



State of Ohio Environmental Protection Agency

**Northwest District Office**

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

Re: Hancock County Landfill  
Ground Water  
Notice of Violation

August 10, 2007

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

Dear Commissioners:

On June 29, 2007, the Ohio Environmental Protection Agency (Ohio EPA), Northwest District Office, received a document titled "Groundwater Monitoring Report, Spring 2007", dated June 28, 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. **The Hancock County Landfill is in violation of OAC Rule 3745-27-10(C)(1)(a) which requires that the owner/operator use the procedures documented within the sampling and analysis plan. The Hancock County Landfill needs to provide additional sampling results for wells SW-9 and SW-10.**

On page 34 of the Groundwater Quality Assessment Plan dated January 18, 2007, in section 8.0 Schedule of Implementation, the owner/operator states, "Spring 2007 The assessment wells and downgradient wells SW-9 and SW-10 will be sampled for the full list of Appendix I and II parameters." A review of the current submittal indicates that Appendix I analyses of well SW-10 were performed; however, there is no report of the full list of Appendix II parameters for this well. In addition, there are no analyses, either Appendix I or Appendix II, for well SW-9. The owner/operator has not provided the analytical results for Appendix II parameters for SW-10 as required by the assessment plan. In addition, the owner/operator has not provided the analytical results for Appendix I or Appendix II for SW-9 as required by that plan. The owner/operator needs to provide these results. It should be noted that wells SW-9 and SW-10 are not currently in the assessment program.

2. **The Hancock County Landfill is in violation of OAC Rule 3745-27-10(B)(1)(b) and OAC Rule 3745-27-10(C)(8). OAC Rule 3745-27-10(B)(1)(b) requires that, a sufficient number of wells be monitored downgradient of the landfill. OAC Rule 3745-27-10(C)(8) requires that the owner or operator determine whether or not there is a statistically significant increase over background. The Hancock County Landfill needs to monitor well SZ-3B as a downgradient well and conduct statistical analyses of the data for the well.**

In several places in the current submittal and in the April 2007 sampling and analysis plan the owner/operator indicates that wells SZ-1A, SZ-2 and SZ-3B are upgradient monitoring wells and well SZ-4A is the downgradient monitoring well for the sand/silt zone. Ohio EPA has indicated and provided documentation that well SZ-3B has been and continues to be downgradient of the landfill. This well must be monitored as a downgradient monitoring well. A review of Table D4-1 indicates that statistical analyses were not performed upon downgradient well SZ-3B as required by OAC Rule 3745-27-10 (C)(8). Also, by not including well SZ-3B with the downgradient wells, the monitoring system is not adequate as required by OAC Rule 3745-27-10 (B)(1)(b). It should be noted that in the fall of 2006 well SZ-3B was statistically analyzed as a downgradient well and determined statistically significant increases for ammonia and potassium. The owner/operator needs to monitor well SZ-3B as a downgradient well. Based on previous analyses, this well appears to be in assessment.

3. **The Hancock County Landfill is in violation of OAC Rule 3745-27-10(C)(1) which requires that Hancock County Landfill provide an accurate representation of ground water quality at the background and downgradient wells. The Hancock County Landfill needs to ensure that procedures are utilized which provide representative samples of low turbidity in all future sampling events. In addition, analytical data from samples displaying these excessive turbidity readings must not be utilized in any background data base.**

A review of the field data sheets indicates that several of the samples collected displayed significantly excessive turbidity readings. Four wells, SW-02, SW-10, SZ-01A, and SZ-03B, displayed turbidity readings of >1,100 NTU; and one well, SW-03 displayed a reading of 550 NTU. The owner/operator's Table 3-5 also provides this information.

These turbidity readings are significantly excessive and are representative of samples with extreme levels of suspended solids. The analytical results are skewed by the inclusion of these suspended solids and are not representative of

the ground water of the site. Because the results are skewed, the utilization of these samples indicates that the procedure is not capable of determining the impact of the facility on the quality of the ground water. Also, the procedures utilized are not resulting in the collection of representative samples. The >1,100 NTU values are at least 220 times the target turbidity levels expressed by the owner/operator in the sampling and analysis plans.

