



State of Ohio Environmental Protection Agency

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

Re: Hancock County Landfill
Ground Water

February 20, 2007

Hancock County Board of Commissioners
300 South Main Street
Findlay, Ohio 45840

Dear Commissioners:

On January 3, 2007, the Ohio Environmental Protection Agency (Ohio EPA), Northwest District Office, received a document titled "Groundwater Monitoring Report, Year Thirteen, First Semi-Annual Statistical Analysis Update" (dated January 2, 2007), for the Hancock County Sanitary Landfill (Facility). Ohio EPA reviewed the submittal to determine compliance with Ohio Administrative Code (OAC) Rule 3745-27-10. Below are Ohio EPA's comments regarding this submittal.

COMMENTS

VIOLATIONS

1. OAC Rule 3745-27-10 (C)(1)(a): The owner/operator is in violation of OAC Rule 3745-27-10 (C)(1)(a). This rule states that, "The owner or operator is required to use the procedures documented within the sampling and analysis plan."

On page (C)-5 of the plan, when discussing wells that are purged dry the owner/operator states, "The recovery of these wells will be monitored and the time allowed for recovery to provide sufficient volume for sampling will be noted." A review of the field data sheets for wells that were purged dry indicates that, with the exception of well SW-3 where the owner/operator indicated that very little water was available for sampling and there was only enough for the sample set, information relating to the time for well recovery was not noted or provided to Ohio EPA. Some of the field forms indicate that some recovery had occurred during purging. From wells SW-4 and SW-5, for example, 1.6 volumes were purged before the wells were bailed dry during the October 2006 event. This indicates that 0.6 volumes of recovery had occurred during purging.

Data from the October 2006 event at well SW-5 indicates that the well was not sampled until 23.7 hours after purging, but in November 2006, there was enough water in the well after only 6 hours. This information is important to help determine if the samples are representative.

The owner/operator is in violation of OAC Rule 3745-27-10 (C)(1)(a) by not providing all of the plan-required data. If available this information needs to be provided. Also, the owner/operator needs to ensure that all plan-required information is provided in the future. Typically this recharge information would only need to be determined once and rechecked on occasion. If this information has not been gathered, the owner/operator needs to acquire this information for use in future events.

MORE INFORMATION NEEDED TO DETERMINE COMPLIANCE

2. OAC Rule 3745-27-10 (C)(1): Compliance with OAC Rule 3745-27-10 (C)(1) cannot be determined at this time. This rule states that, "The ground water monitoring program shall include consistent sampling and analysis procedures and statistical methods that are protective of human health and the environment and that are designed to ensure monitoring results that provide an accurate representation of ground water quality at the background and downgradient wells installed in accordance with paragraph (B), (D), (E), or (F) of this rule."

A review of the well sampling logs (field sheets) for the uppermost aquifer system wells indicates that the purging rate was provided for each well. This information is helpful in determining if excessive purging rates were used prior to collecting samples at any given well. However, these values may not be providing an "accurate representation" since there appears to be errors in the calculations for many of the wells. Following is a table of some of the wells which appear to display larger errors, the stated purging rate, the rate calculated by Ohio EPA by dividing the total purge volume by the total time to purge, and the purging method:

WELL	STATED RATE (GPM)	CALCULATED RATE (GPM)	PURGING METHOD, DATE
MW-3	0.21	0.11	LOW FLOW, 10/06
MW-4	0.18	0.13	LOW FLOW, 10/06
SW-1	0.05	0.47	BAILER, DRY, 10/06
SW-2	0.06	1.05	BAILER, 10/06
SW-3	0.03	0.29	BAILER, DRY, 10/06
SW-4	0.04	0.41	BAILER, DRY, 10/06
SW-5	0.04	0.36	BAILER, DRY, 10/06
SW-12	0.34	0.39	BAILER, DRY, 10/06
SZ-3B	0.03	0.26	BAILER, DRY, 10/06

In order to determine compliance with this rule, the owner/operator needs to show that the data is accurate. If it is not, the owner/operator needs to ensure that any errors will be corrected.

3. OAC Rule 3745-27-10 (C)(1): Compliance with OAC Rule 3745-27-10 (C)(1) cannot be determined at this time. For rule citation see comment 3 above.

The Well Sampling Log (field data sheet) for well SZ-3B indicates that the well volume was 2.73 gallons. The sheet also indicates that the well went dry at 0.8 well volumes. The sheet indicates that 2.3 gallons of the 2.73 gallons were removed from the well. If all of the water was removed from the well, that water should be equal to one well volume. There appears to be an error and it is unclear if the well was purged properly and, therefore, if the resulting sample was representative.

