



**Environmental
Protection Agency**

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

February 15, 2012

**RE: CITY OF AVON LAKE LANDFILL
GROUND WATER
NOTICE OF VIOLATION/REQUEST
FOR ADDITIONAL INFORMATION**

CERTIFIED MAIL 7011 0470 0002 3496 1085

Mr. Thomas E. Lescher
Service Director
City of Avon Lake
750 Avon Belden Rd.
Avon Lake, Ohio 44012

Dear Mr. Lescher:

The Ohio Environmental Protection Agency (Ohio EPA), Division of Materials and Waste Management (DMWM), NEDO received the four reports listed below on the corresponding dates regarding the Avon Lake Municipal Landfill (ALML) that were prepared by HZW Environmental Consultants, LLC (HZW):

- *2011 Annual Ground Water Assessment Monitoring Report* – received January 11, 2012
- *2011 Annual Assessment Activities Report* – received January 11, 2012.
- *2011 Semiannual Ground Water Assessment Monitoring Report* – received August 30, 2011
- *2010 Semiannual Ground Water Assessment Monitoring Report* - received September 8, 2010.

The approximate 13 –acre closed Avon Lake Municipal Landfill (ALML) is located at 750 Avon-Belden Road in Avon Lake, Lorain County, Ohio. The ALML began operation in May 1973, and accepted construction debris, yard waste and special waste (furniture, etc.) until it was closed in December 1990.

2011 Annual Ground Water Assessment Monitoring Report

The *2011 Annual Ground Water Assessment Monitoring Report (AGWAMR)* was submitted to satisfy requirements in OAC Rule 3745-27-10(E)(12)(b) and OAC 3745-27-10(E)(10), and includes ground water sampling analyses for Appendix I parameters for all 12 monitoring wells at the ALML (Table 2, Table 3, and Appendix B), prediction limits (PL) for Appendix I parameters for till/shale zone wells (Table 2), potentiometric surface maps for the till/shale zone UAS and deeper shale zone (Figures 3 and 4), field

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information forms (Appendix A), and certification statement (Appendix C). The ground water samples were collected on December 6 and 7, 2011. According to the *AGWAMR* (pg. 3), "...PLs could not be calculated for the shale wells, as an insufficient amount of data exists due to the recent addition of MW-10, -11, and -12 to the monitoring network." The *AGWAMR* also indicates (pg. i) that it is being submitted to satisfy requirements in OAC Rule 3745-27-10(E)(10) to determine the semiannual rate update to rate, extent, and concentration of waste-derived constituents at the ALML.

Although prediction limits are summarized in Table 2 of the *2011 AGWAMR*, OAC 3745-27-10(C)(10) requires that all statistical analysis results and summary table(s), including the results from any test for normality, need to be submitted. The *2011 AGWAMR* does not include any supporting documentation for how PLs were calculated.

The *2011 AGWAMR* indicates that 28 parameters were reported above quantitation limits for Appendix I parameters. The report indicates that nine of the 28 sample parameters (ammonia, benzene, chloride, manganese, potassium, sodium, total dissolved solids, total alkalinity, and turbidity) were reported in one or more ground water samples at concentrations that exceed respective PL values for the till/shale zone monitoring wells or are classified as volatile organic compounds (VOCs). Statistical analyses of the parameters, alkalinity, total dissolved solids, and turbidity are not required, although a comparison of these parameters to background concentrations must be made, elevated alkalinity, total dissolved solids, and/or turbidity is (are) not a trigger for assessment.

