



State of Ohio Environmental Protection Agency

Northwest District Office

347 North Dunbridge Road
Bowling Green, OH 43402-9398

TELE: (419) 352-8461 FAX: (419) 352-8468
www.epa.state.oh.us

Ted Strickland, Governor
Lee Fisher, Lieutenant Governor
Chris Korteski, Director

Re: Huron County Landfill
Ground Water
Huron County, Ohio

August 21, 2008

Huron County Commissioners
180 Milan Ave.
Norwalk, Ohio 44857

Dear Commissioners:

The Ohio Environmental Protection Agency (Ohio EPA) reviewed the May 2008 (revised) Ground Water Detection Monitoring Plan (DMP); Response to Ohio EPA's April 16, 2008 letter, regarding the February 2008 DMP. The documents were received on May 5, 2008 and prepared by Malcolm Pirnie, Inc. Huron County Landfill is conducting detection monitoring, as well as assessment monitoring for well MW-19. The document contains a revised Ground Water Detection Monitoring Plan (DMP) dated May 2008. Ohio EPA reviewed the documents with respect to Ohio EPA's April 16, 2008 letter and the requirements of Ohio Administrative Code (OAC) Rule 3745-27-10.

Violations

- 1. The owner/operator is in violation of OAC Rule 3745-27-10(C)(1), requiring consistent sampling, analysis, and statistical methods, which are designed to ensure monitoring results that provide an accurate representation of ground water quality at the background and downgradient wells. The owner/operator should revise the Ground Water Detection Monitoring Plan (DMP) with clear, consistent methods and procedures for updating the background data sets.**

The owner/operator is in violation of this rule, because their response to Comment 1 in Ohio EPA's April 16, 2008 letter is inconsistent with the first bullet item on page 7-5 of the revised DMP. The owner/operators response states, "If the initial sample is statistically significant, and the confirmation sample confirms the result (approximately $\pm 25\%$), the first analysis will be considered to be indicative of ground water quality and may signal a shift in the concentration. The initial sample will be considered for background update pending the result of the demonstration submitted to the Ohio EPA under Rule 3745-27-10(D)(7)(c)(ii) indicating that the statistically significant concentration was due to something other than the landfill. If the statistically significant sample and the confirmation sample both indicate a statistically significant increase over the background, the initial statistically significant sample will be considered for inclusion in the background pending the results of a demonstration in accordance with OAC Rule 3745-27-10(D)(7)(c)(ii). If a demonstration has not been submitted or approved, then the initial statistically significant sample will be used in the background as long as it's not shown through statistical tests to

be an outlier. If the demonstration is accepted by the Director of the Ohio EPA, the result from the initial sample and the confirmation sample will be used for updating the background, as long as statistical tests show that the data are not outliers" (Section 7.4.1, p. 7-5).

The owner/operator should revise Section 7.4.1 to clarify if the initial sample will be 'removed from the background database', pursuant to the first bullet item on page 7-5, or 'used in the background as long as it's not shown through statistical tests to be an outlier', pursuant to the second bullet item on page 7-5 of the DMP. However, the DMP also contains provisions to analyze the data for trends in Sections 7.4.3 and 7.5.6. According to Sections 7.4.2, 7.4.3, 7.5.5 and 7.5.6 in the DMP, the data will be analyzed for statistical outliers and trends to determine, if the data are appropriate for the background database.

More Information Needed to Determine Compliance

- 2. Compliance with OAC Rules 3745-27-10(C)(1), please see Comment 1 for rule citation; OAC Rule 3745-27-10(C)(7)(g), requiring that background data is added in blocks of four, resulting from the analysis of four or more statistically independent samples after the data has been statistically compared to the current background data and no statistical differences are detected; OAC Rule 3745-27-10(C)(6)(e), requiring the use of another statistical method, needing the approval of the director; OAC Rule 3745-27-10(D)(7)(b), requiring the notification of wells and parameters that have shown a statistically significant increase over background levels; and OAC Rule 3745-27-10(D)(7)(c)(i), requiring the use of the 1 of M resampling method to demonstrate that the statistically significant increase over background was a false positive, cannot be determined at this time. For Ohio EPA to determine compliance, the owner/operator should provide the following information.**

The DMP states, "...and the confirmation sample confirms the result (approximately +25%)..." (DMP, p. 7-5).

The owner/operator should discuss how the criteria, stated above, were determined. The owner/operator should explain how statistically significant increases are reported consistently using these criteria. Also, the owner/operator must show they have approval from the director or his authorized representative to use this method, since it constitutes another statistical method under OAC Rule 3745-27-10(C)(6)(e).

