is not using this information in the assessment of the PDWS use, how does the agency intend to address the lack of nitrate and pesticide data?

5. Does Ohio EPA require the use of procedures found in 40 CFR 136 where data are being collected for NPDES permit applications, reports required by NPDES permits, or 401 certifications?

Quality Assurance: no questions

Data Management:

1. On page 65, a new EA³ electronic monitoring and assessment database is described that will be web-based and can be shared externally. Does Ohio EPA intend to make this database available to the public online? If so, what is the timetable for developing this capability? If not, will data be made available to the public upon request? Is there presently a way for EPA Region 5 staff to access the EA³ database?

2. How are effluent data (chemical, physical and WET) maintained by Ohio EPA?

3. On page 66 of the Strategy is a statement that Ohio has begun development of a parallel database to EA³ to house ground water quality data, and that this database will be completed in 2011. Has this database been completed?

Data Analysis and Assessment:

1. For the comprehensive Lake Erie nearshore monitoring program that is being developed, will this program be implemented to assess for attainment with water quality standards for the lake? If so, what is the approximate timetable for this?

2. Has Ohio EPA considered using GLNPO or Environment Canada data for open waters of Lake Erie to assess for attainment with water quality standards?

3. Referring to section G.1.3. on page 68, will increased monitoring occur on "watch list" waters?

Reporting: no questions

Program Evaluation: no questions

General Support and Infrastructure Planning:

1. Pages 84 and 91: Region 5 encourages Ohio in developing an algal bio-indicator.

2. Is Ohio EPA able to prioritize the list of deficiencies that is detailed in Table 6 of section J?

3. Referring to p. 86, did Ohio conduct inland lakes monitoring in 2011? Does the agency plan to conduct lake monitoring in 2012?

4. Referring again to p. 86, the lower right box states that a standardized approach to collecting phytoplankton and algal toxin samples would be completed in spring of 2011. Was this accomplished? Recognizing that Ohio has not yet developed indicators for phytoplankton and algal toxins, does the agency plan to collect phytoplankton and algal toxin samples using this standardized sampling methodology in the meantime?

Evaluating State Monitoring and Assessment Programs (2/11/04)

Monitoring Program Element	Level of Development			
	Level 1	Level 2	Level 3	Level 4
<p>Strategy: A comprehensive monitoring program strategy addresses all water quality management needs and all waters of the State, including all waterbody types (e.g., streams, rivers, lakes, Great Lakes, reservoirs, estuaries, coastal areas, wetlands, and groundwater.</p>	<p>Monitoring strategy does not exist or does not address each element.</p>	<p>Monitoring strategy includes information on all elements, but does not provide complete description of program status, identify program needs, or include an implementation plan with milestones to address these needs.</p>	<p>The State has a comprehensive monitoring program strategy that serves its water quality management needs and addresses all State waters. The strategy should contain or reference a description of how the state plans to address each of the remaining 9 elements. The strategy should include a time-line, not to exceed ten years, for implementation. The strategy should identify technical issues and resource needs that are currently impediments to an adequate monitoring program.</p>	<p>Strategy address all water resource management needs including the need to support decisions at scales beyond state boundaries (e.g., inter-jurisdictional waters, ecoregions, national). Strategy includes plans for periodic updates every 3-5 years.</p>
<p>Objectives: The State monitoring program is guided by clearly delineated objectives consistent with the requirements, goals, and intent of the CWA and relevant State laws.</p>	<p>Does not define monitoring objectives that include the CWA and other program needs.</p>	<p>The State has identified some, but not all monitoring objectives to support decision needs relevant to all types of State waters.</p>	<p>The State has identified monitoring objectives critical to the design of a monitoring program that is efficient and effective in generating data that serve management decision needs. EPA expects the State to develop a</p>	<p>State monitoring objectives reflect the need to collect data and support decisions at scales beyond State boundaries (e.g., inter-jurisdictional waters, ecoregions, national).</p>

Evaluating State Monitoring and Assessment Programs (2/11/04)

