



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

November 30, 2012

**RE: MILLENNIUM LANDFILL
 GROUND WATER MONITORING
 PARTIAL RETURN TO COMPLIANCE**

Mr. Rick Hughes
 Millennium Inorganic Chemicals, Inc.
 2426 Middle Road
 Ashtabula, Ohio 44004

Dear Mr. Hughes:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the *Response to February 15, 2012 NOV letter from Ohio EPA, and follow-up meetings with Ohio EPA on March 2, 2012 and June 14, 2012, and phone conferences on March 28, 2012 and June 27, 2012.* The report is dated July 10, 2012 and was received by Ohio EPA on July 23, 2012. The response letter was prepared and submitted to the Ohio EPA by TM Engineering, Inc. on behalf of Millennium Chemicals, Inc. (Millennium). Millennium is the owner of the Millennium Ashtabula Landfill (MAL). Millennium is conducting ground water detection monitoring in accordance with the Millennium Ashtabula Landfill site specific ground water detection monitoring plan (GWDMP) and Ohio Administrative Code (OAC) 3745-29-10 (A)(1), effective October 30, 2008 and OAC 3745-30-08, effective February 1, 2008.

Upon review of the document, Ohio EPA determined that Millennium returned to compliance with the following:

Citation	Requirement	Action taken
OAC Rule 3745-30-08(C)(2)	Submittal of potentiometric map	Received update potentiometric map on March 2, 2012

Millennium stated that the potentiometric surface map submitted with the November 2010 report is from the May 2010 data, not the current round of sampling. A correct map was provided to Ohio EPA at the initial meeting on March 2, 2012. In addition, the contours are inaccurate and need revision because direction of ground water flow was interminable in the saturated zones within the lacustrine geological formation due to non-conforming water levels between wells indicating highly localized conditions and lack of consistent hydraulic communication between these wells. Ohio EPA determined that Millennium submitted the correct map with the correct date. In the future, Millennium should submit both accurate and current potentiometric surface maps with each data submittal. Wells which have no hydraulic

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communication, and are not in the same geologic unit, should not be placed on the same potentiometric surface map.

In addition, Ohio EPA records indicate that Millennium remains in violation of the following:

Citation	Requirement	Date first observed
OAC Rule 3745-30-08(C)(7)	Statistical analysis	February 15, 2012

Upon review of the July 10, 2012 response letter, Ohio EPA determined that Millennium remains in violation of OAC 3745-30-08(C)(7). Specifically, Ohio EPA highlights the following Millennium responses in the July 10, 2012 letter with additional comments from Ohio EPA.

Millennium states:

The current Shewhart-CUSUM control charts submitted have been completed with standardized data, and with that data has adequately identified SSIs; it is the same as being in violation for military versus civilian time.

Ohio EPA Response:

Ohio EPA disagrees with this response, because Millennium did not properly follow the Shewhart-CUSUM Control Chart statistical methodology to completion. In addition, the issue of what constitutes or should constitute background has not been settled. It is not clear how Millennium evaluated the background data for trends and outliers before defining background and performing the Shewhart-CUSUM Control Chart method. Ohio EPA encourages Millennium to consult Chapter 20 of the "Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities Unified Guidance," March 2009 (EPA 530/R-09-007), for the latest guidance and instruction in utilizing the Shewhart-CUSUM Control Chart method. Ohio EPA would also like to encourage Millennium to consider using one of several statistical software packages that are available for assisting landfills in the structure and execution of statistical analysis of ground water data, including, but not limited to: DUMPStat®, Sanitas®, and AquaChem® to name a few.

Millennium states:

The parameters were tested for background trends with visual observation. Trends in Well MW2-1 for alkalinity will be considered in future data analysis when more recent datasets are available.