- 3. Compliance with OAC Rules 3745-27-10(C)(1) and (C)(7)(g) cannot be determined at this time. Please see Comments 1 and 2 for the rule citations. For Ohio EPA to determine compliance, the owner/operator should revise Section 7.4.1 in the DMP to include the following information.**

The May 2008 (revised) Ground Water Detection Monitoring Plan (DMP) states, "Samples that have Practical Quantitation Limits (PQLs) that are elevated will be removed from the potential background data set" (Section 7.4.1, p. 7-3).

The DMP does not discuss the methods and procedures used to identify the 'elevated' PQLs and the criteria that distinguish elevated PQLs from appropriate PQLs. The DMP should be revised to include this information.

4. **Compliance with OAC Rules 3745-27-10(C)(1) and (C)(7)(g) cannot be determined at this time. Please see Comments 1 and 2 for the rule citations. For Ohio EPA to determine compliance, the owner/operator should revise the DMP to include the following information.**

The DMP states, "Detected metals concentrations for any sample that has a turbidity that exceeds 100 NTU may be removed from the potential background database...Soluble parameters such as ammonia, chloride, sodium and potassium are not significantly affected by turbidity and will not be removed from these samples" (Section 7.4.1, p. 7-3).

The DMP does not adequately justify removing metals data from the 'potential background database' when the sample exceeds 100 nephelometric turbidity units (NTUs). The DMP does not discuss how this criterion was determined, nor does it discuss the methods and procedures for identifying this type of data. The owner/operator should revise Section 7.4.1 to include a correlation analysis to determine, if the concentrations are a function of turbidity. Section 7.4.1 should include the results of regression analyses for turbidity (independent variable) and metal concentrations (dependent variables). These analyses should indicate the approximate portion of the dependent variables variance that can be explained by the independent variable. Section 7.4.1 should include a statistical limit (for example the 99% upper confidence limit) at which turbidity affects the sample results. Section 7.4.1 should discuss how the procedure for identifying the turbidity affected data will be implemented. The calculations for these analyses should be included in the revised DMP.

5. **Compliance with OAC Rules 3745-27-10(C)(1) and (C)(7)(g) cannot be determined at this time. Please see Comments 1 and 2 for the rule citations. For Ohio EPA to determine compliance, the owner/operator should revise the DMP to include the following information.**

The DMP states, "Soluble parameters such as ammonia, chloride, sodium and potassium are not significantly affected by turbidity and will not be removed from [the samples that exceed 100 NTUs]" (Section 7.4.1, p. 7-3).

The DMP does not adequately justify exempting sodium and potassium from the results that could be affected by high turbidity. Statistically significant correlations in sodium and potassium concentrations have been due to high turbidity at other municipal landfills in Ohio. The owner/operator should revise Section 7.4.1 to include sodium and potassium in this analysis, or provide information on how the referenced procedure meets the requirements of these rules.

6. **Compliance with OAC Rules 3745-27-10(C)(1) and (C)(7)(g) cannot be determined at this time. Please see Comments 1 and 2 for the rule citations. For Ohio EPA to determine compliance, the owner/operator should revise the DMP to include the following information.**

The DMP states, "Confirmatory sampling could bias the background samples to the high end if both the initial sample and the confirmation sample are included in the background set. Taking an additional sample based on the result of a sample may result in auto-correlation. This would violate the assumption of independent sample values that are

implicit in many of the statistical analyses. Therefore, confirmatory sampling will be handled depending on the results of the analyses as follows" (Section 7.4.1, p. 7-5).

In order to be consistent with the second and third bullet items in page 7-5, the first sentence in the second paragraph on page 7-5 should state: "Confirmatory sampling could bias the background samples to the high end, if both the initial and the confirmation samples are statistically significant *and not independent*." Also, the last sentence in the second paragraph on page 7-5 should state: "Therefore, confirmatory samples will be *independent samples*." The owner/operator should revise Section 7.4.1, accordingly, and discuss the methods or procedures that ensure the samples are independent.

7. **Compliance with OAC Rules 3745-27-10(C)(1) and (C)(7)(g) cannot be determined at this time. Please see Comments 1 and 2 for the rule citations. For Ohio EPA to determine compliance, the owner/operator should revise the DMP to include the following information.**

The DMP states, "*If the initial sample is statistically significant, but the confirmation sample is not, the first analysis will be considered to be an extreme value caused by sampling or analytical error and will be removed from the background database and the confirmatory will be used instead*" (Section 7.4.1, p. 7-5).

Section 7.4.1 is inconsistent with Sections 7.4.2, 7.4.3, 7.5.5 and 7.5.7 of the DMP. The owner/operator should revise Section 7.4.1 by clarifying the background data sets will be updated, based on the results of statistical tests for outliers and trends, as discussed in these sections of the monitoring plan. A statistical outlier, including data that caused a statistically significant increase or trend, should not be added to the background data set, unless it is justified. The owner/operator should revise the DMP to require this justification be included in a demonstration pursuant to OAC Rule 3745-27-10(C)(7)(g). The demonstration should show the data is representative of background ground water quality before it is added to the background data set.