Monitoring Program Element	Level of Development			
	Level 1	Level 2	Level 3	Level 4
			<p>strategy and implement a monitoring program that reflects a full range of State water quality management objectives including, but not limited to, Clean Water Act goals. Consistent with the CWA, monitoring objectives should reflect the decision needs relevant to all types of State waters</p>	
<p>Design: The State has a comprehensive monitoring program design and rationale for selection of monitoring sites that incorporate several approaches (e.g., fixed station, intensive and screening level monitoring, rotation basin, judgmental and probability design) to meet the range of program objectives.</p>	<p>Does not document approach and rationale for how designs meet objectives.</p>	<p>State provides documented approach and rationale for some, but not all monitoring objectives and water body types.</p>	<p>The State has a documented approach and rationale for selection of monitoring designs and sample sites that best serve its monitoring objectives. The State monitoring program will likely integrate several monitoring designs (e.g., fixed station, intensive and screening-level monitoring, rotating basin, judgmental and probability design) to meet the full range of decision needs. The State monitoring design should</p>	<p>Has a tiered monitoring design integrating probability sampling, landscape and other predictive tools, and targeted, special-issue approaches to cover all resource types, all uses and all programs.</p> <p>State monitoring designs reflect the need to collect data and support decisions at scales beyond State boundaries (e.g., inter-jurisdictional waters,</p>

Evaluating State Monitoring and Assessment Programs (2/11/04)

Monitoring Program Element	Level of Development			
	Level 1	Level 2	Level 3	Level 4
Indicators: The monitoring strategy defines a core set of monitoring indicators (e.g., water quality parameters), including physical/habitat, chemical/toxicological, and biological/ecological endpoints that states use to assess attainment.	Does not have a core set of indicators that includes biological and chemical measures.	Has a core set of indicators that include biological, physical, and chemical measures for some, but not all uses OR major waterbody types. And, includes a description of how indicators are linked to the uses.	The State uses a tiered approach to monitoring that includes core indicators selected to represent each applicable designated use, plus supplemental indicators selected according to site-specific or project-specific decision criteria. Core indicators for each water resource type include physical/habitat, chemical/toxicological, and biological/ecological endpoints as appropriate, and can be used routinely to assess attainment with applicable water quality	ecoregions, national).
			include a probability-based network for making statistically valid inferences about the condition of all State water types, over time. EPA expects the State to use the most efficient combination of monitoring designs to meet its objectives.	Applies indicators beyond the core, e.g., emerging issues, diagnostic indicators, microbial stressors, methods comparability studies, biological condition/human disturbance gradient. State indicators reflect the need to collect data and support decisions at scales beyond State boundaries (e.g., inter-jurisdictional waters, ecoregions, national).

Evaluating State Monitoring and Assessment Programs (2/11/04)

Monitoring Program Element	Level of Development			
	Level 1	Level 2	Level 3	Level 4
<p>Quality Assurance: Quality Management Plans and Quality Assurance Program/Project Plans are developed, maintained, and peer-reviewed in accordance with EPA policy to ensure the scientific validity of monitoring and laboratory activities.</p>	<p>No QMP and/or appropriate QAPPs.</p>	<p>State has an EPA approved QAPP and SOPs, but not QMP. State implements QA activities, as defined in plans.</p>	<p>Quality management plans and quality assurance program/project plans are established, maintained, and peer reviewed in accordance with EPA policy to ensure the scientific validity of monitoring and laboratory activities, and to ensure that State reporting requirements are met. State implements QA activities, as defined in plans.</p>	<p>Delegation of QA approval authority to state level. State implements QA activities, as defined in plans.</p> <p>State quality assurance plans and implementation reflect the need to collect data and support decisions at scales beyond State boundaries (e.g., inter-jurisdictional waters, ecoregions, national).</p>
<p>Data Management: The State stores and manages data in a timely and accessible electronic system. EPA will require States to directly or indirectly (via the Central Data Exchange (CDX) and the Monitoring Data Standards) use the new</p>	<p>The States does not have a computerized database.</p>	<p>The State has a computerized database that includes appropriate metadata and State/Federal geo-locational standards.</p>	<p>The State uses an accessible electronic data system for water quality, fish tissue, toxicity, sediment chemistry, habitat, biological data, with timely data entry (following appropriate metadata and State/Federal geo-locational standards) and public</p>	<p>State works with other major data producers to get their data into STORET. State is uploading data to STORET more frequently than annual.</p> <p>State data management activities reflect the need to collect data and support decisions at scales beyond</p>