In order to determine compliance with OAC Rule 3745-27-10 (C)(1), the owner/operator needs to discuss how less than one volume was removed from the well before it went dry, explain how the well was properly purged and also explain how the sample collected is representative of the ground water of the site.

4. OAC Rule 3745-27-10 (B)(3)(e) and OAC Rule 3745-27-10 (C)(1): Compliance with OAC Rule 3745-27-10 (B)(3)(e) and OAC Rule 3745-27-10 (C)(1) cannot be determined at this time. OAC Rule 3745-27-10 (B)(3)(e) states that, "The monitoring wells, piezometers, and other measurement, sampling, and analytical devices shall be operated and maintained to perform to design specifications throughout the life of the monitoring program." For rule citation of OAC Rule 3745-27-10 (C)(1) see comment 3 above.

A review of the well sampling logs indicates that several wells reported high turbidity readings. Following is a table of the well designations, the current turbidity readings from the well sampling logs and the highest value ever recorded based on the Sanitas file provided by the owner/operator on CD:

WELL	CURRENT TURBIDITY (NTU)	HISTORICAL HIGH VALUE FROM CD.	COMMENTS
SW-2	>1100	800 in 10/94	Since 10/2000 highest turbidity was 85.4 NTU.
SZ-3B	>1100	56.4 in 03/2004	No turbidity data on CD May 2005 to present.
SZ-1A	270 in 10/2006. 396 in 11/2006.	1000 in 03/2004	Only 4 values displayed on CD. Last two values recorded in 2004 were 71.57 (03/2004) and 46.6 (09/2004)
SZ-02	159	690 in 10/98	Since 04/2000 highest value was 210 on 05/04. Next highest was 57.3 on 04/2002.
SW-5	87	800 in 10/98	The turbidity recorded in November 2006 is 87 NTU which is significantly greater than the October 2006 value of 4.8 NTU.

It appears that samples collected from these wells display increased turbidity values compared to most previous values. Increased turbidity can significantly affect the representativeness of the samples collected. It is unclear if these most recent increases are the result of damage to the wells or if procedures are designed to ensure monitoring results that provide an accurate representation of ground water quality are being utilized. It is clear from historical data, however, that the zones which are monitored in these wells can produce samples with much lower turbidity values.

In order to determine compliance with OAC Rule 3745-27-10 (B)(3)(e) and OAC Rule 3745-27-10 (C)(1) the owner/operator needs to show how the collection of samples with excessive turbidity levels meets the requirements of OAC Rule 3745-27-10 (C)(1). In addition the owner/operator needs to discuss how these wells are currently meeting the requirements of OAC Rule 3745-27-10 (B)(3)(e). Alternatively the owner/operator may make necessary repairs to these wells which ensure that they will produce samples which are representative of the ground water of the site.

5. OAC Rule 3745-27-10 (C)(1): Compliance with OAC Rule 3745-27-10 (C)(1) cannot be determined at this time. For rule citation see comment 3 above.

A review of Figure 2, "Bedrock Potentiometric Surface Map October 24, 2006" indicates some of the contour lines do not properly honor the data. Below is a table of the wells in question, the stated measured ground water elevations, and the apparent ground water elevations derived from Figure 2:

WELL	MEASURED GROUND WATER ELEVATION (FT)	APPARENT GROUND WATER ELEVATION FROM MAP (FT)
MW-2	744.91	745.2
MW-4	736.91	737.6
MW-5	737.19	736.25
MW-6	734.12	734.65
MW-11	739.69	739
MW-14	736.42	738.8

A review of Figure 3, "Silt Zone Potentiometric Surface Map October 24, 2006" indicates some of the contour lines do not properly honor the data. Below is a table of the wells in question, the stated measured ground water elevations, and the apparent ground water elevations derived from Figure 3:

WELL	MEASURED GROUND WATER ELEVATION (FT)	APPARENT GROUND WATER ELEVATION FROM MAP (FT)
SW-3	762.8	763.75
SW-13	762.84	762.4
SW-14	757.5	757.8

OAC Rule 3745-27-10 (C)(1) requires that the plan contain procedures which will render an accurate interpretation of the data. The interpretations appear to indicate that the contours do not meet this requirement. In order to determine compliance with OAC Rule 3745-27-10 (C)(1) the owner/operator needs to explain how the current maps meet the requirements of this rule. Alternatively, the owner/operator may correct the maps and resubmit them to the agency.

