



2014 WEST VIRGINIA DRAFT
SECTION 303(d) LIST
WITH DECISION RATIONALE
AND SUPPLEMENTS

West Virginia Draft 2014 Section 303(d) List Listing Rationale Table of Contents

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Overview

The federal Clean Water Act contains several sections requiring reporting on the quality of a state's waters. Section 305(b) requires a comprehensive biennial report and Section 303(d) requires, from time to time, a list of waters for which effluent limitations or other controls are not sufficient to meet water quality standards (impaired waters). West Virginia code Chapter 22, Article 11, Section 28 also requires a biennial report of the quality of the state's waters.

This document is intended to fulfill West Virginia's requirements for listing impaired waters under Section 303(d) of the Clean Water Act and the Water Quality Planning and Management Regulations, 40CFR130.7. In addition to the list of impaired waters, it explains the data evaluated in the preparation of the list and methodology used to identify impaired waterbodies. Information is also provided that allows the tracking of previously listed waters that are not contained on the 2014 list.

EPA recommends that states accomplish Clean Water Act Section 305(b) and 303(d) requirements in a single integrated report. The DEP will prepare such a report (i.e the West Virginia 2014 Integrated Water Quality Monitoring and Assessment Report) after consideration of public comments on the Section 303(d) list of impaired waters. The format of the integrated report will categorize state waters as described below.

Water Categories
Category 1 - fully supporting all designated uses
Category 2 - fully supporting some designated uses, but no or insufficient information exists to assess the other designated uses
Category 3 - insufficient or no information exists to determine if any of the uses are being met
Category 4 - waters that are impaired or threatened but do not need a Total Maximum Daily Load (TMDL)
Category 4a - waters that already have an approved TMDL but are still not meeting standards
Category 4b - waters that have other control mechanisms in place which are reasonably expected to return the water to meeting designated uses
Category 4c - waters that have been determined to be impaired, but not by a pollutant
Category 5- waters that have been assessed as impaired and are expected to need a TMDL

303(d) Listing Process

To begin the 2014 Section 303(d) list development process, the DEP requested and assembled all readily available water quality data for West Virginia waters. Significant efforts were undertaken to obtain data from external sources as detailed in the Data Management section of this document. Data evaluation by the agency began in the fall of 2013. DEP personnel possessing varying areas of expertise compared instream data to applicable water quality criteria and determined the impairment status of state waters.

The draft document was advertised for public comment on June 12, 2014. Notices of availability of the draft document were placed in newspapers statewide including requests for public comment. The draft document was also promoted via e-mail and Internet. At the conclusion of the public comment period, the DEP will consider all comments and will make adjustments to the list where appropriate. The DEP will also prepare

a “Responsiveness Summary” to address all issues raised pursuant to the draft document. The Responsiveness Summary will include a summary of comments received, and the DEP’s responses to those comments. The DEP will submit its 2014 Section 303(d) List to EPA Region III for approval. The list will be a component of the Integrated Report submission described in the Overview.

West Virginia Water Quality Standards

Water quality standards are the backbone of the 303(d) and 305(b) processes of the federal Clean Water Act. Instream data are compared with water quality standards to determine the use attainment status of streams and lakes. In West Virginia, the water quality standards are codified as 47CSR2 – Legislative Rules of the Department of Environmental Protection – Requirements Governing Water Quality Standards, and at 60CSR5 – Legislative Rules of the Department of Environmental Protection – Antidegradation Implementation Procedures. Impairment assessments conducted for the 2014 cycle are based upon water quality standards that have received the EPA’s approval and are currently considered effective for Clean Water Act purposes. In that regard, EPA has recently approved several changes to the West Virginia Water Quality Standards.

A waterbody is considered impaired if it violates water quality standards and does not meet its designated uses. Use attainment is determined by the comparison of the instream values of various water quality parameters to the numeric or narrative criteria specified for the designated use (See the Assessment Methodology section for more information on use attainment determination). Waterbodies that are impaired by a pollutant are placed on the 303(d) List and scheduled for TMDL development.

Some examples of designated uses are water contact recreation, propagation and maintenance of fish and other aquatic life, and public water supply. Designated uses are described in detail in Section 6.2 of 47CSR2 and are summarized in Table 1. Each of the designated uses has associated criteria that describe specific conditions that must be met to ensure that the water can support that use. For example, the “propagation and maintenance of fish and other aquatic life” use requires that the pH remain within the range of 6.0 to 9.0 standard units at all times. This is an example of a numeric criterion. Numeric criteria are provided in Appendix E of the water quality standards.

Numeric criteria consist of a concentration value, exposure duration and an allowable exceedance frequency. The water quality standards prescribe numeric criteria for the “propagation of fish and other aquatic life” use in two forms: acute criteria that are designed to prevent lethality, and chronic criteria that prevent retardation of growth and reproduction. The numeric criteria for acute aquatic life protection are specified as one-hour average concentrations that are not to be exceeded more than once in a three-year period. The criteria for chronic aquatic life protection are specified as four-day average concentrations that are not to be exceeded more than once in a three-year period. The exposure time criterion for human health protection is unspecified but there are no allowable exceedances.

