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Integrated Water Quality Monitoring and Assessment Report

prepared to fulfill the requirements of
Sections 305(b) and 303(d) of the Clean Water Act

ASSESS THE SITUATION

PRIORITIZE THE PROBLEMS

SCHEDULE THE WORK

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1 Purpose

This report describes the status of Ohio's waters, as required by section 305(b) and 303(d) of the federal Clean Water Act. Recent guidance from the U.S. Environmental Protection Agency (U.S. EPA) directs states to prepare an integrated 305(b) water quality inventory and 303(d) list of impaired water bodies for all waters of the state. Section 305(b) requires a summary of the status of the state's surface waters, while Section 303(d) of the Clean Water Act requires the state to develop a list of water bodies that do not meet established standards. Such waters are referred to as "impaired waters." The state must take appropriate action to improve impaired water bodies, such as developing total maximum daily loads (TMDLs).

2 Introduction

The 2002 integrated report is the next step in Ohio's continuing evolution to a fully-formed watershed basis for water quality reporting. U.S. EPA's 2002 Integrated Water Quality Monitoring and Assessment Report Guidance, dated November 2001, sets forth a new approach to water quality reporting in satisfying the Clean Water Act requirements for both Section 305(b) water quality reports and 303(d) impaired waters lists. In response to this federal guidance and lessons learned in doing TMDL projects in recent years, this report incorporates some changes in data interpretation and a refined methodology for judging the quality of Ohio's waters.

Traditionally, biological and chemical data collected at sampling sites has been aggregated, catalogued, and reported in terms of water body segments in Ohio's 305(b) reports. Recognizing the importance of addressing water quality impairments on a watershed basis, Ohio EPA, in its 1998 303(d) list, aggregated and prioritized the waterbody segments to produce a watershed-based listing. While a watershed basis has proven to be desirable, the underlying segment reference has produced confusion. Thus, with the 2002 integrated reporting and listing cycle, a methodology that moves directly from site attainment observations to reporting on watershed condition is being adopted.

Ohio has maintained a strong linkage between 305(b) reporting and 303(d) listing. Under the title of "Water Resource Inventories," Ohio has prepared 305(b) reports every two years since 1988 using biological-based assessments. 303(d) lists were compiled in 1992, 1994, 1996, and 1998.

Since the 1998 303(d) list was completed, the listing process has been examined through a number of venues. For example, in Ohio an external advisory group on TMDLs made recommendations on how to improve listing in Ohio, as summarized in Appendix A. The Ohio River Valley Water Sanitation Commission (ORSANCO) hosted a TMDL workgroup to promote consistency in 305(b) reporting and 303(d) listing among states draining to the Ohio River. Nationally, U.S. EPA convened a federal advisory group on TMDLs, a work group on consolidated listing and methodology, and gathered public comment as part of redrafting TMDL rules. Congress sought input on TMDLs from both the Government Accounting Office and the National Research Council. All of these activities, and others, have played some role in this report, either through federal guidance or Ohio's reaction to the guidance and recent experience in completing TMDLs for impaired waters.

Differences from the 1998 303(d) list occur primarily for the following reasons:

- The “integrated” guidance: the 2002 federal guidance that calls for the integration of the 305(b) and 303(d) reporting is fundamentally different in scope, organization, and options for communicating about waters than previous guidance for these reports.
- More recent data: the 1998 303(d) list was based on the 1996 305(b) data, which incorporated data collected between 1979 and 1994. This report uses data collected since 1990.
- Watershed delineation: the 1998 303(d) list prioritized watersheds using a draft set of watershed boundaries; that work is now final.
- Watershed focus in methodology: Ohio EPA’s experience with TMDLs since the completion of the 1998 303(d) list has reinforced the need for a watershed focus in programmatic planning.

This report includes a discussion of why a watershed focus is vital to restoring Ohio’s waters, how Ohio is defining an “assessment unit,” the methodology used in the assessment, how waters may be removed from the 303(d) list, schedules for monitoring and completing TMDLs, and a summary of public involvement in the preparation of the report. Several appendices provide additional detail. The status of Ohio’s waters is presented in a series of tables and maps following the text.

3 Focus on Watersheds

In 1990 the Ohio EPA initiated an organized, sequential approach to monitoring and assessment termed the Five-Year Basin Approach. One of the principal objectives of this new approach was to better coordinate the collection of ambient monitoring data so that information and reports would be available in time to support water quality management activities such as the reissuance of NPDES permits and periodic revision of the Ohio water quality standards (WQS).

The initial step in this process was to section the state into twenty-five different areas which represented aggregations of subbasins within major river basins. The twenty-five areas were each assigned to one of five basin years with respect to the five Ohio EPA districts. Thus within a given year, monitoring takes place within five of the areas and within each of the five Ohio EPA districts. Five years is required to complete the cycle of monitoring within each of the twenty-five areas. Once the field monitoring is completed, data analysis and reporting takes place. The end product is typically a Biological and Water Quality Study (also known as a technical support document (TSD)) which contains the summary and integration of the biological, chemical, and physical assessments. These documents are available electronically on the Ohio EPA Division of Surface Water web page at http://www.epa.state.oh.us/dsw/document_index/psdindx.html.

Since 1998, Ohio EPA has used a process called geometric site selection to identify sampling locations in watersheds targeted for TMDL development. The drainage area of the watershed is divided in half. This value is subsequently halved and so on. Sampling locations which best match these drainage areas are used in combination with other longitudinally relevant sites to adequately assess the watershed. For example, in a 500-mi² watershed a site would be located at 250 mi². Other sites would be located at 125 mi², 63 mi², 31 mi², 16 mi², 8 mi², and 4 mi². In

this example there would probably be about 30 4-mi² sites, 15 8-mi² sites, 10 16-mi² sites, 5 31-mi² sites, 3 63-mi² sites and between 15 to 20 other mainstem sites.

Through these complete watershed evaluations, Ohio EPA has gained some unique perspectives on data extrapolation and credibility especially with regard to small drainages. Additionally, we have encountered some problems with segment-dependent assessments. These problems include:

- Since determination of aquatic life use attainment status is specific to a sampling site, translation of site attainment status to segment attainment status limits assessment coverage and results in underutilization of data applicability.
- Segments force a linear analysis of data. Spatial analysis of data from small drainage areas is preferred.
- Characterization of attainment status within segments, expressed as a proportion of total monitored miles, will inevitably be skewed by the status of segments in small drainage areas if comprehensive watershed sampling is conducted. Small streams are most common.
- Identifying segments is a continuous process. Measures of total assessment coverage are confounded by the growing universe of assessment responsibility.

To address these issues, for this assessment Ohio EPA is adopting a watershed grading technique that incorporates a spatial analysis of sub-basins in addition to the traditional segment approach. This technique fosters direct comparisons of aquatic life use attainment status on a watershed scale. It is a fair reflection of the magnitude of water pollution in a particular area. As such, it is helpful in prioritizing remediation efforts.

4 Definition of Assessment Unit

An assessment unit provides a practicable way to summarize water quality data and to convey information about the inferred status of the water being evaluated. Therefore, an assessment unit changes with the provided analysis. Comparisons between assessment units are useful in water quality management, therefore, some consistency between assessment units is desirable. However desirable, this is not the current condition. In the future, Ohio EPA anticipates incorporating water quality information about streams, lakes, wetlands, water supplies, etc., in one assessment unit encompassing an area in size that is likely to be commensurate with the scale of any necessary remediation.

Although some progress has been made toward this end, this report continues to consider the status of streams separately from lakes which likewise are considered differently than wetlands and water supplies. Each lake that has been assessed in Ohio is considered to be an individual assessment unit. Lake Erie is divided into three assessment units. The Ohio River Valley Sanitation Commission evaluates the status of the Ohio River in sixteen segments which form the state's southern border. Each of these segments is an assessment unit. The status of Ohio's wetlands and water supplies is not reported in any comprehensive format. The Ohio EPA is developing programs to assess these waters.

Previous Ohio EPA 305(b) reports have exclusively used waterbody segments as assessment units. With this integrated report we present a method to assess an entire 11-digit hydrologic unit code (HUC) rather than reach specific segments within the HUC. Thus, 331 HUCs have become principal assessment units for Ohio EPA. Ohio has twenty-three rivers which drain areas considerably larger than 500 mi². Rivers of this size have been excluded from the HUC assessment units. Instead, these rivers are considered to be separate assessment units. Information about the status of these rivers is presented in a completely linear context. In both cases, it is not necessary to subdivide these assessment units unless more detailed information is desired. In that case, individual site performance is most instructive.

The 1998 303(d) list prioritized watersheds using a draft set of watershed boundaries being developed cooperatively by several federal and state government agencies. The agencies completed their work in 1999 and agreed to use the watershed boundaries. Thirty-three (about 10%) of the watershed delineations changed from those used in the 1998 303(d) list, mostly involving Ohio River tributaries. The changes are outlined in Appendix B.

In summary, assessment units considered in this report include the following:

- 331 11-digit HUCs to describe watersheds
- 23 large river units
- 3 Lake Erie units.

5 Assess

Once the assessment unit is defined, data are assembled for each unit. The data are evaluated to determine whether the unit is supporting, partially supporting, or not supporting its designated uses. Each AU is then categorized, or placed in one of the five unique assessment categories identified by U.S. EPA in the integrated reporting guidance.

5.1 Streams and Rivers

Ohio EPA has been instrumental in the development of biological criteria for assessing water resources and has focused the reporting on the assessment of waters in regards to aquatic life use. Focusing on aquatic life use is advantageous in that the criteria are often more stringent than those required for other uses, and the aquatic life use designation applies to almost every Ohio waterbody. Accordingly, the protection of aquatic life use should result in the protection of all other uses.

However, opportunities to improve waterbodies designated for recreation and as drinking water sources may be missed if the focus is only on aquatic life use. With this reporting cycle, a coarse grading of recreation use is introduced and a plan for future consideration of the drinking water use is outlined.

5.1.1 Aquatic Life Uses

Ohio EPA has been evaluating streams using similar methods for more than twenty years. Our stream evaluations are based on the experience gained through the collection of about 20,000 fish population samples, 8,000 macroinvertebrate samples and more than 68,000 water chemistry samples. It is the most robust database of its type in existence. This report is based on data collected since 1990.

Ohio has seven tiers in its aquatic life use designation system (OAC 3745-1-07(B)). Through a use attainability analysis, a given stream reach is assigned an appropriate aquatic life use. Biological sampling is conducted to establish attainment status. Although chemical and physical data are also collected as part of Ohio EPA's comprehensive watershed evaluations, the performance of the fish and macroinvertebrate communities against three indices is solely used to determine attainment status.

A structured process known as the Stream Regionalization Project was used to select reference or least impacted sites in each of Ohio's five ecoregions. Biological data from these sites was used to develop ecoregion specific biocriteria for each aquatic life use. A biological community at a sampling site must achieve the relevant criterion in all three indices in order to be in full attainment of the water quality standard (note: some indices may not apply in certain circumstances). Partial attainment is determined if one criterion is not achieved while non attainment results when all biological scores are less than the criteria or if very poor scores are attributed to either fish or macroinvertebrate communities. These biocriteria were codified in the Ohio Water Quality Standards (OAC 3745-1-07, Table 7-16) in 1990.

Consequently, an individual sampling site is Ohio EPA's most fundamental assessment unit. Any expression of attainment in a larger context is derived from the performance of pertinent sites and a thorough evaluation of all available water quality data. In a linear reach, the position of various sites in relation to pollution sources and applicable landscape features is used to assign distances with degrees of impairment. Typically, overall attainment is reported as a proportion of the larger assessment area. Hence, 80% attainment across ten river miles is a direct reflection of data that indicated the biological community in eight miles of a particular stream fully attained the appropriate aquatic life use.

Ohio has twenty-three rivers of various lengths with drainages of at least 500 mi². The status of these river assessment units is determined according to the linear method. The length of the river deemed to be in attainment is divided by the total length of the river to yield one value which represents the most general expression of the river's aquatic life use status. Table 1 contains summary information about each of these large-river assessment units.

Ohio has 331 HUCs encompassing a median size of 130 mi². The status of these HUC assessment units is determined according to a combination of spatial and linear analysis. The proportional attainment status of all sites with drainages less than 5 mi² is averaged with the proportion of attainment at all sites with drainage areas between 5 mi² and 20 mi². This average proportion of attainment is averaged with the proportion of attainment at all sites with drainage areas between 20 mi² and 50 mi². Effectively, the resulting average is a proportion of attainment status which is weighted toward the biological performance documented in a downstream direction. This proportion is averaged with the linear proportion of attainment for all reaches in the HUC which have drainages of between 50 mi² and about 500 mi². The outcome, a number ranging from zero to one, is multiplied by 100 to be presentable on a more common 0 to 100 scale. This number is the average of the proportional attainment status of sites with drainages of less than 50 mi² in a HUC and the proportion of miles of attainment for any streams in the HUC which drain between 50 mi² and about 500 mi². The final number can be considered to be an average grade of aquatic life use status for a HUC assessment unit.

Adequate sampling is necessary to represent the aquatic life use attainment status for all streams in a HUC. Despite Ohio EPA's significant biological sampling effort, about one third of the state's HUC assessment units are precluded from this analysis due to insufficient data.

About one half of these unassessed HUCs were evaluated prior to 1990 but have not been sampled since then. In other unassessed HUCs where recent sampling may have occurred, the scope of monitoring was likely judged too limited to adequately generate a HUC aquatic life use score. Generally, at least five sample sites are minimally considered necessary for extrapolation. Presently, Ohio EPA prefers that the principal investigators make informed decisions about the data relevance for a particular HUC evaluation rather than institute specific guidance on minimum effort.

Recognizing the state's limited resources, one way to increase HUC assessment coverage is to utilize all available relevant data. While Ohio EPA uses data from a variety of sources in its work, the data used to determine the aquatic life use status in this report was primarily collected by the Ohio EPA. Some additional biological data was provided by the Ohio Department of Natural Resources, Northeast Ohio Regional Sewer District, Miami University and Ohio Northern University. Those interested in providing data for aquatic life use attainment status determinations may attend appropriate training (such as the Voluntary Action Program training provided by Ohio EPA) or otherwise become competent in Ohio EPA biological sampling protocols. All data used to make attainment determinations is carefully reviewed for consistency with all Ohio EPA methods and guidance.

Table 1 and Appendix C contain summary information about the 23 large-river and the 331 HUC assessment units, respectively.

5.1.2 Recreation Use

Determination of recreational use impairment has been infrequent in Ohio. Indeed, it is uncertain whether any assessment unit has ever been documented to be in non-attainment of its recreational use. Previous 305(b) reports have included an analysis of the potential for non-attainment in various streams but listing has not occurred due to complexities in the data collection and use determination process. With the introduction of the HUC assessment unit, a strategy to begin listing Ohio's most severe recreational use impaired areas has been developed.

Ohio has three recreational uses including bathing waters, primary contact and secondary contact. Stream reaches are assigned an appropriate use. Ohio EPA collects bacteriological data as part of a comprehensive watershed evaluation. However, Ohio water quality standards indicate at least five samples in a thirty day period are necessary to establish a violation. This resource intensive protocol is not observed in part because collecting more samples across a wide area is more consistent with Ohio EPA's overall watershed approach. The implied targeted sampling should occur after critical areas are identified in a watershed assessment.