6. OAC Rule 3745-27-10 (B)(1)(a) and (b): Compliance with OAC Rule 3745-27-10 (B)(1)(a) and (b) cannot be determined at this time. This rule states that, "The ground water monitoring system, for detection monitoring, assessment monitoring, or corrective measures, shall consist of a sufficient number of wells, installed at appropriate locations and depths, to yield ground water samples from both the uppermost aquifer system and any significant zones of saturation that exist above the uppermost aquifer system that do the following: (a) Represent the quality of the background ground water that has not been affected by past or present operations at the sanitary landfill facility. (b) Represent the quality of the ground water passing directly downgradient of the limits of solid waste placement."

A review of Figure 4 "Sand/Silt Zone Potentiometric Surface Map October 24, 2006" indicates that, based on this interpretation, the monitoring system might not be adequate. As interpreted, ground water which flows under the landfill would not be monitored by well SZ-4A, the only well designated in this report as being a downgradient well. Ground water monitored by well SZ-4A originates to the south southwest and does not flow under the landfill. Based on this interpretation, there are no downgradient wells which monitor ground water which flows under the landfill.

In order to determine compliance with OAC Rule 3745-27-10 (B)(1)(a) and (b) the owner/operator needs to explain how this monitoring system meets the requirements of this rule. Alternatively, the owner/operator may provide a reinterpretation of the map showing that the monitoring system meets the requirements of the rule or install an appropriate number of wells to meet the requirements.

7. OAC Rule 3745-27-10 (C)(7)(e): Compliance with OAC Rule 3745-27-10 (C)(7)(e) cannot be determined at this time. This rule states that, "The statistical method shall account for data below the limit of detection with one or more statistical procedures that ensure protection of human health and the

environment. Any practical quantitation limit (PQL) used in the statistical method shall be the lowest concentration level that can be reliably achieved within the specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility."

A review of the analytical results indicates that some of the practical quantitation limits (PQLs) utilized were greater than those utilized by other laboratories in Ohio. These lower values utilized by other laboratories have been achieved during routine laboratory operating conditions and have been determined to be reliably achievable. Following is a table of the parameters and PQL values utilized by the owner/operator's laboratory for which there are lower reliably achievable PQLs.

PARAMETER	BELMONT LABS PQL (µg/L)	TYPICAL PQL (µg/L)
Ammonia	500	200
Acrylonitrile	10	5
Iodomethane	10	5
Carbon Disulfide	10	5
Vinyl Acetate	10	5
Trans-1,4-dichloro-2-butene	10	5

In order to determine compliance with OAC Rule 3745-27-10 (C)(7)(e) the owner/operator needs to utilize the lower PQLs noted in the table above or demonstrate how the use of their original PQLs are protective of human health and the environment, are the lowest reliably achievable and will provide an accurate representation of the ground water of the site.

8. OAC Rule 3745-27-10 (C)(1): Compliance with OAC Rule 3745-27-10 (C)(1) cannot be determined at this time. For rule citation see comment 3 above.

On page 3-6 the owner/operator briefly indicated the presence of some of the flags associated with the laboratory analytical QC report. Appendix E contains the laboratory QA/QC report which presents the individual QC reports. While the QC report presents a considerable number of flags including L, S, J, B, M, K, and R flags there is no indication that results for the samples collected at the site which are associated with these flags are acceptable and representative of the ground water of the site.

In order to determine compliance with OAC Rule 3745-27-10 (C)(1) the owner/operator needs to indicate if the sample results associated with the QC flags are acceptable and representative.

9. OAC Rule 3745-27-10 (C)(1): Compliance with OAC Rule 3745-27-10 (C)(1) cannot be determined at this time. For rule citation see comment 3 above.

Appendix E contains the laboratory QA/QC report which presents the individual QC reports. In this appendix are two lists of data qualifiers (flags) and their descriptions. Not included in these lists is a description of a "K" flag.

In order to determine compliance with OAC Rule 3745-27-10 (C)(1) the owner/operator needs to discuss the definition of the "K" flag and how it is used in this report.

RECOMMENDATIONS

No action on the part of the owner or operator is required by rule to address the following recommendations. However, in Ohio EPA's opinion, the recommendations will improve the clarity of the referenced document and/or reduce further misunderstandings between Ohio EPA and the facility owner/operator.

