Report to the Joint Standing Committee on Natural Resources

and the

Joint Standing Committee on Health and Human Services

Concerning the Provisions of Public Law 2003, Chapter 457, Section 4

relating to the

Need for a Comprehensive Safe Drinking Water Program for Private Wells to Address Arsenic and Other Contaminants of Human Health Concern

Submitted by:

The Maine Department of Health and Human Services

Bureau of Health

November 30, 2004

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John Elias Baldacci
Governor

State of Maine
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John R. Nicholas
Commissioner

January 3, 2004

Members of the Joint Standing Committee on
Health and Human Services
Cross Office Building, Room 202
Augusta, Maine 04333

Dear Members of the Health and Human Services Committee:

Enclosed is the Bureau of Health's report with an assessment of the need for a safe drinking water programs for private wells. This report is submitted to the Joint Standing Committees on Natural Resources, as well as on Health and Human Services, as required by PL 2003, Chapter 457, Section 4. The body of the report is drawn from a comprehensive application that the Department submitted to the federal Centers for Disease Control in response to an RFP requesting proposals for creation of an environmental health services program which could address the problem of arsenic and other contaminants in private wells.

Although our application was recommended for approval, the CDC could not fund all the applications submitted by the states in response to the RFP. Unfortunately, Maine did not receive CDC funding to support a safe drinking water program during this round. Though we're disappointed, it is our intent to reapply for federal funding at the first opportunity. In the meantime, we are not requesting state funds in the Administration's FY06-07 budget to implement this initiative. Instead, the Department will apply existing staff resources to advance efforts that we already have underway.

Sincerely,

John R. Nicholas
Commissioner
Department of Health and Human Services

Encl.

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Introduction

This report is submitted to the Joint Standing Committee on Natural Resources and the Joint Standing Committee on Health and Human Services pursuant to Public Law 2003, Chapter 457, section 4, relating to the assessment of the need for a comprehensive safe drinking water program for private wells. The resolve required that the Department of Health and Human Services, Bureau of Health:

> " ...submit a report no later than October 1, 2004 to the Joint Standing Committee on Natural Resources and the Joint Standing Committee on Health and Human Services after consultation with a diverse group of interested parties. The report must contain an assessment of the need for a comprehensive safe drinking water program for private wells to address arsenic and other contaminants of human health concern and recommendations to address identified needs." (PL 2003, c. 457, s.4).

Coincidentally, in April 2004, the Department of Health and Human Services, Bureau of Health (DHHS/BOH) became aware of an opportunity to apply for competitive federal grant funds to implement a comprehensive environmental health services program. DHHS/BOH prepared and submitted a proposal to the Centers for Disease Control (CDC) in late May of 2004 that discussed the need for a comprehensive safe drinking water program for private wells in Maine and proposed a program to address the identified needs. On August 20, 2004, DHHS/BOH learned that although the submitted grant application was recommended for funding, it did not score high enough to obtain the limited funds available (only 9 proposals out of 48 submitted were funded).

It is the belief of DHS/BOH that the submitted grant proposal contains most, if not all, the elements of the legislatively mandated report. Because no state funds were authorized for preparation of the report, DHS/BOH is submitting this grant proposal to the Legislature as the mandated report. As the legislative mandate stipulated consultation with a diverse group of interested parties in preparation of a report, two efforts were made to obtain and document consultations with interested parties. A group made up of academicians and Maine state agency and federal agency representatives were consulted in preparation of the initial grant proposal and asked to provide a letter of support. These letters of support are attached as Appendix B of this report. Secondly, copies of the grant proposal were mailed out to a diverse group of interested parties along a cover letter explaining the legislatively required report and the intent to use the grant proposal as the report. Recipients were asked to submit any written comments they had regarding our discussion of the need for a comprehensive safe drinking water program for private wells, and our specific proposals on how to address these needs. Recipients were specifically urged to comment on whether there are needs that we have not adequately characterized, or whether there are additional recommendations that should be made. The mailing list included individuals involved in the testing of private well water, the treatment of private well water, the drilling of private wells, the delivery of public education materials, the response to contamination of private wells, the study of well water quality issues in Maine, as well as public interest organizations. Copies of the mailing list for interested parties, the cover letter, and written comments received to date are attached as Appendix D.

U.S. Department of Health and Human Services

Centers for Disease Control and Prevention

Program Announcement 04113

Delivery of Environmental Health Services

Application for Funding

Submitted by
Maine Department of Human Services
Bureau of Health
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Executive Summary

The State of Maine has one of the highest per capita uses of domestic household wells for drinking water in the U.S. Based on data from Maine's 2003 Behavioral Risk Factors Surveillance Survey (BRFSS), 52 percent of the state's population relies on private domestic wells for their drinking water. Despite the fact that the majority of Maine residents obtain their drinking water from private household wells, the State does not have an environmental health services program focused on meeting the needs of private well owners. Maine has a variety of significant environmental health issues associated with private well water. For example, analyses of private well water data from either random sampling studies or self-testing data obtained through the State Public Health & Environmental Testing Laboratory indicate the following: a) 11 percent of wells have arsenic levels above the Maximum Contaminated Level (MCL) of 10 ppb; b) 32 percent of wells have radon levels above the proposed MCL of 4000 pCi/L and 10 percent of wells have radon levels above the State guideline of 20,000 pCi/L, and c) 4 percent of private wells have uranium 238 levels above the MCL of 30 ppb. What even these statistics fail to convey is that some domestic wells can have very high concentrations of these naturally occurring toxicants. Arsenic levels as high as 5000 ppb have been detected in Maine, with levels above 100 ppb not uncommon. Similarly, uranium-238 levels as high as 6000 ppb have been reported and levels above 100 ppb are not uncommon. With radon, preliminary analyses of self-testing data indicate that 1 out of every 50 homes that test for radon has water levels above 100,000 pCi/L. The public health burden of these naturally occurring contaminants in well water are largely unknown. Arsenic is a known human carcinogen (skin, bladder, lung). Radon is a known human lung carcinogen. Uranium 238 is both a carcinogen and is toxic to the kidney.

Currently, there are a number of state agencies that provide varying services to private well owners. The Bureau of Health's Environmental Health Unit has been involved in conducting random surveys of contaminants in private well water (e.g., arsenic and uranium 238), responding to specific clusters of wells high in contaminants (e.g., arsenic, and cadmium), undertaking exposure-related studies (e.g., childhood exposure to arsenic from bathing in high arsenic water), development of educational materials (e.g., brochures on arsenic in well water, uranium 238 in well water, and a general well water testing brochure is currently under development), and providing consults to the public on well water contaminant issues through a toll-free line. The Bureau of Health's Drinking Water Program has been involved in responding to calls from the public with questions about treatment technologies for mitigating various well water contaminant issues (e.g., bacteria, nitrate, lead, arsenic, uranium 238, radium). The Radon Control Section of the Bureau of Health's Radiation Program has rules that require the reporting of radon indoor air and water levels to the State. They additional provide targeted health and treatment information to households with radon water levels > 100,000 pCi/L, and similar information to other households on request. The Bureau of Health's Public Health & Environmental Testing Laboratory performs thousands of

private well water tests per year. Its staff often responds to calls from recipients of test results with questions about the next steps when water is reported to be unsatisfactory. The Department of Conservation's Maine Geological Survey (MGS) operates the Ambient Bedrock Water Quality Program, which is designed as a long-term, comprehensive groundwater quality-monitoring program for the State of Maine. Over the past 3 years, the MGS has sampled and analyzed groundwater from approximately 170 bedrock wells in four drainage basins throughout the State, selected for their geological variety and geographic distribution. The Department of Environmental Protection has provided services as a regulatory agency responding to wells contaminated by petroleum related spills, hazardous waste sites, or landfills. The DEP has additionally been a source for some public education materials developed jointly with the University of Maine Cooperative Extension Service (e.g. Safe Homes Project).