The December 6, 2011 Potentiometric Surface Map for the Shale Zone (Figure 4) in the *2011 AGWAMR* indicates that flow patterns have significantly changed from the original June 2011 version of the Potentiometric Map included in *the November 2011 Ground Water Quality Assessment Report*. MW-11 originally shown (June 2011 version) to be an upgradient well, is shown to be downgradient of MW-6 and MW-10. The shale zone monitoring wells include: MW-6, MW-10, MW-11, and MW-12. There appears to be about a 30-foot differential between the shallowest shale zone, well, MW-6 and the deepest, MW-10. It is unclear if MW-11 is an upgradient well, and what the ground water flow direction is in the shale zone. These four wells may not represent the same hydrogeological unit. OAC Rule 3745-27-10(C)(3)(b) requires that the owner/operator determine, for the uppermost aquifer system and for all significant zones of saturation monitored, the direction of ground water flow each time ground water elevation measurements are performed.

The *2011 AGWAMR* implies that PLs are to be calculated for the shale zone monitoring wells. There have been four assessment sampling events (semiannual and annual 2010 and semiannual and annual 2011) since the installation of the three additional shale zone monitoring wells MW-10, MW-11, and MW-12 (April 2010) to the preexisting shale zone monitoring well MW-6. The *July 2010 Revised Ground Water Assessment Plan*

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(pg. 18) states: "Within 180 days of implementing the *GWQAP*, additional statistically independent ground water samples will be collected and analyzed if necessary. The data collected will be used to provide sufficient analyses in order to statistically compare the downgradient ground water quality assessment program monitoring to background wells. The 2009 "U.S. EPA Guidance, *Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities*" indicates that data from a minimum of eight independent samplings are needed in order to determine a PL.

Although the *AGWAMR* also indicates (pg. i) that it is being submitted to satisfy requirements in OAC Rule 3745-27-10(E)(10) to determine the semiannual update to rate, extent, and concentration at the ALML, it does not specifically address how these three parameters have changed or remained constant since their initial determination. Ohio EPA recently reviewed the initial determination of rate, extent, and concentration required by OAC Rule 3745-27-10(E)(6) included in the *November 2011 Ground Water Quality Assessment Report*. Ohio EPA's review of that report (dated February 6, 2012) concluded that the owner/operator had not adequately determined the rate, extent, and concentration of waste-derived parameters in ground water at the ALML, and is in violation of OAC 3745-27-10(E)(6). OAC Rule 3745-27-10(E)(10) requires rate, extent, and concentration to be updated on a semiannual basis. Considering that the first determination of rate, extent, and concentration submitted to Ohio EPA in November 2011 was determined to be inadequate, there is no need to submit semiannual updates to rate, extent, and concentration until the owner/operators believe that they have submitted adequate demonstration to Ohio EPA to return to compliance with OAC 3745-27-10(E)(6). Any future semiannual/annual determination of rate, extent, and concentration should address any changes in those three parameters (e.g., a change in the potentiometric surface may change rate), or indicate that they remain constant from the previous event.

Also, be aware that OAC 3745-27-10(E)(9) requires that after the first determination of rate, extent, and concentration in accordance with paragraph (E)(6) of this rule, that the owner or operator shall notify by certified mail, or any other form of mail accompanied by a receipt, all persons who own land or reside on land that directly overlies, or is reasonably expected to overlie, any part of the plume of contamination, as determined in accordance with paragraph (e)(5) of this rule, of the rate, extent, and concentration of waste-derived constituents in ground water. The owner or operator shall place the return receipts or other evidence of notification into the operating record. Annually, the owner or operator shall re-notify persons or notify additional persons, based on the results of the determinations of rate, extent, and concentration in accordance with paragraph (e)(5) of this rule until released from the obligation by the director.

2011 Annual Assessment Activity Report

The *2011 Annual Assessment Activity Report* was submitted to comply with the requirements of OAC Rule 3745-27-10(E)(12)(a), and provides a narrative of assessment activities that have occurred at ALML since the submittal of the *2011 Semiannual Assessment Activities Report*. These activities included:

- A September 27, 2011 meeting held at ALML between members of Ohio EPA, NEDO, HzW Consultants, and the ALML to discuss concern about the representativeness of ground water samples based on reported elevated turbidity levels in ground water at many of the monitoring wells at the ALML.
- During the meeting the City of Avon Lake agreed to evaluate the effect of turbidity on sample quality.
- The November submission of a report entitled, "*Filtered Versus Unfiltered Metals Demonstration*" to respond to a previously cited violation of OAC Rule 3745-27-10(B)(3) for failing to install, design, develop, and sample monitoring wells in a manner that allows for collection of ground water samples that are representative of ground water quality in the unit being monitored.
- During October 2011, HzW responded to Ohio EPA's September 2, 2011 Notice of Violation and Request for Additional Information.
- During December 2011, an Annual Ground Water Quality Assessment Monitoring Event was performed at the ALML. Ground water wells were sampled for Appendix I Parameters.
- In January 2012, the results of the 2011 Annual Ground Water Assessment Monitoring Event were submitted to Ohio EPA, NEDO.

2011 Semiannual Ground Water Assessment Monitoring Report

The *2011 Semiannual Ground Water Assessment Monitoring Report (SAGWAMR)* was submitted to satisfy requirements in OAC Rule 3745-27-10(E)(12)(b), and includes ground water sampling analyses for Appendix I and II parameters for all 12 monitoring wells at the ALML (Table 2, and Appendix B), prediction limits (PL) for Appendix I and II parameters for till/shale zone wells (Table 2), potentiometric surface maps for the till/shale zone UAS and deeper shale zone (Figures 3 and 4), field information forms (Appendix A), and certification statement (Appendix C). The samples were collected on June 16, 2011.

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According to the *2011 SAGWAMR*, three semi-volatile organic compounds (SVOCS), 2-methylnaphthalene, butyl benzyl phthalate, and naphthalene were detected in the ground water sample collected from MW-6; however, the well was re-sampled on August 4, 2011; and analytical results indicated that initial concentrations of SVOCS were determined to be false positives. The *2011 SAGWAMR* indicates that parameters that exceed PLs include:

- Ammonia in MW-2, MW-3, MW-5A, and MW-9
- Potassium in MW-3, and MW-5A
- Sulfate in MW-4, MW-7, and MW-9
- Total Dissolved Solids in MW-1, MW-2, MW-3, MW-5A
- Turbidity in MW-1, MW-5A, MW-8
-

As previously commented, statistical analyses of the parameters, alkalinity, total dissolved solids, and turbidity are not required, although a comparison of these parameters to background concentrations must be made. Elevated alkalinity, total dissolved solids, and/or turbidity is (are) not a trigger for assessment.

The *2011 SAGWAMR* does not indicate a PL for sodium, but a review of sample analyses indicates elevated concentrations of sodium that would likely exceed the PL for sodium in six of the till/shale zone wells:

- MW-1 – 530mg/l
- MW-3 – 460 mg/l
- MW-5A – 730 mg/l
- MW-7 – 290 mg/l
- MW-8 – 270 mg/l
- MW-9 – 290 mg/l

Although Table 2 of the *2011 SAGWAMR* provides an incomplete summary of PLs, OAC 3745-27-10(C)(10) requires that all statistical analysis results and summary table(s), including the results from any test for normality, need to be submitted. The *2011 AGWAMR* does not include any supporting documentation for how PLs were calculated.

Although PL have not yet been determined for parameters in the shale zone monitoring wells, concentrations of sodium and chloride are extremely elevated.

Table 2 in the *2011 SAGWAMR* references Primary or Secondary Drinking Water Standards for selected parameters including arsenic, chloride, chromium, lead, manganese, sulfate, total dissolved solids, and turbidity. Drinking Water Standards are not relevant and/or applicable to sanitary landfill sites.

2010 Semiannual Ground Water Assessment Monitoring Report

The *2010 Semiannual Ground Water Assessment Monitoring Report (SAGWAMR)* was submitted to satisfy requirements in OAC Rule 3745-27-10(E)(12)(b), and includes ground water sampling analyses for Appendix I and II parameters for all 12 monitoring wells at the ALML (Table 2, and lab analyses are also attached), a potentiometric surface map for the UAS, (Figures 2), field information forms, and certification statement. The samples were collected on June 7, 2010.

