



State of Ohio Environmental Protection Agency

Northwest District Office

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

Re: Hancock County Landfill
GW Monitoring Report
Fall 2008

April 16, 2009

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

Dear Commissioners:

On December 22, 2008, the Ohio Environmental Protection Agency (Ohio EPA), Northwest District Office, received a document titled "*Groundwater Monitoring Report, Fall 2008*", dated December 18, 2008, 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.

Due to continued communication on the issues regarding obtaining representative ground water sampling results at monitoring well SZ-3B and other outstanding concerns with the ground water monitoring program, comments number 1, 4, 13, 14, 15, 16, and 17 have not been included in this correspondence. These comments will not be submitted to the owner/operator of the Facility until at least after SZ-3B sampling is observed.

COMMENTS

VIOLATIONS

- 3. The owner/operator is in violation of OAC Rule 3745-27-10 (C)(1)(a) which requires that Hancock County utilize the procedures which are described in the sampling and analysis plan. During sampling the average flow rate exceeded the purging rate. The plan requires that the sampling rate will not exceed the purging rate. The owner/operator should ensure that the sampling rate does not exceed the purging rate in future sampling events.**

In the last paragraph on page 3-4 of the sampling and analysis plan the owner/operator states, "After the water quality parameters have stabilized, indicating that the pump is withdrawing formation water, groundwater samples will be collected at a pump rate that does not exceed the purge rate." A review of the field logs indicates that for well MW-5 the purge rate was 0.09 gallons per minute (340.6871 ml/min) and the average low flow rate during sampling was 360 ml/min (0.09510194 g/min). The sampling rate exceeds the purging rate by 5.7%.

MORE INFORMATION NEEDED TO DETERMINE COMPLIANCE

2. **Compliance with OAC Rule 3745-27-10 (C)(1)(a), which requires that Hancock County utilize the procedures which are described in the sampling and analysis plan can not be determined at this time. The owner/operator has not provided the time of well measurement as required by the plan. In addition, the owner/operator has not provided the time when static head was established in wells purged with low flow methods as required by the plan. The owner/operator needs to provide the time of measurement information and time of static head for this sampling event if available and provide this information for all future sampling events.**

In Section 2.1, Measurement Procedures, on page 2-1 of the sampling and analysis plan the owner/operator states in item 1, "Record date, time, and weather conditions in the area on the Well Sampling Log form (Figure 2-1)." A review of the Well Sampling Log forms indicates that the time of well measurement was not provided as required by the plan.

On page 2-3 of the plan, Figure 2-1: Well Sampling Log contains a box for "Purge Comments" and in this box is a space for "Static head established @ hhmm (low-flow)". Also, in the first paragraph on page 3-3 the owner/operator states, "The stable drawdown value achieved and the purge rate will be recorded in the field notes." This information was not provided for low flow wells in this sampling event.

5. **Compliance with OAC Rule 3745-27-10 (C)(10)(c), which requires that Hancock County submit the information associated with the semiannual report including all chain of custody forms can not be determined at this time. The owner/operator needs to provide a copy of the chain of custody form for the October 2008 sampling event.**

A review of the submittal indicates that a chain of custody form was provided for the November 2008, resampling event, but no chain of custody form was provided for the October 2008, sampling event as required by OAC Rule 3745-27-10 (C)(10)(c).

6. **Compliance with OAC Rule 3745-27-10 (B)(1), which requires that the ground water monitoring system consist of wells in any significant zones of saturation above the uppermost aquifer system cannot be determined at this time. There appears to be a new saturated zone discovered at the facility. It is unclear if this zone is a significant zone of saturation relative to the current area of waste placement. The owner/operator needs to show that this zone does not currently have the potential to be a preferential pathway of migration away from the limits of solid waste placement. If this zone is a significant zone of saturation it should be defined and monitored.**

In the third paragraph on page 2-2 the owner/operator states, "In January 2008, several borings were advanced in the borrow area to the west of the landfill. Seven of the borings were completed as 1-inch inside diameter piezometers. These piezometers were installed in grey sandy gravels or interbedded silts and clays. The piezometer installed in B-8 appears to screen the Silt Zone at the Landfill, while the other piezometers are screened in saturated lenses deeper than the Silt Zone." Based on the monitoring program and the hydrogeology of the site, there are two significant zones of saturation above the uppermost aquifer system. These are the Silt Zone and the shallower Sand/Silt Zone. There are no other significant zones of saturation noted in the plan besides these two zones. It is unclear if this new zone is a significant zone of saturation relative to the existing area of waste placement. If there is an additional significant zone of saturation on the site it may be necessary to monitor this zone as required by OAC Rule 3745-27-10 (B)(1).

This may be supported by Figure 3, "Silt Zone Potentiometric (sic) Surface Map October 6, 2008". In the northwest portion of the map, in the general area of the north side of the borrow pit, the interpretation displays a significant gradient which is greater than other areas of the map which are supported by well data. This area also shows a pronounced ground water nose in the area of well B-8. This unusual change in gradient may suggest that well B-8 and the other wells are in different hydraulic zones.

7. **Compliance with OAC Rule 3745-27-10 (C)(1)(a), which requires the use of the procedures documented in the sampling and analysis plan, cannot be determined at this time.**

A well which is discussed in the report does not exist in the sampling and analysis plan. The owner/operator needs to clarify which well is being discussed in Section 2.5.