It has been the work of these agencies collectively over the past 10 – 15 years that have brought us to the current state of knowledge about ground water issues in Maine, and the current degree of awareness of these issues amongst the public. Nevertheless, the need for an enhanced, integrated, and coordinated environmental health services program for private wells remains strong. As one indicator of such a need, survey data from a random sample of Maine households with wells found that 1-in-4 (25%) of respondents reported never testing their well water at their current residence. Of those respondents that had tested their well water, half (53 %) reported that they had not tested their water for arsenic. There is no reason to expect higher testing results for other water contaminants such as radon and uranium 238. Another indicator of the need for coordinated services has been calls to the Bureau of Health's Environmental Health Unit's (BOH/EHU) toll-free line by well-owners who have just received their water test results. EHU responds to over 1500 calls per year. Over the years, we have noted that callers often have difficulty interpreting their water test results. For example, the practice of testing laboratories to report arsenic levels in parts-per-million rather than parts per billion causes unnecessary confusion because the public's difficult comprehending decimal figures. Of greater concern is the degree of confusion we confront because conflicting information callers receive from the various state agency, testing laboratories, water treatment companies, and real estate agents that can become involved in responding to well water test results. We have additionally encountered confusion over when it is appropriate to seek clinical care (e.g., urine or blood test for arsenic or uranium). Callers can be unnecessarily alarmed about the magnitude of the health hazard or the important routes of exposure. A common occurrence is that callers are often interested in treatment systems for the entire home rather when a less-expensive point-of-use treatment system would provide appropriate reduction in exposure.

We believe that Maine is in need of an enhanced comprehensive environmental health services program to address the needs of private well owners in Maine. Such a program would be built on the framework of the Ten Essential Public Health Services and Ten Essential Environmental Services. To this end, we propose to undertake the following activities if awarded funding under this program announcement:

a) Increase testing of private well water for major arsenic, uranium 238, radon, bacteria, nitrates and lead through the distribution of a new "plain language" brochure developed using focus group techniques;
b) Develop new test result reporting forms for use by the State Health & Environmental Testing Laboratory using "plain language" health literacy techniques and focus group testing;
c) Develop educational materials for each contaminant using "easy-to-read" health literacy techniques and focus group testing, and develop a new state website dedicated to providing information for private well water owners;
d) Develop an automated electronic alert system for notifying toxicologist of high water test results so that the toxicologist makes the first call to the household;
e) Formalize the arsenic cluster response system by stakeholder involvement in a planning process, involving laboratories, state agency, and local government officials;
f) Achieve improved integration and coordination of delivery of services to private well owners through the organization of a planning consortium consisting representatives from state government, federal government, local government, university, water treatment companies, well drillers, health care providers, and private well owners;
g) Further develop and support partnerships with academic institutions to assist and support relevant well water related research;
h) Develop and implement and evaluation plan consisting of logic models with associated indicators for programmatic work, and state BRFSS testing modules to assess increase awareness and testing of well water.

A. DESCRIBE AGENCY AND ITS POSITION WITH GOVERMENTAL STRUCTURE

The Bureau of Health (BOH) is the State of Maine's lead public health agency. Organizationally, the BOH is situated within the Maine Department of Human Services (DHS). The Director of the Bureau of Health is the State Health Officer and reports directly to the Commission of the DHS, who in turn reports directly to the Governor as a member of the cabinet. The Bureau of Health is organized into five divisions (Disease Control, Community Health, Family Health, Health Engineering, and the Public Health & Environmental Testing Laboratory), two offices (Health Data and Program Management & Public Health Emergency Preparedness), and one unit (Environmental Health) (*see organizational chart in Appendix B*).

There are a number of programs within the Bureau of Health that have responsibility for delivering environmental health services, including the Division of Health Engineering, the Public Health & Environmental Testing Laboratory, and the Environmental Health Unit. The Division Health Engineering includes the Drinking Water Program, and the Radiation Control Program. The primary focus of the Drinking Water Program is ensuring the safety of public water supplies through regulation and technical assistance, and its activities are largely supported by funding from the U.S. Environmental Protection Agency. The Radiation Control Program includes the Radon Control Section that licenses radon inspectors and radon mitigation companies, and provides technical assistance and education to institutions and homeowners with radon indoor air or water problems. The Public Health and Environmental Testing Laboratory provides water and soil testing for environmental contaminants for both regulatory agencies and private individuals.

The Environmental Health Unit (EHU) was established legislatively in 1981 (22 MRSA § 1692). Its mandate is to: 1) develop and monitor health status; 2) identify health problems including those which may be related to environmental factors; 3) investigate as necessary to determine whether particular health problems are related to environmental factors; 4) advise state agencies on the potential health implications of their actions; and 5) provide the public with information on preventive and corrective actions in the area of environmental health.

The EHU is directed by the State Toxicologist and consists of the Environmental Public Health Tracking Program,[1] the Childhood the Lead Poisoning & Prevention Program,[2] Adult Blood Lead Epidemiological Surveillance Program,[3] and the Environmental Toxicology Program (see *organizational chart for the EHU in Appendix B*). EHU staff includes toxicologists, epidemiologists, comprehensive health planner, database analyst, public health physician, a public health nurse, and planning & research associates.

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[1] CDC Cooperative AA # U50/CCU122452-01
[2] CDC Cooperative AA # U57/CCU122851-01
[3] CDC NIOSH ABLES # 0201718D4D

B. DESCRIBE HOW PROJECT WILL BE ADMINISTERED, INCLUDING JOB DESCRIPTIONS FOR ALL PROJECT POSITIONS

The EHU will have primary responsibility for the administration of the proposed environmental health services initiative. The Principal Investigator for this grant will be the State Toxicologist, Dr. Andrew Smith. Dr. Smith is current the PI on several CDC funded projects, including the Environmental Public Health Tracking Grant, a joint CDC/NCEH & Maine Bureau of Health study on Exposure to Arsenic through household well water, and the NIOSH Adult Blood Lead Epidemiological Surveillance Program. He is additionally the PI on the US EPA funded joint Wisconsin & Maine project to evaluate the effectiveness of public health intervention program to increase awareness of safe eating guidelines for fish.

