

FINAL

SUBJECT: Solid Waste Guidance: Alternative Parameter List for Low-Yield Monitoring Wells Not Screened in the Uppermost Aquifer System [OAC Rules 3745-27-10(D)(4) and 3745-29-10(D)(4)]

Number: GD0403.205

Issued: 07/25/95

Revised:

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PURPOSE: To establish guidance and procedures for the submittal and review of a variance request under Ohio Administrative Code (OAC) Rule 3745-27-10(D)(4) for municipal solid waste landfill facilities (MSWLF) and OAC Rule 3745-29-10(D)(4) for industrial SLFs for an alternative parameter list for low-yield monitoring wells not screened in the uppermost aquifer system (UAS).

BACKGROUND: OAC Rules 3745-27-10(D)(4) and 3745-29-10(D)(4) state "The owner or operator may propose in writing, that an alternative list of any of the Appendix I monitoring parameters be used to meet the requirements of paragraph (D)(5)(c) of these Rules for those monitoring wells not screened in the uppermost aquifer system that cannot produce enough water within a twenty-four hour period to allow for the analysis of all the required parameters."

The Ohio EPA recognizes that ground water monitoring of significant zones of saturation (SZS) may necessitate that low-yield ground water monitoring wells located in a SZS be considered for unique monitoring requirements. In the past a sampling team might have had to return to a low-yield monitoring well every 24 hours until sufficient volume of ground water was collected to allow for a complete suite of chemical analyses as required by OAC Rule 3745-27-10(D) and OAC Rule 3745-29-10(D). The alternative parameter list addressed in this policy may allow a sampling team to sample low-yield monitoring wells in significantly less time owing to the collection of a reduced volume of ground water for the alternative parameter list.

GUIDANCE: For clarification, because of similarities involved with ground water monitoring at municipal, industrial and residual landfill facilities, this policy only applies to municipal and industrial landfill facilities regulated by OAC Rules 3745-27 and 3745-29, respectively.

In requesting a variance for the alternative parameters list, the owner/operator shall include their rationale for the request. This should include the reasons for the inclusion of those parameters to remain on the list as well as those requested for deletion. The owner/operator must submit field data verifying the amount of ground water which can be obtained in a twenty-four hour period. The owner/operator must also specify which parameters on the alternative list will be analyzed for with the volume of ground water collected in the twenty-four hour period.

In requesting this alternative parameter list, the owner/operator shall respond to the five factors which follow and are shown in bold type. The portion of each factor shown in quotation marks is from OAC Rule 3745-27-10(D)(4) and OAC Rule 3745-29-10(D)(4). Included with the factors considering (D)(4)(a) and (D)(4)(b) is an information source to address that factor. The information source is recommended but is not intended to be the only source available for information to address the factor.

1. **OAC Rule 3745-27-10(D)(4)(a) and OAC Rule 3745-29-10(D)(4)(a). The request for an alternative parameter list must consider "whether the monitoring well is constructed in accordance with paragraph (B)(3) of this Rule."**

Chapters 7 and 8 of the Ohio EPA-Division of Drinking and Ground Waters-document Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring Programs (TGM), 1995 should be referenced for proper procedures on monitoring well design, installation and development.

2. **OAC Rule 3745-27-10(D)(4)(b) and OAC Rule 3745-29-10(D)(4)(b). The owner/operator shall also consider "whether the well screen is properly placed across the significant zone of saturation in order to maximize yield "when requesting an alternative parameter list.**

The owner/operator should consult chapter 5 of the TGM for information on proper monitoring well screen placement across a SZS in order to maximize yield.

3. **OAC Rule 3745-27-10(D)(4)(c) and OAC Rule 3745-29-10(D)(4)(c). "A calculation of the maximum sustainable yield of the significant zone of saturation shall be submitted with the variance request."**

To address this factor the owner/operator should calculate the rate of recharge of ground water from the low-yielding sediments into the monitoring well. This should be determined by considering the following. The low-yield monitoring well should be purged until water is removed and allowed to recover for 24 hours or until the well completely recovers. To approach this issue in a reasonable manner, if the monitoring well takes longer than 24 hours to recover, measure the ground water level at 24 hours after purging. The owner/operator does not have to wait longer than 24 hours to measure the ground water level after purging the well.

To calculate the rate of recharge from the data obtained, divide the volume of ground water in the casing of the monitoring well itself by the 24 hours or the time required to completely recover if that is less than 24 hours. When determining the volume of ground water in the casing of the monitoring well do not include the volume of water in the sand pack surrounding the well screen. This will determine the rate of recharge of the monitoring well and for practical purposes of implementing this requirement will be considered the maximum sustainable yield.