8. **Compliance with OAC Rules 3745-27-10(C)(1) and (C)(7)(g) cannot be determined at this time. Please see Comments 1 and 2 for the rule citations. For Ohio EPA to determine compliance, the owner/operator should revise the DMP to include the following information.**

The DMP states, "*An example of when an outlier may be kept is when the concentration follows an increasing and then decreasing trend on a time-series plot, with the potential outlier at the top (or bottom) of the cycle*" (Section 7.4.2, p. 7-6).

While the statement in Section 7.4.2 may describe an example of seasonality, it may also describe an example of seasonality with a true outlier as the highest point. This procedure, if used in background data, might result in an unrepresentative change in the background mean and standard deviation and could result in producing false negatives in the compliance data. In order to be protective, the calculated outlier in the background should be removed, until such time that it can be shown that it is not an outlier. This may take several cycles to adequately display any seasonality. The data should not be included in the background, unless its representativeness can be justified. The owner/operator should revise the DMP to require this justification be included in a

demonstration pursuant to OAC Rule 3745-27-10(C)(7)(g). The demonstration may include consideration of proximity in concentration of the outlier to available censored data; supporting evidence found in relevant, professional literature that the outlier concentration is within the normal range of background concentrations expected for the parameter at the facility; a comparison of the outlier concentration to background data from other sample locations located upgradient or downgradient and are unaffected by potential sources of contamination that demonstrates that the outlier concentration is within the normal range of background concentrations expected for the parameter at the facility; and use of an appropriate outlier testing procedure not previously identified in the statistical analysis plan, demonstrating that the data point previously identified as an outlier in accordance with the statistical analysis plan is not an outlier.

9. **Compliance with OAC Rules 3745-27-10(C)(1) and (C)(7)(g) cannot be determined at this time. Please see Comments 1 and 2 for the rule citations. For Ohio EPA to determine compliance, the owner/operator should revise the DMP to include the following information.**

The DMP states, *"For parameters that have greater than 50-percent below detection limit values, data will be examined for suspicious values that may indicate sampling or analytical errors. Judgment will be used when determining when outliers are present in these potential background data sets. The following guidelines will be used: 1. A single detection in a data set that exceeds 3 times the PQL; 2. Any detection that is an order of magnitude greater than the next largest value"* (Section 7.4.2, p. 7-6). The inappropriate inclusion of outliers in the background data set may improperly change the background mean and standard deviation ultimately resulting in false negatives in the compliance data.

Ohio EPA believes the following procedure is appropriate for retaining an outlier if there is only a single detection greater than the PQL and there are 75% or greater censored data:

- A. If the detections above the method detection limit (MDL) are equal to or greater than 50%, apply 2 times the median as the outlier criterion.
- B. If the detections above the MDL are less than 50%, apply the PQL as the outlier criterion.

Ohio EPA believes the following procedure is appropriate for retaining an outlier if there are at least 2 detections above the PQL and there are 75% or greater censored data:

- A. If the detections above the MDL are equal to or greater than 50%, apply 3 times the median as the outlier criterion.
- B. If the detections above the MDL are less than 50%, the highest value shall be considered an outlier (use the second highest value as the statistical limit unless the highest value can be justified).

The owner/operator should revise the DMP accordingly, or provide information on how the stated procedure meets the requirements of these rules.

10. **Compliance with OAC Rules 3745-27-10(C)(1) and (C)(7)(g) cannot be determined at this time. Please see Comments 1 and 2 for the rule citations. For Ohio EPA to**

determine compliance, the owner/operator should revise the DMP to include the following information.

The DMP states, "...new data that exhibits an upward or downward trend in an upgradient, sidegradient, or downgradient well will not be added to the potential background data set unless a cause other than the landfill can be determined" (Section 7.4.3, p. 7-7).

The owner/operator should revise the DMP to require justification that the trend or change is representative of background ground water, before the data is added to the background data set. The justification should be included in a demonstration pursuant to OAC Rule 3745-27-10(C)(7)(g). Information that could justify such data may include: a similarity of background data to the range and variance of site data and regional data; data indicating an off-site source; results indicating a release from an on-site source that does not include a release from the limits of waste unit being monitored; and supporting evidence in relevant, professional literature.

- 11. Compliance with OAC Rules 3745-27-10(C)(1) and (C)(7)(g) cannot be determined at this time. Please see Comments 1 and 2 for the rule citations. For Ohio EPA to determine compliance, the owner/operator should revise the DMP to include the following information.**

The DMP states that Dixon's Test or Rosner's Test will be utilized to test for outliers in Section 7.5.5 (p. 7-10 to 7-11). However, the DMP does not discuss what criteria will be used to determine when each test will be performed. Dixon's Test is typically used for populations equal to or less than 25. There must be at least 20 data points to perform Rosner's Test. The owner/operator should revise the DMP to include this information.