The DEP recently received approval from the EPA for changes in several water quality standards related to total iron, total phosphorus and chlorophyll-a. With respect to total iron, the recent approval revises the chronic aquatic life criterion for troutwaters from 0.5 mg/l to 1.0 mg/l. The DEP and EPA concluded that the revised value is protective of the troutwater use.

The new nutrient criteria include values for total phosphorus and chlorophyll-a for both cool and warm water lakes. The criteria are to be applied to an average of a minimum of four samples collected throughout the sampling period from May 1 to October 31. The warm water lakes criteria

Table 1 - West Virginia Water Use Categories			
Category	Use Subcategory	Use Category	Description
A	Public Water	Human Health	Waters, which, after conventional treatment, are used for human consumption.
B1	Warm Water Fishery	Aquatic Life	Propagation and maintenance of fish and other aquatic life in streams or stream segments that contain populations composed of all warm water aquatic life.
B2	Trout Waters	Aquatic Life	Propagation and maintenance of fish and other aquatic life in streams or stream segments that sustain year-round trout populations. Excluded are those streams or stream segments which receive annual stockings of trout but which do not support year-round trout populations.
B4	Wetlands	Aquatic Life	Propagation and maintenance of fish and other aquatic life in wetlands. Wetlands generally include swamps, marshes, bogs and similar areas.
C	Water Contact Recreation	Human Health	Swimming, fishing, water skiing and certain types of pleasure boating such as sailing in very small craft and outboard motor boats.
D1	Irrigation	All Other	All stream segments used for irrigation.
D2	Livestock Watering	All Other	All stream segments used for livestock watering.
D3	Wildlife	All Other	All stream segments and wetlands used by wildlife.
E1	Water Transport	All Other	All stream segments modified for water transport and having permanently maintained navigation aides.
E2	Cooling Water	All Other	All stream segments having one or more users for industrial cooling.
E3	Power Production	All Other	All stream segments extending from a point 500 feet upstream from the intake to a point one-half mile below the wastewater discharge point.
E4	Industrial	All Other	All stream segments with one or more industrial users. It does not include water for cooling.
<i>When more than one use exists, they shall be protected by criteria for the use category requiring the most stringent protection.</i>			

for total phosphorus and chlorophyll-a are 40 ug/l and 20 ug/l, respectively. Cool water lakes criteria for total phosphorus and chlorophyll-a are 30 ug/l and 10 ug/l respectively. The 2014 assessment includes the listing of eight lake segments for chlorophyll a and/or total phosphorus.

Water quality criteria also can be written in a narrative form. Narrative criteria are contained in Section 3 of 47CSR2. More information regarding the use of narrative criteria is contained in Use Assessment Procedures.

Ohio River criteria

For the Ohio River, both the Ohio River Valley Water Sanitation Commission (ORSANCO) and West Virginia water quality criteria were considered, as agreed upon in the ORSANCO compact. Where both ORSANCO and West Virginia standards contain a criterion for a particular param-

eter, instream values were compared against the more stringent criterion. The DEP supports ORSANCO's efforts to promote consistent decisions by the various jurisdictions with authority to develop 305(b) reports and 303(d) lists for the Ohio River. In support of those efforts, West Virginia has and will continue to work with ORSANCO and the other member states through a workgroup charged with improving consistency of 305(b) reporting among compact states. ORSANCO standards may be reviewed at (<http://www.orsanco.org/standards>).

Prior to West Virginia's Draft 2012 303d List, ORSANCO notified its member states of a change in philosophy for assessing aquatic life standards for its biennial 305(b) report. In previous years ORSANCO has assessed water quality data along sections of the Ohio River bordering West Virginia based on the state's total iron numeric water quality standard. In 2012, ORSANCO's governing commission instructed its personnel to use a weight of evidence approach when assessing all aquatic life standards. Alternatively, the EPA's Region III office has stated for 303(d) listing purposes, it will only accept assessments based upon the independent applicability of all criteria. Therefore, West Virginia's 303(d) assessments for aquatic life will recognize violations based on either water quality or biological survey data. A review of the ORSANCO total iron water quality data revealed violation rates greater than 10 percent for two sections along the West Virginia border and, as such, the segments will be listed as impaired on West Virginia's 2014 303(d) list.

DATA MANAGEMENT

Assessed data

All readily available data were used during the evaluation process. In preparation for the development of this report, the agency sought water quality information from various state and federal agencies, colleges and universities, private individuals, businesses, organizations and others. In addition, news releases and public notices requesting data submissions were published in state newspapers. Specific requests for data were made to state and federal agencies known by the DEP to be generators of water quality data. Table 2 identifies the entities that contributed water quality data for the 2014 listing cycle. The DEP's staff reviewed data from external sources to ensure that collection and analytical methods, quality assurance and quality control and method detection levels were consistent with approved procedures. The DEP has developed guidance for those wishing to submit data. The document contains a list of requirements for submitted data along with helpful internet links and a checklist for data submitters. The guide and additional information regarding data assembly can be found on DEP's Web site using the following link: (http://www.dep.wv.gov/WWE/watershed/IR/Pages/303d_305b.aspx).

