



Agency for Toxic Substances
and Disease Registry

Atlanta, GA 30333

October 29, 2013

Mr. Paul D. Hagemeyer
Vice President - Regulatory Compliance
Chesapeake Energy Corporation
P.O. Box 18496
Oklahoma City, OK 73154-0496

Dear Mr. Hagemeyer:

The Agency for Toxic Substances and Disease Registry's (ATSDR) response to Chesapeake Energy Corporation's (Chesapeake) information quality appeal from May 18, 2013 is attached. This appeal is a follow-up to ATSDR's March 18, 2013, response to Chesapeake's January 23, 2012, information quality request for correction regarding ATSDR's Chesapeake ATGAS 2H Well Site Health Consultation dated November 4, 2011. ATSDR has reviewed Chesapeake's comments on the health consultation.

My sincere appreciation for Chesapeake personnel taking the time to meet with staff members from ATSDR and the National Institute for Occupational Safety and Health (NIOSH) on June 28, 2013. Both agencies appreciated the opportunity to learn more about Chesapeake's operations and concerns.

ATSDR appreciates Chesapeake's willingness to share additional data and reports and will be revising the health consultation (see below). Very importantly, the additional information provided by Chesapeake supports the assumption that every private drinking water well is unique and should be sampled on a regular basis. After a very careful and thorough review of the additional information shared on June 28th, ATSDR determined that the additional information does not change the overall conclusions and recommendations in the ATSDR Chesapeake ATGAS 2H Well Site Health Consultation.

In the information quality appeal, Chesapeake noted appreciation for ATSDR's effort to provide clarifications and qualifications to some of ATSDR's findings and statements in the health consultation. As stated on page 18 of the original health consultation, ATSDR agrees that the overland release following the ATGAS 2H incident did not appear to cause impacts to RW04. ATSDR will repeat this point as a clarification to Conclusion 1 on pages v and 19 of the updated health consultation.

The information quality appeal stated that ATSDR failed to directly respond to technical issues raised in the information quality request for correction. The appeal contained nine specific appeal items and suggested edits. In the attached Appendix A, ATSDR provides

specific responses to each appeal item. Appendix B contains a table of all changes that will be made to the health consultation.

The changes ATSDR made in the health consultation are documented in Appendix B. ATSDR posted the updated health consultation on the ATSDR website. The updated document includes a cover page describing the changes made.

Sincerely,

/S/

Robin M. Ikeda, MD, MPH
RADM, USPHS
Deputy Director, Office of Noncommunicable Diseases,
Injury and Environmental Health, and
Acting Director, National Center for Environmental Health,
and Agency for Toxic Substances and Disease Registry
Centers for Disease Control and Prevention

cc: Chesapeake Appalachia, LLC
Timothy A. Wilkins, Bracewell & Giuliani, LLP

Appendix A: Responses to comments from Chesapeake Energy Corporation

Chesapeake Appeal Item 1:

Hagemeier Comment 1/Wilkins Comment 1: “ATSDR should edit or remove Conclusion 1 and other statements implying any source determination to clearly reflect ATSDR’s role and to make more explicit the data limitations underlying Conclusion 1 and similar statements elsewhere in the Consultation.”

ATSDR Response: As stated in ATSDR’s March 2013 response to Chesapeake, ATSDR did not attempt to attribute conclusively the presence of the chemicals detected in the private wells at this site to a definitive source. The purpose of the health consultation was to evaluate whether any public health exposures of concern exist in the seven private drinking water wells and to highlight possible risks that could exist for these residents or could be of relevance for other private well users in similar circumstances. Because of ATSDR’s responsibility to protect the health of the public, it is important to document possible risks to health, no matter the source or the cause. In accordance with our public health assessment guidance, ATSDR appropriately cited data limitations in the health consultation document (page 12).

As part of this appeal item, Chesapeake proposed the following edit for Conclusion #1: “ATSDR is unable to confirm an exposure pathway between the ATGAS incident and RW04. EPA and Chesapeake Energy have conducted further investigations at this site.” As described in the health consultation document under “Public Health Implications of Exposure to Chemicals of Concern in Private Wells Near the Chesapeake ATGAS 2H Well Site,” ATSDR’s usage of the term ‘exposure pathway’ focuses on how people come in contact with a substance. ATSDR has identified a completed exposure pathway for RW04 since people were drinking water from private well RW04. As stated on page 18 of the original health consultation, ATSDR agrees with Chesapeake and the SAIC report that that contaminants from the uncontrolled flowback release (surface overland flow) did not appear to cause impacts to RW04.