In the first paragraph in Section 2.5 on page 2-4 the owner/operator states, "The potentiometric surface in the Sand/Silt Zone decreased from 0.63 ft. in PZ-5 to 1.67 feet in PZ-1A." There is no well in the Sand/Silt Zone with the designation PZ-1A. It is unclear which well is being discussed.

8. **Compliance with OAC Rule 3745-27-10 (C)(3)(b), which requires that the direction of ground water movement be determined when ground water measurements are performed, cannot be determined at this time. The potentiometric surface interpretation on the Silt Zone Potentiometric (sic) Surface Map October 6, 2008, Figure 3 displays potential errors. These potential errors need to be corrected.**
 - a. There are two different gradients between wells SW-15 and SW-1 even though these wells are only two data points in this area. The gradient between SW-15 and the 770' contour line is about 0.006 ft/ft. The gradient between the 770' contour line and well SW-1 is about 0.003 ft/ft. There is no apparent data which supports this change in gradient.
 - b. Well SW-15 displays a ground water elevation of 765.64', but is located immediately adjacent to the 764' contour line. The contour line should be located farther from well SW-15.
 - c. Well SW-5 is located in a very large flat area and displays a ground water elevation of 755.96'. On the map, it is located between the 758' contour and the 756' contour. The well should be located between the 754' contour and the 756' contour, but close to the 756' contour. The area of the map around SW-5 should be corrected.
 - d. Well SW-9, with a ground water elevation of 758.19', is located downgradient of the 754' contour. It should be located near the 758' contour. The map in this area needs to be corrected.
9. **Compliance with OAC Rule 3745-27-10 (C)(3)(c), which requires water level measurements to be collected in a period of time not to exceed 24 hours, cannot be determined at this time. The owner/operator needs to provide the times when the wells were measured in order to determine compliance with this rule.**

A review of the field data sheets indicates that the time the wells were measured was not provided. For wells which were purged and sampled, purge and sample times were provided, and it is assumed that the wells were measured prior to purging, however, some of the wells (MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, SW-6, SW-7, SW-8, SW-9, SW-10, SW-11) were measured, but not purged and no times at all were provided. For wells that had purge times, if it is assumed that the water levels were measured immediately prior to purging, the 24 hour time frame expressed in OAC Rule 3745-27-10 (C)(3)(c) may have been exceeded at well MW-12.

10. **Compliance with OAC Rule 3745-27-10 (C)(1) and (C)(1)(a), which require the use of the procedures documented in the sampling and analysis plan which will provide representative results, cannot be determined at this time. The owner/operator needs to clarify why the low flow samples were collected 24 hours after purging even though the well produced significant amounts of water.**

The well sampling log for well MW-13 indicates that "Purging ended on 10/06/2008 @ 1920", and also indicates, "Sample taken 10/07/2008 @ 1920". It appears that the low flow sample was collected 24 hours after the end of low flow purging. This procedure could result in the collection of stagnant water samples. Based on the owner/operator's statement, it is not clear if this is a typographical error or if the sample was really collected 24 hours after purging.

11. **Compliance with OAC Rule 3745-27-10 (B)(3)(e), which requires that monitoring wells be maintained, cannot be determined at this time. Well SZ-1A may display signs of siltation. The owner/operator needs to clear the fill-up from the well or explain how this well meets the requirements of this rule.**

The total depth reported on the well sampling log for well SZ-1A is 40.87'. The boring log shows the screen at 40' below ground surface with a stick-up of about 2.351'. This would put the total depth in a clean well at about 42.35'. Based on this information there appears to be about 1.5' of fill-up in the well. The reported turbidity was also reported to be excessive at 140 NTU.

12. **Compliance with OAC Rule 3745-27-10 (C)(3)(b), which requires that the direction of ground water movement be determined when ground water measurements are performed, cannot be determined at this time.**

The potentiometric surface interpretation on the potentiometric surface interpretation on the "Bedrock Potentimetric (sic) Surface Map October 6, 2008", Figure 2 displays three different gradients between wells MW-14 and MW-1 even though these wells are only two data points in this area. The owner/operator needs to clearly indicate which data supports their interpretation and how that data supports the interpretation. Alternatively, the owner/operator may redraw the map by removing the abrupt changes in gradient and resubmit the map to Ohio EPA.

The gradient between MW-14 and the 738' contour is about 0.004 ft/ft. The gradient between the 738' contour and the 748' contour is about 0.017 ft/ft. The gradient between the 748' contour and well MW-1 is about 0.001 ft/ft. There is no apparent data which supports these changes in gradient. The actual gradient, therefore, may be significantly different.

STATEMENTS

18. **It is unclear if the ground water in the Sand/Silt Zone is affected by the borrow pit.** On page 2-4 the owner/operator, while discussing the Silt Zone, states, "In the northern portion of the expansion/borrow area, it appears that a recharge area may be present." This statement appears to establish a connection between the surface water and the Silt Zone. The Sand/Silt Zone is present, at least, in the southern portion of the site and may be present under part of the borrow pit. Since the Sand/Silt Zone is located stratigraphically higher than the Silt Zone, the possibility exists that the Sand/Silt Zone is also, to some extent, in communication with the surface water in the borrow pit. Water is present in a large portion of the borrow pit located west of the landfill. The elevation of the base of the excavation and the depth of the water are not documented and, therefore, the relationship of the Sand/Silt Zone and the surface water in the borrow pit cannot be adequately described.

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

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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, RS,
Environmental Specialist
Division of Solid and Infectious Waste Management

/llr

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