Assessment decisions are made using the most accurate and recent data available to the agency. For stream water quality assessments, the DEP generally used water quality data with sample dates between July 2008 and June 2013. The use of data more than five years old is intentionally limited. In the absence of new information, previous assessments are carried forward even if the data becomes older than five years. Additionally, if a water quality criteria change is approved which affects an older assessment; the new assessment will only reflect the current criteria. Waters are not deemed impaired based upon water quality data collected when stream flow conditions are less than 7Q10 flow (the seven consecutive day average low flow that recurs at a 10 year interval) or within regulatory mixing zones. Further, waters are not deemed impaired based upon "not-detected" analytical results from methodologies having detection limits that are not sensitive enough to confirm criteria compliance. For example, a dissolved aluminum result of "not detected" using a method with a detection limit of 0.1 mg/l would not prompt a dissolved aluminum listing for trout waters with a criterion of 0.087 mg/l.

External data providers

Data submitted from sources outside of the Watershed Assessment Branch were considered in the development of this report. This also includes data from other DEP programs. Entities that provided information in response to the agency’s request for data for the 2014 Section 303(d) list are shown in Table 2. External data received and qualified in the preparation of previous Section 303(d) lists and TMDL efforts were reconsidered in the 2014 review. Once data were submitted, the DEP performed the following:

- ✓ Determined quality and quantity
- ✓ Determined stream codes and mile points
- ✓ Formatted data for evaluation
- ✓ Used qualified data from external sources to make assessment decisions

West Virginia Department of Agriculture	Plateau Action Network	National Park Service - U.S. Department of Interior
Trout Unlimited	Friends of Deckers Creek	Kanawha Valley Development Corporation
U.S. Geological Survey	U.S. Army Corp of Engineers	

USE ASSESSMENT PROCEDURES (303(d) Listing Methodology)

The primary focus of this report is to assess water quality information and determine if the designated uses of state waters are impaired. This section describes the various protocols used to determine use impairment.

Numeric water quality criteria

The decision methodology for numeric water quality criteria used in preparation of the draft 2014 Section 303(d) list are consistent with those used in 2012 listing cycle.

Typically, if an ample data set exists and exceedances of chronic aquatic life protection and/or human health protection criteria occur more than 10 percent of the time, the water is considered to be impaired. If the rate of exceedance demonstrated is less than or equal to 10 percent, then the water is considered to be meeting the designated use under evaluation. Ample data sets are defined as sets with 20 or more distinct observations. If fewer than 20 samples per station or representative area exist and three or more values exceed a criterion value, then the water also is considered to be impaired. For this scenario (three observed violations), if additional non-exceeding monitoring results were available that would increase the data set size to 20 observations, a greater than 10 percent exceedance frequency would still exist.

Under West Virginia Water Quality Standards, acute aquatic life protection criteria have associated exposure durations of one hour and may be exceeded once every three years. The normal practice of “grab-sampling” ambient waters is generally consistent with the one-hour exposure duration specified in the standards. Therefore, a direct application of the allowable exceedance frequency provided in the standards is made when assessing impairment relative to acute aquatic life protection criteria. If two or more exceedances of acute criteria are observed in any three-year period, the water is considered to be impaired.

If the data being evaluated is generated as part of a comprehensive network being monitored for a specific purpose, the data may be assigned a higher level of assessment quality, and the “10-percent rule” may be applied with confidence to data sets containing less than 20 observations per

station. The primary example of an intensified monitoring program that generates higher assessment quality data is that which is conducted by the DEP to support TMDL development. The pre-TMDL monitoring format includes flow measurement and monthly water quality monitoring for one year at multiple locations throughout a watershed. Information is generated over a range of stream flow conditions and in all seasons. Habitat assessment and biological monitoring is performed in conjunction with water quality monitoring. The information generated under this format is among the most comprehensive available for assessing water quality. Upon conclusion of monitoring, it is then necessary for agency personnel to make a definitive judgment relative to impairment. In most instances, application of the “10-percent rule” to the pre-TMDL monitoring data sets result in the classification of waters as impaired if two or more exceedances of a criterion are demonstrated.

Additionally, the DEP does not interpret the impacts of a single pollution event as representative of current conditions if it is believed that the problem has been addressed. Similarly, the DEP does not intend to interpret the results of clustered monitoring of a single event as being representative of water quality conditions for longer time periods. Datasets are screened for excessive clustering of monitoring, in space or time, to avoid misinterpretation.

