

Letter Health Consultation

Data Review

ARKANSAS STATE PLANT BOARD
DESHA – 40 IRRIGATION WELL

WATSON, DESHA COUNTY, ARKANSAS

**Prepared by the
Arkansas Department of Health**

JULY 23, 2010

Prepared under a Cooperative Agreement with the
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

A health consultation is a verbal or written response from ATSDR or ATSDR's Cooperative Agreement Partners to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR or ATSDR's Cooperative Agreement Partner which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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LETTER HEALTH CONSULTATION

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Arkansas Department of Health

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Governor Mike Beebe

Paul K. Halverson, DrPH, FACHE, Director and State Health Officer

June 22, 2010

Jason Robertson
Assistant Director, Pesticide Division
Arkansas State Plant Board
P.O. Box 1069
Little Rock, AR 72203

Dear Mr. Robertson:

Based on a review of the water data collected on June 29, 2009 and May 26, 2010, by the Arkansas State Plant Board (ASPB) from irrigation well Desha-40 in Watson, AR, the Arkansas Department of Health (ADH), in a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), has prepared this health consultation letter to address public health issues related to detected levels of bentazon and quinclorac in Desha-40 well water as indicated from the data submitted to our offices on June 16, 2010.

Background and Statement of Issues

In accordance with the "Arkansas Agricultural Chemical Ground Water Management Plan Memorandum of Understanding" (MOU) between the ASPB and ADH, results of water samples taken from an irrigation well in Watson, AR were sent to our offices for evaluation of detected pesticides. The Desha-40 well is owned by a private citizen, and it is used for agricultural purposes. According to the ASPB documentation, the depth of the well is 112 feet with a 16-inch PVC casing, and there is a concrete pad around the well. The specific crops on which this well water was used for in the past were: soybean in 2008, rice in 2007, and soybean in 2006.

The Desha-40 well was first sampled on June 29, 2009, and tested positive for the presence of the pesticide bentazon in the post-purge water. The well was subsequently resampled on May 26, 2010, and in both the pre-purge and post-purge results, the water sample again tested positive for the presence of bentazon, as well as the presence of quinclorac.

Bentazon (CAS number 25057-89-0) is an herbicide used for postemergence control of many broadleaf weeds in grasses, beans, rice, and other vegetable crops. Quinclorac (CAS number 84087-01-4) is a pre- and postemergence herbicide used in rice, wheat, and turf.

Discussion

Exposure to a contaminant of concern is determined by examining human exposure pathways. An exposure pathway has five parts:

1. A source of contamination (e.g., contaminated irrigation well),
2. An environmental medium such as water, soil, or air that can hold or move the contamination,
3. A point at which people come in contact with a contaminated medium (e.g., irrigation well water in soil),
4. An exposure route, such as accidental ingestion or skin contact with water or soil, and
5. A population who could come in contact with the contaminants.

An exposure pathway is eliminated if at least one of the five parts is missing and will not occur in the future. For a completed pathway, all five parts must exist and exposure to a contaminant must have occurred, is occurring, or will occur. For this evaluation, potential pathways have been identified. Since the irrigation well Desha-40 is known to contain pesticides, agricultural workers have the potential to come into contact with those pesticide concentrations while working in the field. In general, children or adults that may be on the property could potentially come into contact with the pesticides. Potential pathways of concern include: inhalation of contaminated air through the volatilization of chemicals in the water from irrigation, skin contact with contaminated soil or water, and bioaccumulation in crops. Per the MOU established between the ASPB and ADH, the potential for incidental ingestion exposure was considered in order to represent the most conservative public health evaluation. Since bentazon has low volatility (for inhalation), is not readily absorbed dermally, has a low bioaccumulation factor in crops, and low persistence in soil and water, these potential human exposure pathways can be eliminated based on both the Health Comparison Value screening and the known characteristics of this pesticide. So, per the MOU, further review of the data was completed to determine the potential harm of the bentazon concentrations detected in the irrigation well for the accidental ingestion exposure pathway scenario.