The following project positions and individuals will be involved in carrying out activities under this project:

Principal Investigator – Andrew E. Smith, S.M., Sc.D, Principal Investigator

Comprehensive Health Planner – Al May, MFS, MPH. Project Coordinator.

Toxicologist – Eric Frohmberg, M.A.

Environmental Epidemiologist – Chris Paulu, Sc.D.

Surveillance Epidemiologist – Judith Graber, M.S.

Database Analyst – Vacant, final candidates being interviewed

Public Health Physician – Leslie Walleigh, M.D., MPH

Planning & Research Associate II – Rhonda Surette

Detailed descriptions of the duties of each position and time commitment are provided in the table of objectives/activities/timelines (Section C.6.) or in the detailed budget justification (Section E).

C. DESCRIBE PROJECT'S OPERATIONAL PLAN TO ADDRESS AN ENVIRONMENTAL HEALTH SERVICES ISSUE AND IMPLEMENT ACTIVITES NECESSARY TO ENHANCE OVERALL CAPACITY OF THE ENVIRONMENTAL HEALTH SERVICES PROGRAM. REQUIRED ELEMENTS:

1) Description of the environmental health issue and current state of the environmental health services program.

The State of Maine has one of the highest per capita uses of domestic household wells for drinking water in the U.S.[4] Based on data from Maine's 2003 Behavioral Risk Factors Surveillance Survey (BRFSS), 52 percent of the state's population relies on private domestic wells for their drinking water. Despite the fact that the majority of Maine residents obtain their drinking water from private household wells, the State does not have an environmental health services program focused on meeting the needs of private well owners. Maine has a variety of significant environmental health issues associated with private well water. Analyses of private well water data from either random sampling studies or self-testing data obtained through the State Public Health & Environmental Testing Laboratory indicate the following:

- 11 percent of wells have arsenic levels above the Maximum Contaminated Level (MCL) of 10 ppb;
- 32 percent of wells have radon levels above the proposed MCL of 4000 pCi/L and 10 percent of wells have radon levels above the State guideline of 20,000 pCi/L;
- 4 percent of private wells have uranium 238 levels above the MCL of 30 ppb

What these statistics fail to convey is that some domestic wells can have very high concentrations of these naturally occurring toxicants. Arsenic levels as high as 5000 ppb have been detected in Maine, with levels above 100 ppb not uncommon. Similarly, uranium-238 levels as high as 6000 ppb have been reported and levels above 100 ppb are not uncommon. With radon, preliminary analyses of self-testing data indicate that 1 out of every 50 homes that test for radon has water levels above 100,000 pCi/L.

The public health burden of these naturally occurring contaminants in well water are largely unknown. Arsenic is a known human carcinogen (skin, bladder, lung)[5,6]. The projected incremental lifetime cancer risk from regular consumption of water with 10 ppb arsenic is 1 per 1000.[5] According to data from the Maine Cancer Registry, rates of bladder cancer mortality and incidence for males and females have been elevated in Maine as compared to national averages.[7] Whether there is any link between elevated

[4] http://water.usgs.gov/pubs/circ/2004/circ1268/htdocs/text-do.html
[5] Arsenic in Drinking Water, National Research Council, Subcommittee on Arsenic in Drinking Water, National Academy Press, Washington, DC, 1999.
[6] Arsenic in Drinking Water – 2001 Update, National Research Council, Subcommittee on Arsenic in Drinking Water, National Academy Press, Washington, DC, 2001.
[7] Cancer Incidence & Mortality in Maine 1997-1998, Maine Cancer Registry, Bureau of Health, Augusta, ME.

bladder cancer rates in Maine with arsenic exposure from well water is unknown at present, though is a hypothesis under investigation in a National Cancer Institute case-control bladder cancer study involving Maine, New Hampshire, and Vermont. Radon is a known human lung carcinogen.[8] Uranium 238 is a nephrotoxin, with several cross-sectional studies reporting increases in beta-2 microglobulin and other markers of subtle effects of kidney function with increasing exposure.[9,10] Because of disequilibria, Uranium-234 can also be found at radiologically significant levels in wellwater containing U-238 in the thousands of ug/L. At these higher concentrations cancer risk can eclipse the nephrotoxic end point.

Like virtually all states, the Maine Bureau of Health has a Drinking Water Program. The primary focus of this program is providing regulatory oversight and technical assistance to Public Water Systems. Perhaps surprisingly for a state that relies so heavily on domestic well water as the source of drinking water, Maine does not have a dedicated environmental services program focused on the needs of households with domestic wells. Rather, Maine has a loosely, though increasingly, coordinated group of various state agencies, university cooperative extension service, public and private testing laboratories, private water treatment companies, well drillers, and plumbers that attempt to respond to the needs of the private well owner.

The primary state agencies providing environmental health services to households with private well water include the following:

a) Environmental Health Unit (EHU), Bureau of Health. The EHU has been involved in conducting random surveys of contaminants in private well water (e.g., arsenic and uranium 238), responding to specific clusters of wells high in contaminants (e.g., arsenic, and cadmium), undertaking exposure-related studies (e.g., childhood exposure to arsenic from bathing in high arsenic water), development of educational materials (e.g., brochures on arsenic in well water, uranium 238 in well water, and a general well water testing brochure is currently under development), and providing consults to the public on well water contaminant issues through a toll-free line.

b) Drinking Water Program (DWP), Bureau of Health. The DWP has been involved in responding to calls from the public with questions about treatment technologies for various well water contaminant issues (e.g., bacteria, nitrate, lead, arsenic, uranium 238, radium).

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[8] Risk Assessment of Radon in Drinking Water, Committee on Risk Assessment of Exposure to Radon in Drinking Water, National Research Council, Washington, DC 1999.

[9] Zamora M.L. et al., Chronic Ingestion of Uranium in Drinking Water: A Study of Kidney Bioeffects in Humans, *Toxicological Sciences*, Vol. 43, 68-77, 1998.

[10] Assessment of the Effect of Kidney Function on the Long-Term Ingestion of Uranium in Drinking Water by the Kitigan Zibi Community, Report by the Radiation Protection Bureau, Health Protection Branch, Health Canada, December 31, 1998.

c) Radon Control Section, Radiation Program, Bureau of Health. The Radon Control Section has rules that require the reporting of radon indoor air and water levels to the State. They additional provide targeted health and treatment information to households with radon water levels > 100,000 pCi/L, and similar information to other households on request.

d) Public Health & Environmental Testing Laboratory (HETL), Bureau of Health. HETL performs thousands of private well water tests per year. Its staff often responds to calls from recipients of test results with questions about the next steps when water is reported to be unsatisfactory.

e) Maine Geological Survey (MGS), Department of Conservation. The MGS operates the Ambient Bedrock Water Quality Program, which is designed as a long-term, comprehensive groundwater quality-monitoring program for the State of Maine. Over the past 3 years, the MGS has sampled and analyzed groundwater from approximately 170 bedrock wells in four drainage basins throughout the State. These basins were selected for their geological variety and geographic distribution.

f) Department of Environmental Protection (DEP). The DEP's primary involvement has been as a regulatory agency responding to wells contaminated by petroleum related spills, hazardous waste sites, or landfills. The DEP has additionally been a source for some public education materials developed jointly with the University of Maine Cooperative Extension Service (e.g. Safe Homes Project).[11]

2) Description of assessment activities used to identify the environmental issue or current state of the program.