The DEP’s lake assessment of chlorophyll a and total phosphorus results were based on the average of a minimum of four samples collected within the May 1 through October 31 sampling season. Table 3 summarizes the criteria used to make 303(d) impairment decisions relative to numeric water quality criteria period.

Table 3 - Decision criteria summary for numeric water quality criteria		
Water Quality Criteria	Impairment Thresholds	Exceptions
Acute Aquatic Life Protection (Use Category B)	The water is impaired if two exceedances of acute aquatic life protection numeric criteria occur within any three-year period.	If, in the most recent three-year period, no exceedances of criteria are evidenced and at least 12 monitoring results are available, then the water may not be considered impaired.
Chronic Aquatic Life Protection (Use Category B)	The water is impaired if a greater than 10% frequency of exceedance is demonstrated in an ample dataset (20 or more available observations).	If, for waters with regularly scheduled monitoring, in the most recent two-year period, no exceedances of criteria are evidenced and at least eight observations are available, then the water may not be considered impaired.
Human Health Protection (Use Categories A and C)	The water is impaired if three (3) exceedances of criteria occur with less than 20 available monitoring results. The water is impaired if a greater than 10% frequency of exceedance is demonstrated with less than 20 available observations, if the data being evaluated is of high assessment quality (two or more violations)	

Segmentation of streams and lakes

Segmentation based upon the limited amount of water quality monitoring data that is usually available may not accurately portray the extent of impairment and may contradict the ultimate findings of the TMDL that the listing mandates. The DEP believes the TMDL development process, which links extensive water quality monitoring and source tracking efforts with pollutant sources through computer modeling, provides the best assessment of criterion attainment and the most accurate identification of the watershed sources for which pollutant reductions are necessary. TMDL modeling predicts water quality over a wide range of climatic and stream flow conditions, incorporates the specific exposure duration and exceedance frequency terms of water quality criteria and prescribes pollutant/s allocations that will result in attainment of criteria in all stream segments. The majority of newly listed streams were identified as impaired for their entire length. Segmentation occurred only in limited situations involving streams with impoundments or alternative designated uses, or when knowledge of a specific pollutant source allowed clear distinction of impaired and unimpaired segments of streams with multiple monitoring locations with differing results. Multiple sample site stream segmentation, when done, is accomplished by assuming an observed impaired condition extends in both directions until contradicted. In other words, if water quality results from one site indicate impairment, the stream is considered impaired until downstream or upstream samples indicate compliance with water quality.

In large lakes with multiple sampling locations, segmentation may occur based on best professional judgement if data suggests that impairment is limited to specific portions of the lake.

Evaluation of fecal coliform numeric criteria

Fecal coliform assessments were based on the previously described decision criteria for numeric water quality criteria. Given the complexity of this particular criteria, most assessments are performed by comparing observations to the “maximum daily” criterion value of 400 counts/100ml. Evaluation of the monthly geometric mean fecal coliform criterion (200 counts/100ml) occurs only where five or more individual sample results are available within a calendar month.

Numeric fecal coliform water quality criteria are applicable to the Water Contact Recreation and Public Water Supply designated uses. Section 8.13 of Appendix E of the West Virginia Water Quality Standards states:

Maximum allowable level of fecal coliform content for Primary Contact Recreation shall not exceed 200/100ml as a monthly geometric mean based on not less than five samples per month; nor to exceed 400/100ml in more than 10 percent of all samples taken during the month.

A practical difficulty exists in accurate assessment of criteria compliance due to the resource commitment that would be necessary to perform monitoring at a sufficient frequency to make determinations using the geometric mean criteria, since the monthly geometric mean criterion is conditioned upon the availability of at least five distinct sample results in a month. The daily component of the criterion is not conditioned by a minimum sample set requirement, but practical use of the 10 percent exceedance allowance would involve collecting at least 10 samples per month.

The most frequent and regular fecal coliform water quality monitoring conducted by the Watershed Assessment Section is once per month. That monitoring frequency precludes assessment of the monthly geometric mean criterion and hampers accurate assessment of the maximum daily criterion. Due to limited resources, more frequent fecal coliform monitoring could only be accomplished by significantly reducing the number of state streams and/or stations where water quality assessments are performed. The DEP does not consider that to be a reasonable alternative.

The DEP uses the following protocols when making assessments relative to fecal coliform numeric criteria:

- ✓ No assessments are based upon the monthly geometric mean criterion (200 counts/100ml) unless an available data set includes monitoring at five per month or greater frequency. When data sets are available, the listing decision criteria for numeric water quality criteria are applied, considering each monthly geometric mean as an available monitoring result.
- ✓ The listing decision criteria are applied to the maximum daily criterion (400 counts/100ml) and available individual monitoring results, but without the monthly prejudice. For example, if twice per month monitoring is conducted for a year and two results in two separate months are greater than 400, the stream would not be listed (2/24 - 8.3 percent rate of exceedance). If five samples per month monitoring is conducted for one year and four daily results greater than 400 are measured in four different months, the stream would not be listed (4/60 – 6.7 percent rate of exceedance), provided that the monthly geometric means were below the 200 counts/100 ml criteria.

