# ODNR, DIVISION OF MINERAL RESOURCES MANAGEMENT GUIDELINES

**SUBJECT:** Test Hole Variance Request Guidelines

**EFFECTIVE:** November 08, 2010

**PURPOSE:** To provide guidance for the preparation and review of test hole variance requests for surface and underground coal mining and reclamation permit applications.

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## Surface Coal Mining and Reclamation Permit Applications

### Introduction

For surface coal mining operations, Ohio Administrative Code (OAC) 1501:13-4-04(C)(4) states, "Prior to submission of an application, an applicant may request that the requirements of paragraphs (C)(2)(b) and (C)(3)(a) of this rule be waived by the chief. The waiver may be granted only if the chief makes a written determination that the statement required is unnecessary because other equivalent information is accessible to him or her in a satisfactory form. If the chief grants a waiver the waiver shall be submitted with the permit application." Such waivers are identified as test hole variance requests (THVRs).

### Background

OAC 1501:13-4-04(C)(2)(b), available for waiver under OAC 1501:13-4-04(C)(4), contains the following requirements:

1. submission of results of geologic tests conducted on the area of land to be mined;
2. test holes made by the boring or drilling method;
3. a rate of one test hole for each twenty-five acres of land, or fraction thereof, which is underlain by coal on the area of land to be mined;
4. at least one test hole located on the highest elevation in the area of land to be mined;
5. test holes located as far apart as the size and shape of the area of land to be mined allows;
6. test holes drilled to the bottom of the material underlying the lowest coal seam to be mined;
7. test holes staked or otherwise marked at the time of filing an application for a permit so as to be clearly visible at the approximate location;
8. test holes numbered; and

9. stakes or other markers maintained until the permit to conduct a coal mining operation is granted or denied.

OAC 1501:13-4-04 (C)(3)(a), also available for waiver under OAC 1501:13-4-04(C)(4), requires the following:

1. test borings or core samples from the proposed permit area collected and analyzed down to and including the stratum immediately below the lowest coal seam to be mined;
2. individual drilling reports furnished for each test boring or core sampling;
3. drilling reports on forms prescribed by the chief; and
4. Drilling report information:
   a. location of subsurface water, if encountered,
   b. lithologic characteristics including physical properties and thickness of each stratum and each coal seam,
   c. chemical analyses to include pH, neutralization potential, potential acidity, total or pyritic sulfur, and calcium carbonate deficiency of each stratum,
   d. analyses of the coal seam for acid-forming or toxic-forming materials, including, but not limited to, an analysis of the total sulfur and the sulfur present in pyrite and marcasite,
   e. identification of the test hole by the number assigned in paragraph (C)(2)(b) of OAC 1501:13-4-04, and
   f. identification of all coal seams by name and number.

**Requirements For Surface Coal Mining Operations**

In order to adequately review THVRs and make a decision regarding the appropriateness of the request, sufficient information must be included within the submission. During an application review, test hole information is used to evaluate the impacts of a mining operation. In addition, Ohio Revised Code (ORC) 1513.075 specifically addresses the use of test hole information to assist in the analysis of the acid-producing and toxic-producing potential of a proposed operation. A reduction in the number of test holes or in the chemical and lithogic information addressed in OAC 1501:13-4-04(C)(2)(b) and OAC 1501:13-4-04 (C)(3)(a) could affect the calculations required under ORC 1513.075 as well as the mining impact evaluation. The following therefore apply to THVRs:

1. THVRs must be approved prior to the associated application being deemed complete.

2. The THVR must include a statement indicating the specific coal and non-coal strata that will be mined.

3. The THVR must maintain adequate test hole coverage for each individual coal seam, including for mining sites where multiple coal seams are mined to separate highwalls.

4. The "written determination" required by OAC 1501:13-4-04(C)(4) must include an explanation by the Chief of the reasons for the approval. This typically would be in the form of a cover letter to the applicant, along with a stamp of approval and the signature of the Chief on the THVR.

5. The THVR must include at least two cross sections, one in a general strike direction and one in a general dip direction.

6. The THVR must include a discussion of mining and reclamation operations insofar as they impact the need for geologic information (for example, highest elevation to be stripped).

7. The test hole variance request requirements for surface coal mining operations are also applicable to areas to be affected by underground mining surface operations involving removal of the overburden down to the level of the coal seam.