Ohio also has another standard which utilizes bacteriological data to establish public health nuisances (OAC 3745-1-04). This standard is similar to the secondary contact criteria but the requisite number of samples is at least two. In any case, it is reasonable to expect Ohio streams to be free from contamination associated with sewage. Exceedences of the bacterial concentrations associated with the secondary contact criteria represent potentially gross impairment. Therefore, a method to identify areas of excessive bacterial pollution and to identify these assessment units as impaired is desirable.

In this report any of the 23 river assessment units or any of the 331 HUC assessment units where at least five exceedences of the secondary contact criterion maximum (5000/100 ml Fecal Coliform or 576/100 ml *E. Coli*) have been recorded in the last five years are identified as

impaired. Additionally, if a dermal contact advisory has been issued by the Ohio Department of Health or a county health board for any part of the assessment unit, then the affected unit will be identified as impaired. This will qualify these units for the development of a TMDL to address recreational use issues.

The availability of bacteriological data is widespread especially in comparison with requisite data for other beneficial use determinations. The Ohio Department of Natural Resources monitors state park beaches. The Ohio Department of Health and county health boards also collect data that is likely to be appropriate for recreational use determinations. However, Ohio EPA was not able to consider other potentially valid data for this report. All bacteriological data used to characterize recreational use impairment in this report was collected by Ohio EPA. Six assessment units were identified as impaired based on an Ohio Department of Health or a county health board dermal contact advisory.

In the near future, it is anticipated that Ohio EPA will implement a more robust recreational use attainment analysis. The ability to accept data from external contributors will be considered at that time. However the use attainment process matures, it is certain that assessment units shown as impaired for recreation use in Appendix C would continue to be considered to be impaired under any new appraisal protocols.

5.1.3 Sport Fish Consumption

Conceptually, the importance of identifying streams from which the consumption of fish is not advisable is consistent with the Clean Water Act. However, Ohio does not include fish consumption among the codified beneficial uses. Since the use is not established, no criteria exist and attainment status cannot be assessed. Instead, the Ohio Department of Health issues the Sport Fish Consumption Advisory based on data collected by Ohio EPA and the Ohio Department of Natural Resources. The 2002 advisory can be viewed at <http://www.odh.state.oh.us/alerts/fishadv.pdf>.

Determination of sport fish consumption use attainment status is not necessarily synonymous with the issuance of an advisory. Should a recommendation that people refrain from eating carp more than once a week from a particular stream be regarded as an impaired use? Clearly, a recommendation that no fish should be consumed from a given river is non-attainment but the lack of criteria confound other interpretations.

A reasonable determination of impairment might be based on the one meal a month advisory. However, the extent of the Ohio Department of Health recommendations are broad in comparison with Ohio EPA assessment units. For instance, a typical advisory applies to the entire named stream even though the supporting data is often specifically associated with an individual site. While the purposes of both programs overlap and it is probable that the same data can be used to establish attainment status and advisories, there are significant differences in the intended uses of the information. In this situation, the implications of incorrectly characterizing an assessment unit as impaired cannot be dismissed especially in light of the fact that the public is well served by the advisory listing.

Obviously, further development of the sport fish consumption use is required. It is outside the scope of this report to attempt to discern non-attainment. Despite this, Ohio EPA is aware that streams have been identified where the health risks associated with eating fish are relatively greater. To begin to address this dilemma, any assessment unit which is considered to be in non-attainment of another beneficial use will be given a higher priority if any part of the unit is

the subject of an Ohio Department of Health Sport Fish Consumption Advisory. The priority will reflect the severity of the advisory limitations.

5.1.4 Drinking Water Use

The inclusion of drinking water assessments within the 305(b) report may help identify potential impairments to drinking water sources. Coordinating drinking water assessments with the Source Water Assessment and Protection (SWAP) program would lead to a more comprehensive picture of the overall quality and potential threats to Ohio's water resources. A more complete picture could assist in the ranking of waterbodies for 303(d) listing and potentially increase the funding opportunities available for improvement and protection of drinking water resources. Focusing funding of water quality improvement plans to watersheds with impaired drinking water sources would decrease costs of water supply treatment, thereby providing savings to communities while improving the overall health of the waterbodies for use by both aquatic and human life.

As the incorporation of assessing drinking water supplies would be a new addition to Ohio's 305(b) process, Ohio EPA has initiated the following activities to develop an appropriate methodology for assessing drinking water sources in Ohio:

1. **Nationwide Drinking Water Assessment Methodology Summaries.** Ohio EPA reviewed 305(b) reports and related materials from other states and contacted corresponding agency representatives to determine how this process is carried out nationwide. For states which had not previously assessed the drinking water use, the state was contacted to determine if it was planning on assessing the drinking water use in future reports.
2. **Ohio Drinking Water Assessment Criteria.** Beginning in the summer of 2002, an Agency workgroup will focus on developing a methodology appropriate for assessing the drinking water use in Ohio. The workgroup will review the methodologies practiced by other states and data from public water supply systems to establish criteria for evaluating the drinking water use.
3. **Data Sources for Drinking Water Assessment.** The workgroup will examine existing and potential data sources for assessing the drinking water use. These sources include, but are not limited to, the following: public water system treated and raw data, Ohio EPA ambient data and Ohio EPA SWAP data. A method for collection of data should be established by Spring 2003, so data collection for this use may begin Summer 2003.
4. **Data Analysis for Drinking Water Assessment.** By spring 2003, the workgroup will have a framework in place for analyzing collected data. The analysis method will include guidelines for determining full-, partial-, and non-support categories. The completion of this and the above tasks should allow drinking water assessments to be complete for the 2004 integrated report.

5.2 Inland Lakes, Ponds, and Reservoirs

Functionally, Ohio EPA's program to assess lakes began in 1989 when a Clean Water Act Section 314 Lake Water Quality Assessment grant supported the evaluation of 52 lakes. Various additional grants enabled the evaluation of 89 more lakes through 1995. An analysis and determination of use status for 447 public lakes (>5 acres in surface area) was presented in Volume 3 of the 1996 Ohio Water Resource Inventory (305(b) report). Since then, Ohio EPA

has monitored 53 lakes. Data from this effort has not been analyzed in a manner that facilitates inclusion in this report.

Although fewer resources have been available for Ohio EPA lake data collection and analysis, a significant lake evaluation tool was developed that is potentially applicable today. The Lake Condition Index was created to characterize overall ecosystem health and to assess beneficial use status. The Index was revised in 1996 to address changes in the interpretation of the threatened use, full attainment status. Even so, the current implications of identifying a lake as impaired with the necessity of a TMDL, were not anticipated. Hence, uncertainty exists about whether a lake sampled in the early 1990s that was deemed threatened should be considered in priority rankings for TMDL development.

Ohio is obliged to report on the water quality of lakes, ponds, and reservoirs, but dedicated funding to support a lakes monitoring program has not been available. With renewed attention to this shortcoming, an updated assessment of lake quality including under-utilized data is possible. Additionally, HUCs have been identified for TMDL development. Ohio EPA's watershed approach strives to address all water quality issues in a HUC. It follows that lakes in TMDL areas should be evaluated concurrently with other water resources and that appropriate remedial actions should ensue. However, current resources are not available to incorporate lake assessments in Ohio monitoring or TMDL analyses.

5.3 Wetlands

Ohio EPA began development of tools to determine beneficial use status in wetlands in 1996. In 1998, the State of Ohio established wetland water quality standards. Narrative criteria have been codified which protect the functional and recreational aspects of a designated wetland. Numeric biological criteria are anticipated in the future. These criteria will establish benchmarks for attainment of a likely tiered ecoregion-specific wetland use system. The ecological integrity of a particular wetland will be evaluated using vascular plants, macroinvertebrates, and amphibians.

With more than 200,000 potential wetlands to be evaluated, methods to accurately characterize the status of an assessment unit which may include several designated wetlands are being considered. A probabilistic evaluation of wetland quality in several HUCs has been initiated. To date, 121 individual wetlands have been assessed. Attainment status of these wetlands will be determined subsequent to further advances in wetland water quality standards.

5.4 Ohio River

Ohio EPA participated in an Ohio River Valley Water Sanitation Commission (ORSANCO) workgroup to promote consistency in 305(b) reporting and 303(d) listing. Following that effort, ORSANCO prepared and endorsed a 305(b) report for the Ohio River. For the purposes of this report, Ohio EPA defers to ORSANCO's analysis and includes as impaired those Ohio River areas bordering Ohio that are identified as impaired in ORSANCO's 305(b) report.

Approximately 450 miles of the Ohio River's 981-mile length flows along the southern boundary of Ohio. Of that length, ORSANCO indicates the following miles of impairment by use:

- 7 miles of aquatic life use impairment: partial support, based on biological data
- 80.1 miles of contact recreation use impairment, partial and non-support, pathogens

- 10.5 miles of public water supply use impairment, partial support, phenols
- 450.9 miles of fish consumption use support: partial support, PCBs, dioxin, mercury.

5.5 Lake Erie Nearshore, Islands, and Lacustuaries (Including Maumee and Sandusky Bays)

Aquatic life use determinations are predicated on a narrative description of the aquatic community associated with the relevant use tier. In the absence of numeric criteria, the narrative expectation provides the impairment determination. Ohio EPA completed *Development of Biological Indices Using Macroinvertebrates in Ohio Nearshore Waters, Harbors, and Lacustuaries of Lake Erie in Order to Evaluate Water Quality* in 1997. In 1999, *Biological Monitoring and an Index of Biotic Integrity for Lake Erie's Nearshore Waters* was produced. The data analysis in these documents provide a foundation to establish numeric biocriteria for aquatic life use in Lake Erie along the Ohio shoreline and in lacustuary areas.

The term "lacustuary" was coined to specify the zone where Lake Erie water levels have intruded into tributary river channels. The aquatic life use status of a lacustuary is included in the assessment of the tributary river. Excluding lacustuaries, the status of the Lake Erie shoreline is evaluated in three assessment units: western basin nearshore, islands, and central basin nearshore ("nearshore" in this case meaning areas within 100 meters of the shoreline). Techniques to assess open water areas are being explored under grants from the Ohio Lake Erie Protection Fund.

Concurrent with Ohio EPA's efforts to evaluate Lake Erie conditions, an international plan to improve attainment of beneficial uses began in 1994. The Great Lakes Water Quality Agreement provided the impetus for a bi-national Lakewide Management Plan for Lake Erie. The plan addresses 14 beneficial uses for Lake Erie, 11 of which are impaired, and establishes action plans to promote restoration. Ohio EPA has a leadership role in the development and implementation of the plan.

For this report, fish community data which best represent current conditions along the Lake Erie nearshore and island shorelines was evaluated against the expectations established in the documents cited above. In the western basin nearshore, 17% attainment was documented. Around the islands, 46% attainment was documented. In the central basin nearshore, 32% attainment was documented. Macroinvertebrate data has not been collected since 1996. Further development of the macroinvertebrate assessment methods are warranted before use characterizations are forthcoming.

The status of aquatic life use along the Ohio shoreline is strongly influenced by adjacent land use practices and by tributary conditions. To achieve full attainment, remedial actions directed at improving land use in Ohio are required. Therefore, it is reasonable for the Ohio EPA to include the Lake Erie nearshore on the Ohio 303(d) list. Ohio EPA is working with the other appropriate jurisdictions to attain a desired future state for Lake Erie. Listing the Lake Erie nearshore for TMDL development and our involvement with various Lake programs are part of Ohio's commitment to international restoration activities.

5.6 Establishing Assessment Categories

After assessing the status of the various uses of each assessment unit, one of five categories is assigned to each unit, or area assessed. Waterbodies with impairments are listed in Categories

4 and 5. Waterbodies that are not impaired are shown in Categories 1 through 3. The categories are defined as follows:

1. Suitable data available, the assessment unit is attaining the water quality standard, and no use is threatened.
2. Attaining some of the designated uses; no use is threatened; and insufficient or no data or information available to determine if the remaining uses are attained or threatened.
3. Insufficient or no data or information to determine if any designated use is attained.
4. Impaired or threatened for one or more designated uses but does not require the development of a TMDL, because
 - A. All needed TMDLs have been completed.
 - B. Other pollution control requirements are reasonably expected to result in the attainment of the water quality standard in the near future.
 - C. Impairment is not caused by a pollutant.
5. The water quality standard is not attained. The assessment unit is impaired or threatened for one or more designated uses by a pollutant(s), and requires a TMDL.

Category 5 constitutes the Section 303(d) list of waters impaired or threatened by a pollutant(s) for which one or more TMDL(s) are needed.

6 Prioritize

Waters identified as impaired and requiring a TMDL (Category 5) are prioritized according to the type and degree of impairment. As a practical matter, only the 331 11-digit-HUC and the 23 large-river assessment units are included in the priority-setting exercise. Recognizing the functionality and importance of watersheds, areas and assessment units identified in other ways (inland lakes, Lake Erie nearshore areas) are assigned the priority of the appropriate surrounding or contiguous 11-digit HUC.

The 11-digit-HUC and the large-river assessment units were evaluated using the following set of priorities (maximum possible total points is 13):

- Status of the Recreation Use, as determined by the factors identified in this assessment (bacteria and dermal contact). Any assessment unit having a Recreation Use impairment is automatically a high-priority water. (7 points)
- Status of the Aquatic Life Use, as determined by the factors identified in this assessment. The assessment unit scores were segregated into three sub-priority classes, as follows:
 - S Low priority for TMDL, 0 to 39: scores in this range generally indicate severe basin-wide problems, comprehensive degradation that may require significant time and resources and broad-scale fixes, including, possibly, fundamental changes in land use practices. Educating about how water quality is affected by various practices and encouraging stewardship may be more effective in these areas than a traditional TMDL approach. For example, a program by Ohio EPA and the Ohio Department of Natural Resources that funds watershed coordinators to develop a comprehensive,

implementable, community-driven watershed plan may be appropriate in these areas. (1 point)

- S Medium priority for TMDL, 80 to 99: scores in this range generally indicate a localized water quality issue. Addressing the impairment may not require a complete watershed effort; rather, a targeted fix for a particular problem may be most effective. (2 points)
- S High priority for TMDL, 40 to 79: scores in this range indicate a problem of such scale that purposeful action should produce a measurable response within a 10-year period. These waters are the best candidates for a traditional TMDL. The watershed coordinator idea mentioned above can also work effectively in these areas in concert with a TMDL effort. (3 points)

Because the evaluation of the Aquatic Life Use is more highly developed, it is possible to consider another important aspect of the assessment. Where over half of the Aquatic Life Use “non-attainment” is “partial,” the chances for recovery are better. Thus, additional consideration is given to assessment units with this characteristic (1 point). This has the effect of moving such an area to the next higher class.

- Additional consideration is given to assessment units with a fish consumption advisory. (1 point)
- Additional consideration is given to areas where recent data, sufficient to proceed with a TMDL, are available. (1 point)

No modifications were made to account for NPDES permit changes and other abatement measures made since the last 303(d) listing, as is allowed under Section 303(d). It is Ohio EPA's opinion that waters should remain on the TMDL list until an assessment indicates that impairment has been abated.

The priority information is reported in both the summary table (Table 1) and the detailed information for each assessment unit (Appendix C).

6.1 Ohio River and Lake Erie

Other organizations have accepted lead responsibility for TMDLs in two special waters affected by multiple jurisdictions: U.S. EPA for the open waters of Lake Erie, ORSANCO for the mainstem of the Ohio River. Ohio EPA automatically assigns these waters a low priority *for Ohio EPA-initiated action*. Ohio EPA will participate in TMDL actions conducted by the lead organizations.