There have been a number of assessment activities and related efforts over the past 6-years to assess environmental health issues with private well water and to assess the delivery of environmental health services to ensure safe drinking water for Maine families. These efforts have been largely focused on the presence of arsenic in well water. Below is a synopsis of the assessment activities that have identified arsenic as a significant environmental issue for Maine.

- 1994 – The Department of Human Services and the Maine Geological Survey performed a well water sampling study for arsenic in the Buxton-Hollis area. The study obtained water samples from 1111 private wells in the two towns, and reported 14% of wells with arsenic levels greater than 50 ppb.[12]
- 2000 – Following release of NAS report affirming arsenic as a human bladder and lung carcinogen, BOH/EHU revises its Maximum Exposure Guideline for

[11] See http://www.maine.gov/dep/rwm/homeowner/safehomes.htm

[12] Marvinney, R.G. et al., Arsenic in Maine groundwater: an example from Buxton, Maine, Maine Geological Survey, Augusta, ME, 1995.

drinking water of 50 ppb down to 10 ppb. HETL adds arsenic to the standard water test so private homeowners no longer need to specifically request a separate test for arsenic.

- 2000 – EHU develops and begins limited distribution of a brochure on arsenic in well water.
- 2000 – In response to discovery of a cluster of wells with water arsenic levels above 1000 ppb arsenic, the EHU initiates a community-level response consisting of the following elements: a) distribution of clinical guidance for local health care providers, b) coordination with local town officials and residents to publicize need to have well water tested and to facilitate testing by shipping test kits to the town office for distribution, c) tracking of test results with spatial (GIS) analyses and sharing of results with town officials. This community response becomes known as the "arsenic cluster response", and is subsequent applied to apparent clusters in the towns of Ellsworth, Standish, Rangeley and Stockton Springs.
- 2001 – EHU makes a toll-free phone number available to recipients of water test results from the state Public Health & Environmental Testing Laboratory, to improve the public's access to toxicologist for well water consults.
- 2001 – EHU, MGS jointly undertake a study of a random sample of 412 household wells to more reliably characterize the statewide occurrence of arsenic and uranium 238 in well water. This study finds 11% of wells have arsenic water levels above 10 ppb with 2 percent greater than 50 ppb. 4% of sampled wells were found to have elevated uranium levels (i.e., > 30 ppb).
- 2001 – EHU initiates a joint study with CDC/NCEH to evaluate residual childhood exposure to arsenic in households that have either switched to bottled water or installed a point-of-use treatment system at the kitchen sink. The study is initiated in response to questions from the public and water treatment companies as to when it is appropriate to install a point-of-entry treatment system versus a point-of-use treatment system. Field work is completed in late 2003.
- 2002 & 2003 – EHU develops and funds a state BRFSS module to evaluate testing of domestic well water generally, and testing for arsenic specifically. This survey finds that 25% of respondents with wells report having never tested their current well water, and of those that have tested, fully 53% report having not tested for arsenic.
- 2003 – EHU established a listserve to foster integration, consistency, and collaboration on well water issues (includes individuals both within and outside state government).
- 2003 – EHU obtains funding from U.S. EPA to develop a new brochure to promote testing of well water, using "easy-to-read" health literacy techniques and focus group testing.

Collectively, these activities have documented that the occurrence of arsenic in private well water is a statewide environmental health issue. Specifically, that 11% of household wells in Maine have arsenic levels greater than health guideline of 10 ppb; that elevated levels can be found all over Maine; that levels of arsenic can be sufficiently high to warrant consideration of clinical evaluation; and that high levels can cluster together and therefore warrant a community based response to get enhanced testing of wells.

These efforts have resulted from coordination and collaboration among various interested groups, and have happened in the absence of any formal systems approach for ensuring safe drinking water for private well owners. These efforts have increased our understanding of the occurrence of arsenic in well water in Maine and they reflect the conduct of elements of the ten essential environmental health services and core capacities for the effective practice of environmental health. While these efforts have been largely confined to addressing concerns specific to arsenic in well water, Maine nevertheless is well positioned to move forward with an effort to develop a formal systems approach for responding to other private well water issues (e.g., uranium, bacteria, nitrates, radon).

The need for an enhanced, integrated, and coordinated environmental health services program for private wells remains strong. Perhaps the best indicator for this is data from Maine's 2003 state BRFSS module on household well water testing. EHU developed a module of questions that are being used to: estimate and describe use of well water as a water source; evaluate the ongoing intervention to increase well-water testing, and; support the development of legislation to require disclosure of any arsenic test results during a housing transaction. Of 2,238 respondents, 52 % said they get any of the water they currently use for drinking, cooking or bathing from a well. 25 % of respondents reported never testing their well water at the current residence. Of those respondents that had tested their well water, 53 % reported that they had not tested their water for arsenic. Respondents with a lower level of formal education (high school graduate or less) were more likely than those with any college education to get their water from a well (P-value =0.0018). Those who were younger (18-34), had a lower annual household income (<$25,000) and those with less education (high school graduate or less) were less likely to have ever had their current well-water tested (P-value: 0.0472, 0.0073 and 0.0015 respectively). Respondents with any college education and those with a higher annual household income (>=$25,000) sited a home sale as the most common reason for well water testing. Older respondents (>=65 years) and those with a lower higher annual household income (<$25,000) cited concern for water most often. Respondents who had tested their wells specifically for arsenic had a higher annual household income (>=$25,000) and were younger (age 18-34 (p-value <0.09, 0.005 respectively) then those who had not tested their water for arsenic.

There is no reason to expect higher testing results for other water contaminants such as radon and uranium 238. Uranium 238 was only recently added to the standard water test kit available from the Health & Environmental Testing Laboratory, and radon is not part of the standard water test. While the Radon Control Program has legislation requiring the reporting of test data, the quality of reported data has severely limited ability to undertake even basic spatial and population analyses (e.g., most data is only reported at the zip code level, there are many duplicates in the database because of tendency of both laboratories and inspectors to separately report the same data).

Another indicator for assessing current environmental health services has been calls to the EHU's toll-free line by well-owners who have just received their water test results. EHU responds to over 1500 calls per year. Over the years, we have noted that callers often have difficulty interpreting their water test results, especially when data are

reported with decimals. For example, the practice of testing laboratories to report arsenic levels in parts-per-million rather than parts per billion causes unnecessary confusion because the public's difficult comprehending decimal figures. We do not confront similar confusion with uranium 238, for example, because test results are reported in parts-per-billion. Of greater concern is the degree of confusion we confront because conflicting information callers receive from the various state agency, testing laboratories, water treatment companies, and real estate agents that can become involved in responding to well water test results. We have additionally encountered confusion over when it is appropriate to seek clinical care (e.g., urine or blood test for arsenic or uranium). Callers can be unnecessarily alarmed about the magnitude of the health hazard or the important routes of exposure. A common occurrence is that callers are often interested in treatment systems for the entire home rather when a less-expensive point-of-use treatment system would provide appropriate reduction in exposure.