8. The Division may request additional test hole information during the application review, in light of the totality of the information submitted with a complete application and per OAC 1501:13-4-04(C)(3)(b) and (c), which state: "(b) To verify the results of the applicant's tests, the chief may, prior to approval of the application, require the applicant to drill additional test holes and provide the information required in paragraph (C)(3)(a) of this rule. (c) If more precise information than can be provided by drilling techniques is warranted by potentially adverse site conditions, the chief may require that the test hole information required in paragraph (C)(3) of this rule be obtained by core drilling." Furthermore, per OAC 1501:13-4-04(G), the Chief may require supplemental information if the probable hydrologic consequences portion of the application "indicates that adverse impacts on or off the proposed permit area may occur to the hydrologic balance, or that acid-forming or toxic-forming material is present that may result in the contamination of ground-water or surface-water supplies, ....Such supplemental information may be based upon drilling..." If the THVR is granted, it is merely a decision based on the determination that equivalent information is accessible to the Chief in a satisfactory form. The granting or denial of a THVR is to be based solely on whether equivalent information exists, not on the anticipated outcome of this information. It is possible that additional test hole data could be requested during review of the entire application if that review, with all information at hand, indicates the potential for impacts to the hydrologic balance. In addition, if the hydrogeologic conditions and mining plan contained in the coal mining and reclamation permit application vary from those addressed in the THVR submittal, then an assessment will be made by the reviewing geologist to determine if additional test holes are warranted.

9. When original or adjacent area applications contain THVRs, the test holes included in those applications will not be used to determine the test hole requirements for subsequent adjacent area applications for the same permit.

10. A separate THVR must be submitted for each original or adjacent area application where a variance is sought.

11. In order to evaluate the appropriateness of a THVR, applicants are encouraged to discuss application preparation with the division prior to the actual application submittal.

## Underground Coal Mining and Reclamation Permit Applications

### Introduction

Ohio Administrative Code 1501:13-4-13(C)(3) addresses test hole variance requests for underground coal mining applications: "Prior to submission of an application, an applicant may request that the requirements of paragraphs (C)(2)(c) to (C)(2)(e) of this rule be waived by the chief. The waiver may be granted only if the chief makes a written determination that the statement required is unnecessary because other equivalent information is accessible to him or her in a satisfactory form. If the chief grants a waiver, the waiver shall be submitted with the permit application." These waivers are identified as test hole variance requests (THVRs).

### Background

The provisions of OAC 1501:13-4-13(C)(2)(c), addressing areas to be affected by underground mining surface operations involving removal of the overburden down to the level of the coal seam, can be waived according to OAC 1501:13-4-13(C)(3). OAC 1501:13-4-13(C)(2)(c) requires:

1. test borings or core samplings down to and including the stratum immediately below any coal seam to be mined; and
2. test borings or core sample information:
   a. the location of areas where subsurface water will be exposed at the face-up area,
   b. the logs of drill holes showing the lithologic characteristics of the strata to be affected,
   c. the physical properties of each stratum within the overburden,
   d. chemical analyses of each stratum to be affected, including the stratum immediately below the lowest coal seam to be mined, to identify, at a minimum, those horizons which contain potential acid-forming, toxic-forming, or alkalinity-producing materials, and
   e. analyses of the coal seam for acid- or toxic-forming materials, including, but not limited to, an analysis of the total sulfur and the sulfur

present in pyrite, unless the chief finds that the analysis of pyritic sulfur is unnecessary.

OAC 1501:13-4-13(C)(2)(d), also available for waiver under OAC 1501:13-4-13(C)(3), addresses lands within the permit and adjacent areas where the strata above the coal seam to be mined will not be removed. It requries:

1. test borings or drill cores; and
2. test boring or drill core information:
   a. logs of drill holes showing the lithologic characteristics, including physical properties and thickness of each stratum that may be affected and location of ground water,
   b. chemical analyses for acid- or toxic-forming or alkalinity-producing materials and their content in the strata immediately above and below the coal seam to be mined,
   c. chemical analyses of the coal seam for acid- or toxic-forming materials, including but not limited to an analysis of the total sulfur and the sulfur present in pyrite, unless the chief finds that the analysis of pyritic sulfur content is unnecessary, and
   d. for standard room and pillar mining operations, the thickness and engineering properties of clays or soft rock such as clay shale, if any, in the stratum immediately above and below each coal seam to be mined.