- 12. Compliance with OAC Rules 3745-27-10(C)(1) cannot be determined at this time. Please see Comment 1 for the rule citation. For Ohio EPA to determine compliance, the owner/operator should revise the DMP to include the following information.**

The DMP states, "A Confidence Level of 5-percent (minimum) will be used for interwell analyses but the level will be increased such that the single comparison False Positive Rate is not less than 1-percent (i.e. Confidence Level = 7% for 7 comparisons)" (Section 7.5.8, p. 7-12).

To help clarify the stated procedure and ensure it is implemented consistently, Section 7.5.8 could be revised to state: While performing interwell statistical procedures, a 5% confidence level must be maintained. However, for multiple comparisons, this 5% confidence level should be divided by the number of comparisons up to a maximum of 5. For example, for single comparisons the confidence level is 5%, for 2 comparisons the confidence level is 2.5% and for 5 or more comparisons the confidence level is 1%.

- 13. Compliance with OAC Rules 3745-27-10(C)(2)(c)(i) and (C)(2)(c)(ii), requiring the collection of ground water samples, cannot be determined at this time. For Ohio EPA to determine compliance, the owner/operator should revise the DMP to include the following information.**

Although not specified in the revised DMP or the owner/operator's May 1, 2008 response letter, the owner/operator's May 16, 2008 letter, regarding the assessment monitoring plan, states: "We have been using submersible pumps and low-flow purging/sampling techniques in all wells at the landfill" (letter dated May 16, 2008, p. 3). However, the DMP states, "Some of the site monitoring wells will be purged with new polyethylene or PVC bailers" (Section 3.2, p. 3-1).

The owner/operator should revise the DMP to state what wells will be purged and sampled with bailers and state, where low-flow purging and sampling with pumps will be used. If the owner/operator intends to use low-flow methods, then Section 3.3 in the DMP should be revised to include the stabilization criteria for drawdown. In making these revisions, Sections 3, 3.2, 3.3 and Table 2-1 need to be revised.

14. **Compliance with OAC Rule 3745-27-10(C)(2)(d)(ii), requiring the calibration of field devices, cannot be determined at this time. For Ohio EPA to determine compliance, the owner/operator should revise the DMP to include the following information.**

It remains unclear what devices will be used to measure field parameters and how these devices will be calibrated. The DMP contains instructions to calibrate a Yellow Springs Instrument (YSI) Model 556 Multi Probe System and an Oakton pH/temperature/conductivity meter. The owner/operator should revise the DMP to clarify, which device is used at the wells that are bailed and, which device is used at the wells that are pumped. The owner/operator should also clarify what field parameters these devices are used to monitor and at which wells. The owner/operator states a YSI 6-series sonde and a flow-through cell are rented for use during each sampling event, but this statement does not appear in the DMP. The dissolved oxygen portion of the YSI device should be calibrated daily, according to the owner/operator's May 1, 2008 letter. This information should be stated in the DMP.

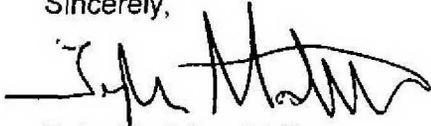
Statements

15. Comments 1-12 in this letter regard the owner/operator's response to Comment 1 in Ohio EPA's April 16, 2008 letter.
16. Comment 14 in this letter regards the owner/operator's response to Comment 2 in Ohio EPA's April 16, 2008 letter.
17. The owner/operator's response to Comment 3 in Ohio EPA's April 16, 2008 letter is adequate. Section 6.4 has been revised accordingly in the DMP.
18. Monitoring well MW-2 has been reinstated to the ground water detection monitoring program (letter dated June 18, 2008). The DMP text, including Tables 1-1 and 1-2, can be revised accordingly.

Huron County Commissioners
August 21, 2008
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If you have any questions please feel free to contact Pete Sokoloski at the Ohio EPA Northwest District Office (419-373-4100). Any written correspondence should be sent to the attention of Tyler Madeker, Division of Solid and Infectious Waste Management, Ohio EPA Northwest District Office, 347 N. Dunbridge Road, Bowling Green, Ohio 43402.

Sincerely,



Tyler Madeker S.I.T.
Division of Solid and Infectious Waste Management

/lb

pc: Peter Welch, Huron County Landfill Manager
Wes Rhiel, Malcolm-Pirnie
~~Files Huron County, Huron County Landfill, Ground Water~~

ec: Habib Kaake, DSIWM-NWDO
Mike Reiser, DSIWM-NWDO
Tyler Madeker, DSIWM-NWDO
Pete Sokoloski, DDAGW-NWDO
Jack Leow, DDAGW-NWDO 5-7737