Perhaps as a final indication of the need for enhanced environmental health services for private well owners, it should be noted that the Maine State Legislature enacted a public law in the 121st Legislature requiring the Department of Human Services, Bureau of Health, to submit a report to the Joint Legislative Committees on Natural Resources and Health and Human Services (Chapter 457, Sec. 4). The report is to contain an assessment of the need for a comprehensive safe drinking water program for private wells to address arsenic and other contaminants of human health concern and recommendations to address any identified needs. Because of fiscal constraints on the State budget, no funding was provided to undertake this assessment.

3) Description of the proposed intervention to address the environmental health issue and enhance capacity

Based on these experiences and information, we believe that Maine is in need of an enhanced comprehensive environmental health services program built on the framework of the Ten Essential Public Health Services and Ten Essential Environmental Services. To this end, we propose to undertake the following activities if awarded funding under this program announcement:

a) Increase testing of private well water for major arsenic, uranium 238, radon, bacteria, nitrates and lead through the distribution of a new "plain language" brochure developed using focus group techniques;
b) Develop new test result reporting forms for use by the State Health & Environmental Testing Laboratory using "plain language" health literacy techniques and focus group testing;
c) Develop educational materials for each contaminant using "easy-to-read" health literacy techniques and focus group testing, and develop a new state website dedicated to providing information for private well water owners;
d) Develop an automated electronic alert system for notifying toxicologist of high water test results so that the toxicologist makes the first call to the household;

e) Formalize the arsenic cluster response system by stakeholder involvement in a planning process, involving laboratories, state agency, and local government officials;
f) Achieve improved integration and coordination of delivery of services to private well owners through the organization of a planning consortium consisting representatives from state government, federal government, local government, university, water treatment companies, well drillers, health care providers, and private well owners;
g) Further develop and support partnerships with academic institutions to assist and support relevant well water related research;
h) Develop and implement and evaluation plan consisting of logic models with associated indicators for programmatic work, and state BRFSS testing modules to assess increase awareness and testing of well water.

Further elaboration of proposed activities is provided within the next section.

4) Description of the use of the ten essential environmental health services and core capacities to address the issue.

Informing, educating, and empowering people about environmental health issues. The first three proposed activities (3a - 3c, above) reflect the application of environmental health services aimed at informing, educating, and empowering people about environmental health issues. Any effort to empower people through information and education must confront reading literacy. For example, in a 1995-6 study of the relationship of literacy to asthma knowledge, the percent of asthma patients who knew that they should stay away from things that they are allergic to even when they take their asthma medication every day was 89% for those with a high school graduate reading level, 77 % for those with a 7-8th grade reading level, 59 % for those with a 4-6th grade reading level, and 45% among those asthma patients with a reading level of 3rd grade.[13] Though the average reading level in the U.S. is approximately 8th grade, many health related materials are written at above 10th grade reading levels. For example, we have recently tested a variety of written materials targeted to private well owners and distributed by the Maine Cooperative Extension Service as well as some produced and distributed in conjunction with a recent initiative by the U.S. Environmental Protection Agency Region 1 Office. These materials generally tested at reading levels between 12th and 16th grade levels. Consequently, under activities described under 3b and 3c above, we are proposing to develop new reporting forms for laboratory test results along with new chemical-specific education materials with targeted literacy levels equivalent to below 8th grade. In undertaking this work, we will partner with the same team (Sue Stableford, University of New England AHEC Adult Health Literacy Center) and use the same approach used in developing our "Eat Fish Low in Mercury" brochure (meetings with key informants, focus group testing, plain language), that received national recognition as representing a "particularly exemplary job of tailoring materials and programs to the literacy needs of their target audiences." Indeed, this same team and and

[13] Williams, Mark V., David W. Baker, Eric G. Honig, et al., *Inadequate Literacy Is a Barrier to Asthma Knowledge and Self-Care*, Chest, Vol. 114 (4), American College of Chest Physicians, 1998

approach are currently in use to develop a new brochure intended to promote testing of well water.

Linking people to needed environmental health services. Even materials developed at the appropriate literacy level are only effective if people receive them and read them. This is where the task of linking people to needed environmental health services and assuring the provision of health services when otherwise unavailable comes in. The services people require is knowledge of what to test their well water for, how often to test, how to test, and what to do should their well water test prove unsatistfactory. We propose to link people to many of these services (testing laboratories, state staff with specific expertise) through the distribution of a new brochure currently under development. The latest draft of this brochure is currently being tested in focus groups. Proposed distribution outlets include town and city offices, real estate agents, well drillers, water treatment companies, and testing laboratories. We will additional perform targeted mailings, such as mailing to all households in Maine with a recent birth located in a town with a high proportion of private well water use (i.e., linking Maine's Birth Certificate Registry data with U.S. Census data). We have successfully applied this targeted mailing approach in the past to target recruitment efforts for studies of households likely to have both young children and well water, and to reach households that have someone with a fishing license and a young child for targeted distribution of the "Eat Fish Low in Mercury" brochure.

While we will continue to provide access to toxicology staff for consults on interpreting well water test results via our statewide toll-free telephone number, it is expected that this increased out-reach effort will increase both the number of calls and the types of calls (e.g., bacteria, fluoride and radon, in addition to arsenic, uranium and lead). This can be a problem for staff that are already struggling to respond to the current volume of calls. We therefore propose the development of a new state website that will be used as a gateway to information on testing, health concerns, and treatment technologies. The hope is to make easy-to-read informational materials available over the internet, thereby either reducing the volume of calls or decreasing the length of calls for Bureau of Health staff by providing a referral place for more information.

Diagnosing and investigating environmental health problems and health hazards in the community. We currently have a manual system wherein the chemist will email toxicology staff when a particularly high arsenic or uranium test result is detected. The toxicologist then makes the initial call to the well owner to provide a health consult. We propose to automate this system (activity 3d above), which will soon be possible as the state HETL is migrating its current legacy IT system to LIMS USA StarLIMS system. StarLIMS should also be capable of allowing EHU epidemiological staff to directly download laboratory data by town or zip code, which in turn can be merged with other sources of data (e.g., E911 Rds database) to obtain geocode information sufficient for spatial analyses. This will enable more rapid community level assessment in the early stages of a cluster investigation. As a final component of this effort, there would be a concurrent development of a protocol for when to recommend clinical evaluation, which will be jointly developed with Northern Maine Poison Center.