ATSDR Action: A clarifying statement regarding this point will be added to Conclusion 1 on pages v and 19 of the updated health consultation. Further, ATSDR will emphasize the role of environmental regulatory agencies in source determination and the fact that ATSDR did not make a conclusive source attribution determination in this health consultation in the limitations sections on pages viii and 2.

Chesapeake Appeal Item 2:

Hagemeier Comment 2/Wilkins Comment 3: “ATSDR should use consistent units of measurement and should correct the Consultation accordingly.”

ATSDR Response: As stated in ATSDR’s March 2013 response, ATSDR strives to use consistent and appropriate scientific units for the environmental data provided. For the primary sampling data summary table and throughout the full body of the report when discussing the private well

sampling results, ATSDR consistently used the units of micrograms per liter (µg/L) or parts per billion (ppb). Milligrams per liter (mg/L) units were generally used when referencing source material that used these units. Although there is variability in the technical literature, it is common to see concentrations of naturally occurring contaminants such as metals or methane referenced in mg/L or ppm. Concentrations of other contaminants (such as man-made organic compounds) are generally detected in drinking water at concentrations orders of magnitude less and therefore are often referenced in µg/L or ppb.

ATSDR Action: No new information that would change ATSDR's response to the original information quality request for correction was provided. ATSDR does not see the need for updates to the units of measurement used in this health consultation. Therefore, modification of the health consultation is not warranted.

Chesapeake Appeal Item 3:

Hagemeier Comment 2/Wilkins Comment 10: "ATSDR should retract the Consultation as it failed to perform an adequate exposure pathway analysis that could support any linkage between detected concentrations and oil and gas activities."

ATSDR Response:

The purpose of the health consultation was to evaluate whether any public health exposures of concern exist in the seven private drinking water wells and to highlight possible risks that could exist for these residents or could be of relevance for other private well users in similar circumstances. Because of ATSDR's responsibility to protect the health of the public, it is important to document possible risks to health, no matter the source or the cause.

As described in the Health Consultation document under "Public Health Implications of Exposure to Chemicals of Concern in Private Wells Near the Chesapeake ATGAS 2H Well Site," ATSDR's exposure pathway analyses focus on how people come in contact with a substance. ATSDR's document considered exposure pathways relevant to a public health determination. ATSDR identified a completed exposure pathway for RW04 because people were drinking water from private well RW04. As stated in ATSDR's March 2013 response, ATSDR did not attempt to attribute conclusively the presence of the chemicals detected in the private wells at this site to a definitive source.

ATSDR Action: No new information that would change ATSDR's response to the original information quality request for correction was provided. ATSDR evaluated appropriate exposure pathways for human exposure in its health consultation. Therefore, retraction of the health consultation is not warranted.

Chesapeake Appeal Item 4:

Hagemeier Comment 3/Wilkins Comment 2: “The Consultation’s explanation of naturally occurring background concentrations of most of these “contaminants” is inadequate and should be corrected.”

ATSDR Response: ATSDR does not determine background geologic settings (or provide comprehensive reviews of background geology), but appropriately referenced and cited the best source for this region: “Hydrogeology and groundwater quality of the glaciated valleys of Bradford, Tioga, and Potter Counties, Pennsylvania, Fourth Series”(USGS 1998). Additionally, ATSDR consulted directly with the primary USGS author of this report during the development of the health consultation document.

ATSDR Action: No new information was made available that changed ATSDR’s response to the original information quality request for correction. The health consultation correctly explains naturally occurring background concentrations of the contaminants. Therefore, modification of the health consultation is not warranted.

Chesapeake Appeal Item 5:

Wilkins Comment 9: “ATSDR’s selective attribution of causation to before and after concentration comparisons casts doubt about its conclusions, especially Conclusion 1, which should be sharply modified or retracted.”