OAC 1501:13-4-13(C)(2)(e) is also referenced at OAC 1501:13-4-13(C)(3). It requires:

1. that each application contain the results from test holes bored or drilled on lands above the underground workings;
2. that a minimum of three test holes be submitted;
3. that the test holes not be in a straight line and spaced to indicate the strike and dip of the coal seam; and
4. a minimum of one test hole per one hundred sixty acres.

**Requirements For Underground Coal Mining Operations**

In order to adequately review THVRs and make a decision regarding the appropriateness of the request, sufficient information must be included within the submission. During an application review, test hole information is used to evaluate the impacts of a mining operation. The following therefore apply to THVRs:

1. The THVR requirements for surface coal mining operations are also applicable to areas to be affected by underground mining surface operations involving removal of the overburden down to the level of the coal seam.

2. THVRs must be approved prior to the associated application being deemed complete.

3. The THVR must include a statement indicating the specific coal seams that will be mined.

4. The "written determination" required by OAC 1501:13-4-13(C)(3) must include an explanation by the Chief of the reasons for the approval. This typically would be in the form of a cover letter to the applicant, along with a stamp of approval and the signatuare of the Chief on the THVR.

5. The THVR must include at least two cross sections, one in a general strike direction and one in a general dip direction.

6. The THVR must include a discussion of mining and reclamation operations insofar as they impact the need for geologic information (for example, highest elevation above the coal seam).

7. The Division may request additional test hole information during the application review, in light of the totality of the information submitted with a complete application and per OAC 1501:13-4-13(C)(2)(f) and (g), which state: "(f) Additional test hole data or test holes may be required by the chief at specific sites when necessary to describe localized conditions or variations in geology which may affect the ability of the underground coal mining operation to be conducted in accordance with these rules. (g) If more precise information than can be provided by drilling techniques is warranted by potentially adverse site conditions, the chief may require that the test hole information required in paragraph (C) of this rule be obtained by core drilling." Furthermore, according to OAC 1501:13-4-13(G), the Chief may require supplemental information if the probable hydrologic consequences portion of the application "indicates that adverse impacts on or off the proposed permit area may occur to the hydrologic balance, or that acid-forming or toxic-forming material is present that may result in the contamination of ground-water or surface-water supplies, ....Such supplemental information may be based upon drilling..." If the THVR is granted, it is merely a decision based on the determination that equivalent information is accessible to the Chief in a satisfactory form. The granting or denial of a THVR is to be based solely on whether equivalent information exists, not on the anticipated outcome of this information. It is possible that additional test hole data could be requested during review of the entire application if that review, with all information at hand, indicates the potential for impacts to the hydrologic balance. In addition, if the hydrogeologic conditions and mining plan contained in the coal mining and reclamation permit application vary from those addressed in the THVR submittal, then an assessment will be made by the reviewing geologist to determine if additional test holes are warranted.

8. When original or adjacent area applications contain THVRs, the test holes included in those applications will not be used to determine the test hole requirements for subsequent adjacent area applications for the same permit.

9. A separate THVR must be submitted for each original or adjacent area application where a variance is sought.

10. In order to evaluate the appropriateness of a THVR, applicants are encouraged to discuss application preparation with the division prior to the actual application submittal.

## Equivalent Information – Surface and Underground Coal Mining and Reclamation Permit Applications

The submission of equivalent information, as required by OAC 1501:13-4-04(C)(4) and OAC 1501:13-4-13(C)(3), is the essential requirement for approval of a THVR. Equivalent is defined as "equal in quantity, value, force, meaning, etc." (Webster's, 4th Edition) Therefore, the information submitted must be able to be used and evaluated in the same manner as the waived information. Without such equivalency, the reviewer is incapable of adequately assessing the geologic background of the permit area, which is essential to the hydrology review. Under this provision, submission of a reduced number of test holes is only acceptable if other information is available. A reduction in the number of test holes, justified by the presence of "enough" information, does not constitute "equivalent" information.