Evaluating State Monitoring and Assessment Programs (2/11/04)

Monitoring Program Element	Level of Development			
	Level 1	Level 2	Level 3	Level 4
STORET (STorage and RETrieval) system.			access. State is uploading data to STORET and using ADB and NHD (where available).	State boundaries (e.g., inter-jurisdictional waters, ecoregions, national).
Data Analysis: The State has a methodology for assessing water quality based on analysis of various types of data (chemical, physical, biological, land use) from various sources, including all waterbody types and all waters of the State.	Little or no information is provided.	Methodology does not address all waterbody types and uses OR the methodology is not reproducible OR the State is not using data from other sources.	The State has a documented methodology for assessing attainment of water quality standards based on analysis of various types of data (chemical, physical, biological, land use) from various sources, for all waterbody types and all State waters. The methodology includes criteria for compiling, analyzing, and integrating all readily available and existing information (e.g., volunteer monitoring data, discharge monitoring reports).	Data management system supports/automates the assessment process. Documented methodology on how state performs cumulative effectiveness of water quality programs. Documented methods for assessing stressors (causes/sources) associated with impaired or vulnerable waters. <i>Data analysis plans formulated to address other water program needs, e.g., NPDES program effectiveness and permitting, trend analyses, water effect ratios, TMDL calculations, etc.</i>
				State monitoring objectives reflect the need to collect

Evaluating State Monitoring and Assessment Programs (2/11/04)

Monitoring Program Element	Level of Development			
	Level 1	Level 2	Level 3	Level 4
<p>Reporting: The State produces useful reports on its findings - 395(b), 314, 303(d), and others.</p>	<p>Does not provide a 305(b) report, 303(d) list and/or integrated report (IR). Does not provide required annual updates.</p>	<p>Provides water quality reports including 305(b), 303(d) (or the Integrated Report). Reports may not be timely or complete.</p>	<p>The State produces timely and complete water quality reports and lists called for under Sections 305(b) and 303(d) (or the Integrated Report), 314, and 319 of the Clean Water Act and Section 406 of the Beaches Act.</p>	<p>data and support decisions at scales beyond State boundaries (e.g., inter-jurisdictional waters, ecoregions, national). Uses the Integrated Reporting format, including reporting results of randomized design and aggregating site-specific assessment finds for the whole state. Timely updates to the ADB to reflect changes based on final 303(d) lists. Provides the information on web-sites.</p>
<p>Program Evaluation: The State, in consultation with its EPA Region, will conduct periodic reviews of each aspect of its monitoring program to determine how well the program serves its water quality decision needs for</p>	<p>Does not have a monitoring program evaluation process</p>	<p>Has incomplete monitoring program evaluation process, for example lacks process for soliciting feedback from all programs.</p>	<p>The State, in consultation with its EPA Region, conducts periodic reviews of each aspect of its monitoring program to determine how well the program serves its water quality decision needs for all State waters,</p>	<p>Seeks external participation in program evaluation, for example scientific peer review, monitoring councils, volunteer organizations, academic institutions, local government, private organizations, etc.)</p>

Evaluating State Monitoring and Assessment Programs (2/11/04)

	Level of Development			
	Level 1	Level 2	Level 3	Level 4
<p>Monitoring Program Element</p> <p>all navigable U.S. waters in the State, including all waterbody types.</p>			<p>including all waterbody types. This should involve evaluating the monitoring program to determine how well each element is addressed and determining how needed changes and additions are incorporated into future monitoring cycles.</p>	
<p>General Support and Infrastructure: States identify current and future monitoring infrastructure needs.</p>	<p>Does not document current and future resource needs.</p>	<p>Provides incomplete report of current and future resource needs to implement monitoring strategy.</p>	<p>The State identifies current and future resources required to fully implement its monitoring program strategy. This needs assessment includes funding, staff, training, laboratory resources, and upcoming improvements.</p>	<p>Plan for meeting resource needs includes use of other partners (e.g., other state agencies, volunteer organizations, academic institutions, local government, private organizations, etc.)</p>

