

In-Stream Monitoring Provisions for Resource Extraction Individual Permits in OSRW Watersheds without Federally Listed Species and Exceptional Waters

Outstanding State Resource Waters (OSRWs) are those surface waters designated by the Energy and Environment Cabinet pursuant to 401 KAR 10:031, Section 8. OSRWs are streams that contain populations of federally listed species, but also include certain unique waters of the commonwealth such as Kentucky wild rivers, waters flowing through Kentucky Nature Preserves and surface waters that have an undisturbed or relatively undisturbed watershed which can provide basic scientific data and possess outstanding water quality characteristics, or fulfill two (2) of the following criteria:

- a. Support a diverse or unique native aquatic flora or fauna;
- b. Possess physical or chemical characteristics that provide an unusual and uncommon aquatic habitat; or
- c. Provide a unique aquatic environment within a physiographic region.

Exceptional waters are those surface waters designated by the Energy and Environment Cabinet pursuant to 401 KAR 10:030, Section 1 Subsection 2, which meet any of the following criteria:

- a. Surface water is designated as a Kentucky wild river and is not categorized as an outstanding national resource water;
- b. Surface water is designated as an outstanding state resource water as established in 401 KAR 10:031, Section 8;
- c. Surface water contains either of the following:
 1. A fish community that is rated "excellent" by the use of the Index of Biotic Integrity included in Development and Application of the Kentucky Index of Biotic Integrity (KIBI), 2003; or
 2. A macroinvertebrate community that is rated "excellent" by the Macroinvertebrate Bioassessment Index included in "The Kentucky Macroinvertebrate Bioassessment Index," 2003; or
- d. Surface water in the cabinet's reference reach network.

Provisions for OSRW/Exceptional Waters Streams

- 1) A one year, pre-resource extraction monitoring program is required for all permits involving OSRWs/Exceptional Waters before any land disturbance has occurred, in accordance with Methods for Conducting Resource Extraction Intensive Surveys in

Outstanding State Resource Waters (KDOW 2010). This is data will be used to determine background conditions.

- 2) Prior to onset of sampling, a comprehensive study plan shall be submitted to and approved by KDOW. **This study plan must have all the requirements listed in the Quality Assurance Project Plan application (KDOW 2010).** Copies of the KDFWR collecting permit shall be included with the study plan.
- 3) No in-stream disturbances shall occur in the OSRW/Exceptional Water stream segment or in any blue-line tributary as delineated by the U.S.G.S 7.5 minute Quadrangle Map or upstream segments of the main stem as designated by KDOW that demonstrate a reasonable potential to cause a loss of the OSRW designated use unless approved by KDOW.
- 4) A 100-foot buffer zone shall be maintained for each OSRW/Exceptional Water stream segment. Width variances of the buffer zone may be granted on a case-by-case basis. The OSRW/Exceptional Water shall not be used for sediment control or permanent material storage without prior approval from KDOW.
- 5) All underground activities within the immediate watershed of an OSRW/Exceptional Water shall adhere to a 150-foot minimum subsidence zone buffer so that no stream will be impacted by loss of flow and/or habitat disturbance.
- 6) Active resource extraction monitoring provisions include monthly water chemistry and yearly habitat assessment, macroinvertebrate community assessment and fish community assessment.
- 7) In-stream, physico-chemical parameters for pre-resource extraction and active resource extraction monitoring provisions are listed in the table below:

Characteristic	Minimum	Average	Maximum	Sample Type
Flow (cfs)		Report	Report	Instantaneous
Dissolved Oxygen (mg/L)		Report	Report	Grab
Temperature (°F)		Report	Report	Grab
Conductivity (µS/cm)		Report	Report	Grab
Alkalinity (as mg/l CaCO ₃)		Report	Report	Grab
pH (standard units)	Report		Report	Grab
TDS (mg/l)		Report	Report	Grab
Sulfates (as mg/l SO ₄)		Report	Report	Grab
Chlorides (mg/l)		Report	Report	Grab