According to the *2010 SAGWAMR*, 31 samples were reported above laboratory method detection limits for Appendix I and II parameters, and that eight of these parameters (antimony, chloride, iron, manganese, pH, sulfate, and TDS) were determined to exceed their respective Primary or Secondary Maximum Contaminant Level (MCL) Drinking Water Standards. In addition, three VOCs consisting of acetone, benzene, and carbon disulfide were detected.

Primary and Secondary Drinking Water Standards are not relevant and/or applicable to sanitary landfill sites. Further, the *July 2010 Revised Ground Water Quality Assessment Plan* indicates (pg. 4): "Prediction limits, or background values, shall be calculated by DUMPStat in accordance with OAC 3745-27-10(C)(6)(a). Any detection that exceeds the prediction limit shall be categorized as statistically significant as well as any volatile organic compound (VOC), semi-volatile organic compound (SVOC), herbicide, and/or pesticide. Should any constituent be deemed statistically significant, further statistical methods such as multiple comparison procedures to identify statistically significant evidence of contamination will be utilized in accordance with OAC 3745-27-10(C)(6)(c) and (d)." The *2010 SAGWAMR* does not indicate that required comparisons to prediction limits or background concentrations specified in the *2010 Revised Ground Water Quality Assessment Plan* were made. OAC Rule 3745-27-10(E)(1) requires that the owner/operator implement and comply with the ground water quality assessment plan.

The following violations were identified during the review of the documents:

1. **The facility owner/operator Avon Lake Municipal Landfill is in violation of OAC Rule 3745-27-10(C)(10) requiring that all statistical analysis results and summary table(s) including the results from any test for normality need to be submitted as part of reports.**
 - A. Although prediction limits are summarized in Table 2 of the *2011 Annual Ground Water Assessment Monitoring Report*, the aforementioned report does not include any supporting documentation for how PLs were calculated.

In order to return to compliance with OAC Rule 3745-27-10(C)(10), the owner/operator needs to provide the supporting documentation for how PLs were calculated to the Ohio EPA.

- B. Although Table 2 of the *2011 Semiannual Ground Water Assessment Monitoring Report* provides an incomplete summary of PL (no PL for sodium is given), the aforementioned report does not include the supporting documentation for how the PLs were calculated.

In order to return to compliance with OAC Rule 3745-27-10(C)(10), the owner/operator needs to provide the PL for sodium, and supporting documentation for how all of the PLs were calculated to the Ohio EPA.

2. The facility owner/operator at Avon Lake Municipal Landfill is in Violation of OAC Rule 3745-27-10(E)(1) requiring that the owner operator comply with the ground water quality assessment plan.

- A. The *2011 Annual Ground Water Assessment Monitoring Report* implies that PLs are to be calculated for the shale zone monitoring wells. There have been four assessment sampling events (semiannual and annual 2010 and semiannual and annual 2011) since the installation of the three additional shale zone monitoring wells MW-10, MW-11, and MW-12 (April 2010) to the preexisting shale zone monitoring well MW-6. The *July 2010 Revised Ground Water Assessment Plan* (pg. 18) states: "Within 180 days of implementing the GWQAP, additional statistically independent ground water samples will be collected and analyzed if necessary. The data collected will be used to provide sufficient analyses in order to statistically compare the downgradient ground water quality assessment program monitoring to background wells. The 2009 "U.S. EPA Guidance, *Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities*" indicates that data from a minimum of eight independent samplings are needed in order to determine a PL.

In order to return to compliance with OAC Rule 3745-27-10(E)(1), the owner operator needs to collect a sufficient number of additional ground water samples for analyses from upgradient shale zone well to calculate PLs for the shale zone, calculate those PLs, and submit this information to the Ohio EPA.