The pesticides detected in the water samples submitted to ADH were screened using ATSDR Health Comparison Values. Health Comparison Values are doses or substance concentrations set well below levels that are known or anticipated to result in adverse health effects. These values help health assessors make consistent decisions about what substance concentrations or dose levels require a closer look. The ATSDR Health Comparison Value for bentazon in drinking water is 300 micrograms per liter, or parts per billion (ppb), for a child and 1,000 ppb for an adult. The highest reported values of bentazon (3.8 ppb post-purge in June 2009, and 5.83 ppb pre-purge and 7.82 ppb post-purge in May 2010) fall below these comparison values for drinking water (representing a very conservative incidental ingestion scenario). Furthermore, because bentazon has been identified as cancer classification Group E, "evidence of non-carcinogenicity for humans," no cancer evaluation was conducted. Theoretical calculations for acute (less than one year), non-cancer health effects were made assuming a child or adult may accidentally ingest 1.0 fluid ounce of the irrigation well water at a bentazon concentration of 7.82 ppb. Daily exposure dose values fell well below the U.S. Environmental Protection Agency (EPA) oral reference dose (RfD) health guideline of 0.03 milligrams per kilograms per day

(mg/kg/day). Calculated daily exposure dose values were 0.000014 mg/kg/day for a child and 0.0000032 mg/kg/day for an adult. It was determined that the concentrations of bentazon in all samples submitted were below the Health Comparison Value and RfD, and no further theoretical risk calculations were required for this exposure scenario.

Quinclorac is not listed in the ATSDR Health Comparison values table or the EPA Regional Screening Levels table. According to the National Pesticide Information Center (NPIC) and the EPA, quinclorac is not classifiable as a human carcinogen. Therefore, quinclorac was not evaluated further in this review.

Conclusions

ADH/ATSDR conclude that bentazon and quinclorac concentrations found in irrigation well Desha-40 are not expected to harm people's health because levels were found to be below regulatory health comparison values, and no further action is required at this time.

Recommendations

No recommendations for this well are needed at this time. Should future tests detect levels of pesticides at higher concentrations for the Desha-40 well or surrounding wells, please do not hesitate to contact us again with the new data.

Thank you for allowing ADH/ATSDR the opportunity to work with your agency on this site. Please feel free to contact me at 501-280-4041 or ashley.whitlow@arkansas.gov, if you have any questions.

Sincerely,



Ashley Whitlow, M.S., CPM
ADH Epidemiologist
ATSDR Health Assessor
Environmental Epidemiology

cc: Lori Simmons, M.S., Environmental Epidemiology Section Chief/ATSDR Program Coordinator, ADH
Carrie Poston, B.S., CHES, Epidemiologist/ATSDR Health Outreach Coordinator, ADH
Jeff Kellam, M.S., Division of Health Assessment and Consultation, Technical Project Officer, ATSDR

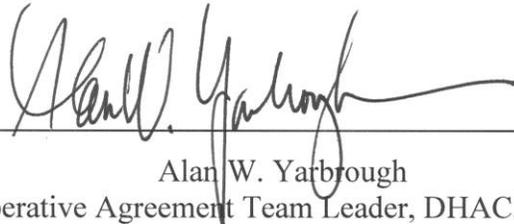
Certification

The Arkansas Department of Health prepared this letter health consultation for Arkansas State Plant Board Desha-40 Irrigation Well, Desha County Arkansas under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It was completed in accordance with approved methodology and procedure existing at the time the health consultation was initiated. Editorial review was completed by the cooperative agreement partner.



Jeff Kellam, M.S.
Technical Project Officer
Division of Health Assessment and Consultation (DHAC)
ATSDR

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation and concurs with its findings.



Alan W. Yarbrough
Cooperative Agreement Team Leader, DHAC, ATSDR