One of the ongoing frustrations has been the repeated discovery of the new groundwater quality problems. Though both arsenic and radon have been a major focus environmental health services since the early 1990s in Maine, we have struggled to respond to new information about the statewide occurrence of uranium 238, a cluster of wells high in cadmium in the Blue Hill region, and a cluster of wells high in antimony in the Corinna/Carmel/Corinth region. The discovery of these new well water concerns has partly been the result of new laboratory instrumentation (ICP-MS) for water analyses that supports simultaneous analysis of a large number of inorganic constituents. The initiation of the Ambient Bedrock Water Quality Program by the Maine Geological Survey in 2001 has resulted in the first systematic survey of this issue. However, available resources constrain both the number of wells sample, the number of study locations, limit this effort and the number of constituents analyzed. We propose to partner with the Maine Geological Survey to provide limited funding to expand both the number of wells tested and constituents analyzed to better address environmental health concerns.

Mobilizing community partnerships to identify and solve environmental public health problems. In the past we have worked directly with either town elected officials, local health officers (Maine does not have a county health department system), or community residents when mounting cluster investigations. These are individuals who volunteer to help spread the word about the need to test wells and/or act as a distribution center for test kits. We intend to explore ways to formalize such partnerships through development of a formal protocol with input from local officials (activity 3e).

Evaluating the effectiveness and accessibility of population-based environmental health services. As discussed above, the EHU has already performed a baseline analysis of general testing of well water and specific testing for arsenic among the statewide population of Maine residents relying on private well water. We will develop a follow-up state BRFSS module to evaluate whether we have achieved our objective of increased testing for well water contaminants approximately one year after a new information campaign has been mounted. We will additionally expand the questions asked to begin to explore whether individuals with well water issues are taking action to reduce the hazard, as well as testing for other contaminants (e.g., radon, uranium). We are additionally planning to use a mailed survey instrument to evaluate to effectiveness of a re-designed reporting form for laboratory test results. This survey instrument would be sent with the test results to approximately 1000 recipients, both before the redesign of the reporting for and after.

Ensuring a competent environmental health workforce and collaborating with academic institutions and others conducting research for new insights to environmental health problems. We view these two essential environmental health services as closely linked. We believe that by maintaining collaborative relationships with academic institutions and supporting research opportunities, we additionally act to ensure a competent environmental health workforce. This occurs through the interaction of state staff with academic and governmental researchers. The EHU has and is collaborating on a number of research projects with academic and public health institutions. As noted above, we

have had a very productive ongoing collaboration with CDC's National Center of Environmental Health with the joint study of childhood exposure to arsenic in household well water. This study has concluded the field stage and is moving into the data collation and analysis stage. A follow-up study that would focus on the performance of arsenic removal systems in the real world is in the design stages. EHU has had a collaborative relationship with the University of Maine's Department of Natural Resource Economics, resulting in a study to assess the cost effectiveness of different arsenic removal systems (*reference*), and a new study to assess willing-to-pay for arsenic removal. We are exploring collaborations with the new University of Southern Maine Center for Integrated and Applied Toxicology, which is interested in a potential studying of arsenic and adverse reproductive outcomes. Our role in such collaborations is to facilitate research by providing understanding of and access to various state data that can be used to conduct studies (e.g., well water test data). We are proposing to formally allocate a percentage of time of our environmental epidemiologist to become more involved in both facilitating and participating in such studies, in part so we can gain from the collaboration.

5) Integration of intra- and inter-departmental state and local partnerships with academic institutions and/or other environmental health programs for assistance and support

Aside from the state agencies involved in providing some level of environmental health services for private well owners, there are also a number of groups from the private sector. These groups include testing laboratories, water treatment companies, well drillers, real estate agencies, and home inspectors. We propose to bring all these governmental and nongovernmental stakeholders together into a planning consortium process for two purposes. One purpose is to assess needs and develop plans for greater integration, coordination, and consistency in environmental health services provided to well owners. The other purpose is to ask this group to collectively respond to the charge from the 121st Maine Legislature (Public Law 457, Section 4) – Is there a need for a comprehensive safe drinking water program for private wells and recommendations to address any identified needs?

6. Long and short range objectives and timelines for schedules of completion, and expected long and short range measurable outcomes.

Objectives	Activities	Responsible Party	Timeline	Measures
1. Increase testing of private wells for known Maine environmental health issues (arsenic, radon, U238, bacteria, lead, nitrate)	❑ Obtain printer for new brochure by RFP and print copies for distribution	Project Coordinator & PRA II, Contractor	09/04 – 10/04	❑ Brochures printed
	❑ Develop a distribution plan and tracking database and delivery schedule	Project Coordinator, PRA II, and DBA	09/04 – 10/04	❑ Distribution plan
	❑ Distribute Brochures to town offices, real estate agents, well drillers, water treatment companies, and targeted mailings (e.g., households with a new child and living in a town with a high proportion of private well water use).	Project Coordinator, PRAII & Contractor	11/04 – Ongoing	❑ Brochures distributed
2. Inform, educate and empower people about well water related environmental health services issues.	❑ Develop new "easy-to-read" laboratory reporting forms.	PI, Toxicologist, Laboratory stakeholders, Contractor (UNE/AHEC)	11/04 – 06/05	❑ New laboratory reporting forms approved for use by state Health & Environmental Testing Lab, and shared with private labs.
	❑ Develop new "easy-to-read" well water contaminant brochures with information about health and treatment issues.	PI, Project Coordinator, Toxicologist, Treatment system stakeholders, Contractor (UNE/AHEC)	07/05 – 07/06	❑ New brochures for arsenic, radon, uranium, lead, nitrates, and bacteria, all at a literacy level below an 8th grade equivalent reading level.
	❑ Develop well water website as gateway for information on environmental health services related to well water.	PI, Project Coordinator, and Contractor (InforME)	11/04 – 06/05	❑ New operational website

Objectives	Activities	Responsible Party	Timeline	Measures
2. Inform, educate and empower people, continued…	❑ Obtain printer for new brochure by RFP and print copies for distribution	Project Coordinator, and PRAII	08/06 – 09/06	❑ New brochures printed and distributed on request and as down-loading files from new website.
3. Enhanced diagnosing and investigating well water hazards in the community.	❑ Develop automated electronic reporting system for flagging especially high test results directly to a toxicologist.	PI, Toxicologist, DBA, HETL staff.	10/04 – 04/05	❑ Automated electronic reporting system functional
	❑ Enhance and formalize a high arsenic well water cluster response system	PI, Toxicologist, Env. Epi., PHP, HETL staff, local gov't stakeholders, Poison Center	10/04 – 04/05	❑ Plan describing response system ready to be implemented
	❑ Exploit capabilities of state public health laboratories new IT system (StarLims) to gained improved direct access to well water data for geo-coding and use in investigator community water hazards.	Env. Epidemiologist, DBA, HETL staff.	11/04 – 02/05	❑ Ability to gain direct access to HETL well water data, geo-code, and prepare GIS maps for spatial characterization of hazards.
4. Improved integration and coordination of delivery of services to private well owners	❑ Develop a planning consortium consisting of governmental and non-governmental stakeholders involved with well water related environmental health services .	PI, Project Coordinator, Contractors (Muskie)	10/04– 12/04	❑ List of planning consortium members who have agreed to participate