- B. In the *2010 Semiannual Ground Water Assessment Monitoring Report*, concentrations of parameters detected in ground water samples from assessment wells were compared to Primary and Secondary Maximum Contaminant Level (MCL) Drinking Water Standards. Primary and

Secondary Drinking Water Standards are not relevant and/or applicable to sanitary landfill sites. Further, the *July 2010 Revised Ground Water Quality Assessment Plan* indicates (pg. 4): "Prediction limits, or background values, shall be calculated by DUMPStat in accordance with OAC 3745-27-10(C)(6)(a). Any detection that exceeds the prediction limit shall be categorized as statistically significant as well as any volatile organic compound (VOC), semi-volatile organic compound (SVOC), herbicide, and/or pesticide. Should any constituent be deemed statistically significant, further statistical methods such as multiple comparison procedures to identify statistically significant evidence of contamination will be utilized in accordance with OAC 3745-27-10(C)(6)(c) and (d)." The *2010 SAGWAMR* does not indicate that required comparisons to prediction limits or background concentrations specified in the *2010 Revised Ground Water Quality Assessment Plan* were made. OAC Rule 3745-27-10(E)(1) requires that the owner/operator implement and comply with the ground water quality assessment plan.

In order to return to compliance with OAC 3745-27-10(E)(1), the owner/operator needs to calculate PLs for the 2010 Semiannual Sampling Event, compare assessment monitoring well ground water analytical data from the 2010 Semiannual Event to those PLs, and provide that information to the Ohio EPA. Further, Ohio EPA recommends that the owner/operator remove all references to Primary and Secondary MCL Drinking Water Standards from the *2010 Semiannual Ground Water Assessment Monitoring Report* for clarity.

- 3. The facility owner/operator at Avon Lake Municipal Landfill is in Violation of OAC Rule 3745-27-10(E)(7) requiring that all ground water elevation, sample analysis and statistical analytical results generated in accordance with paragraphs (B), (C), (D), (E), and (F) of this rule be submitted to the Ohio EPA no later than 75 days after sampling the well.**

On September 8, 2010, Ohio EPA received the *2010 Semiannual Ground Water Assessment Monitoring Report*. The date the Agency received the aforementioned report was 93 days after the 2010 Semiannual Sampling Event was initiated on June 7, 2010.

Additional information is needed in order to determine compliance with the following rules:

- 1. Compliance with OAC Rule 3745-27-10(C)(3)(b), requiring that the owner operator determine for the uppermost aquifer system and for all significant zones of saturation monitored, the direction of ground**

water flow each time ground water elevation measurements are performed.

The December 6, 2011 Potentiometric Surface Map for the Shale Zone (Figure 4) in the *2011 AGWAMR* indicates that flow patterns have significantly changed from the original June 2011 version of Potentiometric Map included in the *November 2011 Ground Water Quality Assessment Report*. MW-11, originally shown (June 2011 version) to be an upgradient well, is shown to be downgradient of MW-6 and MW-10. The shale zone monitoring wells include: MW-6, MW-10, MW-11, and MW-12. There appears to be about a 30-foot differential between the shallowest shale zone monitoring well MW-6, and the deepest MW-10. It is unclear if MW-11 is an upgradient well, and what the ground water flow direction is in the shale zone. These four wells may not represent the same hydrogeological unit.

Please provide an explanation for the apparent change in the potentiometric surface that occurred between June and December 2011 and/or re-evaluate the interpretation of the potentiometric surface in the shale zone.

Ohio EPA has the following recommendation regarding the 2011 Semiannual Ground Water Assessment Monitoring Report:

1. Table 2 of the *2011 Semiannual Ground Water Assessment Monitoring Report* references Primary or Secondary MCL Drinking Water Standards for selected parameters including arsenic, chloride, chromium, lead, manganese, sulfate, total dissolved solids, and turbidity. Drinking Water Standards are not relevant and/or applicable to sanitary landfill sites. Ohio EPA recommends that all references to the Primary or Secondary MCLs be removed for clarity.

Ohio EPA has the following statements regarding the documents:

1. Statistical analyses of the parameters, alkalinity, total dissolved solids, and turbidity are not required, however, comparison of these parameters to background concentrations need to be made.