The owner/operator is in violation of and OAC Rule 3745-27-10 (C)(1) for using procedures which do not provide an accurate representation of ground water quality. The owner/operator needs to ensure that procedures are utilized which provide representative samples of low turbidity in all future sampling events. In addition, analytical data from samples displaying these excessive turbidity readings must not be utilized in any background data base.

4. **The Hancock County Landfill is in violation of OAC Rule 3745-27-10(C)(7)(f), which requires that, "If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data." The Hancock County Landfill needs to correct for spatial variability when conducting statistical analyses of the data.**

Beginning near the bottom of page 3-8 and continuing at the top of page 3-9 of the submittal the owner/operator states, "Intra-well comparisons were performed for barium, chloride, and sodium at down-gradient Uppermost Aquifer System wells MW-3, MW-4, MW-5, MW-13, and MW-14. Intra-well comparisons were performed for ammonia at Silt Zone well SW-13, and for chloride and sodium at downgradient Silt Zone wells SW-3, SW-4, SW-5, SW-13, SW-14, and SW-15. It has been shown that there is spatial variation in up-gradient well concentrations for both the Uppermost Aquifer System and the Silt Zone (submittal to Ohio EPA dated October 2, 2002). It has been shown that there that there (sic) is spatial variation in SW-4, SW-5, and SW-13 for potassium (submitted to Ohio EPA dated January 29, 2007). The existing limits established for potassium use inter-well comparison, since there is spatial variability in these wells the use of inter-well analysis is not appropriate. The limits will be re-established using intra-well analysis following this sampling event." On page 4-2 the owner/operator states, "This statistical procedure was shown to be an inappropriate method for determining the presence of a statistically significant increase over background in the "Demonstration of False Indication of Contamination of Potassium in SW-4, SW-5, and SW-13" submitted January 29, 2007 to Ohio EPA." The owner/operator utilized an inappropriate statistical method.

A review of Table 3-6, Statistical Comparison, Uppermost Aquifer System and Table 3-7, Statistical Comparison, Silt Zone Wells, indicates that inter-well statistical procedures were utilized for ammonia and potassium in wells MW-4, MW-5, MW-13, and MW-14. Inter-well procedures were also utilized for potassium in wells SW-3, SW-4, SW-5, SW-13, SW14, and SW-15. Since these wells display spatial variability, as indicated by the owner/operator and there is no procedure utilized to correct for this spatial variability as required by OAC Rule 3745-27-10 (C)(7)(f), the owner/operator is not meeting the requirements of this rule.

The owner/operator is in violation of OAC Rule 3745-27-10(C)(7)(f) by not utilizing procedures to correct for spatial variability as required by this rule. The owner/operator needs to correct for spatial variability as necessary.

5. **The Hancock County Landfill is in violation of OAC Rule 3745-27-10(D)(5)(b)(iii), which requires that statistical analyses be conducted for the results from monitoring wells not screened within the uppermost aquifer system. The Hancock County Landfill needs to provide additional results of the statistical analyses for this sampling event.**

In the submittal Table 3-7 provides the statistical comparison between the calculated statistical limit and the concentration of the parameters. There is no comparison present for ammonia in downgradient wells SW-4 and SW-14 since there are no statistical limits presented in the table for ammonia. OAC Rule 3745-27-10(D)(5)(b)(iii) requires that the downgradient wells be statistically analyzed.

In addition on page 3-10 of the submittal the owner/operator states, "No statistically significant evidence of contamination was detected in any well in the Silt Zone." Utilizing a procedure which does not make the statistical comparison does not mean a statistically significant increase does not exist.

The owner/operator is in violation of OAC Rule 3745-27-10(D)(5)(b)(iii) for not performing the required statistical analyses for ammonia in samples collected from wells SW-4 and SW-14. The statistical analyses for this event in these wells need to be provided to Ohio EPA.