ATSDR Response: As stated in ATSDR’s March 2013 response, ATSDR did not attempt to attribute conclusively the presence of the chemicals detected in the private wells at this site to a definitive source. ATSDR’s health consultation did not determine that the incident at the ATGAS 2H well site caused particular impacts but rather noted that changes to the quality of well water appeared to occur between the pre-drill sampling and EPA’s April 2011 sampling. The purpose of the health consultation was to evaluate whether any public health exposures of concern exist in the seven private drinking water wells and to highlight possible risks that could exist for these residents or could be of relevance for other private well users in similar circumstances. Because of ATSDR’s responsibility to protect the health of the public, it is important to document possible risks to health, no matter the source or the cause. In accordance with our public health assessment guidance, ATSDR appropriately cited data limitations in the health consultation document.

While developing the health consultation, ATSDR reviewed all available, relevant data. In addition to post-incident EPA analytical data from April 2011, ATSDR reviewed Chesapeake’s pre-drilling data that was readily available at that time for these wells, and other rounds of analytical data for RW04 collected after April 2011. Other scenarios in the lifecycle of natural gas hydraulic well development (i.e. drilling, casing and cementing) and use would potentially involve different considerations for groundwater quality over both acute and chronic exposure durations.

ATSDR Action: ATSDR does not attempt to make a source determination in the health consultation. ATSDR will emphasize the role of environmental regulatory agencies in source determination and the fact that ATSDR did not make a conclusive source attribution determination in this health consultation in the limitations sections on pages viii and 2. Therefore, retraction of the health consultation is not warranted.

Chesapeake Appeal Item 6:

Wilkins Comments 11 and 21: “ATSDR should retract portions of the report that involved selective inclusion of questionable worst case sampling results.”

ATSDR Response: The private water well sampling data that ATSDR included in this health consultation document were validated data and are not considered “questionable.” Results were consistently high across EPA’s, PADEP’s, and Chesapeake’s sampling of RW04 in April 2011.

ATSDR Action: No new information that would change ATSDR’s response to the original information quality request for correction was provided. Retraction of portions of the health consultation that describes the data in question is not warranted.

Chesapeake Appeal Item 7

Wilkins Comment 36: “ATSDR should remove Recommendation 4 because it is unreasonable for ATSDR to request additional data when it ignored huge volumes of existing data and to recommend extensive and costly sampling and studies based on questionable results from one sampling event that has been demonstrated to be unnecessary by subsequent sampling that was not considered by ATSDR.”

ATSDR Response:

ATSDR’s Recommendation #4 was to conduct additional groundwater sampling near the event site. This recommendation was adopted by the EPA and included EPA sampling in July and September of 2011. Our recommendation was included in the health consultation in order to determine whether groundwater quality in the site area was of public health concern. Additional sampling was conducted at the down gradient Haire well by Chesapeake, including multiple sampling events to evaluate the efficacy of the Chesapeake-funded water treatment system that had been installed following the ATGAS 2H blowout.

ATSDR Action: ATSDR’s recommendation was relevant when the health consultation was developed and has since been acted upon by EPA and Chesapeake. Therefore, removing Recommendation #4 from the health consultation is not warranted.

Chesapeake Appeal Item 8:

Wilkins Comments 37 and 38: “ATSDR should remove Recommendations 5 and 6 because it is unreasonable to recommend extensive and costly sampling and studies based on questionable results from one sampling event as it has been demonstrated to be unnecessary by subsequent sampling that was not considered by ATSDR.”

ATSDR Response:

ATSDR agrees that many factors may affect groundwater quality. Private well users need to test their wells to ensure there are not unacceptable levels of contaminants in their drinking water. Testing should be conducted regardless of the source of the contaminants and particularly when new industrial activities occur within close proximity to a source of drinking water. ATSDR and CDC make this general recommendation to all private well users in Pennsylvania and nationwide, when appropriate, as a prudent public health measure.

ATSDR continues to support further assessment of water quality and a more standardized and consistent approach to baseline sampling to better understand natural groundwater conditions prior to drilling. As emphasized in a recent review article in *Science*, there is a need for increased baseline groundwater sampling in the Marcellus formation: “It is difficult to determine whether shale gas extraction in the Appalachian region since 2006 has affected water quality regionally, because baseline conditions are often unknown or have already been affected by other activities, such as coal mining.” (R. Vidic *et al.*, *Science* 340, 1235009 (2013). DOI: 10.1126/science.1235009.)