The *2011 AGWAMR* indicates that 28 parameters were reported above quantitation limits for Appendix I parameters. The report indicates that nine of the 28 sample parameters (ammonia, benzene, chloride, manganese, potassium, sodium, total dissolved solids, total alkalinity, and turbidity) were reported in one or more ground water samples at

concentrations that exceed respective PL values for the till/shale zone monitoring wells or are classified as volatile organic compounds (VOCs).

2. OAC Rule 3745-27-10(E)(10) requires rate, extent, and concentration to be updated on a semiannual basis. Considering that the first determination of rate, extent, and concentration submitted to Ohio EPA in November 2011 was determined to be inadequate, there is no need to submit semiannual updates to rate, extent, and concentration until the owner/operators have submitted adequate demonstration to Ohio EPA in compliance with OAC 3745-27-10(E)(6). Any future semiannual/annual determination of rate, extent, and concentration should address any changes in those three parameters (e.g., a change in the potentiometric surface may change rate) or indicate that they remain constant from the previous event.

Although the *AGWAMR* also indicates (pg. i) that it is being submitted to satisfy requirements in OAC Rule 3745-27-10(E)(10) to determine the semiannual update to rate, extent, and concentration at the ALML, it does not specifically address how these three parameters have changed or remained constant since their initial determination. Ohio EPA, recently reviewed the initial determination of rate, extent, and concentration required by OAC Rule 3745-27-10(E)(6) included in the *November 2011 Ground Water Quality Assessment Report*. DDAGW's review of that report concluded that the owner/operator had not adequately determined the rate, extent, and concentration of waste-derived parameters in ground water at the ALML, and is in violation of OAC 3745-27-10(E)(6).

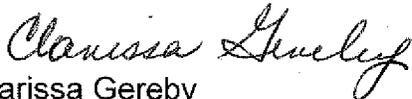
3. Please note, that OAC 3745-27-10(E)(9) requires that after the first determination of rate, extent, and concentration are made in accordance with paragraph (E)(6) of this rule, that the owner or operator shall notify by certified mail, or any other form of mail accompanied by a receipt, all persons who own land or reside on land that directly overlies, or is reasonably expected to overlie, any part of the plume of contamination, as determined in accordance with paragraph (e)(5) of this rule, of the rate, extent, and concentration of waste-derived constituents in ground water. The owner or operator shall place the return receipts or other evidence of notification into the operating record. Annually, the owner or operator shall re-notify persons or notify additional persons, based on the results of the determinations of rate, extent, and concentration in accordance with paragraph (e)(5) of this rule until released from the obligation by the director.

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Please respond to this Notice of Violation/Request for additional information within 45 days of receipt of this letter. If you have any technical questions regarding this review, please do not hesitate to contact Albert Muller, Division of Drinking and Ground Waters, at (330) 963-1211. Please submit all future correspondence to Clarissa Gereby, Ohio EPA, Division of Materials and Waste Management, Northeast District Office 2110 East Aurora Road, Twinsburg, Ohio 44087.

Nothing in this letter shall be construed to authorize any waiver from any requirements of applicable state solid waste laws or regulations. This authorization shall not be interpreted to release the City or others from responsibility under ORC Chapters 3704, 3714, 3734, or 6111, the Federal Clean Water Act, the Resource Conservation and Recovery Act, the Toxic Substances and Control Act or the Comprehensive Environmental Response, Compensation and Liability Act, or from other applicable requirements for remedying conditions resulting from any release of contaminants from the facility to the environment.

Sincerely,



Clarissa Gereby
Environmental Specialist
Division of Materials and Waste Management

CG/cl

cc: Fleming Mosely, Lorain City Health Department
Al Muller, DDAGW, NEDO
Suzanne Eden, HzW Environmental Consultants, LLC
File:[Sowers/Land/Avon Lake/GRO/47]
DMWM #s 4209, 4077, 3489