The total number of reports of individual data collection points (Attachment 12s, Attachment 13s, Drilling Reports - Surface, Drilling Reports – Underground, or other reports) submitted for a THVR must at least equal the minimum 25:1 ratio for strip acreage to number of test holes or the minimum 160:1 ratio for underground workings acreage to number of test holes. In other words, the total number of substitute data points submitted must be no less than the number for which the waiver is being sought. For example, if the applicant proposes to strip mine 200 acres of #6 Coal (eight required test holes), and submits Drilling Reports - Surface for five test holes from within the application area, the applicant must submit data from at least three additional data collection locations. Furthermore, substitute test holes must include <u>all</u> of the data required; therefore, an original driller's log or one without chemical analyses in the currently prescribed format would <u>not</u> count towards the test hole tally. Sampling intervals in all test holes must conform to the standards described in other Division of Mineral Resources Management guidelines.

The THVR option allows for the submission of equivalent data obtained in close proximity to the application area. Therefore, equivalent information must be

obtained from the area on or within approximately one thousand feet of the proposed permit area (excluding haul roads) or shadow area, as applicable. In addition, approval or denial of the THVR does not rest with an evaluation of whether the proposed operation will result in acid mine drainage, since an entire coal mining application is not submitted with the THVR.

From a practical perspective, equivalent information would likely be limited to test hole data. Geologic data contained in unpublished or even published reports will probably not be sufficiently site-specific to address the regulatory concerns that resulted in test hole requirements.

In addition to its general importance across most of the issues considered in a proposed coal mining and reclamation operation, geologic data collected from the test holes is used specifically for the purposes listed below. Therefore, the THVR must provide data equivalent to the missing data so that the following items, among others, can be satisfactorily addressed by the applicant in the coal mining permit application and evaluated by the Division during the application review. The THVR will be reviewed to ensure that these items (as applicable to surface and/or underground mining operations) can be adequately addressed in the full coal mining and reclamation permit application.

1. Acid base accounting (ABA). ORC 1513.07 (B)(1)(o) addresses the results of test borings from the proposed permit area, and states, "If the test borings or core samplings from the permit area indicate the existence of potentially acid forming or toxic forming quantities of sulfur in the coal or overburden to be disturbed by mining, the application also shall include a statement of the acid generating potential and the acid neutralizing potential of the rock strata to be disturbed..." In light of this specification, the ABA required by ORC 1513.07 and ORC 1513.075 imposes limitations on the granting of THVRs. In addition, in order to perform the ABA calculations, equivalent information must be useable in the required ABA.

2. The probable hydrologic consequences of the operation on the quality and quantity of surface water and ground water, including the extent to which surface water and ground water monitoring is necessary, per OAC 1501:13-4-04 (C)(1)(a) and OAC 1501:13-4-13 (C)(1)(a).

3. All potentially acid- or toxic-forming strata down to and including the stratum immediately below the lowest coal seam to be mined, per OAC 1501:13-4-04 (C)(1)(b) and OAC 1501:13-4-13 (C)(1)(b).

4. Whether reclamation can be accomplished and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area, per OAC 1501:13-4-04 (C)(1)(c) and OAC 1501:13-4-13 (C)(1)(c).

5. A general statement of the geology, per OAC 1501:13-4-04 (C)(2)(a) and OAC 1501:13-4-13 (C)(2)(a).

6. The lithology and thickness of aquifers within the proposed permit and adjacent areas, per OAC 1501:13-4-04 (D)(1)(b) and OAC 1501:13-4-13 (D)(1)(b).

7. The depth to the water in the coal seam, if the seam is a water-bearing stratum, and to each water-bearing stratum above and potentially affected water-bearing stratum below the coal seam, per OAC 1501:13-4-04 (D)(1)(e) and OAC 1501:13-4-13 (D)(1)(e).

8. A reclamation plan to minimize disturbance to the hydrologic balance within the permit and adjacent areas and to prevent material damage outside the permit area, per OAC 1501:13-4-05 (E)(1)(a) and OAC 1501:13-4-14 (E)(1)(a).

9. A reclamation plan to avoid acid or toxic drainage, per OAC 1501:13-4-05 (E)(1)(c) and OAC 1501:13-4-14 (E)(1)(c).

10. The probable hydrologic consequences determination findings regarding whether adverse impacts may occur to the hydrologic balance, per OAC 1501:13-4-05 (E)(2)(b)(i) and OAC 1501:13-4-14 (E)(2)(b)(i).

11. The probable hydrologic consequences determination findings regarding whether acid-forming or toxic-forming materials are present that could result in the contamination of surface water or ground water supplies, per OAC 1501:13-4-05 (E)(2)(b)(ii) and OAC 1501:13-4-14 (E)(2)(b)(ii).