6.2 Removing Waters From the 303(d) List

Federal regulations require a demonstration of good cause for not including waterbodies on the 303(d) list that were included on previous 303(d) lists (pursuant to 40 CFR 130.7(b)(6)(iv)). Good cause includes, but is not limited to, more recent and accurate data, more sophisticated water quality modeling, flaws in the original analysis that led to the waterbody being listed, or changes in conditions.

The 1998 Ohio 303(d) list included 273 HUCs based on data from 881 waterbody segments. The method used to develop this integrated report evaluated HUCs using site-specific data. Some rationale for not “filtering” the data with a segment analysis in route to constructing a HUC assessment is presented in Section 3. An additional reason to avoid segmentation is that some interpretations of the 1998 list disregarded the 273 HUCs and instead suggested that TMDLs were necessary to improve each waterbody segment. In this view, each cause associated with each non-attaining segment would require a TMDL. Effectively, this perspective considers segments to be discrete entities. Ohio EPA’s objective is to restore beneficial uses in entire watersheds. Segment assessment confuses this objective. Ohio EPA is developing TMDLs to improve conditions in all streams in a targeted watershed.

The 2002 Ohio 303(d) list identifies 205 HUCs and 15 large rivers for TMDL development. Apparent discrepancies between the former and present lists were reviewed to ensure that any exclusions were justified with good cause. One inconsistency that confounds direct comparison is that in the intervening years the boundaries of some HUCs have changed, as described earlier. Consequently, some impaired streams are in different HUCs today. Another mismatch between the two lists is that Ohio EPA now excludes large river data from the HUC assessment. In 1998 many HUCs were listed for TMDL development based on an impaired large river within the HUC. Often, the only sampling which has occurred in the HUC is on the large river. Now, the large-river data which supported the 1998 HUC listing is used instead to uphold the listing of the large river. If no other data are available to characterize the HUC, the HUC is considered unassessed.

This changing of streams within HUCs and reconsidering of data utility can be confusing. To avoid potential lapses between the lists, the present relevance of each of the 881 waterbody segments was individually reviewed. This investigation determined that 91 segments in 56 HUCs were incorrectly part of the 1998 303(d) list. Two flaws in the 1998 listing methods were discovered in this inquiry:

- Some waters were listed based on old data (older than ten years in 1998)
- Some waters were listed based on insufficient data (often only one sampling site)

The 1998 list was prepared using data that had been compiled for the 1996 305(b) report. Although those compiling the list desired to use “recent and readily available data,” a mistake likely occurred when the 305(b) assessment year was erroneously considered to be the year of data collection. The 1988 305(b) report presented the status of aquatic life use against proposed biological criteria for the first time. To do so, all previous data were entered in a computer database in a 1988 category field. Data in this field was subsequently used to understand trends in two-year 305(b) report cycles. In 1996, the database included fields for 1996, 1994, 1992, 1990, and 1988. In 1998, it would have been logical to assume that data in the 1988 field fit within a ten-year period (1996 to 1986).

Regardless of how the situation occurred, 31 HUCs appear on the 1998 303(d) list based on data in 60 segments that was typically collected in the early 1980s. In 1998, Ohio EPA would not have considered fifteen-year-old data to be “recent” even though it was “readily available.” Nevertheless, this data should be considered in its context. Historically, impairment was documented. Future monitoring should be scheduled with priority toward these HUCs.

Another flaw in the 1998 list occurred when an insufficient amount of data was used to characterize a HUC. Absent a linear relationship between multiple sites, extrapolation of site

attainment status to segment attainment status is difficult. For the purposes of explaining statewide trends in a 305(b) report, data from a single site has sometimes been used to infer the quality of a larger reach. The associated implications of this were more fully realized after the 1998 303(d) list was published.

It is unusual for Ohio EPA to have current data from only one or two sampling locations within a HUC. These situations occur where a reference site exists but no other sampling has been initiated. In some cases, single site sampling occurs in tributary streams to a larger river that are accessed by boat. Other peculiar situations may also occur. The 1998 303(d) list included 25 HUCs based on limited data from 31 segments. These data insufficiencies were not apparent during previous listings because the number of sites within a segment is not available in the 305(b) database. What is relevant now is that Ohio EPA is removing 25 HUCs from the 303(d) list that should not have been listed in 1998.

Finally, three HUCs on the 1998 303(d) list have been retained although the data which supported this placement is now considered old. The aquatic life use in these HUCs is impacted by historic and current mining-related activities.

Table 3 identifies the HUCs and associated segments on the 1998 list that are not on the 2002 303(d) list. The three HUCs that were retained are also identified. It is important to note that these waters are not being abandoned. Because there is some evidence of impairment, even though the data are old or limited in scope, these waters are given a higher priority for monitoring.

As part of three approved TMDLs, some waters that were demonstrated to be in attainment were to be removed during the next listing opportunity. However, with the evolution to more in-depth watershed assessment analysis with this listing, these changes may occur as part of the general analysis but they are not specifically pursued.

7 Schedule

Once waters are assessed and the problems prioritized, the next step is to determine a schedule to address the monitoring needs of all waters and restoration needs (including TMDLs) of the impaired ones. Various factors must be considered, including Ohio's ongoing TMDL work and the process identified to do TMDLs, the monitoring strategy, and the resources available for the work.

7.1 Ohio TMDL Status

Ohio EPA is currently working on TMDLs in twenty project areas, encompassing approximately sixty assessment units, as illustrated in the "TMDLs In Progress" map. All of these TMDLs address Aquatic Life Use impairments, and one also addresses a Recreation Use impairment. TMDLs in four of the areas are approved, and implementation is proceeding.

Ohio EPA is committed to producing meaningful TMDLs. From the outset of Ohio EPA's TMDL work, a basic tenet has been that the effort must be a meaningful expenditure of resources - not doing the work to "check off a box," but to bring about real environmental improvement. While Ohio EPA has the responsibility to establish TMDLs based on federal regulatory requirements, it also has a responsibility to the people of Ohio to protect, improve, and restore the integrity of all

waters in Ohio. The TMDL process provides a road map for the specific implementation of a watershed-based delivery of resources aimed at eliminating impairments to Ohio waters.

Ohio EPA has worked to build on traditional programmatic strengths in monitoring, modeling, permitting, and nonpoint source incentives to develop an integrated approach to TMDLs that aligns program goals and uses resources efficiently. In addition to program integration, Ohio adopted an active stakeholder process for its TMDLs. Given the fact that nonpoint source pollution is the dominant cause of impairment in Ohio, this local involvement is a key to success in restoring impaired waters. Recent experience has reinforced the importance of public involvement in local problem-solving and decision-making, as local stakeholders work to formulate implementation plans or reach consensus on local priorities. While such involvement leads to better decisions and more sustainable solutions, it complicates project schedules and makes product delivery more difficult to predict.

In addition to public involvement, an important feature of Ohio's TMDL process is the in-depth watershed assessment that typically kicks off the project. While the "causes and sources" included in this document are valid for various uses, decisions about how to bring waters into attainment with aquatic life, recreation, and other uses are best made with recent data. Thus, how best to approach restoration of uses and what parameters to target within TMDLs is decided as part of the TMDL project itself.

Ohio's TMDL program approach has been endorsed by an external advisory group of Ohio citizens, businesses, and interest groups. As U.S. EPA reconsiders its TMDL rule in light of the National Research Council (NRC) 2001 study, it is notable that Ohio's program already incorporates many of the NRC recommendations.

A schedule for completing all TMDLs in Ohio within fifteen years (from 1998) was established in February 1999. The schedule called for a limited number of projects in the first few years, with an accelerated pace beginning with the 2002 field season (TMDLs to U.S. EPA in 2004). Neither of the actions needed to move to the accelerated pace materialized, namely the completion of federal TMDL rule revisions and technical guidance and the acquisition of additional funding for TMDLs in the state budget cycle. Accordingly, in August 2001, Ohio EPA notified U.S. EPA Region 5 that the TMDL schedule would be revised. In October 2001, U.S. EPA was sued by several environmental interest groups over the pace of progress in Ohio's TMDL program. This was the 41st such lawsuit in the country. Ohio and various utilities and industry groups have intervened in this litigation.

We continue to seek other sources of funding for TMDLs and to work with other agencies or groups to produce TMDLs and similar products.

7.2 Long-Term Schedules for Monitoring and TMDLs

Ohio's five-year basin approach provides a foundation for scheduling monitoring and TMDL projects. The assessment methodology allows that, generally, monitoring data up to ten years old are valid for judging assessment units, so it follows that each assessment unit must be monitored at least once every ten years to maintain full coverage. Thus, each assessment unit is assigned to one of the next two monitoring cycles using the following factors:

- Ohio EPA's Five-Year Basin Monitoring Strategy
- Time since most recent assessment
- Distribution of work effort among Ohio EPA district offices

- TMDL schedule.

Our experience in doing TMDLs indicates that local involvement is a key to success. Although one indicator of local involvement is included among the scheduling criteria, it is difficult to gauge the level of local interest sufficient to sustain a TMDL effort. Thus, the schedule is flexible and can be influenced by expressions of local interest to undertake a TMDL (e.g., significant interest from local citizens and decision-makers, especially combined with letters of resolution from local governments).

The long-term TMDL schedule was generated based on the following criteria:

- Existing commitments
- Priority ranking
- Presence of a funded watershed coordinator who can assist with TMDL activities
- Distribution of work effort among Ohio EPA district.

In an effort to maintain the monitoring and TMDL schedule, Ohio EPA is committed to researching and pursuing additional resources, both in terms of funding and partnering opportunities.

The scheduling and TMDL information is reported on the detailed information sheets for each assessment unit (large rivers in Table 1 and watersheds in Appendix C). Table 7 isolates and sorts the scheduling information by monitoring year. Both the long-term monitoring and TMDL schedules are illustrated on maps included in the report.

7.3 Short-Term Schedule for TMDL Development

Ohio EPA has scheduled several TMDL projects during the next two years, as described in Table 4. TMDLs approved in the past two years are listed in Table 5.

8 Public Involvement

Ohio EPA convened an advisory group that included representatives from the regulated community (e.g., industries, municipalities), environmental groups, consultants, citizens, state and federal agencies, farm organizations, and development interests. The group, which included about eighty active participants, met from late 1998 to June 2000. One subgroup addressed listing issues. Their conclusions were as follows:

- Monitoring and data quality are essential
- Use outside data of highest quality
- Endorse priorities of 1998 list
- Increase attention to human health issues
- Quantify “cost of inaction”
- More monitoring is needed
- Data should be accessible and geographically referenced
- Increased public involvement is needed
- Current funding and resources are inadequate.

The cost associated with implementing the advisory group’s listing recommendations was \$3.2 million annually; the cost for implementing all advisory group recommendations was \$9.7 million

annually. Ohio EPA used these estimates to seek additional state funding but ultimately was unsuccessful in competing with other state funding priorities. We have incorporated the “low cost” recommendations (the first four listed above), and we continue to seek ways to address all of the group’s recommendations.

Much of the data used in this report has been presented to the public in meetings and publications concerning individual watersheds. Data and assessments have also been available in previous 305(b) reports. All of this information can be accessed from the following Internet web site: http://www.epa.state.oh.us/dsw/document_index/psdindx.html.

Comments were solicited on the draft Integrated Report in a 30-day comment period, August 21 through September 20, 2002. The responses to those comments are contained in Appendix D.

Maps

Watershed (HUC11) Assessment Units

Large River Assessment Units

Aquatic Life Use Status of HUC11 Assessment Units

Aquatic Life Use Status of Large River Assessment Units

Recreational Use Status of HUC11 Assessment Units

Recreational Use Status of Large River Assessment Units

Categories of HUC11 Assessment Units

Categories of Large River Assessment Units

Priority of Impaired Waters: HUC11 Watersheds

Ohio TMDLs in Progress

Ohio Long-Term Monitoring Schedule

Ohio Long-Term TMDL Schedule

Tables

Table 1. Status of Large Rivers Assessment Units (Detail Table)	23 pages
Table 2. Status of Watershed (HUC11) Assessment Units (Summary Table)	23 pages
Table 3. Waters on the 1998 List Not on the 2002 List	4 pages
Table 4. Short-Term Schedule for TMDL Development	3 pages
Table 5. TMDLs Approved in Past Two Years	1 page
Table 6. 303(d) List of Prioritized Impaired Waters (Category 5)	15 pages
Table 7. Monitoring and TMDL Schedule for Ohio's Watershed and Large River Assessment Units	16 pages

Table 3. Waters on the 1998 List Not on the 2002 List

Assessment Unit	Description	Sampling Year
<i>HUCs and associated segments that were inadvertently included on the 1998 303(d) list despite the fact that the data used to support the listing was more than 10 years old.</i>		
04100007 070	Little Auglaize River (Evans Ditch to Dog Creek)	1983
	Little Auglaize River (Headwaters to Evans Ditch)	1983
04100007 080	Prairie Creek (Hagerman Creek to Little Auglaize River)	1983
	Prairie Creek (Headwaters to Hagerman Creek)	1983
04100007 090	Little Auglaize R. (Dog Creek to Auglaize River)	1983
	Dog Creek	1983
04100011 010	Muddy Creek (Headwaters to Gries Ditch)	1982
04100011 130	Pickereel Creek	1983
04100012 050	Vermilion River (Southwest Branch to East Branch)	1987
	Vermilion River (Headwaters to Southwest Branch)	1987
	Clear Creek	1987
05030101 170	Trib to Wills Creek	1983
05030101 190	Yellow Creek (Brush Creek to Ohio River)	1983
	North Fork Yellow Creek	1983
	Randolph Run	1983
	Yellow Creek (Town Fork to Brush Creek)	1983
05030101 210	Trib to Wills Creek	1983
05030101 340	Tributary to Dry Fork (Rm 5.43)	1983
	Cross Creek (Headwaters to Salem Creek)	1983
05030106 040	Wheeling Creek (Headwaters to Cox Run)	1983
	Deep Run	1988
05030106 100	McMahon Creek (Williams Creek to Ohio River)	1983
	Little McMahon Creek	1983
	Kings Run	1983
	Aults Run	1983
	McMahon Creek (Headwaters to Williams Creek)	1983
	Williams Creek	1991
05030204 020	Rush Creek (Headwaters to Little Rush Creek)	1982

Table 3. Waters on the 1998 List Not on the 2002 List

Assessment Unit	Description	Sampling Year
	Bluntnose Creek (Trib. To Rush Creek Rm 19.40)	1982
	Center Branch Rush Creek	1982
	Turkey Run	1982
05030204 030	Durbin Run	1982
	Raccoon Run	1982
05040001 020	Holmes Brook	1983
	Unnamed Trib. To Little Chippewa Creek	1986
05040001 070	Conotton Creek (Headwaters to Mcguire Creek)	1982
05040001 080	Conotton Creek (Indian Fork to Tuscarawas River)	1989
05040001 170	Stillwater Creek (Brushy Creek to Tuscarawas R.)	1983
05040001 190	White Eyes Creek	1983
	Evans Creek	1983
05040004 040	Kent Run	1986
	Jonathan Creek (Headwaters to Buckeye Fork)	1986
05040004 090	West Br. Wolf Creek (Laurel Run to Muskingum R.)	1984
	West Br. Wolf Creek (Headwaters to Laurel Run)	1984
05040004 100	South Branch Wolf Creek	1984
05040004 110	Olive Green Creek	1984
05040005 030	Leatherwood Creek	1984
	Mud Run	1984
	Hawkins Run	1984
	Infirmary Run	1984
05040005 050	Crooked Creek	1984
05040006 020	Lake Fork	1984
05060002 080	Middle Fork Salt Creek (Headwaters to Pigeon Creek)	1986
	Middle Fork Salt Creek (Pigeon Creek to L. Salt Creek)	1986
05060002 090	Buckeye Creek	1986
05060002 130	Sunfish Creek (Chenoweth Fork to Scioto River)	1979
05060002 140	S Fk Scioto Brush (Shawnee Cr. To Scioto Brush Cr)	1984