6. **The Hancock County Landfill is in violation of OAC Rule 3745-27-10(C)(7)(a), which requires that, the statistical method used to evaluate ground water monitoring data shall be appropriate for the distribution of**

**chemical parameters or waste-derived constituents.**

On page 3-10 of the submittal the owner/operator states, "No statistically significant evidence of contamination was detected in any wells in the Silt Zone. Monitoring wells SW-4, SW-5 and SW-13 were returned to the Detection Monitoring Program on March 7, 2007 from being in assessment for potassium. The wells were returned to the detection monitoring program because it was shown that the statistically significant increase over background resulted from error in the statistical evaluation. Therefore, the limits shown on table 3-6 are not appropriate, and new limits will be established following this sampling event."

In this statement the owner/operator is indicating that they utilized a statistical method which is not appropriate for the data collected from wells in the Silt Zone. Not using an appropriate statistical method is a violation of OAC Rule 3745-27-10(C)(7)(a). The owner/operator needs to perform statistical analyses on this data utilizing an appropriate method.

7. **The Hancock County Landfill is in violation of OAC Rule 3745-27-10(D)(5)(b)(iii), which requires that, statistical analyses be performed on downgradient wells in the significant zones of saturation. The Hancock County Landfill needs to perform proper statistical analyses on the data for well SZ-3B.**

Table 3-8 "Statistical Comparison, Sand/Silt Zone Wells" provides the comparisons for statistical analyses for this zone. The only statistical comparisons made were for well SZ-04A. As discussed with the owner/operator in comments to prior submittals, well SZ-03B is a downgradient well based on hydrogeological evidence. The well is both in a general downgradient position relative to the landfill and has been shown to be downgradient of well SZ-3A which is located between the landfill and SZ-03B. Stating that well SZ-3A is an upgradient well does not make it so.

The owner/operator is in violation of Rule 3745-27-10(D)(5)(b)(iii), by not performing statistical analyses on well SZ-03B which is a downgradient well in the Sand/Silt Zone. The owner/operator needs to perform proper statistical analyses on the data from this well.

8. **The Hancock County Landfill is in violation of OAC Rule 3745-27-10(C)(3)(b), which requires that a determination be made for the direction of ground water flow for the significant zones of saturation (SZS). The Hancock County Landfill needs to accurately redraw the map for the SZS**

**and provide the new interpretations to Ohio EPA.**

A review of Figure 3, "Silt Zone Potentiometric Surface Map May 14, 2007" indicates a significant error in the northwest corner of the map. Well SW-9, displayed a May 14, 2007 ground water elevation of 755.50'. Relative to the map's contours this well is located between the 755' and 753' contours in a position relatively close to the 753' contour. Based on the contour lines as drawn the ground water elevation should be about 753.50'. Proper contouring of the data would result in significant change in the flow direction in this area. The flow directions in this area are, therefore, inaccurate and are not representative of the flow conditions in this portion of the site.

The owner/operator is in violation of OAC Rule 3745-27-10(C)(3)(b) by not determining "the direction of ground water flow" as required by this rule. The owner/operator needs to accurately redraw this map and provide the new interpretation to Ohio EPA.

9. **The Hancock County Landfill is in violation of OAC Rule 3745-27-10(E)(3), which requires that the owner/operator submit a ground water assessment plan within one hundred and thirty-five days of notifying Ohio EPA of a statistically significant increase over background. The owner/operator needs to provide a ground water assessment plan for well SZ-03B.**

Data indicate that well SZ-03B was sampled on October 25, 2006. In a report of findings for this sampling event dated January 2, 2007 and received by Ohio EPA January 3, 2007 the owner/operator indicated that the sample from SZ-03B exceeded background values for potassium. No demonstration was received or approved in accordance with OAC Rule 3745-27-10(D)(7)(c) within 210 days from initial sampling. The well was, therefore, in the assessment program.