The decision criteria does not provide for 303(d) listing of waters with severely limited data sets with exceedances (i.e., one sample in a five-year period > 400 counts/100ml). Such waters would be classified as having insufficient data available for use assessment. The DEP will target these “fecal one-hit” waters for additional monitoring by incorporating them into the pre-TMDL monitoring plans at the next opportunity for TMDL development in their watershed.

Narrative water quality criteria – biological impairment data

Passage of Senate Bill 562 in the 2012 regular legislative session requires DEP to develop and secure legislative approval of new rules to interpret the narrative criterion for biological impairment found in 47 CSR 2-3.2.i. A copy of the legislation may be viewed at <http://www.legis.state.wv.us>.

The narrative water quality criterion of 47CSR2 – 3.2.i. prohibits the presence of wastes in state waters that cause or contribute to significant adverse impact to the chemical, physical, hydrologic and biological components of aquatic ecosystems. Historically, DEP interpreted the criterion using the West Virginia Stream Condition Index (WVSCI). The WVSCI is benthic macroinvertebrate multi-metric index for use in wadeable streams. It is composed of six metrics that were selected to maximize discrimination between streams with known impairments and reference streams. Streams were listed if the data was comparable (e.g., collected utilizing the same methods used to develop the WVSCI, adequate flow in riffle/run habitat, and within the index period). The historical WVSCI listing threshold was 60.6, which represented the 5th percentile of reference scores less 7.4 points to account for uncertainty.

Whereas the WVSCI evaluates biological integrity using only benthic macroinvertebrate data, SB 562 directs DEP to additionally consider fish in its assessment methodology. The revised assessment methodology called for in SB 562 has not yet been finalized. The development of a multi-assemblage tool has proven to be much more difficult than originally expected. Although not available for this list, a new methodology is expected to be presented to the 2015 Legislature.

In its preparation of the Draft West Virginia 2012 Section 303(d) list, the DEP did not add new biological impairments. Previously listed biological impairments were proposed to be retained. In finalizing the 2012 list, EPA added biological listings to those proposed by the DEP. The EPA

considered available benthic macroinvertebrate data and added impairments to the list for biological scores less than 68 under the WVSCI methodology. The EPA determined the uncertainty zone historically used by the DEP was not scientifically supported and therefore used an impairment threshold equal to the 5th percentile of reference scores.

The DEP has decided to propose biological impairment listings based upon the methodology that is expected by the EPA to properly execute Clean Water Act requirements as evidenced in their 2012 oversight actions. The DEP is proposing to retain most of the biological impairments identified in the Final West Virginia 2012 Section 303(d) List and to add new listings using the WVSCI and a threshold of 68.

Each listed stream will be revisited prior to TMDL development. Additional biological monitoring will be performed as necessary to implement the new assessment methodology. The causative stressor(s) of impairment and the contributing sources of pollution will be identified during the TMDL development process.

Biological impairments identified in the Final West Virginia 2012 Section 303(d) List are proposed to be delisted under the following scenarios:

- ✓ Where previous listings were determined to have been made in error.
- ✓ Where more recent biological monitoring results demonstrated WVSCI scores greater than 68.
- ✓ Where approved TMDLs have been developed pursuant to numeric water quality criteria and the Stressor Identification performed in the TMDL process demonstrated that their implementation would resolve the stress to the benthic macroinvertebrate community that caused the original listing.

Delistings under the first two scenarios are identified in Supplemental Table A. The prior listings for which surrogate TMDLs address biological impairment are identified in Supplemental Tables B and B-1 (Example 1).

Example 1

Stream Name	Stream Code	Criteria	TMDL Date
HYDROLOGIC GROUP E			
WEST FORK WATERSHED - HUC# 05020002			
Mill Fall Run	WVMW-1	CNA-Biological (surrogate)	2014
		Fecal Coliform	2014
		Iron	2014

Narrative water quality criteria – fish consumption advisories

The narrative water quality criterion of 47CSR2 – 3.2.e prohibits the presence of materials in concentrations that are harmful, hazardous or toxic to man, animal or aquatic life in state waters. Fish consumption advisories are used to inform the public about potential health risks associated with eating fish from West Virginia’s streams. The DEP, Division of Natural Resources, and the Bureau for Public Health have collaborated on fish contamination issues since the 1980s; however, an executive order by the governor in 2000 mandated a formal collaborative process to issue fish consumption advisories. Fish consumption advisories are developed and issued in accordance with an interagency agreement. In the absence of specific body-burden criteria, the presence of contaminants in fish tissue from commonly consumed species in amounts equivalent to a two meal per month advisory is considered sufficient evidence of impairment.

Risk-based principles are used to determine whether fish consumption advisories are necessary. These advisories are used as a public education tool to help citizens make informed decisions about eating fish caught in state streams. The risk-based approach estimates the probability of adverse health effects and provides a statement on the health risk facing the angler and high-risk groups including women of childbearing age and children. West Virginia’s fish consumption advisories include guidelines on the number of meals to eat and information on proper fish preparation to further minimize risk.