Chesapeake notes that baseline water sampling is being conducted by natural gas production companies. Unfortunately, sampling may not include all the information necessary to determine whether a well provides safe drinking water prior to and over the course of natural gas activities near the private drinking water source. For example, Chesapeake’s consultant determined that the baseline groundwater sample for RW-04 was not representative because “the well was not sufficiently stressed during that sampling” (SAIC 2011). Further, although voluntary industry baseline sampling information is reported to PADEP, it is not always available in a publicly accessible and useable format.

ATSDR Action: ATSDR’s recommendations for additional sampling are included as a prudent public health measure and will support efforts to better understand natural groundwater conditions in the Marcellus Shale region. Therefore, removing Recommendations 5 and 6 in this health consultation are not warranted.

Chesapeake Appeal Item 9:

Wilkins Comments 4-8, 12-19, 24-35, 39-42: “As noted above, Chesapeake believes that ATSDR’s responses to these sections of our Request for Correction are non-responsive and fail to overcome the criticisms presented. ATSDR should re-consider and accept these requests for

correction. By failing to show how the Consultation satisfies the DQA standards cited in our Request, the Response is insufficient and inadequate.”

ATSDR Response: ATSDR intends these most recent responses, additional explanations, and planned revisions to be helpful and informative to Chesapeake.

ATSDR Action: ATSDR has made several updates to the health consultation in response to Chesapeake’s appeal (see Appendix B).

Appendix B. Revisions made to the ATSDR Chesapeake ATGAS 2H Well Site Health Consultation

Please note: ATSDR updated the Public Health Action Plan on page 21 to reflect the status at this site as of October 2013.

Request Comment Number	Error	Correction
(New) Appeal Item 1	None	To further emphasize the point made on page 18 of the original document, ATSDR added this clarification to Conclusion 1 on pages v and 19 of the updated document: "The available information indicates that the overland release following the ATGAS 2H incident did not appear to cause the water quality impacts observed in RW04."
(New) Appeal Items 1 and 5	None	To emphasize that ATSDR did not attempt to conclusively determine the source of contamination, ATSDR added this language to the limitations sections on pages viii and 2 of the updated document: "In this document, ATSDR does not attempt to attribute conclusively the presence of the chemicals detected in the private wells at this site to a definitive source. ATSDR recognizes the expertise and authority of EPA and state environmental agencies to make final determinations about relevant sources of contamination."
2	Mislabeling of Table 3.	ATSDR removed the duplicate Table 3 header and re-labeled the tables on pages 15 and 18 of the updated document.
20	Incorrect sampling date for RW03 (April 27, 2011).	ATSDR corrected the sampling date for RW03 (April 28, 2011) on page 4 of the updated document.

Request Comment Number	Error	Correction
22	ATSDR relied on “blank-qualified” data for Oil and Grease (HEM) to make unsupportable conclusions regarding the presence of hydrocarbons, especially in RW04.	ATSDR removed the parenthetical reference to HEM results in the Conclusions portions on pages v and 19 of the updated document.
23	The conversion of methane concentration of 87 percent in air to a concentration in µg/L is incorrect.	The appropriate conversion should be approximately 581,000 µg/L. ATSDR made this correction on p. 15 of the updated document.
27	ATSDR states on Page 3 that there is a notable increasing trend in strontium levels and warrant further consideration in future hydraulic fracturing-related groundwater sampling events.	ATSDR corrected the statement about an increasing trend in strontium levels on p. 3 of the updated document. The sentence now reads: “Although the detected levels of strontium did not exceed CVs and thus are not included in Table 1, site-specific and general industry-wide information for this chemical warrants further consideration in future hydraulic fracturing-related groundwater sampling events.”
30	ATSDR states on page 7 that the iron concentration at RW02 is 500 µg/L and in Table 1 it is listed as 550 µg/L.	ATSDR corrected the RW02 value to 550 µg/L on page 7 of the updated document.