Table 3. Waters on the 1998 List Not on the 2002 List

Assessment Unit	Description	Sampling Year
	Turkey Run	1979
	Mill Creek	1979
05060002 150	Scioto Brush Creek (Rarden Creek to South Fork)	1987
05080002 080	Indian Creek	1985
<i>HUCs and associated segments that were inadvertently included on the 1998 303(d) list despite the fact that the data used to support the listing was insufficient (parenthesis number is number of sites).</i>		
04100004 030	St. Marys River (Miami/Erie Canal to Sixmile Cr.)	1991 (5)
04100008 020	Blanchard River (The Outlet to Eagle Creek)	1989 (3)
04100009 070	Swan Creek (Ai Creek to Blue Creek)	1989 (1)
	Swan Creek (Headwaters to Ai Creek)	1989 (1)
04100010 060	Sugar Creek	1994 (2)
04100011 110	Beaver Creek Reservoir	1992 (1)
04110001 010	Beaver Creek	1992 (3)
04110004 010	Grand River Wildlife Area Lake	1995 (1)
04110004 030	Roaming Rock Lake	1995 (1)
04110004 050	Jefferson Reservoir (Lampson Lake)	1995 (1)
05030103 020	Berlin Reservoir	1989 (1)
	Deer Creek Reservoir	1995 (1)
05030106 010	Short Creek (Piney Fork to Ohio River)	1988 (2)
	Sally Buffalo Creek	1985 (1)
05030202 010	Little Hocking River	1990 (1)
05030202 020	Forked Run Lake	1995 (1)
05030202 040	Shade River	1990 (1)
05040001 040	Still Fork Sandy Creek	1993 (2)
05040001 160	Tappan Lake	1995 (1)
05040002 080	Black Fork Mohican R. (Rocky Fork to Clear Fork)	1988 (3)
05040006 040	Beaver Run	1989 (1)
05090101 070	Indian Guyan Creek (L. Indian Guyan Creek to Ohio River)	1990 (3)
05090101 090	Buffalo Creek	1990 (2)
	Caulley Fork	1990 (2)

Table 3. Waters on the 1998 List Not on the 2002 List

Assessment Unit	Description	Sampling Year
05090101 100	Symmes Creek (Venisonham Creek to Ohio River)	1990 (1)
05090103 010	Ice Creek	1990 (2)
05090103 030	Bear Run	1990 (1)
	Glady Run Swale	1993 (2)
05090202 070	Todd Fork (Dutch Creek to Little East Fork)	1984 (2)
	Todd Fork (Headwaters to Dutch Creek)	1982 (2)
	Dutch Creek	1983 (1)
<i>HUCs and associated segments that were included on the 1998 303(d) list and are retained on the 2002 303(d) list, in spite of old data.</i>		
05030202 100	Kyger Creek	1990
	Bell Lick Run	1982
05040004 050	Moxahala Creek (Headwaters to Jonathan Creek)	1988
	Ogg Creek	1987
05040004 080	Meigs Creek	1989
	Dyes Fork	1989

Table 4. Short-Term Schedule for TMDL Development

Basin Code	Basin Name	TMDL Status			
		Aquatic Life		Recreation	
04110002 010	Cuyahoga River (headwaters to below Black Brook)	in progress	2002		
04110002 040	Cuyahoga River (below Little Cuyahoga River to below Brandywine Creek)	in progress	2002	in progress	2002
04110002 050	Cuyahoga River (below Brandywine Creek to below Tinkers Creek)	in progress	2002	in progress	2002
04110002 060	Cuyahoga River (below Tinkers Creek to Lake Erie)	in progress	2002	in progress	2002
05030201 110	East Fork Duck Creek	in progress	2002		
05030201 120	Duck Creek (except East Fork)	in progress	2002		
05040001 100	Sugar Creek (headwaters to above Middle Fork Sugar Creek)	in progress	2002		
05040001 110	South Fork Sugar Creek	in progress	2002		
05040001 120	Sugar Creek (above Middle Fork to Tuscarawas River [except South Fork])	in progress	2002		
05060001 060	Scioto River (above Bokes Creek to above Mill Creek)	in progress	2002		
05060001 070	Mill Creek	in progress	2002		
05080001 090	Stillwater River (headwaters to above Swamp Creek)	in progress	2002		
05080001 100	Stillwater River (above Swamp Creek to above Greenville Creek)	in progress	2002		
05080001 110	Greenville Creek (headwaters to below West Branch)	in progress	2002		
05080001 120	Greenville Creek (below West Branch to Stillwater River)	in progress	2002		
05080001 130	Stillwater River (below Greenville Creek to above Ludlow Creek)	in progress	2002		
05080001 140	Stillwater River (above Ludlow Creek to Great Miami River)	in progress	2002		
05090101 020	Raccoon Creek (headwaters to above Hewett Fork)	in progress	2002		
05090101 030	Raccoon Creek (above Hewett Fork to below Elk Fork)	in progress	2002		
05090101 040	Raccoon Creek (below Elk Fork to above Little Raccoon Creek)	in progress	2002		

Table 4. Short-Term Schedule for TMDL Development

Basin Code	Basin Name	TMDL Status	
		Aquatic Life	Recreation
05090203 010	Mill Creek	in progress	2002
04100007 010	Auglaize River (headwaters to below Pusheta Creek)	in progress	2003
04100007 020	Auglaize River (below Pusheta Creek to above Jennings Creek)	in progress	2003
04100007 060	Auglaize River (above Jennings Creek to above Little Auglaize River)	in progress	2003
04100011 020	Sandusky River (headwaters to above Broken Sword Creek)	in progress	2003
04100011 030	Broken Sword Creek	in progress	2003
04100011 040	Sandusky River (below Broken Sword Creek to above Tymochtee Creek)	in progress	2003
04100011 050	Tymochtee Creek (headwaters to below Warpole Creek)	in progress	2003
04100011 060	Tymochtee Creek (downstream Warpole Creek to Sandusky River)	in progress	2003
04100011 070	Sandusky River (below Tymochtee Creek to above Honey Creek)	in progress	2003
04100011 080	Honey Creek	in progress	2003
05030204 060	Monday Creek	in progress	2003
05030204 070	Sunday Creek	in progress	2003
05060001 130	Big Walnut Creek (headwaters to Hoover Dam)	in progress	2003
05060001 140	Big Walnut Creek (below Hoover Dam to above Alum Creek)	in progress	2003
05060001 150	Alum Creek (headwaters to Alum Creek Dam)	in progress	2003
05060001 160	Big Walnut Creek (above Alum Creek [except above Alum Creek Dam] to Scioto River)	in progress	2003
05060001 190	Big Darby Creek (headwaters to below Sugar Run)	in progress	2003
05060001 200	Big Darby Creek (below Sugar Run to above Little Darby Creek)	in progress	2003
05060001 210	Little Darby Creek	in progress	2003

Table 4. Short-Term Schedule for TMDL Development

Basin Code	Basin Name	TMDL Status	
		Aquatic Life	Recreation
05060001 220	Big Darby Creek (below Little Darby Creek to Scioto River)	in progress	2003
04100012 010	West Branch Huron River (headwaters to above Slate Run)	in progress	2004
04100012 020	West Branch Huron River (above Slate Run to above East Branch Huron River)	in progress	2004
04100012 030	Huron River (above East Branch to Lake Erie) and Lake Erie Tributaries (below Sawmill Creek to below Huron River)	in progress	2004
04100012 040	Lake Erie Tributaries (below Huron River to above Vermilion River)	in progress	2004
04100012 050	Vermilion River (headwaters to above East Branch)	in progress	2004
04100012 060	Vermilion River (above East Branch to Lake Erie)	in progress	2004
04110001 020	West Branch Black River (headwaters to Black River)	in progress	2004
04110001 030	East Branch Black River (headwaters to below Coon Creek)	in progress	2004
04110001 040	East Branch Black River (below Coon Creek to Black River)	in progress	2004
04110001 050	Black River (below East Branch to Lake Erie) and Lake Erie tribs (below Black R. to above Porter Cr)	in progress	2004
05080002 060	Sevenmile Creek	in progress	2004

Table 5. TMDLs Approved in Ohio

Basin Code	Basin Name	TMDL Status	
		Aquatic Life	Recreation
04110002 020	Cuyahoga River (below Black Brook to below Breakneck Creek)	approved	2000
04110002 030	Cuyahoga River (below Breakneck Creek to below Little Cuyahoga River)	approved	2000
04110001 070	Rocky River (below West Br. to Lake Erie [including East Br.] and Lake Erie tribs [above Porter Cr to above Cuyahoga R])	approved	2001
05090202 010	Little Miami River (headwaters to above Massies Creek)	approved	2002
05090202 020	Little Miami River (above Massies Creek to below Beaver Creek)	approved	2002
05090202 030	Little Miami River (below Beaver Creek of above Caesar Creek)	approved	2002
05090202 040	Anderson Fork Caesar Creek	approved	2002
05090202 050	Caesar Creek (except Anderson Fork)	approved	2002
05060001 060	Scioto River (above Bokes Creek to above Mill Creek)	approved	2002

Appendix A. Summary of Listing Recommendations of the Ohio TMDL External Advisory Group

The following is from the Executive Summary of "Recommendations on Total Maximum Daily Loads," Report to the Director of the Ohio EPA, June 30, 2000, prepared by the Ohio EPA External Advisory Group on Total Maximum Daily Loads.

The Listing Subgroup prepared sixteen major recommendations in a number of important areas related to listing and de-listing of the waters on Ohio's TMDL (303d) list. Recommendations were made in the areas of monitoring and data, priority setting and public involvement.

- Monitoring and Data

The Listing Subgroup urges the Ohio EPA to increase the coverage of monitoring in Ohio to allow watersheds to be listed and de-listed with sufficient time for the TMDL process to address the range of impaired waters across the State. The subgroup is especially concerned about the number of waters for which data is unavailable, insufficient or too old with which to make sound decisions about listing and de-listing.

Related to the increase in monitoring is the need to make all the information used in the TMDL process promptly available to stakeholders and the public in easily understandable and easily accessible formats (e.g., web). Because of the importance of human health concerns, all human health and fish tissue data collected by the various resource agencies in Ohio (state, local, and federal) should be coordinated and available electronically for the TMDL process.

Ohio EPA should investigate other available information sources, and each type of data collected and used in the TMDL process should have an appropriate and adequate level of accuracy, precision, and reliability for its intended use in the TMDL process. The white paper the subgroup produced on minimum data quality requirements for listing and de-listing waters comprises its recommendation for minimum requirements related to the listing process.

- Priority Setting

The Listing Subgroup recognizes that the TMDL process cannot immediately address all impaired waters. As a result, the subgroup recommends that a priority system be developed to allow Ohio EPA to address some problem areas more quickly, and perhaps with more effort, than others. The subgroup recommends that human health risks should receive additional priority in the TMDL process, including impaired and threatened public water supplies. Because of the predominance of habitat impairment of aquatic life in Ohio, waters impaired by habitat should be incorporated into the priority process as if a TMDL were required.

The Listing Subgroup recognizes that there are environmental costs to deferring certain waters until late in the process, when they may then be more difficult or less able to be restored. Ohio EPA should quantify the "cost of inaction" and incorporate this factor into its priority system. Ohio EPA should also develop a clear decision making process, using the factors mentioned here and others, including the presence of federal/state endangered or

threatened species, restorability, and magnitude of impairment, and make this available for public review.

- Public Involvement

The Listing Subgroup recommends that public involvement be incorporated throughout the listing process. The process of listing and identifying causes and sources of impairment should be clearly and concisely summarized in the 303(d) list introduction. How various types of data can and will be used should also be described, and public input on all aspects of the proposed list should be solicited. Finally, the Ohio EPA should provide a specific mechanism for the public to appeal the agency's decisions on listing, failure to list, de-listing or acceptance of data.

Appendix B. Watershed Delineation Changes Since the 1998 303(d) Listing

The 1998 303(d) list prioritized watersheds using a draft set of watershed boundaries being developed by a collection of federal and state government agencies. The agencies completed their work in 1999. Thirty-three (10%) of the watershed delineations changed from those used in the 1998 303(d) list, mostly involving Ohio River tributaries.

Final 11-Digit HUC Number	Final 11-Digit HUC Description	Draft HUC Number Used in 1998 303(d) List
04100001 020	Tenmile Creek/Ottawa River	04100001 010
05030106 010	Ohio River tributaries (below Cross Cr to below Short Creek)	05030106 040
05030106 040	Ohio River tributaries (below Short Creek to below Wheeling Creek)	05030106 070
05030106 100	Ohio River tributaries (below Wheeling Creek to below McMahon Creek)	05030106 140
05030106 110	Ohio River tributaries (below McMahon Creek to below Fish Creek [WV])	05030106 200
05030201 100	Little Muskingum River (above Clear Fork to Ohio River)	05030201 220
05030201 120	Duck Creek (except East Fork)	05030201 240
05030202 010	Ohio River tributaries (below Muskingum R to above Hocking R) [Little Hocking River]	05030202 040
05030202 020	Ohio River tributaries (below Hocking R to above Shade R)	05030202 100
05030202 040	Shade River below Middle Branch and West Branch	05030202 110
05030202 090	Leading Creek	05030202 180
05030202 100	Ohio River tributaries (below Leading R to above Kanawha River [WV])	05030202 210
05090101 020	Raccoon Creek (headwaters to above Hewett Fork)	05090101 045
05090101 030	Raccoon Creek (above Hewett Fork to below Elk Fork)	05090101 050
05090101 040	Raccoon Creek (below Elk Fork to above Little Raccoon Creek)	05090101 060
05090101 050	Little Raccoon Creek	05090101 070
05090101 060	Raccoon Creek (below Little Raccoon Creek to Ohio River)	05090101 080
05090101 070	Ohio River tributaries (below Raccoon Creek to above Symmes Creek)	05090101 180
05090101 090	Symmes Creek (below Black Fork to below Buffalo Creek)	05090101 200
05090101 100	Symmes Creek (below Buffalo Creek to Ohio River) plus Ohio River drainage below Symmes Creek to above Big Sandy River	05090101 210

Final 11-Digit HUC Number	Final 11-Digit HUC Description	Draft HUC Number Used in 1998 303(d) List
04100001 020	Tenmile Creek/Ottawa River	04100001 010
05090103 010	Ohio River tributaries (below Big Sandy River [WV] to above Pine Creek)	05090103 050
05090103 020	Pine Creek	05090103 060
05090103 030	Little Scioto River (headwaters to above Rocky Fork)	05090103 070
05090201 010	Ohio River tributaries (below 8-digit divide to above Ohio Brush Creek)	05090201 020
05090201 030	Ohio Brush Creek (headwaters to below Baker Fork)	05090201 100
05090201 040	West Fork Ohio Brush Creek	05090201 105
05090201 050	Ohio Brush Creek (below Baker Fork to Ohio River [except West Fork])	05090201 110
05090201 070	Eagle Creek	05090201 200
05090201 080	Ohio River Tributaries (below Eagle Creek to above Whiteoak Creek)	05090201 250
05090201 090	Whiteoak Creek (headwaters to below East Fork)	05090201 260
05090201 100	Whiteoak Creek (below East Fork to Ohio River)	05090201 270
05090201 120	Ohio River Tribs. (above Indian Creek to above Little Miami River)	05090201 400
05090203 010	Mill Creek	05090203 030

Appendix C. Detailed Information for Each Watershed (11-Digit HUC) Assessment Unit

(331 pages)

Appendix D. Response to Public Comments

Four letters and several email comments were received during the 30-day public comment period (August 21 to September 20, 2002). The text of the letters and emails is reproduced below (contact names and phone numbers within the letters have been deleted). Ohio EPA responses follow each set of comments in *italic* type. Draft replies to email inquiries were provided as the inquiries were received.