Also, no ground water assessment plan was received within 135 days from notification of Ohio EPA of the statistically significant increase over background. This date was May 18, 2007. Because no assessment plan was received for well SZ-03B by this date as required by OAC Rule 3745-27-10 (E)(3) the owner/operator is in violation of this rule. The owner/operator needs to provide the assessment plan for this well.

**MORE INFORMATION NEEDED TO DETERMINE COMPLIANCE**

10. **Compliance with OAC Rule 3745-27-10(B)(1)(a) and (b), which requires that the monitoring system be adequate, cannot be determined at this time. The**

**Hancock County Landfill needs to demonstrate which zone is monitored by well SW-2 and, if necessary, make adjustments to the potentiometric surface map.**

A review of the owner/operator's sampling and analysis plan and the owner/operator's current submittal indicates that well SW-2 is interpreted to be an upgradient well in the silt zone. Potentiometric surface map interpretations provided by the owner/operator are consistent with that statement. A review of the boring log and well completion diagram indicate that well SW-2 is screened between a depth from surface of 33.9' (760.76' amsl) and 38.9' (755.76' amsl). The sand pack extends from 32.0' (762.66' amsl) to 38.9' (755.76' amsl). This interval includes a relatively thin zone described as "gray sandy silt, 50/50 sand & silt".

Cross section G-G', provided by the owner/operator to Ohio EPA with the Explosive Gas Monitoring Plan dated September 2005, indicates that this zone is correlative with the same zone monitored by sand/silt zone wells SZ-2, SZ-3 and SZ-3A, and by correlation with other cross sections, SZ-1, SZ-4 and possibly PZ-5. Since well SW-2 is monitoring the sand/silt zone (SZ zone) the potentiometric surface map for the silt zone (SW zone) may be in error and the silt zone monitoring system may be inadequate.

The owner/operator needs to clearly, and in detail, demonstrate which zone is monitored by well SW-2 and, if necessary, make adjustments to the potentiometric surface maps. Also, additional wells may be necessary to ensure that the requirements of OAC Rule 3745-27-10(B)(1)(a) and (b) are met.

11. **Compliance with OAC Rule 3745-27-10(C)(1), requiring sampling and analysis procedures that provide an accurate representation of ground water quality, cannot be determined at this time. The Hancock County Landfill needs to provide details on how the "duplicate" samples were collected and demonstrate which values are representative of ground water and in compliance.**

In the submittal, Table 3-2 indicates the parameters with greater than a 25% difference in duplicate samples. The SW-03/SW-31 duplicate sample set displays significant relative percent difference (RPD) values for seven (7) metals. The table indicates what is called the "compliance sample" as SW-03 and the "duplicate sample" as SW-31. For all seven parameters the "duplicate sample" displayed greater concentrations than the "compliance sample". Based on statements made in the detection and assessment plans, the duplicate sample

sets would have been collected on a sample set-for-sample set basis with the "duplicate sample" being collected subsequent to the "compliance sample".

The field data sheet for SW-03 indicates a field turbidity reading of 550 NTU with that sample being collected at 11:15 on April 17, 2007. This time is stated to be 20.1 hours after purging the well. The sample was said to be cloudy and the bailer was only half full. The field data sheet also indicates that, "Well had very little water at time of sampling; just enough to collect sample."

It appears that the sampling procedure (bottle set for bottle set rather than bottle for bottle) may be resulting in a more turbid sample set for the "duplicate sample" (collected second) relative to the "compliance sample" (collected first). Based on the excessive RPD, it cannot be determined which result is representative of the ground water at the site. Neither result may be representative. It also appears that the sampling procedure is resulting in unrepresentative sample results. In addition, based on the excessive RPD, the procedures may not be consistent.

In order to determine compliance with OAC Rule 3745-27-10(C)(1) the owner/operator needs to provide details relating to how the two samples in the sample set were collected and when the turbidity reading was collected. The owner/operator also needs to demonstrate which values, or neither set of values, are representative of the ground water at the site and unimpacted by turbidity.