Characteristic	Minimum	Average	Maximum	Sample Type
Total Calcium (µg/l)		Report	Report	Grab
Total Magnesium (µg/l)		Report	Report	Grab
Total Sodium (µg/l)		Report	Report	Grab
Total Potassium (µg/l)		Report	Report	Grab
Antimony (µg/l)		Report	Report	Grab
Arsenic (µg/l)		Report	Report	Grab
Cadmium (µg/l)		Report	Report	Grab
Copper (µg/l)		Report	Report	Grab
Iron (µg/l)		Report	Report	Grab
Lead (µg/l)		Report	Report	Grab
Manganese (µg/l)		Report	Report	Grab
Mercury (µg/l)		Report	Report	Grab
Nickel (µg/l)		Report	Report	Grab
Selenium (µg/l)		Report	Report	Grab
Thallium (µg/l)		Report	Report	Grab
Zinc (µg/l)		Report	Report	Grab
Total Suspended Solids		Report	Report	Grab
Total Settleable Solids		Report	Report	Grab
Hardness (as mg/l CaCO ₃)		Report	Report	Grab

Water quality sampling sites shall be established. A control site shall be included above all disturbances in the watershed, if possible. Each tributary that contribute flow to the OSRW/exceptional water shall also be monitored for water quality parameters.

One Year, Pre-Resource Extraction Monitoring Program Provisions

- 1) Water Chemistry Characterization (every two weeks) during periods of discharge from the operation
- 2) Habitat Assessment (once)

- 3) Macroinvertebrate Community Assessment (once)
- 4) Fish Community Assessment (once)

Active Resource Extraction Monitoring Provisions – Conducted Through Phase 2 Bond Release

- 1) Water Chemistry Characterization (monthly)
- 2) Habitat Assessment (yearly)
- 3) Macroinvertebrate Community Assessment (yearly)
- 4) Fish Community Assessment (yearly)

Required Standard Operating Procedures for Intensive Surveys:

See: *Methods for Conducting Resource Extraction Intensive Surveys in Outstanding State Resource Waters (KDOW 2010b).*

Data Reporting Requirements:

- 1) All quarterly reports will be compiled into a final calendar year report. All quarterly reports shall be submitted to the Division of Water and Kentucky Ecological Services Field Office, U.S. Fish and Wildlife Services, 3761 Georgetown Road, Frankfort, KY 40601.
- 2) All quarterly reports will be compiled into a final calendar year report.
- 3) All final reports will contain a yearly and seasonal comparison of all past reported data. This comparison will include but not limited to water quality data, macroinvertebrate metric assessments and fish IBI scores and assessments.
- 4) All stations will be identified by latitude and longitude in decimal degrees. Mile points will also be given for each station.
- 5) The metrics that will be used to determine stream health will include but will not be limited to the following metrics for macroinvertebrates: Taxa richness; Total Number of Individuals; EPT; m%EPT; mHBI; %Ephemeroptera; %Clingers; and %Chironomidae+Oligochaeta.

For macroinvertebrates: calculation of the Macroinvertebrate Bioassessment Index (MBI) will be included in the report. The MBI template to be used is titled MBI Template – Genus Species Full Pick Method, located at this website. <http://www.water.ky.gov/sw/swmonitor/sop/>.

For Fish: Index of Biotic Integrity (IBI) based on Kentucky Division of Water assessments and re-evaluations. The KIBI template to be used is located at this website <http://www.water.ky.gov/sw/swmonitor/sop/>.

- 6) A CD in an Excel Spreadsheet format shall be included with the aforementioned yearly report with all past pre-mining sampling data included with the current sampling year's data. Subsequent data CD's will include only the current sampling year. Data that shall be included but not limited to: Date of sampling; Time of sampling; Station ID, Number and all pertinent site information; Sampler ID; Method of sampling; Macroinvertebrates, fish, and water quality data in separate files and associated metrics with each site; and habitat information sheets.

REFERENCES

Kentucky Division of Water. 2010a. Quality Assurance Project Plan Individual Coal Mining Permits - Focus Monitoring for Water Quality, Biological Communities and Habitat Conditions. Kentucky Department of Environmental Protection, Frankfort, KY.

Kentucky Division of Water. 2010b. Methods for Conducting Resource Extraction Intensive Surveys in Outstanding State Resource Waters. Kentucky Department of Environmental Protection, Frankfort, KY.