Keith Dimoff Assistant Director, Ohio Environmental Council, Columbus, Ohio	Received 9/20/2002
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Thank you for the opportunity to comment on the draft report referenced above regarding Ohio's TMDL watershed restoration program. The Ohio Environmental Council (OEC) has several comments that we hope you will take into consideration while preparing the final report for US EPA:

- Sixty river segments that were on the previous schedule for Ohio's watershed restoration program, which was prepared by Ohio EPA in 1998, have been dropped from the new list (Table 3). The justification by the Ohio EPA in the new draft is that the previous listing was based on data collected prior to 1990 and is therefore considered to be too old. However, the OEC does not believe that this de-listing of sixty river segments is for good cause nor is it consistent with federal law and guidance. Waterways should only be de-listed if new data shows that the water is in attainment with water quality standards. The OEC believes that all of these de-listed waterbodies should be included on the 2002 list.
- Thirty-one river segments were de-listed for an insufficient number of sampling sites (Table 3). The OEC believes that these waterways should remain listed until new data shows that they are in attainment with the Clean Water Act.
- There are no listings for inland lakes, ponds, reservoirs or wetlands. The Ohio EPA's draft notes that there is inadequate funding for the state to be able to include these waters in its TMDL watershed restoration program. The OEC believes that these waters of the state should be included and urges the Ohio General Assembly to adequately fund the state's watershed restoration program.
- The draft report does not address impairments due to mercury contamination. The OEC believes that the report must address this serious, statewide problem in a timely and comprehensive manner.
- The draft 2002 report does not incorporate threats to drinking water sources, but only lays out possible future efforts to do so. The OEC calls upon the state of Ohio to commit to funding and completing the drinking water assessments necessary for inclusion in the 2004 watershed restoration program report.
- The draft report does not identify those waters that are not meeting minimum water quality standards for fish consumption. The OEC is concerned that some Ohioans, particularly in environmental justice communities, are at risk from eating contaminated fish, while the state's watershed restoration program is not identifying those waters as impaired under the Clean Water Act.

- The draft includes a new priority scheme that incorporates human health threats. Also, bacteria impairments are included for the first time. The OEC applauds these improvements.
- The draft list identifies those watersheds scheduled for the preparation of a TMDL watershed restoration plan in 2003-2004. However, it does not identify schedules for the remainder, which includes the bulk of the state. The draft report notes that "...scheduling information may not be available for the public notice period..." Indeed, the schedule has not been available during the public comment period. At the September 10 public information session, the Ohio EPA still did not have that list but said it is expected that the submittal to U.S. EPA will have a schedule for all watersheds. The OEC believes that the failure to identify schedules for the development of most TMDLs during the public notice period has deprived us and the citizens of Ohio the full and fair opportunity to comment on the list. The OEC urges the state of Ohio to commit to a timely, specific schedule for all TMDL watershed restoration plans around the state and to ensure adequate funding for the program.

Thank you again for considering our comments. The OEC is very interested in the state's TMDL watershed restoration program. We see this program, under section 303(d) of the Clean Water Act, as a vital safety net for Ohio's watersheds. It has the laudable goal of fulfilling the promise of the Clean Water Act—to restore the chemical, physical and biological integrity of the nation's waters.

Response: The following responses echo the points in the letter.

1. *U.S. EPA's November 2001 guidance includes the following regarding delisting:*

This guidance does not, and cannot, change existing rules for listing and delisting. The existing regulations require states, territories, and authorized tribes, at the request of the Regional Administrator, to demonstrate good cause for not including waterbodies on the 303(d) list that were included on previous 303(d) lists (pursuant to 40 C.F.R. 130.7(b)(6)(iv)). Good cause includes, but is not limited to, more recent and accurate data, more sophisticated water quality modeling, flaws in the original analysis that led to the waterbody being listed, or changes in conditions, e.g. new control equipment, or elimination of discharges. Where a waterbody was previously listed based on certain data or information, and the state or territory removes the waterbody without developing or obtaining any new information, EPA will carefully evaluate the state's or territory's re-evaluation of the available information, and will not approve such removals unless the state's or territory's submission describes why it is appropriate under the current regulations to remove each affected waterbody. EPA has the authority to disapprove the list if EPA identifies existing and readily available information, available at the time the state or territory submitted the list, that shows a waterbody does not attain water quality standards. See 40 C.F.R. 130.7(b)(6)(iv).

The removals of the 31 hydrologic unit code (HUC) assessment units in this 303(d) cycle are based on "flaws in the original analysis that led to the waterbody being listed." Watersheds were not eliminated because data were collected prior to 1990, but rather because their listing was based on data that was more than 10 years old at the time of their listing. A discussion of the circumstances is described in Section 6.2 of the report.

We agree with the commenter that minus a flaw in the original listing, the watersheds would not be removed merely because the data had aged. Indeed, some watersheds were examined and retained because we believed that the impairment was widespread and due to a long-term impact (mining) and could not have improved significantly since the data were collected. We will not attempt to remove watersheds currently listed when the data on which their listing is based has aged unless a legitimate basis for delisting exists.

It is not clear from the comment whether the commenter objects to the ten-year data window. Ohio uses data longer than many other states (many limit 303(d) listing only to data collected within the past 5 years), but we believe that data up to 10 years old is typically reliable if conditions in the watershed have not changed significantly since the data were collected. In Ohio, data older than 10 years has traditionally been used only to evaluate temporal trends or to investigate patterns in aggregated data.

- 2. The segments referred to are contained in 25 HUC assessment units, and these are being removed using a similar rationale as described above. Our intention is not to shorten the list of impaired waters, but to make it meaningful and reliable in the context of a watershed analysis.*
- 3. We will include inland lakes, ponds, reservoirs when we have adequate monitoring data. We continue to make progress in evaluating wetlands and plan to include wetlands in future listings when the program has developed sufficiently.*
- 4. Mercury listings in the past have been statewide, based on fish consumption advisories alone. However, for this listing we determined that sport fish consumption use attainment status is not synonymous with the issuance of a consumption advisory (we restricted the use of advisory information for TMDL listing purposes to prioritization). Having made that determination, there is no basis for mercury listings. However, we remain concerned about mercury issues. Since most mercury sources are airborne, dealing with mercury on a broad, regional scale makes more sense. We are committed to participating in regional efforts to deal with mercury issues. We also recently adopted rules that ban mixing zones for mercury from point sources.*
- 5. We have outlined a series of steps that should lead to the inclusion of drinking water assessments in the 2004 report, and meeting this goal is a priority.*
- 6. Like the commenter, we also are concerned about the consumption of contaminated fish. However, listing for 303(d) purposes must be based on an identifiable use impairment. Ohio does not have minimum water quality standards for fish consumption that enable impairment decisions. The advisories, which cover broad areas and are issued based on precautionary considerations, play an important role in public health. In fact, Ohio EPA recently demonstrated its commitment to future advisories when this agency agreed to assume responsibility for issuing advisories when the Ohio Department of Health could no longer fund the advisory program.*
- 7. We have added the Recreational Use status in response to a recommendation from our TMDL external advisory group. We are committed to identifying human health threats and look forward to refining the recreational use listing rationale in future lists.*
- 8. The long-term monitoring and TMDL schedules were not contained in the draft report. Technically, schedule information is not required to be public noticed under current statute*

or regulation. The report as public noticed did contain more information than was required to be available for public comment, but the schedule could not be completed in time to public notice the report and allow time for completion of the final report before the October 1 deadline. The final report will contain the long-term schedule.

John C. Fisher Executive Vice President, Ohio Farm Bureau Federation, Columbus, Ohio	Received 9/18/2002
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The Ohio Farm Bureau Federation (OFBF) would like to thank you for the opportunity to review and submit comments on the draft Section 303(d) TMDL Priority List for 2002.

OFBF is the largest voluntary nonprofit agricultural organization in the state of Ohio. Our members produce virtually every kind of agricultural commodity and as a result, OFBF is strongly interested in Ohio's TMDL program.

In an effort to ensure that Ohio agriculture is an active partner in watershed management activities, OFBF developed and launched the Agricultural Watershed Awareness and Resource Evaluation (AWARE) program. This program is designed to raise the comfort level of the agricultural community so that they will engage in watershed management discussions. Without the involvement of all watershed stakeholders, the TMDL program is destined for failure.

The voluntary implementation of management practices by Ohio's agricultural producers is resulting in many positive impacts on air, soil and water quality. We encourage our members to continue to be good stewards of our natural resources.

As per the published August 21, 2002 Public Notice, we have performed our review of the draft Section 303(d) TMDL Priority List for 2002. OFBF supports the use of scientifically based data and information to develop and establish water resource management programs for the state of Ohio. We are encouraged by the general approach being used by Ohio EPA in the development of the Integrated Water Quality Monitoring and Assessment Report. Water quality reporting on a watershed basis rather than a stream segment basis does have advantages when it comes to the development and implementation of watershed management plans.

The watershed monitoring and assessment process being utilized by Ohio EPA is dependent upon the use of a geometric site selection process to correctly characterize its water resources. Geometric site selection prior to water resource assessment has only taken place in a limited number of watersheds in Ohio to date. OFBF sees this as a major limitation to ensure that watersheds are assessed consistently.

The Ohio Farm Bureau Federation would like to express our disappointment that the public did not have the opportunity to review, discuss and comment on the specifics of the listing process prior to Ohio EPA development of the Integrated Listing Report. Prior review of the listing process would have allowed us to conduct a thorough and accurate review of the document.

Our specific comments and questions regarding the draft Section 303(d) TMDL Priority List for 2002 follow:

1. Page 5, Paragraph 4 discusses the process used to calculate the aquatic life use assessment score for each of the assessment units. The equation incorporates biological

performance weighted in the downstream direction into the assessment unit calculation. What is the rationale that formed the basis for the development of this complex equation for the calculation of the assessment unit aquatic life use assessment score?

2. Page 5, Paragraph 4 and associated figure illustrate the fact that the aquatic life use assessment score ranges from 0 to 100. What is missing from the discussion is how to interpret the value of the assessment score. What do scores near zero represent?, scores near 100?, etc. What is the basis for the six ranges of the attainment score that are used in the figure? Why were the ranges established where they were? Why are the ranges not consistent in size?
3. Page 5, Paragraph 5 discusses data adequacy and principal investigator judgement as it relates to data relevance. What is the decision matrix or flowchart that the numerous principal investigators used to ensure that data relevancy decisions were made consistently throughout the development of the assessment unit aquatic life use score calculation process?
4. Page 6, Paragraph 1 discusses the use utilization of all available relevant data in the assessment process. The Ohio Farm Bureau Federation supports the use all available data that meet specific, established data quality objectives and protocols. What is the list of necessary data requirements that Ohio EPA uses to screen non-Ohio EPA data for aquatic life use attainment status determination?
5. Page 10, Section 5.6 discusses assignment of assessment categories to each assessment unit. What is the decision matrix that was used to evaluate each assessment unit prior to placing into one of the assessment categories? What does it take to get into Category 1? Category 2?, Category 3, etc.
6. When reviewing the HUC 11 Assessment Unit maps, there appears to be some inconsistencies. If one assumes that if aquatic life use attainment scores in the 90 to 100 (purple) range indicate attainment of the aquatic life use and the recreational use is attaining (blue) then at a maximum, there should be 38 assessment units in Category 2 (green) and 1 in Category 1 (blue). In reality, 11 assessment units have been placed in Category 2 (green) and 1 in Category 1 (blue). It is obvious that an aquatic life attainment score of near 100 is needed to indicate attainment. Even so, why is it that only 1 of the assessment units indicating attainment of recreational use (blue) also in Category 2 (green) attaining some WQS?
7. Page 11, Section 6 discusses the prioritization process. The discussion is silent on how priority points are assigned to each assessment unit on the Category 5 list. How does one assessment unit receive 12 priority points and another only receive 1?

Once again, thank you for the opportunity to provide comments.

Response: Concerning the general comments, we appreciate the commenter's support for the approach of the report. We note that geometric sampling site selection is now the predominant method of watershed assessment. Finally, we understand the commenter's disappointment that little public involvement was available during the compilation of this report. Staffing shortages, as well as the departure of key staff familiar with past 305(b) and 303(d) reporting efforts, limited our outreach efforts. We are fortunate, however, that the recommendations of the external

advisory group on TMDL issues were available, and we used those recommendations where possible within budget and time constraints.

Specific comments:

1. *It is intuitive to interpret changing conditions in a downstream direction with regard to upstream influences. The linear intrinsic qualities of a stream increase with drainage area. Streams that drain an area larger than 50 square miles generally have an assimilative capacity that is sufficient to resist or otherwise recover from perturbations that would significantly impair a headwater stream. Conceptually, the capacity of a large river to dilute the impact of a small pollutant load are factors of scale.*

The scope of water resource monitoring in Ohio has grown since inception to progressively include smaller streams. Previously, expressions of status were limited to longitudinal trends apparent in data with orientation to flow. However, the network of headwater streams is better understood from a spatial perspective. Regarding small-drainage data in a linear framework unnecessarily limits extrapolation and yields an impression of inadequate monitoring coverage. Additional rationale for inclusion of a spatial approach to small stream assessment is included in Section 3, Focus on Watersheds.

Although the determination of a watershed score may be novel in Ohio, the method used to calculate the score is simple. The proportion of samples within three drainage stratifications, less than 5 square miles, 5 to 20 square miles and 20 to 50 square miles, are successively averaged to generate an overall impression of relative water quality. Traditionally, Ohio EPA has relied on proportions of miles of attainment to summarize attainment status. Now, instead of proportional miles, the number of sites where the use criteria were achieved is divided by the number of sampled sites to produce a proportion of attainment for each drainage stratification.

The sizes of the stratifications are consistent with Ohio stream bifurcation and inherent aquatic community traits. Although a simple proportion of all sites could have been used, the stratification limits the bias possible because more smaller streams are sampled. Alternatively, the status of larger drainages within the area of spatial assessment is deemed more likely to affect downstream use attainment. To lend some weight to this bias, the proportion of attainment in the smallest streams was averaged with the subsequent proportion of attainment of the next larger stratification and this number was averaged with the proportion of attainment in the largest stratification.

The difference between a simple proportion (number of attaining sites divided by number of sites) and the weighted average proportion was generally nominal for most watershed assessment units. However, the assessment unit score is the average of the weighted proportion of attainment and the proportion of attaining stream miles for reaches in the watershed that drained between 50 and 500 square miles. Thus, the status of the network of small streams (<50 square miles) is equally represented with the status of larger streams (>50 to 500 square miles) in the score. The disparity between these values is apparent in Appendix C.