12. **Compliance with OAC Rule 3745-27-10(C)(1) which requires the owner/operator to provide an accurate representation of ground water quality, cannot be determined at this time. The Hancock County Landfill needs to explain the presence of parameters in the blanks and how procedures will be modified to prevent parameters from entering the blanks.**

On page 3-5 of the submittal the owner/operator provides Table 3-3. Parameters Detected in Blanks. The presence of these parameters in the field and equipment blanks appears to be a persistent problem on this site. Blanks are produced by using analyte-free water. The presence of parameters in the blanks is indicative of problems with field and/or laboratory procedures since the presence of parameters in the blanks should not come from the analyte-free water used to produce the blanks. Improper preparation of the blanks, improper field procedures, and improper laboratory procedures, indicated by the presence of parameters in the blanks, may be a violation of OAC Rule 3745-27-10(C)(1).

In order to determine compliance with OAC Rule 3745-27-10(C)(1) the owner/operator needs to explain the presence of these parameters in the blanks, explain how the procedures utilized by the owner/operator are meeting the requirements of this rule and explain how the owner/operator will modify their field and laboratory procedures to ensure that these parameters are not observed in the blanks.

13. **Compliance with OAC Rule 3745-27-10(D)(7)(b), requiring the owner/operator to submit written notification of statistically significant increases to Ohio EPA, cannot be determined at this time. The Hancock County Landfill needs to clearly indicate whether or not there are statistically significant increases of wells MW-13 and Sw-5.**

At the top of page 3-10 the owner/operator states, "Statistically significant evidence of contamination was detected for ammonia in MW-5 and MW-14. The results of the re-sampling event did not confirm ammonia in MW-5. MW-14 is in assessment for ammonia so the well was not re-sampled."

A review of Table 3-6, Statistical Comparison, Uppermost Aquifer System, indicates that ammonia in well MW-13 was reported at a concentration of 0.54 mg/L which exceeds the statistical limit for ammonia of 0.50 mg/L. Based on the table, well MW-13 also displays an exceedance for ammonia, however, in the text the owner/operator is not reporting this exceedance.

In addition, a review of table 3-7 indicates that for well SW-5, the determined concentration from the sample for potassium was 5.7 mg/L and the statistical limit is 5.60 mg/L. This normally would indicate an exceedance of the statistical limit, however, on page 3-10 the owner/operator states, "No statistically significant evidence of contamination was detected in any well in the Silt Zone." It is unclear if the owner/operator is or is not indicating that the well is displaying a significant increase above background.

In order to determine compliance with OAC Rule 3745-27-10(D)(7)(b) the owner/operator needs to clearly explain if the ammonia data at well MW-13 display an exceedance. In addition the owner/operator needs to clearly explain if the potassium in well SW-5 is displaying an exceedance. If there are no exceedances the owner/operator needs to explain how the data in the tables appear to indicate that an exceedance exists. If there are exceedances, the owner/operator may need to proceed toward meeting the requirements of OAC Rule 3745-27-10(E).

14. **Compliance with OAC Rule 3745-27-10(C)(1), which requires that the ground water monitoring program include consistent sampling and analysis procedures that are protective of human health and the environment and provide an accurate representation of ground water quality, cannot be determined at this time. The Hancock County Landfill needs to provide all of the statistical comparisons and explain how the procedure which does not make all necessary comparisons was utilized.**

Table 3-7 provides the statistical comparison for the Silt Zone wells and includes the latest concentration in one column and the statistical limit in an adjacent column. The owner/operator has chosen to utilize prediction limit analyses by comparing the current parameter concentrations to previously calculated statistical limits. The statistical limits for ammonia, however, appear to be incomplete. While statistical limits are provided for ammonia at wells SW-13 and SW-15, there are no statistical limits, and therefore no comparisons made for downgradient wells SW-4 and SW-14 even though there were ammonia detections observed in the samples collected from these wells.