Waterbody-specific fish consumption advisories exist for nine state streams and five lakes for a variety of fish species and contaminants. Additionally, there is a general statewide advisory that recommends limiting the consumption of certain sport-caught fish from all West Virginia waters in relation to low-level mercury and/or polychlorinated biphenyl (PCB) contamination. The statewide advisory provides species-specific recommendations ranging from one meal per week to one meal per month. The following webpage contains the 2014 West Virginia fish consumption advisories: (<http://www.wvdhhr.org/fish>).

West Virginia water quality standards also contain a numeric body-burden criterion for methylmercury in fish tissue for protection of public water supply and water contact recreation designated uses. The criterion states “The total organism body burden of any aquatic species shall not exceed 0.5 µg/g as methylmercury.” Thus, the DEP must apply the criteria to all aquatic species rather than just the commonly consumed fish species.

In the 2010 listing cycle, the DEP delisted many previous mercury impairments because they were based upon total mercury rather than methylmercury fish tissue concentrations and upon fillet rather than whole body samples. Current mercury listings adhere to the specific conditions of the criterion (whole-body, methylmercury, species-specific).

The following methodology was used for assessment of methylmercury in fish tissue. The DEP collected fish from selected streams and lakes that had been removed from the 303(d) list in 2010 and other waters with suspected contamination. Each fish collected was processed separately and analyzed for whole body methylmercury concentration. The analytical results from these fish were assessed as ‘pseudo-composites’ – averaging the individual results within like-sized groups to include only fish with a length equal to or greater than 75% of the longest individual fish in each species. This qualification is based on a general rule for compositing of fish tissue samples. The individual results of all qualified fish within each species were averaged to obtain a value for comparison to the criterion. If the average for any potential pseudo-composite exceeded the 0.5 µg/g criterion, the waterbody was listed as impaired for methylmercury. The 2014 303(d) list contains six lakes listed as impaired for methylmercury.

For the mainstem Ohio River, the applicable ORSANCO body-burden criterion is 0.3 µg/g. As with previous 303(d) lists, the DEP has deferred to ORSANCO's assessment results for mercury listing purposes. ORSANCO's assessment methodology can be found at (<http://www.orsanco.org/biennial-assessment-of-ohio-river-water-quality-conditions-305b>).

Narrative water quality criteria – algal blooms assessment in West Virginia Streams

The methodology to assess the narrative criteria at 47CSR 2-3.2.g and h has been updated. To summarize, the listing methodology is based on research done by Responsive Management to determine tolerance levels for riverine filamentous algae growth. The Responsive Management research was conducted following a July 2010 ruling from the West Virginia Environmental Quality Board (EQB) which faulted the DEP for having “failed to develop a workable standard for algal growth.” The EQB found fault with DEP because it “took no surveys and collected no data with regard to the public's use of the river or its tolerance for algal growth outside anecdotal evidence.” The Responsive Management report *West Virginia Residents' Opinions On And Tolerance Levels Of Algae In West Virginia Waters* determined the percent of the population whose use would be impaired by different levels of filamentous algae cover.

The DEP has developed guidelines to determine impairment of a stream's use(s) caused by filamentous algae blooms, which may be found at: (<http://www.dep.wv.gov/WWE/Programs/wqs/Pages/FilamentousAlgaeinWestVirginia.aspx>). While there are more details and nuances, generally streams are classified as impaired if: filamentous algae cover of greater than 20% extending for a longitudinal distance greater than three times the average stream width (3xW) in the impacted segment of stream OR a filamentous algae cover of greater than 40%, regardless of the longitudinal extent of the bloom, will be judged to interfere with the recreational use of a stream. The DEP also classified as impaired if algae blooms cause taste or odor that interferes with the use of the water and/or causes additional treatment to be required at drinking water plants.

The application of the assessment methodology to observations from the 2011, 2012, 2013 growing seasons resulted in the following impairments on the 2014 Draft West Virginia 303(d) List:

- ✓ Greenbrier River - refinement of the 2012 listing to reflect impairment from Stony Creek (MP 12.1) to Howards Creek (MP 50.00)
- ✓ Cacapon River – Forks of Cacapon to Wardensville (listing remains unchanged)
- ✓ South Branch of Potomac River – Romney to Moorefield (listing remains unchanged)
- ✓ Tygart River – New Listing – Just upstream of Elkins POTW (MP 80.32) to Grassy Run