Ohio EPA Response:

Ohio EPA noted that trend tests by visual means are not an accurate representation of statistical trends. The background data should be tested for trends following the methodology in "Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities Unified Guidance," March 2009 (EPA 530/R-09-007), prior to conducting the selected statistical methodology. The use of control charts is not suitable when background is trending. Again, Ohio EPA would like to encourage Millennium to consider using one of several statistical software packages that are available for assisting landfills in the structure and execution of statistical analysis of ground water data, including trend tests.

Millennium states:

The background data was routinely updated to adequately define the characteristics of the data. The conclusions by Ohio EPA were based on the first 16 data points, and not on the updated data.

Ohio EPA Response:

Ohio EPA is not clear how Millennium conducted the background updates and whether or not Millennium fully complied with OAC Rule 3745-30-08(C)(6)(g). This rule specifically requires Millennium to conduct a statistical comparison (typically a two-sample test for comparing two groups of data...i.e. a two sample t-test or the Wilcoxon Rank Sum test) between the existing background dataset and a minimum of four new, independent sample results prior to updating the background dataset. If a statistical difference is identified, Millennium must request director's approval to incorporate the new data into the existing background dataset. It appears that Millennium simply updated background with no regard for any of the stipulations required by this rule, as indicated in Millennium's response, "background data consisted of the first 16 data points and updates beyond this time," and "control charts for the retained parameters started in 1996 and control charts for the new parameters started in 2004;" The implication being that all data since these dates were simply added to background, without actually being subjected to the scrutiny this rule requires.

Millennium states:

More data points will be required to establish an adequate background. Because of this, Millennium requests that the background be established as the November 2005 through the May 2009 sampling event for the datasets which are demonstrated to be normal. For the datasets that require non-parametric methods, background should consist of November 2001 through May 2009.

Response by Ohio EPA:

Ohio EPA disagrees that Millennium requires more data to establish an adequate background dataset. Millennium has been sampling and collecting data since 2004 at the least, and this is adequate. Since it is now the Fall of 2012, and in the interest of moving forward without spending too much effort looking back, Millennium needs to redo the statistical analyses of the Spring 2012, Fall 2011, Spring 2011, and Fall 2010 sampling events. These analyses should be completed utilizing background datasets comprised of the ground water data beginning with Fall 2005 and ending with the Spring of 2010 for normal data, and Fall 2001 ending with the Spring of 2010, for non-normal data. Millennium will need to reevaluate the background datasets for outliers, distribution, and trends; select and apply the correct procedure and methodology in the *Unified Guidance* for the control chart or appropriate non-parametric method for distribution free datasets for each of the aforementioned sampling periods and determine if there have been SSIs. Millennium should submit the results of these statistical reevaluations to Ohio EPA for review within 60 days. Once again, Ohio EPA would like to encourage Millennium to consider using one of several statistical software packages that are available for assisting landfills in the structure and execution of statistical analysis of ground water data to accomplish this task and all future statistical analyses.

In addition, Ohio EPA has the following comments in regards to Millennium's July 10, 2012 response to previously mentioned recommendations:

1. Recommendations that Millennium Ashtabula Landfill identify the source of the low levels of VOCs that were detected in November 2010 at monitoring well MW2-1: Benzene at 1.35 µg/L, and 1, 2-dichloroethane at 1.29 µg/L, and benzene in MW2-3 at 1.19 µg/L, and for May 2011, benzene was detected in monitoring well MW2-1 at a concentration of 5.47 µg/L, and in monitoring well MW2-3 at 1.03 µg/L, and determine the rate, extent, and concentration.

Millennium states:

The source of low level VOCs is unknown to Millennium. The waste within the landfill contains none of the parameters. The constituents appear to be chemicals possibly used in the laboratory for testing and maintenance of equipment.

Response by Ohio EPA:

Ohio EPA has reviewed Millennium's 2010 and 2011 annual reports and determined there are no VOCs present in the leachate. Please continue to note any VOCs present in the downgradient monitoring wells, and collect and analyze field blanks for those wells with VOCs present in the ground water during the next sampling event, to

determine if there are air sources of VOCs present that are contaminating the ground water samples during collection.