In order to determine compliance with OAC Rule 3745-27-10(C)(1) the owner/operator needs to explain why a procedure which does not present the statistical comparisons was utilized. Also the owner/operator needs to provide details of the statistical analyses and comparisons.

15. **Compliance with OAC Rule 3745-27-10(B)(3)(e) requiring the owner/operator to operate and maintain wells to perform to design specifications cannot be determined at this time. The Hancock County Landfill needs to show how the wells are operated and maintained to perform to design specifications.**

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-02	>1100	800 in 10/94	Since 10/2000 highest turbidity was 85.4 NTU. There is no data on disc after 11/05, but Fall 2006 reported >1100 NTU.
SW-03	550	180 in 10/94	Next highest historical value was 180 in 10/94. Typical values <30 NTU. No turbidity data on the disc subsequent to 9/04.
SW-10	>1100	No data.	No data on disc.
SZ-3B	>1100	56.4 in 03/2004	No turbidity data on CD May 2005 to present.
SZ-1A	>1100	1000 in 03/2004	Typical values <50. No data on disc after 9/04, but 270 NTU recorded 10/2006 and 396 recorded on 11/2006. Last two values recorded in 2004 were 71.57 (03/2004) and 46.6 (09/2004)
SZ-3B	>1100	57.7 in 10/98	Typical values <20. No data on disc after 9/04.

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) 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 and/or change purging and sampling procedures in such a manner as to result in the collection of representative samples.

16. **Compliance with OAC Rule 3745-27-10(C)(1), which requires that the ground water monitoring program include consistent sampling and analysis procedures that are protective of human health and the environment and provide an accurate representation of ground water quality, cannot be determined at this time. The owner/operator needs to explain why wells which display recharge are not sampled when enough water is available. Also, the Hancock County Landfill needs to provide a plan which allows non-turbid, representative samples to be collected when enough water is available for sampling.**

A review of the field data sheets indicates that several of the wells were purged dry. In order to ensure that non-stagnant, representative samples are collected, the wells are typically monitored to ensure that samples are collected as soon as enough water is available in the well for sample collection. From some of the wells which were purged dry, only 1.0 well volume was removed before the well went dry. This is suggestive of rather slow recharge and a longer wait time to sampling is appropriate. However, some wells displayed significant recharge even though the well was bailed dry. For example, well SZ-03B was bailed of 2.4 well volumes over a 21 minute period at the average rate of 0.29 gallons per minute. Since most of the potential three (3) well volumes were removed from the well in a 21 minute interval, it is clear that the well was experiencing significant recharge and yet the well was not sampled until 18.3 hours later. The field data indicate that the water at the end of the purging period was approaching stability, however, conductivity readings at the time of sampling, 18.3 hours following purging, are similar to the stagnant water values at the beginning of purging. This suggests that the water sampled may have been stagnant and, therefore, not 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 explain in detail why wells which display recharge during purging are not sampled for over 18 hours. In addition, the field data sheet indicated that this well sample displayed a turbidity of >1100 NTU. Since the reason for increased turbidity is often a lack of proper well development and/or excessive speed in purging and sampling, it is recommended that wells like SZ-3B be purged more slowly. Low flow purging and sampling may be appropriate in these situations. This might result in lower turbidity values and provide fresh, representative samples.

17. **Compliance with OAC Rule 3745-27-10(B)(3) and OAC Rule 3745-27-10(C)(1) cannot be determined at this time. OAC Rule 3745-27-10(B)(3) requires that monitoring wells be designed, installed, and developed to produce**

**representative ground water samples. OAC Rule 3745-27-10(C)(1), requires that the ground water monitoring program include consistent sampling and analysis procedures that are protective of human health and the environment and provide an accurate representation of ground water quality. The Hancock County Landfill needs to provide a plan which ensures that low turbidity, representative samples are collected from all wells.**

On the field data sheet for well SZ-3B is a note which states, "Approximately 4" silt in bottom of 5 gal. purge bucket." The owner/operator is responsible for utilizing procedures which will result in the collection of samples which are representative of the ground water of the site. The owner/operator is also responsible for properly installing, developing, and maintaining the wells to ensure the collection of representative samples. If 4" of silt are observed in a five (5) gallon purge bucket the well is likely not properly developed, installed or maintained, or improper procedures are being utilized in purging and/or sampling.