Objectives	Activities	Responsible Party	Timeline	Measures
4. Improved integration and coordination of delivery of services *continued...*	❑ Convene Planning Consortium to develop plan for improved integration and coordination of services to private well owners, and to assess needs, concerns, barriers to improved integration.	PI, Project Coordinator, Contractor (Muskie)	01/05 – 09/05	❑ Plan for improved integration and coordination in the delivery of services and a report which can be submitted to State Legislature on the need for a Safe Drinking Water Program for Private Wells
5. Further develop and support partnerships with academic institutions and other environmental health organizations to assist and support relevant well water related research	❑ Assist in the design and identification and obtaining of water test data to support a planned study assessing association between arsenic levels in water and adverse reproductive outcomes being planned by the University of Southern Maine Center for Intregrated and Applied Environmental Toxicology.	PI, Env. Epidemiologist, DBA	09/04 – 08/06	❑ Completed study design, USM undertakes study, completed report.
	❑ Assist with the conduct of a study of the public's willingness to pay to protect households on private wells from elevated levels of arsenic.	PI, Env. Epidemiologist, DBA	09/04 – 08/07	❑ Successful conduct of study and manuscripts for publication
	❑ Partner with Maine Geological Survey to support expanded and ongoing assessments of ground water quality in Maine and factors that influence it.	PI, Env. Epidemiologist, Project Coordinator	09/04 – 08/07	❑ Expanded assessment of well water monitoring system, and reports with results.
	❑ Partnership with CDC National Center for Environmental Health and U.S. Geological Survey on study to assess performance of water treatment systems in "real world" settings.	PI, Env. Epidemiologist, Project Coordinator	01/05 – 08/07	❑ Successful conduct of study with reports and manuscripts for publication. ❑

Objectives	Activities	Responsible Party	Timeline	Measures
7. Evaluation for environmental health services program	❑ Complete analysis of 2003 BRFSS results on testing of well water as baseline data for testing of private well water.	Epidemiologist	09/04 – 10/04	❑ Contribute to development of a EPHT network implementation plan
	❑ Develop Logic models and evaluation plans for each objective.	PI, Project Coordinator, Contractor (MCPH)	09/04 – 01/05	❑ Competed logic models and evaluation indicators.
	❑ Develop follow-up state BRFSS modules to assess any improvement of testing for arsenic and other well water contaminants, and whether action taken to reduce hazard.	PI, Project Coordinator, Epidemiologist	04/05 – 08/05	❑ Set of field test & validated BRFSS questions.
	❑ Run state BRFSS module to evaluate increased testing of well water and prevalence of action to reduce hazard.	Epidemiologist, Contractor (Maine BRFSS Survey Contractor)	01/06 – 12/06	❑ Survey administered and completed
	❑ Analyze results of 2006 state BRFSS module on well water testing	Epidemiologist	02/07 – 03/07	❑ Basic weighted estimates from survey
			03/07 – 06/07	❑ Full analysis with demographic variables.
	❑ Tracking logic model evaluation indicators	PI, Project Coordinator, Contractor (MCPH)	02/05 – 08/07	❑ Status reports on progress meeting evaluation indicators.

Abbreviations: PI – Principal Investigator; DBA – Database Analyst; Env. Epi – Environmental Epidemiologist; PHP – Public Health Physician; PRAII – Planning & Research Associate II; HETL - Health & Environmental Testing Laboratory; MCPH – Maine Center for Public Health; UNE/AHEC – University of New England Adult Health Literacy Center; Muskie – University of Maine Muskie Institute.

7) Description of methodology for sustainability efforts of the activities beyond 3-year period

We believe this proposed scope of work should be sustainable beyond the 3-year period. There are several reasons for this optimism. First, there are significant one-time expenses associated with proposed activities that are not anticipated in need of significant ongoing support. For example, costs associated with: a) developing laboratory reporting forms and informational/education materials, b) developing a new well water website, c) developing IT systems for automated direct reporting of test results, and d) organizing and operating a planning consortium of governmental & non-governmental stakeholders – are largely one-time costs. Costs associated with reprinting materials and postage is not viewed as major expenses.

Second, we have not requested any new staff, but rather, partial support (typically small fractions of an FTE) for existing positions.

Third, this Program Announcement comes at a very opportune time in that we currently have a legislative mandate to report back on the need for a comprehensive safe drinking water program for private wells and recommendations to address any identified needs. If funded by CDC, we will have an opportunity to demonstrate what a comprehensive safe drinking water program would look like, as well as show any evidence of success in increasing testing of private wells. This in turn could form the basis of a recommendation for ongoing State support of a comprehensive environmental health services program to address the needs of private well owners.

D. DESCRIBE PROJECT'S EVALUATION PLAN TO MEASURE PROCESS AND OUTCOMES (LONG-TERM AND SHORT-TERM).

We propose to develop logic models to clearly identify short-term, intermediate and long-term outcomes, which in turn will facilitate identifying evaluation indicators. We have made extensive use of logic models for this process in our current work under the Environmental Public Health Tracking Grant. We will be contracting with Dr. Brenda Jolly of the Maine Center of Public Health, who is an expert in Program Evaluation and has had extensive experience in developing logic models for numerous BOH programs.

The most likely measurable long-term outcome is a focus on the reduction of environmentally related risk factors known to contribute disease. Levels of contaminants in well water can be viewed environmentally related risk factors. BRFSS will be the primary survey instrument for tracking a reduction in environmentally related risk factors such as testing of well water and taking action to reduce exposures.

Appendix A

Grant Proposal Budget Information

Version 7/03

APPLICATION FOR FEDERAL ASSISTANCE

2. DATE SUBMITTED	Applicant Identifier
5/27/04	
3. DATE RECEIVED BY STATE	State Application Identifier
4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier

1. TYPE OF SUBMISSION:

Application	Pre-application
☐ Construction	☐ Construction
☑ Non-Construction	☐ Non-Construction

5. APPLICANT INFORMATION

Legal Name: State of Maine, Department of Human Services	Organizational Unit:
	Department: Department of Human Services
Organizational DUNS: 80-904-5594	Division: Bureau of Health / Environmental Health Unit
Address:	
Street: 11 SHS 285 Water St Key Plaza 3rd Floor	Name and telephone number of the person to be contacted on matters involving this application *(give area code)*
City: Augusta	Prefix: Dr / First Name: Andrew
County: Kennebec	Middle Name: E
State: ME / ZIP: 04333	Last Name: Smith
Country:	Suffix: S.M.,Sc.D
6. EMPLOYER IDENTIFICATION NUMBER *(EIN)*: 01-6000001	Phone Number *(give area code)*: (207) 287-5189 / FAX Number *(give area code)*: (207) 287-3981
8. TYPE OF APPLICATION: ☑ New ☐ Continuation ☐ Revision If Revision, enter appropriate letter(s) in box(es): (See back of form for description of letters) Other *(Specify)*:	7. TYPE OF APPLICANT *(See back of form for Application Types)*: A. State Other *(Specify)*:
	9. NAME OF FEDERAL AGENCY: Center for Disease Control and Prevention
10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER: 93-283 TITLE *(Name of Program)*: Delivering Environmental Health Services	11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT: Environmental Health Unit
12. AREAS AFFECTED BY PROJECT *(Cities, Counties, States, etc.)*:	
13. PROPOSED PROJECT:	14. CONGRESSIONAL DISTRICTS OF:
Start Date: 09/01/2004 / Ending Date: 08/31/2007	a. Applicant: First / b. Project: First and Second