10. Underlying Table 2-1, located on page 2-1, are Notes 1 and 2. In the table are several places where a superscript number 2 can be seen denoting applicability of Note 2, however, there are no places where a superscript number 1 is observed. It is recommended that the owner/operator review Table 2-1 and add references for Note 1 if appropriate.
11. An Ohio EPA review of several boring logs for Silt Zone and Sand/Silt Zone wells indicates that they may have been incorrectly correlated. As a result some wells may have been completed in a zone other than that which is indicated. For example, on the west side of the landfill silt zone wells are completed with the bottom of the screen at about 731' above mean sea level (MSL) as seen in silt zone well SW-15. Sand/Silt Zone wells are completed with the bottom of the screen between about 754' MSL and 750' MSL as seen in Sand/Silt Zone wells SZ-4A and PZ-5 respectively. Well SW-14 is said to be a Silt Zone well, but is completed with the bottom of the screen at 746.3' MSL and in a sand which occurs about 750' MSL. It appears that well SW-14 may be completed in the Sand/Silt Zone rather than the Silt Zone. Other wells might also be completed in zones other than that which are stated. It is recommended that the owner/operator review all of the geological data and make necessary corrections.

STATEMENTS

12. On page 1-5 of the submittal the owner/operator states, "During the October 2006 sampling event, up-gradient groundwater monitoring wells SZ-01A, SZ-02 and SZ-03B were sampled for Appendix I parameters 16-66." On page 2-1 of the submittal Table 2-1 indicates that these wells are upgradient. On page 3-9 of the submittal the owner/operator states, Concentrations of ammonia in SZ-01A and SZ-13B, and for potassium in SZ-03B exceeded previously calculated values and the background values will be recalculated after the spring 2007 sampling event.

The potentiometric surface map indicates that SZ-03B is upgradient of the landfill, and therefore no re-sampling was performed at this well."

The owner/operator is reminded that the sampling and analysis plan states in section (C)(4) on page (C)-15, "Except for the parameters that exhibit spatial variability (listed below) the background water quality will be established for the Hancock County Sanitary Landfill using water quality data from the upgradient wells at the site which are as follows: SZ-2 (Saturated Sand/Silt Zone); SW-1, SW-2 and SW-12 (Saturated Silt Zone); MW-1, MW-2 and MW-12 (Uppermost Aquifer System)." In addition, plan Table D4-1, Parametric Prediction Limits, indicates that the only background well in the Sand/Silt Zone is SZ-02. It is clear from the plan that wells SZ-01A and SZ-03B are considered to be downgradient wells. Since downgradient well SZ-01A was resampled and the presence of ammonia was not confirmed, it will remain in the detection monitoring program. However, well SZ-03B recorded exceedances for ammonia and potassium, but was not resampled.

Since statistical exceedances occurred at these wells, as indicated by the owner/operator, these wells could be subject to the requirements of OAC Rule 3745-27-10 (E) (i.e., assessment) if a demonstration consistent with OAC Rule 3745-27-10 (D)(7)(c) is not presented and accepted by the director, as appropriate, within 210 days of first sampling on October 25, 2006. This date would be May 23, 2007.

13. On page 3-1 the owner/operator states, "The statistical evaluation was performed using the methods recommended for the detection monitoring program that are consistent with OAC Section 3745-27-10 (C)(5) and the performance standards requirements contained in OAC Section 3745-27-10 (C)(6)." The owner/operator should be aware that the statistical methods are described in OAC Rule 3745-27-10 (C)(6), not (C)(5); and the performance standards are described in OAC Rule 3745-27-10 (C)(7), not (C)(6).
14. A review of the laboratory analytical results and Table C1-4 indicates that a concentration of phenol which is less than the practical quantitation limit (PQL) and greater than the method detection limit (MDL) was observed in samples from silt zone wells SW-4 and SW-5 and uppermost aquifer system well MW-14. While these results are marked with a "J" flag and the concentrations are not quantifiable, their detection may be indicative of the presence of waste-derived constituents in the sample or may be indicative of potential errors in laboratory or field procedures.

If you have any questions, please feel free to contact Randy Skrzyniecki at the Ohio EPA Northwest District Office (419) 373-3149.

Hancock County Board of Commissioners
February 20, 2007
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Any written correspondence should be sent to the attention of Jeremy Scoles, Division of Solid and Infectious Waste Management, Ohio EPA Northwest District Office, 347 North Dunbridge Road, Bowling Green, Ohio 43402.

Sincerely,



Jeremy Scoles, S.I.T., CHMM
Environmental Specialist
Division of Solid and Infectious Waste Management

/l/r

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