12. The probable hydrologic consequences determination findings regarding whether an underground or surface source of water may be contaminated, diminished, or interrupted, per OAC 1501:13-4-05 (E)(2)(b)(iii) and OAC 1501:13-4-14 (E)(2)(b)(iii).

13. Overburden analysis on remining pollution abatement areas, per OAC 1501:13-4-15(C)(3)(b).

14. The identification, burying, or treating of acid-forming and toxic-forming spoil, per OAC 1501:13-9-04(J) and OAC 1501:13-9-14(J).

15. Ground water and surface water protection issues, per OAC 1501:13-9-04(K) and (M).

16. Excess spoil disposal, per OAC 1501:13-9-07(E)(7).

17. Coal waste disposal issues, per OAC 1501:13-9-09.

18. Discharges from underground mine entries, per OAC 1501:13-12-04.

## Special Considerations

### Surface Coal Mining Applications

Some situations that raise concerns with respect to THVRs for surface mining applications are listed below. Specifically, these are situations where even if the THVR is granted, additional test hole data might be required during the application review process in order to ensure that toxic-forming and acid-forming material will be properly disposed, that the hydrologic balance will be protected, and that the mining operation will not result in material damage beyond the permit area. The applicant may want to reconsider whether to apply for a THVR in these cases, since all of the information necessary for evaluation may not be available until submittal of the full coal mining and reclamation permit application. Given the review obligations of OAC 1513, a request for additional information, after approval of a THVR and following receipt of the entire application, could be warranted. Although the following situations would not necessarily cause the disapproval of a THVR, they address situations that may trigger the request for additional information, perhaps in the form of more test hole data, during an application review. It is necessary to enumerate these concerns, because, in many cases, information pertinent to the various topics will be partially or completely unavailable during the review of the THVR. This list is not exhaustive.

1. When the ratio of the strip acreage to the number of test holes within the proposed permit area is greater than 50:1, even if equivalent information is submitted;

2. Applications in which the proposed conventional and/or highwall miner auger acreage is greater than 50% of the proposed strip mine acreage;

3. Interception of abandoned underground mines;

4. Disposal of coal mine waste and/or noncoal mine waste;

5. Beneficial use of coal combustion byproducts;

6. Presence of gob from previous mining;

7. Applications in which background surface water and/or ground water sampling sites exhibit acid mine drainage;

8. A history of acid mine drainage in the immediate vicinity of an application area;

9. Where the acid base accounting required by ORC 1513.07(B)(1)(o) and 1513.075 identifies potential for creation of acid- or toxic-mine drainage;

10. Proximity to areas included in a current or previous AMD Inventory List;

11. Applications that include a request for remining modified NPDES effluent limitations, given the test hole requirements of OAC 1501:13-4-15(C);

12. Application areas within the watershed of a stream that the Ohio EPA has designated as a State Resource Water (SRW), Exceptional Warmwater Habitat (EWH), or Coldwater Habitat (CWH), as indicated *from the link to the appropriate drainage basin* at the Ohio EPA Division of Surface Water website www.epa.state.oh.us/dsw/rules/3745_1.aspx.

13. The presence of a public water supply source or an OEPA-designated Drinking Water Source Protection Area, either ground water or surface water, within the hydrologic review area of a proposed application. There is of particular concern for areas with sole source aquifers;

14. Any area in which there is only one alternative water source, particularly if there is no public water line and/or if developed springs are a common water supply;

15. An area in which the unit below the lowest coal seam to be mined has been breached, with the result that the proposed operation poses a risk to deeper aquifers;

16. Any area where the deeper aquifers have been adversely impacted, even if only in the form of alkaline mine drainage;

17. Any area in which an alluvial aquifer below the mining area serves as a source for a significant number of water supplies. Alluvial aquifers, lacking an upper confining unit, are particularly susceptible to contamination.

**Underground Coal Mining Applications**

The Special Considerations that are listed for surface coal mining applications will be taken into account for underground coal mining applications where appropriate. In addition, special attention will be given when the ratio of the underground workings acreage to the number of test holes within the underground workings area is greater than 320:1, even if equivalent information is submitted.

## Closing

In all cases, best professional judgment will be exercised in evaluating a THVR.