Total Maximum Daily Load (TMDL) Development Process

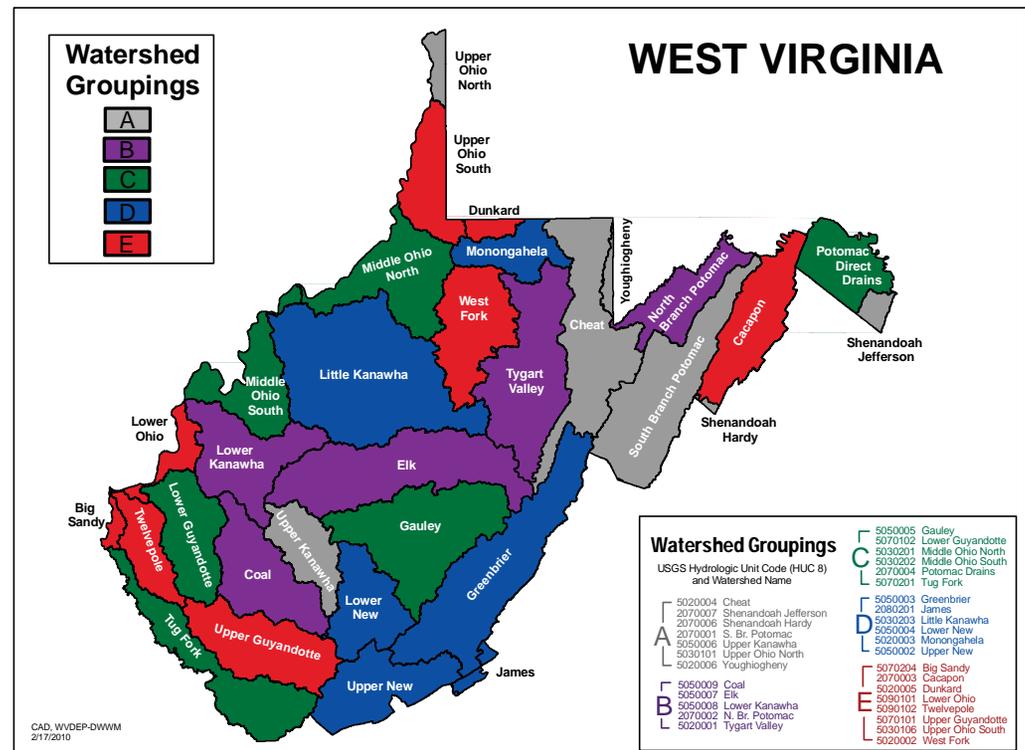
From 1997 until 2003, EPA Region III developed West Virginia TMDLs under the settlement of a 1995 lawsuit, Ohio Valley Environmental Coalition, Inc., West Virginia Highlands Conservancy, et. al. v. Browner, et. al. The lawsuit resulted in a consent decree between the plaintiffs and the EPA that specified TMDL development requirements and compliance dates. While the EPA was working on developing TMDLs, the DEP concentrated on building its own TMDL program. With the help of the TMDL stakeholder committee, the agency secured funding from the state legislature and created the TMDL section within the Division of Water and Waste Management.

The TMDL section is committed to implementing a TMDL process that reflects the requirements of TMDL regulations, provides for the achievement of water quality standards, and ensures that ample stakeholder participation is achieved in the development and implementation of TMDLs.

The DWWM’s approach to TMDL development allows 48 months to develop a TMDL from start to finish. This approach enables the agency to carry out an extensive data generation and gathering effort to produce scientifically defensible TMDLs, and allows ample time for modeling, report drafting and frequent public participation opportunities.

The DEP TMDLs are developed according to the Watershed Management Framework cycle. The framework divides the state into 32 major watersheds and operates on a five year, five-step process. The watersheds are divided into five hydrologic groups (A - E). Watersheds within each group are considered for TMDL development every five years. This map depicts the 32 watersheds and hydrologic groupings. The TMDL process begins in the first year of the cycle with pre-TMDL sampling and public meetings in the affected watersheds. The data is compiled and TMDL development begins in year two of the cycle. In the third year, TMDL development continues and the TMDL is drafted. The TMDL is finalized in the fourth year. In the fifth year of the cycle, TMDL implementation is initiated through the NPDES permitting process and efforts toward limiting nonpoint source loading. Throughout the TMDL development process, there are numerous opportunities for public participation and input.

Since its inception, the DEP’s TMDL section pursued timely development of TMDLs for the waters and impairments identified in the consent decree between the EPA and the Ohio Valley Environmental Coalition, et. al. The TMDLs developed and approved in the Dunkard Creek, Upper Ohio River South, Youghiogheny, and Camp Creek/Twelvepole Creek watersheds in 2009 fully accomplished EPA’s commitments under the consent decree.



The 303(d) list identifies and prioritizes the waters and impairments for which future TMDLs will be developed by specifying the year in the “Projected TMDL Year” column. The impaired waters intended for TMDL development in 2014, 2015 and 2016 are known and identified. For other waters and impairments, where the timing of TMDL development is less certain, the “Projected TMDL Year” is identified as the most future year when opportunity exists per the DEP’s plans to develop TMDLs in concert with the Watershed Management Framework.