In order to determine compliance the owner/operator needs to provide a plan which ensures that low turbidity, representative ground water samples are collected from all wells.

18. **Compliance with OAC Rule 3745-27-10(C)(1), which requires that the ground water monitoring program include consistent sampling and analysis procedures that are protective of human health and the environment and provide an accurate representation of ground water quality, cannot be determined at this time. The Hancock County Landfill needs to explain how the data provided for the MW-15 resampling event are representative or provide a new field data sheet with the correct data.**

The field data sheet for what is said to be the May 24, 2007 resampling event at well MW-15 contains some field data which is different than that presented for the April sampling event. However, in the "Purge Comments" section, the start and stop times for the purge are exactly the same for both the April sampling and May resampling events. It is unclear if the procedure utilized to report the field data is providing the agency with representative data.

In order to determine compliance with OAC Rule 3745-27-10(C)(1) the owner/operator needs to explain how the data on the resampling event field data sheet is representative of the data collected at that event. If the data is not representative a corrected field sheet should be provided.

19. **Compliance with OAC Rule 3745-27-10(C)(7)(e) cannot be determined at this time. This rule requires that practical quantitation limits (PQL) utilized in statistical analysis meet the definition of a PQL. The Hancock County Landfill needs to demonstrate how the values utilized by the owner/operator meet the definition of a PQL, or utilize the PQL values from Guidance Document #406.**

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 ( $\mu\text{g/L}$ )	TYPICAL PQL ( $\mu\text{g/L}$ )
Arsenic	5	3
Cobalt	20	10
Antimony	4	3

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. (A complete list of target PQL values can be found in Ohio EPA Division of Solid and Infectious Waste Guidance Document #406.)

20. **Compliance with OAC Rule 3745-27-10(C)(1), which requires that the ground water monitoring program include consistent sampling and analysis procedures that are protective of human health and the environment and provide an accurate representation of ground water quality, cannot be determined at this time. The Hancock County Landfill needs to provide laboratory documentation indicating that proper chain of custody was maintained.**

A review of the Belmont Labs analytical report for the May 2007 resampling event for ammonia at well MW-5 indicates the matrix to be "Waste Water",

however, the chain of custody form for this sample indicates the matrix to be ground water. It is not known if the result is representative of the ground water of the site. It is unclear if the difference between the laboratory report and the chain of custody form is indicative of a typographical error or a mix-up of samples resulting in the wrong results being reported.

In order to determine compliance with OAC Rule 3745-27-10(C)(1) the owner/operator needs to provide laboratory documentation which demonstrates that proper chain of custody was maintained and that the result is truly for well MW-5 collected May 24, 2007.

21. **Compliance with OAC Rule 3745-27-10(C)(1), which requires that the ground water monitoring program include consistent sampling and analysis procedures that are protective of human health and the environment and provide an accurate representation of ground water quality, cannot be determined at this time. Hancock County needs to provide laboratory documentation regarding laboratory quality control qualifiers and laboratory certification that results, associated with quality control flags, are valid.**

On page 3-6 of the submittal the owner/operator briefly indicates the presence of "qualifiers" (flags) in the laboratory reports and laboratory quality control (QC) reports. On page 3-7 the owner/operator provides Table 3-4. Quality Control Report Summary, which lists "J" flagged parameters and their associated sample location and batch ID. In Appendix B-1 the owner/operator provides the analytical laboratory reports for the April 16 and 17, 2007 sampling event. This report includes a case narrative which comments on two laboratory control issues related to volatile organic compounds and indicates that the, "Sample results are valid." In Appendix E, Laboratory QA/QC, the owner/operator provides Belmont Labs QA/QC reports which include a case narrative. In the case narrative the laboratory comments on QA/QC issues relative to PCB, pesticide, semivolatle organic compounds, herbicides, cyanide, and ICP for tin QA/QC issues and indicates that the sample results are valid.

