STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY
BOARD OF PESTICIDES CONTROL
28 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

To: Maine Board of Pesticides Control
From: Mary Tomlinson, Pesticides Registrar/Water Quality Specialist
RE: Proposal for 2019 Statewide Groundwater Monitoring Program
Date: January 7, 2019

Background

Since 1994, the Maine Board of Pesticides Control (BPC) has conducted groundwater monitoring in accordance with the State of Maine Generic State Management Plan for Pesticides and Groundwater (State Plan).[1] These monitoring efforts are designed to assess the presence of pesticide residues in groundwater in areas determined to potentially be most at risk of pesticide contamination.

Further, the Board has a statutory charge under 7 M.R.S. §607-A. REVIEW OR REREGISTRATION 2-A, to "conduct a water residue survey at least once every 6 years to establish a representative sample of a number of wells or bodies of water, selected at random, in areas of possible contamination or at other locations to be described by the board, for the purpose of testing these waters and preparing a profile of the kinds and amounts of pesticides present. [2005, c. 620, §7 (NEW) .]"

Monitoring conducted under Maine's statewide pesticides and groundwater monitoring program indicated that pesticide contamination does occur in drinking water in domestic wells near active pesticide use sites. The number of wells typically sampled was approximately 150, until 1994 when 50 wells were sampled. Of the ~150 wells sampled, the percent of wells with positive detections ranged between 9%-24% until 2014 when 68% of the 50 wells sampled tested positive for pesticides. The increase in detections was partially a function of newer technology which allowed lower detection limits and analysis of 90-plus pesticides compared to a maximum of seven pesticides analyzed in previous years. The reduced sample size may also have affected the percent of detections.

BPC testing has found two instances where contamination exceeded established health advisory levels. In 1994, an ant control product was misused by a homeowner. In 2014, a well was steeply down-gradient and within 90 feet of a corn crop where a narrow drainage ditch along the drive directed the runoff to the wellhead.

The statewide groundwater monitoring program is critical to identifying and addressing emerging contaminants in the state. For example, the high detection rate of hexazinone in 1994 led to the development of the Hexazinone Statewide Management Plan resulting in the use-restriction on hexazinone (no longer in effect), identification of best management practices, and educational outreach to reduce groundwater contamination.

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Study Objective

In accordance with State Plan, the objectives of this study are to:

- Assess the occurrence of pesticides in private drinking water wells associated with an active agricultural field throughout the state of Maine.
- To determine trends in agricultural pesticides detected in groundwater collected from private drinking water wells associated with an active agricultural field.

Sampling Plan

- Samples will be drawn across the state from 200 randomly-selected domestic wells located within ¼ mile down gradient of an active agricultural pesticide use site during February and March. An equal number of samples will be collected from each inspector region. A larger number of samples would be required to estimate an average concentration of contaminants, but cost and personnel constraints currently make this level of sampling prohibitive. However, 200 wells will provide a ±6-7% confidence level in terms of the probability of contamination compared to a 10-12% confidence level with 100 wells.
- Ten field duplicates and 10 field blanks will be collected for quality control and quality assurance purposes. The number of duplicates and blanks are collected on a 5% basis or one in 20 samples which will be distributed equally across all five inspector regions.
- All historical samples from the 2014 statewide groundwater monitoring will be incorporated as part of the 200 samples to assess trends in groundwater contamination over time. Any historical sites no longer viable for sampling will be replaced with new randomly selected sites.
- Samples will be shipped to Montana Analytical Laboratory, an accredited lab with a current Quality Assurance Project Plan (QAPP). The QAPP is required by the Environmental Protection Agency (EPA) as part of the Cooperative Agreement between the EPA and Maine and is also required under the State Plan. The analysis method employed will be the "Universal Method for the Determination of Polar Pesticides in Water Using Solid Phase Extraction and Liquid Chromatography/Mass Spectrometry/ Mass Spectrometry" and analyzes for 102 pesticides.

Estimated Project Cost

The estimated cost for analysis and shipping of 220 samples is $91,000. Montana Analytical Laboratory offers a 20% discount on six or more samples which reduces the cost to approximately $73,400.

Reference

Maine Board of Pesticides Control. *State of Maine Generic State Management Plan for Pesticides and Groundwater*. 1994, Rev 1998, Rev 2006.