4. **OAC Rule 3745-27-10(D)(4)(d) and OAC Rule 3745-29-10(D)(4)(d). "Field data demonstrating the time necessary for the well to recover completely after purging" shall also accompany the variance request.**

Information to consider when addressing this factor includes, but is not limited to: the amount of time necessary to purge the well dry, and recovering intermittent ground water levels (e.g., after 2,4,6...24 hours, etc.). This is a suggested schedule and does not require nor imply measuring ground water levels every two hours. Any calculations or information used to address this factor must be supported by documented field data.

5. **OAC Rule 3745-27-10(D)(4)(e) and OAC Rule 3745-29-10(D)(4)(e). In the written variance request, the owner/operator shall consider "The amount of water needed to analyze for all required parameters. This should include a discussion of which parameters will be deleted and the amount of water needed to analyze for these deleted parameters as well as the alternative list of parameters which will be analyzed for in the samples and how much water is required to analyze for these parameters."**

When addressing this factor the owner/operator shall also consider that ammonia, sodium, chloride and chemical oxygen demand are priority parameters in that they are required to be statistically evaluated in accordance with OAC Rule 3745-27-10(D)(7)(a)(ii) and OAC Rule 3745-29-10(D)(7)(a)(ii). A minimum of 600 mL of ground water is necessary in order to analyze for these four parameters. These four parameters must be included on the alternative parameter list.

Ground water samples should be collected and containerized in the following order of volatilization sensitivity.

- Volatile organic compounds (VOCs),
- Purgeable organic carbon,
- Purgeable organic halogens,
- Total organic halogens,
- Total organic carbon,
- Extratable organics,
- Total metals,
- Phenols,

- Cyanide,
- Sulfate and chloride,
- Nitrate and ammonia, and
- Radionuclides

6. **Additional considerations when sampling low-yield monitoring wells not screened in the UAS.**

While sampling the well, the applicant may have to return to the well on several occasions, within the 24-hour period, to collect samples. This may include the morning following the well purging. A maximum of 24 hours should transpire between purging the well and final collection of the sample(s). For safety considerations, the applicant should not collect samples during non-daylight hours.

In order to increase the amount of ground water available for sampling from low-yield monitoring wells, the owner/operator may also consider the installation of 4-inch monitoring wells. By purging the 4-inch well and allowing it to recover, the amount of well-bore storage of ground water to be sampled from the monitoring well will be increased. This is due to the increased recharge area of the well bore. This will allow for additional ground water to be collected and subsequently a greater number of laboratory analyses can be performed.

Included with this policy is an Attachment showing the Appendix I parameter list. This list shows the similar parameter types (e.g., metals, VOCs) used for purposes of chemical analysis and the volume of ground water necessary to analyze for that particular parameter type. The information shown is from the OEPA, Division of Environmental Services (DES) and may not accurately represent the quantity of ground water used by the facilities laboratory of choice. This attachment is meant to provide an initial reference point when determining the number of parameters which can be analyzed for when requesting an alternative parameter list. Based on the information in the Attachment, monitoring wells not screened in the UAS require a minimum of approximately 3,020 mL for all of the parameters listed in the Attachment. This number does not consider pH, temperature or specific conductance which are field measurements.

The owner/operator may use the alternative parameter list for low-yield wells not screened in the uppermost aquifer system upon approval by the Director or his authorized representative. This alternative parameter list may be requested at any time during the active life of the landfill and during the closure/post-closure care period.

PROCEDURE:

A variance request under OAC 3745-27-10(D)(4) or OAC 3745-29-10(D)(4) shall be submitted by the owner/operator of a MSWLF to the Division of Solid and Infectious Waste Management (DSIWM) in the appropriate Ohio EPA district office. The DSIWM District Supervisor shall submit the variance request to the Division of Drinking and Ground Waters-Ground Water Program (DDAGW-GWP) District Supervisor with a work request form to review the variance request. The DDAGW-GWP District Geologist shall review the submittal to ensure that the variance request is substantially complete and contains the information required by OAC 3745-27-10(D)(4) or OAC 3745-29-10(D)(4).

The DDAGW District Geologist shall complete the review within the time-frames agreed to by the DSIWM and DDAGW-GWP District Supervisors. The results of the review shall be communicated in writing through the DDAGW-GWP District Supervisor to the DSIWM District Specialist. This communication shall include a list of all constituents that are not to be deleted from the Appendix I analysis list for the MSWLF unit in question.

DDAGW-CO shall be copied on the final communication.