Review of Appendix C with attention to the full percent attainment scores for small and large streams and reference to the full assessment unit score will provide some awareness of the scale of watershed specific issues. Bear in mind that this mix of spatial and linear assessment is skewed toward downstream data. Reliance on a proportion of sites alone or

just a proportion of all monitored miles will produce a skew toward small streams because there are more of them.

The overall rationale implicit in the assessment unit score is that the downstream environment should be more difficult to pollute because greater assimilative capacity is a property that is correlated with greater drainage area. From this perspective, the impairment of a large river is a more serious environmental concern than the impairment of a very small drainage. That said, the collective impairment of the majority of Ohio's small drainages is also an important environmental issue.

- 2. The score is water quality information presented on a continuum that is familiar in that 100 is a perfect score and 0 is a complete failure. Every sampled site in nine watershed assessment units was determined to be in full attainment of the relevant aquatic life use. Ohio EPA data supports the perception that water quality is very good in these nine areas. Conversely, none of the sampled sites in 26 watershed assessment units was capable of supporting aquatic life at a level required by the Clean Water Act. Ohio EPA data supports the perception that significant effort will be necessary to improve water quality in these areas. The assimilative capacity in the entire watershed is exhausted.*

The score of a specific watershed is a synoptic, or summary, value that is relevant to other watershed scores. This information can be framed in various ways to address particular interests. For instance, in Section 6, where prioritization is discussed, three ranges are defined. Using attributed points, a prioritization process is framed within the continuum to focus on the middle range for future TMDL work. For the figure to which the commenter refers, ranges were selected to frame the information visually - it was supposed that five equal divisions of 100 would be useful to the reader; the upper range was split to provide additional information on how close high-performing watersheds are to the goal. No other implication was intended.

- 3. Although no matrix or flowcharts exist, each score was independently reviewed by three integrated report contributors.*
- 4. No list exists. All data is carefully evaluated for any flaws regarding adherence to published Ohio EPA methodology and all applicable guidance. This process applies to both internal and external data. Data that is not acceptable for attainment purposes may be valuable in another manner as the situation warrants.*
- 5. The decision followed the flow chart provided in the November 2001 U.S. EPA guidance for the integrated report. The categories are assigned based on the attainment status of the aquatic life and recreation uses. Assignment to category 1 is possible only if sufficient data exists to make all use attainment determinations and then only if no impairment is indicated. Ohio has one watershed assessment unit where the aquatic life use score was 100 and no recreational use impairment was documented.*

Although eight other watershed assessment units and four large river assessment units were in full attainment of the aquatic life use expectation, these units did not include the seven other watershed assessment units or the one large river assessment unit that were in full attainment of the recreational use expectation. Assignment to category 2 might have been appropriate for these units if attainment of the alternate use was indeterminate. If impairment was detected, then assignment to category 5 was consistent with the guidance.

Category 3 is populated by assessment units where a lack of data precludes any attainment determination. Ohio EPA has insufficient aquatic life use data for 104 watershed units and one large river and lacks recreational use data for 202 watersheds and 5 large rivers. Assessment units were assigned to category 3 if a lack of data for both uses was extant.

Category 4 is intended for assessment units where all TMDL's needed to restore all beneficial uses have been completed. This category may also be assigned under some specific circumstances that are best understood through reading the US EPA guidance.

Most of Ohio's assessment units were placed in Category 5 because some use impairment has been documented within the unit.

- 6. The initial assumption only applied to nine of the purple watershed assessment units. The assertion that 100 reflects complete attainment is correct. No inference other than a visual representation of the continuum of aquatic life use status across Ohio was intended. The aquatic life use map has been adjusted to indicate which assessment units have a 100 score.*
- 7. The point system has been added to the report text. Assessment units were awarded points in each of the decision areas and the points were summed to arrive at the final priority points.*

Michael A. Snyder Shumaker, Loop & Kendrick, LLP, Columbus, Ohio	Received 9/19/2002
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The following comments on the Integrated Water Quality Monitoring and Assessment Report and 303(d) list that Ohio EPA has proposed to send to U.S. EPA are being submitted on behalf of the Ohio Electric Utility Institute (OEUI) Environment Committee and the following member companies (hereinafter collectively referred to as "the Utilities"):

- American Electric Power Co.
- Buckeye Power, Inc.
- Cinergy, Inc.
- The Dayton Power & Light Company
- Ohio Valley Electric Corporation.

Changes from 1998 303(d) List and Waterbody Identification Process:

The Utilities favor many of the changes made in the draft integrated 305(b)/303(d) report (the "integrated report"). Consistent with U.S. EPA guidance, the Utilities agree with Ohio EPA that integrating the 305(b) and 303(d) reports will make them much more useful for the agency and the general public. The merging of these reports creates a more transparent process that should improve Ohio EPA's ability to use waterbody information to make more informed decisions on impairment. The Utilities strongly favor Ohio EPA's consideration of the most recent water quality and biological data when making impairment assessments. While the Utilities have no objection to the use of waterbody-specific information collected during the assessment period 1990-2000, we recommend that Ohio EPA place a higher significance (weight) on the most recent biological results, especially where a waterbody assessment was conducted two or more times during the period 1990-2000.

The Utilities generally favor the shift from a “segment-specific” assessment unit to a “watershed scale” assessment unit. From a reporting standpoint, this change results in a lower number of assessment units (331 HUCs and 23 large river units) and, ultimately, a lower number of impaired waterbody segments when compared to the 1998 approach. Moreover, the Utilities agree that the attainment status of large rivers should be assessed separately from tributary watershed units. The focus on watershed assessment and impairment delineation makes sense from a water quality planning and ecological standpoint. However, the Utilities are aware of problems associated with over-simplifying the use attainment status of a watershed. Identifying the specific causes and sources of impairment within individual segments of waters in a watershed is an extremely important factor to the proper allocation of resources that are required to return a watershed to use attainment. The Utilities encourage Ohio EPA to implement the most efficient, easily interpreted, and externally transparent approach to translate site-specific biological and water quality data into meaningful use attainment assessments. The agency appears to have spent considerable time evaluating the most appropriate assessment unit and procedure to assess waterbody information. To this end, the Utilities cannot endorse or recommend any alternate procedures for delineation of assessment units.

The Utilities are encouraged that Ohio EPA has addressed, to the extent possible, the recommendations provided by the TMDL external advisory groups (Ohio EPA. 2000. Report to the Director of Ohio EPA: Recommendations on Total Maximum Daily Loads). Some of the recommendations made by the Listing Group are worth special mention because they play a significant role in determining whether waterbodies are deemed to be in attainment, or are impaired. One of the specific recommendations made by the Listing Group was that non-Ohio EPA waterbody information collected by entities other than Ohio EPA be considered in the overall waterbody assessment process. See “White Paper on Minimum Data Quality Requirements for Listing and De-Listing Waterbody Segments Pursuant to Federal Clean Water Act 303(d)”, which is included in pages 7-8 in the above-referenced document. On page 6 of the integrated report, Ohio EPA indicates that:

While Ohio EPA uses data from a variety of sources in its work, the data used to determine the aquatic life use status in this report was primarily collected by the Ohio EPA. Some additional biological data was provided by the Ohio Department of Natural Resources, Miami University and Ohio Northern University. Those interested in providing data for aquatic life use attainment status determinations may attend appropriate training (such as the Voluntary Action Program training provided by Ohio EPA) or otherwise become competent in Ohio EPA biological sampling protocols.

The Utilities understand the resource limitations (economic and otherwise) that agency staff must contend with when dealing with these issues. However, the Utilities believe that the data source issue should have received greater attention by agency staff since this recommendation was contained in the TMDL group’s final recommendations. Has the agency made any progress in establishing a process whereby outside sources of information are (at least), initially reviewed? The Utilities suggest that the agency commit to developing a procedure along with interested stakeholders that describes the steps needed for submission of non-Ohio EPA waterbody information to Ohio EPA. The Utilities strongly recommend that outside sources of data be considered fully prior to issuance of the draft integrated report in 2004.

Prior to issuing the draft 2002 integrated report Ohio EPA could have requested biological and/or chemical waterbody information from non-EPA sources. In this solicitation, the agency could have communicated that any information submitted for purposes of waterbody listing or de-listing, must conform to written Ohio EPA data quality and QA/QC procedures and

standards. This data submission procedure was discussed by the Listing Subgroup in the “White Paper” recommendations referenced herein. As indicated in the “White Paper”, it would be the responsibility of the stakeholder that its data conform to Ohio EPA standards and procedures.

As part of permit conditions, some permittees are required to submit biological sampling results to Ohio EPA. In other cases, permittees voluntarily collect biological information to evaluate the health and status of a waterbody near the respective facility. This information should also be considered by the agency when making attainment determinations.

Comments on Individual Sections:

Section 5.1.1

In Section 5.1.1, Ohio EPA states,

[a]lthough chemical and physical data are also collected as part of Ohio EPA’s comprehensive watershed evaluations, the performance of the fish and macroinvertebrate communities against these indices is solely used to determine attainment status.

The Utilities believe that the selection of data used to make use attainment/non-attainment determinations deserves much more attention. The agency appears to be making a policy decision that non-biological information will not be considered for listing or de-listing purposes. If this is the case, the agency’s policy needs to be clearly explained to the public. For example, some watershed monitoring groups measure various water quality parameters to determine the present status of waters and/or analyze long-term trends. However, it appears that Ohio EPA will not consider this information when it makes use attainment determinations. Is this true even in cases where the agency has no biological information of its own, but valid water quality data exists? For waterbodies that have not formally adopted biological criteria (Limited Resource Waters, Lake Erie), is the reliance on biological information to discern use attainment appropriate? How is water-column chemical data interpreted in these instances? The Utilities strongly recommend that the final integrated report clearly delineate the types of information that will be evaluated by the agency for purposes of listing and de-listing waterbodies. At a minimum, the Utilities ask that the agency provide them with answers to the questions set out herein. If it is the intention of the agency to retain this water quality data for 305(b) purposes only, this should be clearly explained.

The Utilities generally believe that attainment of applicable promulgated biological criteria should be the sole gauge of attainment for aquatic life use designations that have codified biocriteria. Likewise, demonstrated attainment of biological criteria should weigh heavily in NPDES permitting decisions regarding the need for chemical-specific or whole effluent toxicity limitations. Regardless, the agency must have a process of reviewing chemical water quality information, whether collected by Ohio EPA or other parties. For waters that do not have promulgated biological criteria, the Utilities believe that biological information may be used in conjunction with chemical water quality data, but non-attainment of the aquatic life use should not be deemed using biological information alone.

Ohio EPA seems to have abandoned the “Area of Degradation” method to determine the magnitude of aquatic life use impairment. On page 11 of the integrated report (“Prioritize” section), the agency indicates that the type and degree of aquatic life use impairment is determined using three factors: 1) spatial scale of impairment in assessment unit; 2) degree of impairment; and 3) restoration timeline. The categories of low, medium, and high priority are

delineated by numeric scores (e.g., “low” priority streams have scores from 0 – 39). What do the “scores” actually represent? Is there any relationship between these scores and “Area of Degradation”, which was used in the 1998 303(d) report? How are these scores related to the narrative use attainment categories of full attainment, partial attainment, and non-attainment?

Section 5.1.3

In the draft 2002 integrated report Ohio EPA has chosen not to equate the issuance of statewide fish consumption advisories with impairment of a specific beneficial use. As such, fish consumption advisories issued by the Ohio Department of Health are not considered an impairment of any numeric water quality standard. The Utilities support this decision because they believe it is legally sound, pragmatic and will result in good policy.

Declaring the entire state as “impaired” solely because of a fish consumption advisory was not legally sound. If the state’s water quality regulations do not include a numeric or narrative water quality criterion that protects a fish consumption beneficial use, any listing of a waterbody (or entire state) as impaired results in a new *de facto* water quality standard that has not been publicly noticed or promulgated pursuant to the terms and conditions of Chapter 119 of the Ohio Revised Code.

Individual Waterbody Impairment Listings

In reviewing the list of waterbodies listed by Ohio EPA as impaired and therefore requiring development of a TMDL (Category 5), the Utilities find that some waterbody segments on the list appear to be the same waters that have been proposed as Superior High Quality Waters or State Resource Waters in Ohio EPA’s most recent proposal to amend the antidegradation rule (O.A.C. § 3745-01-05). The Utilities find this regulatory inconsistency disturbing because it sends mixed signals to the public about the status of certain waterbodies. Below, we cite two examples of this puzzling “waterbody status” characterization.

First, the upper portion of the Muskingum River (large river hydrologic code 05040004 001) is listed as requiring a TMDL (Category 5) due to impairment of the aquatic life beneficial use. In the “Status of Large Rivers Assessment Units – detailed tables” section of the rule, the agency indicates the following attainment information:

Monitored Miles: 35.33
% of Monitored Sites in Full Attainment: 33.5
% of Monitored Sites in Partial Attainment: 62.0
% of Monitored Sites in Non-attainment: 4.5

For this waterbody stretch, the “high magnitude cause of impairment” is “organic enrichment/DO”, and the “high magnitude source of impairment” is “major industrial point source”. Moreover, Ohio EPA indicates that the impairment listing is based on the upper 20 miles of the Muskingum River (20 miles downstream of the Tuscarawas and Wolhonding River confluence), since this is the only portion of the river having recent assessment information. Ohio EPA’s technical basin report - “Biological and Water Quality of the Upper Muskingum River Basin” (EPA Technical Report MAS/1995-8-9), summarizes the aquatic life use attainment status in the upper 20 miles of the Muskingum River as follows:

The Muskingum River was in full attainment of the designated WCH use in the upper 9.7 river miles from Coshocton to Wills Creek, a short distance downstream from the Conesville EGS thermal discharge. Fish communities were in the good to marginally good ranges in this section while macroinvertebrates met the exceptional criterion. Aquatic life use

attainment dropped to partial in the remaining 8.4 miles of the study area from Adamsville (downstream from Wills Creek) to Dresden. Macroinvertebrates also experienced declines in community performance, but still reflected good and exceptional quality within the segment. (p. 3)

While Ohio EPA's own monitoring information indicates that some portions of the upper Muskingum River are impaired, the agency has characterized a portion of this waterbody segment as a Superior High Quality Water in its most recent proposed revision of the antidegradation rule. Under "Appendix 1. Ohio Streams & Rivers : Antidegradation Tier Justification, SRW, SHQW", the agency proposes a SHQW classification for the upper 11.83 miles of the Muskingum River. As indicated above, this section of river was in attainment of the WCH use designation. However, the upper 20 miles of the Muskingum River has been proposed as being impaired, thus requiring a TMDL. Thus, within this 20-mile stretch, the upper ½ of the segment is characterized as water-quality impaired, but is also classified as a SHQW. These contradictory characterizations of waterbody status should not exist. Moreover, the Utilities believe that only the lower ½ of the 20-mile stretch of the upper Muskingum River should be listed as impaired, as reflected by the agency's own monitoring results.

A second example of contradictory waterbody status and characterization is Wakatomika Creek (a tributary of the Muskingum River near Dresden, OH). Ohio EPA previously proposed that this stream be classified as a State Resource Water ("Antidegradation Classifications Assigned to State and National Scenic Rivers in Ohio under Proposed Rules, March 25, 2002"). However, Ohio EPA has listed the entire Wakatomika Creek (assessment units 05040004 020 and 05040004 030) as impaired on its most recent 303(d) list. In the upper Muskingum River biological and water quality assessment report, the agency describes sampling results for this creek as follows:

Biological communities throughout the Walhonding River and Wakatomika Creek were consistently of exceptional quality. (p.9)

The Utilities do not believe that a waterbody should be classified as impaired on Ohio EPA's 303(d) list and listed as a Superior High Quality Water or State Resource Water for antidegradation purposes. At minimum, the Utilities request that Ohio EPA re-evaluate the proposed 303(d) list and delete those waterbody segments that have been proposed to have the SHQW or SRW antidegradation classification.