TMDL development for biological impairments has been paused with the passage of SB 562 because it requires a new assessment methodology to be developed and presented to the West Virginia Legislature prior to implementation. Many biological impairments have been 303(d) listed for extended periods of time and have undergone biological stressor identification in prior TMDL projects. DEP will place high priority on those impairments when it begins implementation of a new assessment methodology. Dates are not specified in the “Projected TMDL Year” column. The alternative “TBD” entries signify the DEP’s intent to address the impairments as soon as practicable after accomplishing SB 562 requirements.

At any point in time, the DEP personnel are working on TMDLs in each of the five hydrologic groups (A-E). Each set of TMDLs moves through several stages of development prior to finalization and the EPA's approval. Table 4 shows the state's TMDL development progress.

The DEP's Web site contains all approved TMDL documents and the draft TMDL documents currently out for public comment. These documents can be found at (<http://www.dep.wv.gov/WWE/watershed/TMDL/Pages/default.aspx>).

List Format Description

The format of the 2014 Section 303(d) list is organized around the Watershed Management Framework. The five hydrologic groups (A-E) of the framework provide the skeleton. Within each hydrologic group, watersheds are arranged alphabetically and impaired waters are sorted by stream code in their appropriate watershed. The information that follows each impaired stream includes the stream code, the affected water quality criterion, the general source of the impairment (where known), the impaired length (or, by default, the entire length), the planned or last possible timing of TMDL development and whether or not the impairment was on the 2012 list. The cause of impairment is often unknown or uncertain at the time of listing and is so indicated on the list. The scheduling of TMDL development is discussed in detail in Total Maximum Daily Load (TMDL) Development Process section. A West Virginia Watershed Management Framework map is provided to assist navigation within the list. A key is also provided to aid in the interpretation of presented information.

List Supplements Overview

Seven supplements are provided that contain additional information.

Supplemental Table A - Previously Listed Waters – No TMDL Developed

Previously listed waters from the 2012 list that are not on the 2014 list are included in this supplement if a TMDL has not been developed, and these waters have been reevaluated and determined not to be impaired. Causes for revision of the impairment status include recent water quality data demonstrating an improved water quality condition, revision to the water quality criteria associated with the previous listing, documentation that the water was previously listed in error or a modification of the listing methodology.

Supplemental Table B - Waters with TMDLs Developed

TMDLs have been developed for many previously listed waters. TMDL development allows the removal of an impaired water from the 303(d) list. In the suggested format of the Integrated Report, such waters are to be classified in Category 4A and clearly distinguished from Category 5

Hydrologic Group	Watersheds	Progress
E2	West Fork	Submitted for U.S. EPA approval
A3	Upper Kanawha South Branch of Potomac Shenandoah (Hardy)	Draft TMDL in development
B3	Tygart Valley	Draft TMDL in development
C3	Gauley Potomac Direct Drains	Sampling and source tracking
D3	Monongahela Little Kanawha	Stream selection and sampling (July 1, 2014 - June 30, 2015)

and the 303(d) list. Waters included in Category 4A have TMDLs developed, but water quality improvements are not yet complete and/or documented. The waters identified in Supplement B will match those of Category 4A of the Integrated Report.

Supplemental Table B-1 – West Fork Watershed TMDLs to be Approved in 2014

TMDLs for certain impaired waters in the West Fork River Watershed are currently being developed by the DEP. For the purpose of this draft, it is assumed that the EPA will approve these TMDLs prior to their approval of the 2014 Section 303(d) list. Barring unforeseen complications, the waters/impairments shown in Table B-1 will also be included in Category 4A of the Integrated Report.

Supplemental Table C - Water Quality Improvements

The goal of TMDLs and stream restoration projects is to bring the stream back to the point where it meets its designated uses and the associated water quality criteria. Supplement C includes a listing of streams with improved water quality. In the Integrated Report, the waters in Supplement C are to be included in Category 1 (meeting all uses), provided that impairments for other uses/pollutants are not evidenced.

Supplemental Table D - Impaired Waters - No TMDL Development Needed

This table lists impaired waters for which either other control mechanisms are in place to control pollutants or the water is not impaired by a pollutant (i.e., flow alterations caused by mining). These are the same waters contained in the Integrated Report's Category 4b and 4c, respectively.

Supplemental Table E – Total Aluminum TMDLs Developed

Supplemental Table E - Total Aluminum TMDLs identify waters for which aluminum TMDLs were developed based upon water quality criteria that are no longer effective. After the subject TMDLs were developed, EPA approved revisions to West Virginia water quality standards that changed the aluminum numeric water quality criteria from total to dissolved form. This table is included to document the development of the obsolete TMDLs and to distinguish them from the effective TMDLs identified in Supplemental Table B. Once these streams are assessed for dissolved aluminum, they will be removed from Table E.

Supplemental Table F – New Listings 2014

This table is a list of impaired waters that were not previously included on the 2012 Section 303(d) list.

Responsiveness Summary (Reserved)

EPA Approval: Resultant Refinements (Reserved)



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