A review of the QA/QC reports indicates a significant number of flags associated with metals analyses; however, there are no case narrative discussions provided which discuss these flags associated with metals QA/QC or which indicate if the results associated with these flags are valid.

In order to determine compliance with OAC Rule 3745-27-10(C)(1) the owner/operator needs to provide information relating to these flags and laboratory certification that the results associated with these flags are valid.

## STATEMENTS

22. **The owner/operator is reminded that ground water monitoring programs are self-implementing.**

On page 4-1 of the submittal the owner/operator states, "The statistical methods chosen to evaluate the data were consistent with the approved Groundwater Monitoring Program, as revised in April 2007." The revised Groundwater Monitoring Program of April 2007 is neither approved nor denied.

23. **Contouring anomalies which could affect the understanding of the ground water flow are apparent on the Silt Zone Potentiometric Surface Map.**

A review of Figure 3, "Silt Zone Potentiometric Surface Map May 14, 2007" indicates several possible problems. While the map consistently shows a general southeast to northwest flow direction for ground water in this zone there are local anomalies in the interpretation which may affect the understanding of the ground water flow in these areas.

In the northeast corner of the site in the area of wells SW-3 and SW-13 there is an unusual interpretation of the contours which could result in an abrupt change in ground water gradient. At a minimum, the interpretation shows a geologically unusual contour pattern.

In the area of well SW-15 there is an abrupt change in ground water gradient. Immediately north of SW-15 the ground water gradient, based on the drawn contours, is about 0.025 ft/ft, while immediately south of this well the ground water gradient is about 0.002 ft/ft.

As expressed above in comment number 9, well SW-2, located on the east side of the site, is shown to be an upgradient well in the Silt Zone, however, boring logs and cross sections indicate that it is completed in the shallower Sand/Silt Zone. Flow directions may be significantly different than interpreted.

24. **A review of Figure 4, Sand/Silt Zone Potentiometric Surface Map May 14, 2007 indicates potential errors.**

As indicated in comments 9 and 22 above, well SW-2 is completed in the Sand/Silt Zone. Addition of this well to the Sand/Silt Zone map on Figure 4 will result in a significant change in ground water flow direction.

Well SZ-3A has been decommissioned and does not appear on this map. Previous maps indicate that it is located between the landfill and well SZ-3B and is upgradient of well SZ-3B. Ground water flow is, therefore, generally from SZ-3A toward SZ-3B and both wells are downgradient of the landfill.

25. **A demonstration in accordance with OAC Rule 3745-27-10(D)(7)(c) for well SZ-03B was not received by May 23, 2007; therefore, the well is in assessment.**

In response to the submittal of the ground water report for fall 2006 Ohio EPA provided a statement relating to exceedances in well SZ-03B. Ohio EPA indicated that on page 1-5 of that submittal the owner/operator stated, "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 stated, "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 was reminded by Ohio EPA that the sampling and analysis plan in effect at the time stated 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, indicated that the only background well in the Sand/Silt Zone was SZ-02. It is clear from the plan that wells SZ-01A and SZ-03B were 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 are 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) was not presented and accepted by the director, as appropriate, within 210 days of first sampling on October 25, 2006. That date was May 23, 2007. A

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A demonstration in accordance with OAC Rule 3745-27-10(D)(7)(c) was not received, nor approved by May 23, 2007. Since well SZ-03B was considered to be a downgradient well in the plan and since Hydrogeological evidence indicates that this well is downgradient of the landfill, well SZ-03B should be considered to be in assessment for ammonia and for potassium.

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

/lb

pc: John Shoop, Hancock County Health Department  
Wes Rhiel, P.E., Malcolm Pirnie, Inc

~~File: Hancock County, Hancock County Landfill, Ground Water~~

ec: Abdul Smiley  
Jack Leow  
Randy Skrzyniecki

i.d.: 5-7031