The Utilities appreciate the opportunity to comment on these important issues and look forward to working with the agency and other interested stakeholders to continue to improve the listing and de-listing process.

Response:

With regard to aquatic life use attainment determination, new data completely supercedes old data. Aquatic life use attainment in the integrated report is limited to the most recent biological data collected since 1990.

Ohio EPA strives to provide information in a context that is consistent with the needs of the particular audience. The peril of oversimplification exists with any extension of data inference or summary of data significance. For instance, nutrients may be deemed to be a cause of impairment. Several different parameters in combination or an acute condition may provoke the listing. As a cause, "nutrient" is a simplification of underlying data.

To address the cause, the supporting data and rationale for the impairment association should be reviewed. In the same manner, the presentation of aquatic life use status based on a short reach of a small stream or based on a long reach of a large river are both summaries. To address concerns that are specific to either, the supporting data should be reviewed. Ohio EPA can answer specific questions posed for specific purposes, but reliance on a summary to obtain a specific insight is not recommended.

Ohio EPA produces Biological and Water Quality Reports which include extensive reviews and summaries of data for selected watersheds. These reports routinely include evaluations of permitted discharger performance. Although a nutrient-influenced impairment might be most associated with an unrelated cause, if discharge data included some background contribution this aspect would be explained in the report.

Water quality information has many audiences. The assessment units in the integrated report were selected with attention to the needs of the U.S. EPA which requires this product, to provide summary information to the public, and to facilitate a watershed focus in restoration efforts. Ohio EPA will attempt to be responsive to other needs and may provide information about various assessment units pursuant to our mission, goals or objectives.

The ability of Ohio EPA to accept external data can be improved. This is especially true for the bacteriological data used to make recreational use assessments. Some of the many organizations which collect this type of data are identified in the integrated report. The potential to maximize the use of all data is obvious, but the data management difficulties are less apparent. The assumption that QA/QC procedures are the limiting factor is incorrect.

Ohio EPA is most willing and able to accept biological data. All data is carefully evaluated regarding adherence to published Ohio EPA methodology and all applicable guidance. This process applies to both internal and external data. Data that is not acceptable for attainment purposes may be valuable in another manner as the situation warrants.

Aquatic life use attainment in Ohio is based on biological performance. Aquatic life use determinations are predicated on narrative descriptions of the aquatic community associated with the relevant use tier. In the absence of numeric criteria, the narrative expectation provides the impairment determination. Lake Erie and Limited Resource Water biocriteria have been published and reviewed in various formats. All Ohio EPA Biological and Water Quality Reports include aquatic life use attainment tables. The process used to determine aquatic life use attainment is explained in these reports and the attainment status of every sample location is apparent in the attainment table.

Ohio EPA uses all available data to interpret water quality conditions. Generally, more information will enable better understanding of these conditions and aid the entire assessment process. Although demonstrated attainment of the relevant aquatic life use is based on biological data alone, all data is valuable when used in the most appropriate manner.

The method used to determine the watershed assessment unit aquatic life use score is explained in the integrated report and further detailed in response to the Farm Bureau's comments. The Area of Degradation Value (ADV) was not used for this report. No attempt to correlate the ADV and the watershed scores was made but a relationship is certain because the supporting data is completely common.

The aquatic life use scores depicted on maps or otherwise referenced are specific to full

attainment. Partial and non-attainment component scores appear in Table 1 and Appendix C. The inference suggested on page 11 may be a misinterpretation. A discussion of the scores is also part of the response to the Farm Bureau's comments.

The entire Muskingum River is one large river assessment unit. The entire Walhonding River is one large river assessment unit. All biological data from the Walhonding River attains the (exceptional warmwater) aquatic life use criteria. Thus this assessment unit has no aquatic life use impairment and is not listed for a TMDL project. According to U.S. EPA integrated report guidance, assessment units should be assigned to Category 5 if use impairment has been documented. The Muskingum River is scheduled for a TMDL project because data indicates aquatic life use impairment exists.

Portions of both of these streams have been proposed for superior high quality antidegradation tier. The requirements for this designation are independent from the U.S. EPA integrated report guidance. No contradictions should be inferred. If aquatic life use impairment is documented within the Walhonding River assessment unit in the future, this impairment would evoke assignment to Category 5. Alternatively, if a future assessment of the Muskingum River included data that superceded all current data and if no aquatic life or other use impairment was documented, then this assessment unit would be removed from Category 5.

The implication that only one assessment unit should be a candidate for superior high quality antidegradation designation is not acceptable. Ohio EPA cannot delete assessment units from Category 5 based on any conditions other than those specified in U.S. EPA guidance.

Erwin J. Odeal

Executive Director, Northeast Ohio Regional Sewer District, Cleveland, Ohio

Received 9/20/2002

The following comments are being offered in response to the Ohio EPA's public notice concerning the 2002 Integrated Water Quality Monitoring and Assessment Report. We note that in July 2002 we submitted detailed comments on sources and causes for a list of Lower Cuyahoga River segments as a part of the Lower Cuyahoga TMDL process. A copy of those comments is attached.

Proposed Change to Hydrologic Unit Code for Assessment Units

The assessment report makes some valid points in favor of moving toward the hydrologic unit code and more expansive major river segments as a basis for assessment units to serve the broad purposes of the 303(d) list. At the same time there is a great loss of specificity if Ohio EPA is signaling that it is falling back from data collection, storage, and analysis by segments to hydrologic unit codes. Using the Cuyahoga River as an example, individual tributaries that are encompassed in a single hydrologic unit code can have very different characteristic and problems. Maintaining a database with segment specificity has great value for the purposes of developing remediation and pollution control programs as elements of a total watershed program. This high level of specificity is also critically important for the purposes of research to understand relationships between factors such as land use and biological attainment. Ohio EPA should continue to maintain high quality data at the stream segment level, if not as the 303(d) list then in another format.

The Need for Standards in Determining Sources and Causes

As in previous years, the proposed 303(d) list includes sources and causes of impairments. Given the importance that other Ohio EPA programs attach to 303(d) listed sources and causes (for example Ohio's proposed general stormwater permit and Ohio's WRRSP), it is critical that the data on sources and causes be of high quality. This can only occur through the use of objective criteria and decision rules for listing particular sources and causes. To assure that listed sources and causes are meaningful, some level of criteria and decision rules should be established and data that supports such determinations must be made part of the public record.

Impact of the Change to HUC Units on Currently Listed Sources and Causes

Our past work and comments to help improve 303(d) list including sources and causes has focused on providing information on a segment by segment basis. Looking at the current 303(d) list it appears as though segment specific sources and causes have been rolled up to the HUC unit level or to expanded major river segments. To the extent that this has been done it may invalidate some current and proposed Ohio EPA uses of the 303(d) list. For instance, Section 3.1.2 of Ohio's proposed General Stormwater Permit requires substantive measures for discharges that have 303(d) listed pollutants in their discharge. If, as it appears, segment information on sources and causes as been rolled up into larger units then a discharger of a pollutant on tributary A may be inappropriately burdened for a problem that is specific and isolated to tributary B in the same HUC. To avoid this problem Ohio EPA will either have to; A) revert to carefully chosen segments as assessment units or subcategories of assessment units, B) make programmatic changes related to uses of 303(d) listed sources and causes or, C) will have to establish explicit decision rules to assure that those listed sources and causes affect the entire assessment unit for applicable programmatic purposes.

Need for Clarity in Assessment Unit Description

We find that the language style used to describe hydrologic assessment units confusing in many cases. For instance, the hydrologic unit description for 04110002050 in table 6 is given as "Cuyahoga River (downstream Brandywine Creek to Tinkers Creek); Tinkers Creek; excluding Cuyahoga". Slightly long descriptors would greatly help to clarify the coverage of the applicable hydrological assessment unit.

Recreation Use Impairment

The current draft report relies, in determining recreational use impairment for TMDL development, on a sparse database that is acknowledged to be inadequate to meet the minimum requirements for determining water quality criteria violations. Considering the magnitude of the resources often needed to address recreational use impairment, the short-cut approach used in the draft report is clearly unsatisfactory. We strongly urge the Ohio EPA to proceed with implementing a more robust recreational use attainment analysis, utilizing all reliable data sources that fully meet minimum standards for both quantity and quality.

Sport Fish Consumption

We support the draft report's decision to not discern use attainment for sport fish consumption. The Ohio EPA is correct in recognizing that sport fish consumption use attainment status is not necessarily synonymous with the Ohio Department of Health's issuance of an advisory. Considering the limitations, it is appropriate to restrict use of advisory information for TMDL listing purposes to prioritization.

Lake Erie Near Shore Aquatic Life Use Attainment

We question the validity of the draft report's reliance on interim biocriteria in determining aquatic life use impairment in the Lake Erie near shore, islands, and lacustuaries. These biocriteria have not been adopted into the State's rules and they have not been subject to the public

scrutiny that would occur if they had been proposed for such adoption. Until they have gone through the rulemaking process through which the existing biocriteria for Ohio streams went, we cannot support the interim biocriteria as a basis for determining the need for TMDL development.

Inclusion of Drinking Water Assessments Within the 305(b) Report

The 2002 assessment report suggests a rationale for coordinating drinking water assessments with Source Water Assessment and Protection programs and the 303(d) list.

The basic logic is sound. However the following statement in the justification paragraph indicates an overly narrow perspective or a less than fully expressed idea:

“Focusing funding of water quality improvements plans to watersheds with impaired drinking water sources would decrease costs of water supply treatment, thereby providing savings to communities while improve the overall health of the water bodies for use by both aquatic and human.”

The particular concern is that funding for water quality improvement plans should also be a priority for the continued protection of high quality water supply sources. It is obvious that the (sic?) Ohio would not want to jeopardize a high quality resource such as Lake Erie by purposely focusing water quality improvement away from high quality resources to impaired drinking water sources.

Near Shore Lake Erie Assessment Units

Justification for listing near shore Lake Erie units in the 303(d) list does not appear to be contained in the assessment report or appendices and tables. The report suggests that the status of nearshore assessment units is evaluated by the information contained in three assessment units. We were unable to find these assessments in the report or the supplemental information accompanying the report. Additionally, we suggest that the report's supplemental information, much of which is in a difficult to search PDF format, would benefit from a table of contents as a navigation guide.

Again, thank you for the opportunity to comment on these most recent TMDL developments. I'm sure you are aware that the District has a great deal of interest and concern with the outcome of these rules and appreciates the chance to provide valuable input.

(The attachment to this letter is not reproduced here.)

Response:

Proposed Change to Hydrologic Unit Code for Assessment Units

Data is generally specific to a single sampling location. Subsequent extrapolation to any other scale entails the types of concerns indicated above. Ohio EPA will continue to maintain high performance expectations.

The Need for Standards in Determining Sources and Causes

Many audiences exist for Ohio EPA evaluations. As new audiences are identified we will continue to provide the best information possible to meet their needs. Formerly, causes and sources were primarily regarded with respect to statewide trends and to identify the types of water quality issues that policy makers and other leaders might solicit support to address.

Ohio EPA publishes robust biological and water quality evaluations based on annual data collection efforts that are specific to major river basins in Ohio. These evaluations are available on the Agency web site. Reliance on summary information provided in other formats may limit a particular audience's perception of the watershed specific issues.

We are aware of the request to be adaptive to future audiences and intend to provide water quality information in targeted and concise formats that we hope will suit various specific needs.

Impact of the Change to HUC Units on Currently Listed Sources and Causes

The influences attributed to specific entities are described in the relevant Biological and Water Quality Report. As mentioned above, Ohio EPA is aware that various audiences with different interests prefer formats that cater to particular needs. We will continue to work to meet these requests.

Need for Clarity in Assessment Unit Description

We agree that the differing names are confusing. In the final report, we adopted the names used by the task force that delineated the HUC boundaries. We trust that the information is now more consistent and clear.

Recreation Use Impairment

Ohio, like the majority of states, has an under-developed recreational use assessment program. However, the inference that water quality violations are precluded with regard to recreational use criteria in our current context is a misinterpretation of the extent of Ohio's comprehensive data collection effort. Exceedences of a maximum criterion are a violation. The integrated report acknowledges a need for improvement in the recreational use assessment effort. Furthermore since impairment determinations for this use are new and will attract new interest, Ohio EPA has maintained a conservative approach to enable refinement in the process. Nevertheless, the recreational use impairments identified in the integrated report constitute gross problems. Any future iterations in recreational use assessment will also identify this impairment because it is so significant. While many resources may be required to resolve this impairment, the magnitude of this pollution is more compelling. The reduction of benefit from this use and associated compounding costs of inaction prompted Ohio EPA to assign a high priority to correct this impairment through the TMDL process.

Sport Fish Consumption

No response is needed.

Lake Erie Near Shore Aquatic Life Use Attainment

Aquatic life use determinations are predicated on a narrative description of the aquatic community associated with the relevant use tier. In the absence of numeric criteria, the narrative expectation provides the impairment determination. The use of interim Lake Erie biocriteria which have been published and reviewed in peer and public formats is completely consistent with Ohio Water Quality Standards. The word "interim" should be understood to imply the criteria are valid and will be formalized.

Inclusion of Drinking Water Assessments Within the 305(b) Report

No response is needed.

Near Shore Lake Erie Assessment Units

All discussion pertinent to Lake Erie is contained in text in Section 5.5 of the integrated report. The justification is clear. Fish communities along the Ohio portion of the Lake Erie shoreline

including island areas do not completely meet the aquatic life use expectation. U.S. EPA guidance requires use impaired assessment units to be scheduled for TMDL development.

Timothy W. Lohner, Ph.D.
Environmental Services, American Electric Power, Columbus, Ohio

Received 9/20/2002

Has Ohio EPA listed any portion of the Ohio River on its 303(d) list?

Response: In this report, Ohio EPA defers to ORSANCO's analysis of Ohio River water quality data and includes as impaired those Ohio River areas bordering Ohio that are identified as impaired in ORSANCO's 305(b) report. Please refer to Sections 5.4 and 6.1 for additional information. ORSANCO's Biennial Assessment of Ohio River Water Quality Conditions for Water Years 2000 and 2001 can be viewed and downloaded at the following Internet site: <http://www.orsanco.org/rivinfo/pubs/pdf/305b%202000-2001/305b.pdf>

Dudley Patrick
Environmental Engineer, U.S. Naval Facilities Engineering Command

Received 9/19/2002

I have two inquiries concerning the subject listing. First, what assessment unit number has been assigned, if any, to that segment of the Ohio River in Cincinnati's Walnut Hill area (intersection of Victory Parkway and Madison Road)? Second, what assessment unit number has been assigned, if any, to that portion of Lake Erie in Cleveland, adjacent to Municipal Stadium (E. 9th Street terminus)? I was unable to identify these segments on the current list. Thank you for your assistance.

Response: For the purposes of this report, assessment units in terms of 11-digit HUCs or large rivers do not apply to the Ohio River (Cincinnati location in your inquiry) because Ohio EPA deferred to ORSANCO's assessment information as contained in their recent 305b report for the Ohio River. See previous response for information about this report.

