Ohio Department of Natural Resources
Division of Mineral Resources Management

**** Policy/Procedure Directive ****

Permitting & Hydrology 2000-2

SUBJECT: Seasonal Variations

EFFECTIVE: July 1, 2001

PURPOSE: To establish standards for documenting baseline seasonal variability in the quality and quantity of surface water and ground water associated with proposed coal mining and reclamation permit application areas

NOTE: **This Policy/Procedure Directive revises portions of Division Advisory Memo No. 27, dated July 2, 1985, and Addendum to Division Advisory Memo No. 27, dated February 13, 1986. It does not revise the July 30, 1987 addendum to Division Advisory Memo No. 27.**

Background

Seasonal variation is the fluctuation in water quality and quantity that is documented prior to mining and is attributable to natural changes in the hydrologic cycle throughout the year.

Rules 1501:13-4-04(D)(5), 1501:13-4-13(D)(5), 1501:13-4-04(E)(3), and 1501:13-4-13(E)(3) of the Ohio Administrative Code require that, **"Water quality and quantity data sufficient to identify seasonal variations shall be submitted with an application for a permit."** The extent of seasonal variability in each of the parameters for which sampling and analysis are required must be documented in the coal mining and reclamation permit application. The variation in quality and quantity is characterized by the changes in the parameters specified at Ohio Administrative Code 1501:13-4-04(D)(4) and 1501:13-4-04(E) for surface mining applications and 1501:13-4-13(D)(4) and 1501:13-4-13(E) for underground mining applications. This and other information is used by the applicant to determine the probable hydrologic consequences of the proposed coal mining operation on the hydrologic regime of the proposed permit and adjacent areas. The probable hydrologic consequences must describe the hydrologic regime before, during, and after mining with respect to the quantity and quality of water in surface water and ground water systems under seasonal conditions.

Seasonal variation information is also used by the Division of Mineral Resources Management (the Division) to assess the cumulative hydrologic impacts of all anticipated coal mining in the general area of a proposed operation on the hydrologic balance. The Division also

uses the hydrologic data contained in the application to assist in investigating citizen complaints. Consequently, the ability to accurately characterize pre-mining conditions is important to the applicant, to the Division, and to the general public.

Documenting Seasonal Variations

For each coal mining and reclamation permit application, three samples from each required baseline sampling point (wells, springs, streams, etc.) must be submitted. One sample shall be obtained during the designated low flow period, one sample shall be obtained during the designated high flow period, and one sample shall be obtained during one of the two designated intermediate flow periods. The designated flow periods are:

Flow Period	Duration
Low Flow	August 16th through October 31st
Transition Flow	November 1st through November 15th
Intermediate Flow	November 16th through January 31st
Transition Flow	February 1st through February 14th
High Flow	February 15th through April 30th
Transition Flow	May 1st through May 15th
Intermediate Flow	May 16th through July 31st
Transition Flow	August 1st through August 15th

Guidelines for All Samples

1. The period between consecutive samples must be at least 30 days, but not more than 18 months, and samples may not pre-date the date of application submission by more than 36 months. These timetables will reasonably allow equilibrium between flow periods to be reached in the surface water and ground water flow systems and will also ensure that the samples represent current, rather than past, conditions. However, the 18-month and 36-month timeframes may be waived if the applicant provides a description of all land disturbance activities within the local watershed that could affect the quality and quantity of surface water and ground water. The description must include all surface disturbances, including but not limited to, mining operations, highway construction, cut and fill operations, building constructions, and dam construction or demolition which existed at the time of the earliest sample date. The description must also compare the earlier disturbances to the intervening disturbances and to the disturbances which existed at the time the last sample was obtained. This information will assist in evaluating whether differences among samples are due to seasonal variability or to other factors.

2. A "no-flow" condition may be used for a low flow sample if the applicant documents that at least two attempts were made to collect a flow during the low flow period. Generally, no

additional low flow sampling for quality or quantity will then be required at the sampling site. The reviewing Division hydrologist may, however, depending on site-specific conditions, require additional attempts to obtain low flow samples during the application review process. The permit may be also be conditioned to prohibit affecting any areas in the watershed or recharge area of a sample location until a low flow sample is obtained or another baseline sample point is provided.

3. No precipitation data will be required for samples obtained during a designated flow period, unless the sample is taken during a transition period (see below).
4. Sampling need not occur in consecutive windows.

Requirements for Samples Obtained during Transition Flow Periods

A sample obtained during a Transition Flow Period can be used for either the preceding or succeeding flow period if the following conditions are met:

1. The applicant documents that the sample from the transition period accurately reflects the flow period for which the sample is submitted.
2. The sample obtained during a transition period is not used for both the preceding and succeeding flow periods.
3. The reviewing Division hydrologist concurs that the transition period reflects the flow period for which the sample is submitted.
4. At least one of the three required samples is obtained during a designated sampling period other than a transition period.
5. The applicant submits precipitation data for the local watershed for the 30 days prior to the sample date.

Substitute Sample Points

The applicant may request that a sample obtained from a location other than a designated baseline sampling location be substituted for one of the three required samples at the designated baseline sampling location. The applicant must:

1. describe how the substitute site adequately represents the original baseline site;
2. demonstrate that the substitute sample site is located in the same aquifer as the original baseline sample site;

3. demonstrate that the geology of the groundwater recharge area of the substitute site is similar to that of the original baseline site;

4. demonstrate that the surface disturbance of the recharge area of the substitute site is comparable to that of the original baseline site;

5. demonstrate that the substitute sample site represents and performs the same function as the original baseline site;

6. demonstrate that the analysis of the water quality and quantity data from the substitute site accurately represents the quality and quantity of the water at the original site and explain any anomalies in water quality or quantity at the substitute site;

7. demonstrate that the flow obtained at the substitute site was obtained during the flow period missed at the original site;

8. include precipitation data for the 30 days prior to the sample date at the substitute site;

9. provide a description of the location of the substitute sample site relative to the original sample location. The description must include bearing and distance measurements from the original sample location to the substitute sample location.

10. submit additional information if required by the Chief to support the use of a substitute sample; and

11. accept the determination made by the Division as to the appropriateness of the substitute site and conclusions derived by using the submitted data.

If the applicant does not or cannot obtain at least two samples from a designated baseline sample location, the applicant must select a new baseline sample location and provide three baseline samples for the new sample location.

NOTE: A sample from a substitute site <u>cannot</u> be used as the <u>earliest</u> of the three required samples.

If you have any questions, please contact Mike Dillman in the Columbus office at (614) 265-6628.

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