2. Recommendation that Millennium Ashtabula Landfill refer to OAC Rule 3745-30-08(D)(8) when determining if there has been a statistically significant increase (SSI) which requires that if at any monitoring well, Millennium determines for two consecutive semiannual statistical determination periods, that there has been a SSI from background values for one or more of the applicable indicator parameters specified in Appendix III of this rule according to the statistical method specified by Millennium pursuant to paragraphs (C)(5), (C)(6), and (D)(9) of this rule, Millennium shall notify Ohio EPA no later than 15 days after receiving the second period's statistical or analytical results which indicate a statistically significant change. The notification must indicate which parameters have shown a statistically significant change from background.

Millennium states:

The background dataset selected will determine if an SSI occurred. If allowable background updates are incorporated, or if the requested background data can be agreed upon, there are no SSIs. We look forward to the Agency's concurrence to proceed with the background update.

Response by Ohio EPA:

Ohio EPA does not understand Millennium's response to this recommendation. Based on how Millennium responded, Ohio EPA refers Millennium to Ohio EPA responses to the first violation documented in this letter.

3. Recommendation that on page two of three in the "Summary of Statistical Analysis" for the November 2010 report, Well MW2-5 is stated as being downgradient. In addition, statistical analysis is performed on the data from this well. On the potentiometric surface map, it appears this well is upgradient of the limits of waste. It is recommended that if well MW2-5 is consistently upgradient of the limits of waste at all times, then statistical analysis of data from this well is not necessary or required by the rules, and Millennium may cease statistical analysis of well MW2-5. If flow in well MW2-5 is up and downgradient from time to time, then it would be appropriate to continue to statistically analyze the data from this well.

Millennium states:

The sampling events in May 2011, November 2011, and May 2012 confirm that MW2-5 is an upgradient well. Statistical analyses for data from MW2-5 will be discontinued for future events.

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Response by Ohio EPA:

This is acceptable to Ohio EPA.

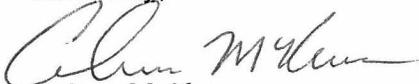
Millennium needs to immediately take the necessary measures to return to compliance with Ohio's environmental laws. Within 30 days of receipt of this letter, Millennium is requested to provide documentation to this office including the steps taken to abate the violations cited above. Documentation of steps taken to return to compliance includes written correspondence, updated policies, and photographs, as appropriate, and may be submitted via the postal service or electronically to colum.mckenna@epa.ohio.gov.

Please be advised that violations cited above will continue until the violations have been properly abated. Failure to comply with Chapter 3734 of the Ohio Revised Code and rules promulgated thereunder may result in a civil penalty of up to \$10,000 per day for each violation. It is imperative that you return to compliance. If circumstances delay the abatement of violations, Millennium is requested to submit written correspondence of the steps that will be taken by date certain to attain compliance.

Nothing in this letter shall be construed to authorize any waiver from the requirements of any applicable state or federal laws or regulations. This letter shall not be interpreted to release the owner or operator, or others, from responsibility under Chapters 3704, 3714, 3734, or 6111 of the Ohio Revised Code or under the Federal Clean Water Act, Resource Conservation and Recovery Act, or Comprehensive Environmental Response, Compensation, and Liability Act for remedying conditions resulting from any release of contaminants to the environment.

Please contact Kay Springer Amey at (330) 963-1289 if you have any technical questions regarding this review. Otherwise, please submit all correspondence to Colum McKenna, Ohio EPA, Division of Materials and Waste Management, Northeast District Office, 2110 East Aurora Road, Twinsburg, Ohio 44087.

Sincerely,



Colum McKenna
Environmental Specialist
Division of Materials and Waste Management

CJM/cl

cc: Katherine Springer Amey, NEDO-DDAGW Steve Kilper, ALMI
Ray Saporito, Ashtabula County Board of Health
File: [Singh/LAND/Millennium Landfill/GRO/04] DMWM #4050