The Cleveland location is in or adjacent to 04110001 070. More specific information about Ohio HUCs can be found at the following website: <http://www.oh.nrcs.usda.gov/waterres/14digFrameSet1.html>. The site shows 14-digit HUCs (subdivided from 11-digit HUCs), and this finer detail can make it easier to discern specific locational information. For instance, the Cleveland location has a 14-digit address of "04110001-070-050-Lake Erie Tribs. east of Rocky R. and west of Cuyahoga R."

Kelly Danczak
Environmental Planner, Cuyahoga River Remedial Action Plan (RAP), Cleveland, Ohio

Received 9/19/2002

I have reviewed the 2002 Integrated Water Quality Monitoring and Assessment document. I have reviewed "Table 2. Status of Watershed (HUC 11) Assessment Units (Summary Table);" on page 6 there are two Assessment Units that are unclear to me in their description:

04110002 050 Cuyahoga River (downstream Brandywine Creek to Tinkers Creek); Tinkers Creek; excluding Cuyahoga

04110002 060 Cuyahoga River (downstream Tinkers Creek to mouth); excluding Cuyahoga R. mainstem

On the Division of Surface Water: Nonpoint Source Program, Ohio Nonpoint Source Pollution Control Program Watershed Eligibility for the FY2003 319 Grant, page 3, the following is stated:
04110002 050 Cuyahoga River (below Brandywine Creek to below Tinkers Creek)
04110002 060 Cuyahoga River (below Tinkers Creek to Lake Erie)

I do not understand why these two identification numbers do not correlate exactly in each document. On the Watershed Eligibility List 2003 the descriptions lead me to believe that they include and are in fact referencing the mainstem of the Cuyahoga River between tributaries and Lake Erie. However, the exact same codes on Table 2 specifically state that they do not include the mainstem of the Cuyahoga River. Also, Brandywine Creek and Tinkers Creek do not intersect except via the Cuyahoga River. Can you please clarify which document is accurate in its description of the area referred to by the preceding codes?

Response: We agree that the differing names are confusing. In the final report, we adopted the names used by the task force that delineated the HUC boundaries. We trust that the information is now more consistent and clear.

The numbers are the HUC 11 hydrologic codes that correspond to watershed boundaries. These watersheds are scored in this report to communicate water quality information on a scale that is commensurate with likely remedial actions. There are 23 large rivers in Ohio which obviously intersect various HUCs. Water quality issues related to large rivers can most effectively be addressed through focused attention on the contributing HUC 11 watershed concerns and through an organized concert of activity involving the many constituents within the entire large river watershed.

Regarding the Cuyahoga, Table 1 indicates the large river portion begins downstream from the Brandywine Creek confluence and incorporates about 25 stream miles. The map that displays large river aquatic life use status illustrates that the Cuyahoga is among four of Ohio's most impaired rivers for this use. Many who are familiar with all of these rivers regard the Cuyahoga as the most feasible to restore among the four.

04110002 050 Cuyahoga River (downstream Brandywine Creek to Tinkers Creek); Tinkers Creek; excluding Cuyahoga:

This watershed was scored based on data from Indian Creek, Tinkers Creek, Chippewa Creek and several others. Data from the Cuyahoga mainstem is not part of the watershed score.

04110002 060 Cuyahoga River (downstream Tinkers Creek to mouth); excluding Cuyahoga R. mainstem:

This watershed was scored based on data from Mill Creek, Big Creek, West Creek and a few others. Likewise, Cuyahoga mainstem data was excluded from this watershed score.

The 050 HUC has an aquatic life use score of 20 and the 060 HUC scored 3. These values indicate it is unusual to find a healthy stream in either area. Upstream, the 040 HUC scored 39 which reflected data from the mainstem, Brandywine Creek and many smaller streams. Our data indicates the 040 HUC has improved for aquatic life use in the last ten years. This is testament to the reference above about the large river potential.

Progressing upstream through Akron to the headwaters the scores are 030=9, 020=80, 010=19. The 80 score reflects data from about 15 mainstem stream miles and from Breakneck Creek, Potter Creek, Wahoo Ditch and other streams. In this area it is unusual to not to find a healthy stream. The most upstream Cuyahoga River HUC is influenced by channelized stream habitat, degraded water quality downstream from several dams (low dissolved oxygen-high ammonia concentrations) and by wetland conditions which do not score as high as more typical riffle, run, pool type streams.

Several documents on the Division of Surface Water's web site provide detailed information about all of the streams in the basin (http://www.epa.state.oh.us/dsw/document_index/psdindx.html). We also anticipate an analysis of the data that was collected in 2000 in the Cuyahoga River watershed to be available in the near future. The resulting report will be posted to this location when available.

The scores mentioned above are illustrated in a color map in the report. Review of this map shows how the Cuyahoga HUCs compare not only to each other but also to the rest of the state. RAP priorities for improvement of aquatic life may be influenced by the scores. Should future effort be devoted to the "80" sub-basin, the "39" sub-basin or toward one or all of the other sub-basins? The same question can be addressed from a statewide perspective. Also, since most of the Cuyahoga is considered to be impaired for recreational use, how should that concern be prioritized?

Jim Turner, P.E. City Engineer, Fairfield, Ohio	Received 9/18/2002
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I have a couple comments on the 2002 Integrated Water Quality Report.

Issue #1: In Appendix C of the report, a summary is provided for each of the assessment units. If that assessment unit is impaired, causes and sources of impairment are listed. This impairment summary is confusing to me for one watershed of interest, the Great Miami River downstream of Fourmile Creek to its mouth - AU 05080002 090. The listed causes of impairment are: "cause unknown", "flow alteration", and "other habitat alterations." The sources listed are: "land development / suburbanization (NPS)", "urban runoff / storm sewers", "removal of riparian vegetation", and "natural."

It's not clear to me how a TMDL would be developed for this watershed, given the fact that no pollutants are listed as a cause of impairment. I assume that this TMDL would address flow alteration in the river and establishing more vegetation in the riparian zone. Also, I'm curious as to why non-point source pollution ("NPS"), is listed as a source when no pollutant is included in the cause list.

Issue #2: The new assessment unit approach in the 2002 report loses some of the detail from earlier water quality reports. Specifically, the Mill Creek watershed (AU 05090203 010) was previously divided into 10 waterbodies - each with a description of causes and sources of impairment. The wide variety of problems in the Mill Creek leads to a long list of sources and causes when the watershed is looked at as a single unit. Because these problems are often tied to local sources that are not found throughout the watershed (i.e., combined sewer overflows), I think the assessment unit summary could be easily misinterpreted. If the state

chooses to keep this assessment unit basis, a more detailed description of causes and sources should definitely be included in the TMDLs that are prepared.

Thank you for your consideration of these comments. Please let me know if you have any questions.

Response: We agree that the situation is somewhat confusing, but we are hopeful that new electronic information management efforts and more attention to how the cause and source information is being used by various parties will allow us to provide better and more useful information in future reports.

To determine the watershed aquatic life use assessment scores for this report, the investigator most familiar with each assessment unit assembled and reviewed all pertinent biological data that had been collected in the assessment unit in the last ten years, then calculated the aquatic life use score. The scores represent an amount of impairment and provides an appreciation of the relative magnitude of water quality issues in each evaluated basin during the last ten years.

The causes and sources that appear in this report were generated based on our previous 305(b) reporting activities. Although these concerns exist in the particular watershed there is no aspect of proportional significance intended. The solution you suggest to better characterize and summarize concerns - "a more detailed description of causes and sources should definitely be included in the TMDLs that are prepared" - is part of our existing strategy and alludes to our detailed watershed evaluations, published as Biological and Water Quality Reports and commonly known as Technical Support Documents (TSDs). Any subsequent representation is a summary of the TSD evaluation and by definition some detail is not included. The bottom line is that your awareness of local water quality will not be enhanced by a summary.

Many of our TSDs are available to be downloaded at: http://www.epa.state.oh.us/dsw/document_index/psdindx.html. Those that are out of print can be photocopied and provided. All of our data and any reports are public information. Dennis Mishne (614-836-8775) can help determine where we have information that may interest you and make arrangements to provide it.

The Fourmile Creek watershed excludes any data from the Great Miami River. The GMR is one of the large rivers that is included in Table 1. If you are interested, a TSD for the GMR (dated 1996) is on the web site referenced above. Otherwise, the watershed score is based on data from Taylor Creek, Paddy's Run, Bluerock Creek, Briarly Creek, Wesselman Creek, Steel Creek and an unnamed GMR tributary. Unless we get back to this area and obtain more information before the next integrated report, it is uncertain whether the amount of data collected since 1994 will be sufficient to sustain the calculation of a status score. However, even if the data lapses, the watershed will remain on the impaired waters (303(d)) list.

A TMDL should not be based on the causes and sources that appear in this integrated report summary. Once a watershed is selected for TMDL effort, a robust data collection survey is conducted. Afterward, all data would be considered to address the most critical causes and sources.

David W. Hacker Regulatory Affairs Specialist, US Filter Engineering and Construction, Moon Township, PA	Received 9/12/2002
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I was unable to attend the public meeting in Columbus on Tuesday. Are there any minutes available regarding that meeting? If so, how would I obtain them?

I am most concerned with the anticipated TMDLs affecting the Maumee River. When reviewing the Integrated Report, I see several areas mentioned that include the Maumee River, but may exclude the mainstem. I was uncertain as to what the effect this would have on a potential discharger who anticipates discharging into the main channel.

I am also interested in how Ohio EPA develops TMDLs for "total toxics." Because it is not a specific pollutant, how will TMDLs for "total toxics" affect dischargers? My understanding of "total toxics" is that no known sources of toxic pollutants and/or no specific pollutant has been identified, but toxicity is an issue. In essence, it's a broad category. I am currently evaluating a direct discharge option for a refinery. The refinery currently discharges to a POTW. Current data suggests that assuming that the antidegradation issues are adequately addressed, water quality issues should not be a problem. However, if TMDLs are developed for the Maumee River, this could substantially change after spending millions of dollars on plant upgrades to become a direct discharger.

Regarding "total toxics", is it helpful if available acute and chronic toxicity tests of the effluent indicate no toxicity? Any insight on TMDLs on the Maumee River and the how OEPA will develop TMDLs for total toxics (as opposed to an individual parameter) would be helpful. Please respond with any available information regarding the availability of minutes or the issues of TMDLs via the medium of your preference. Thank you in advance for your reply.

Response: The public meeting was attended by five individuals (besides those associated with Ohio EPA). No minutes were taken at the informal gathering. The discussion centered around explaining information in the draft report. No new information was asked for or provided.

The Maumee is one of the large river assessment units in our integrated approach. Data specific to the mainstem is not reflected in the score of the various smaller watershed assessment units through which the river flows. TMDLs for the various smaller watersheds would be an important first step toward improving the large river.

We collect drainage-area-stratified data from all streams in the watershed as a first step in developing a TMDL. As a practical matter, TMDLs address the most important limiting factors first and then get to the other concerns in a stepwise process. If data indicates that aquatic life is not performing, we review all information and allow the most compelling information to guide our investigation. Among the evidence examined in this weight of evidence approach is water and sediment chemistry samples, permit compliance records, and effluent toxicity tests.

In 1997, Ohio EPA evaluated the Maumee from the state line to Waterville. Part of this data was evaluated and a short report was prepared on the status of the Defiance WWTP. Otherwise, this data has not been analyzed or presented in any comprehensive manner. The Maumee is not scheduled for monitoring in the next five years. In the entire 6608-square-mile Maumee watershed, toxicity is not a notable limiting factor. In the course of a more detailed Maumee analysis, more information on the "total toxicity" would likely be collected to identify the impairment more definitively.

Rosida Porter

Watershed Coordinator, ODNR Division of Soil and Water Conservation, Columbus, Ohio

Received 9/11/2002

On page 4, section 5.1.1 shouldn't a listing of aquatic life uses be listed somewhere (EWWH, WWH, etc.)?

If the 2002 Ohio 303 (d) identifies 203 HUCs for TMDL development, this means that only 38.5 percent of HUCs are in full attainment of water quality standards. If we're now looking at HUCs instead of stream segments does our goal of "80 percent of stream segments in full water quality attainment by 2010" need to be updated to something else?

Also, on page 11 and 12, I'm glad under 6 "prioritization" that this document recognizes the watershed coordinators and their plans as a tool to move waters towards attainment though stakeholder-driven comprehensive watershed plans.

Response: In the interest of brevity, we elected to include much of this type of information by reference. The regulations that describe the aquatic life uses are cited in Section 5.1.1.

Statewide water quality summary statistics and trend information will be available later this year. The "80%" statistic in particular has a long history and we are considering how best to express a meaningful and accurate picture of what the data support.

Concerning watershed coordinators, we are happy to acknowledge that while TMDLs may be required, there could be other tools to address problems in watersheds, especially with limited resources. Finding the best mix of efforts and programs is important.

Guy M. Jamesson, P.E.

Associate, Malcolm Pirnie, Inc., Columbus, Ohio

Received 9/6/2002

It appears that 3 HUCs referenced in the 2002 Integrated Water Quality Monitoring and Assessment Report are incorrectly categorized. I believe the correct AU Category should be "4A" for each of the following:

- 04110001 070
- 04110002 020
- 04110002 030

These three are categorized as "5", which results in their incorrect designation in several tables or maps included with this report. (e.g., Tables: 2, 6; Map: Categories of HUC11 AUs; Appendix C...)

Response: Our interpretation of U.S. EPA's guidance does not seem to allow the 4a category for the three assessment units since all the TMDLs have not been approved in the areas.

04110001 070 was included in the Rocky River TMDL, although U.S. EPA acted on only the Plum Creek area. Regardless, it is impaired for bacteria and that TMDL did not cover bacteria. As shown on page C-78, bacteria problems were found at 16 of 18 sampling sites, with 31 samples over 5000 colonies/100 ml fecal coliform. Only when a TMDL for bacteria is approved can this unit be moved to Category 4a.

Similarly, 04110002 030 was included in the middle Cuyahoga TMDL, but bacteria issues were not addressed. Bacteria problems were found at 20 of 34 sampling sites, with 23 samples exceeding 5000 colonies/100 ml fecal coliform (page C-81).

A small portion of 04110002 020 was included in the middle Cuyahoga TMDL, but the majority of this HUC lies upstream of Lake Rockwell and was not included in the analysis. A TMDL is currently underway in the area, however.

We believe that Category 5 is the correct status for each of these assessment units at this time.

Marilyn Ortt Friends of the Lower Muskingum River, Marietta, Ohio
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Received 8/21/2002

The Muskingum River has the largest watershed in the entire state. The Friends of the Lower Muskingum have a grant to write a management plan. For this reason, it would be very helpful to have TMDL done on the Muskingum - can it be added or substituted?

We considered this request during the compilation of the long-term monitoring and TMDL schedules, taking into account the factors discussed in Section 7 of this report, as well as Ohio EPA's current and projected budget situation. The Muskingum mainstem has been scheduled for monitoring in 2008, with TMDL work due to be completed in 2010. We regret that this monitoring will not be available to assist in the creation of the management plan; monitoring needs in Ohio exceed capacity by a significant margin. However, excellent work in watershed recovery is being accomplished by interested groups of citizens throughout the state. We urge you to continue your work and use resources available to you in the Ohio EPA, the Ohio Department of Natural Resources, and other agencies to develop an approvable watershed plan and then to seek available funding to implement the actions you identify.