15. ESTIMATED FUNDING:	
a. Federal	169,887.00
b. Applicant	
c. State	
d. Local	
e. Other	
f. Program Income	
g. TOTAL	169,887.00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

a. ☐ YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON

DATE: _____

b. ☑ NO. PROGRAM IS NOT COVERED BY E. O. 12372

OR PROGRAM HAS NOT BEEN SELECTED STATE FOR REVIEW

17. IS APPLICATION DELINQUENT ON ANY FEDERAL DEBT?

☐ YES If "Yes," attach an explanation. ☑ No

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.

a. Authorized Representative

Prefix	First Name	Middle Name
Mr	Craig	
Last Name: Hitchings		Suffix
b. Title: Acting Executive Manager		c. Telephone Number *(give area code)*: (207) 287-1905
d. Signature of Authorized Representative		e. Date Signed: 5/26/04

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Standard Form 424 (Rev. 9-2003)
Prescribed by OMB Circular A-102

OMB Approval No. 0348-0044

BUDGET INFORMATION - Non-Construction Programs

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Delivering Environm	93.283	$ 169,887.00	$	$	$	$ 169,887.00
2.						0.00
3.						0.00
4.						0.00
5. TOTALS		$ 169,887.00	$ 0.00	$ 0.00	$ 0.00	$ 169,887.00

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
a. Personnel	$ 49,901.00	$	$	$	$ 49,901.00
b. Fringe Benefits	20,959.00				20,959.00
c. Travel	6,748.00				6,748.00
d. Equipment	0.00				0.00
e. Supplies	910.00				910.00
f. Contractual	60,000.00				60,000.00
g. Construction	0.00				0.00
h. Other	22,760.00				22,760.00
i. Total Direct Charges *(sum of 6a - 6h)*	161,278.00	0.00	0.00	0.00	161,278.00
j. Indirect Charges	8,609.00				8,609.00
k. TOTALS *(sum of 6i and 6j)*	$ 169,887.00	$ 0.00	$ 0.00	$ 0.00	$ 169,887.00
7. Program Income	$ 0.00	$	$	$	$ 0.00

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8.	$	$	$	$ 0.00
9.				0.00
10.				0.00
11.				0.00
12. TOTALS *(sum of lines 8 and 11)*	$ 0.00	$ 0.00	$ 0.00	$ 0.00

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 169,884.00	$ 87,471.00	$ 27,471.00	$ 27,471.00	$ 27,471.00
14. Non-Federal	0.00				
15. TOTAL *(sum of lines 13 and 14)*	$ 169,884.00	$ 87,471.00	$ 27,471.00	$ 27,471.00	$ 27,471.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16. Environmental Health Unit	$ 169,887.00	$ 169,887.00	$ 1,698,887.00	$ 169,887.00
17.				
18.				
19.	$	$	$	$
20. TOTALS *(sum of lines 16 - 19)*	$169,887.00	$169,887.00	$1,698,887.00	$169,887.00

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: $161,278.00	22. Indirect Charges: $8,609.00
23. Remarks	

Appendix B

Letters of Support

usm
UNIVERSITY OF
SOUTHERN MAINE
Center for Integrated and
Applied Environmental
Toxicology

May 26, 2004

Andrew E. Smith, Ph.D.
Environmental Health Unit
Maine Bureau of Health
286 Water St.
Augusta ME 04333

Dear Andy:

I am very pleased to learn that you have an opportunity to apply for funds from CDC to enhance your delivery of environmental health services.

As you and I have discussed over the past several months, we at the Center for Integrated and Applied Environmental Toxicology (CIAET) at the University of Southern Maine are keenly interested in further expansion of our collaboration with the Environmental Health Unit at the Bureau of Health.

The CIAET is growing rapidly. With the submission of an application this fall for a COBRE grant from the National Institutes of Health and with submission of several new R01 applications, we plan to augment our current multidisciplinary team of scientists with recruitment of several new researchers having expertise in the areas of neurotoxicology, genetic toxicology, immunotoxicology, molecular epidemiology and bioinformatics. We feel that our initial strong emphasis on the effects of arsenic on development in mice and humans represents a program of research that is especially appropriate for Maine, given the public health issues with drinking water here. One of our long-term goals is to secure ongoing funding from the National Institute of Environmental Health Sciences as a comprehensive Environmental Health Center. All of this growth depends critically on our close working relationship with you and your staff.

We are extremely appreciative of all of the assistance that you and members of your staff have provided to us in our development of a USM-based epidemiologic study of the relationship between arsenic in drinking water and the birth weight of infants in Maine. Based on the background information and the specific Maine data that you have shared with us, it seems that a useful study can be mounted in the near future. This work will greatly strengthen our applications for enhanced funding of our Center and will contribute important information concerning effects of arsenic in a U. S. population. Throughout this effect we

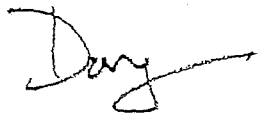
P.O. Box 9300, Portland, ME 04104-9300
(207) 228-8040, TTY (207) 780-5646, FAX (207) 228-8057
www.usm.maine.edu/ciaet

will benefit enormously from the availability of the expertise of you and your staff as collaborators.

Dr. Dan Wartenberg, an eminent environmental epidemiologist, is planning to spend a semester with us as a Visiting Libra Scholar for the spring term of 2005. As we have discussed, one of his primary activities will be to work with both your unit and our center to develop collaborative projects and to contribute his expertise to your several initiatives that relate to Environmental Public Health Tracking.

We look forward to continuing and enhanced collaboration.

Sincerely yours,



W. Douglas Thompson, Ph.D.
Professor of Epidemiology and Associate Director,
Center for Integrated and Applied Environmental Toxicology

Department of Resource
Economics and Policy

THE UNIVERSITY OF MAINE

5782 Winslow Hall
Orono, Maine 04469-5782
www.umaine.edu

May 24, 2004

To Whom it Concerns:

This letter is written in support of Dr. Andrew Smith's request for funding to support the delivery of environmental health services to ensure safe drinking water for households with private wells. This is an extremely important issue in Maine.

Dr. Smith and I have worked on a number of applied research projects to enhance public understanding of the benefits and costs of protecting households on private wells from exposure to arsenic. WE have conducted a cost-effectiveness study of home treatment systems for arsenic, which led to information disseminated to households in Maine and a co-authored journal article. We are also in the middle of a large grant from U.S. EPA, as co-investigators, to look at the effects of arsenic water test results on sale prices of residential properties and the publics' willingness to pay to protect households on private wells from elevated levels of arsenic in drinking water.

These research activities have been a rich collaboration for the University of Maine and the Maine Bureau of Health. Further funding would help the Maine Bureau of health in extending services to protect households from contaminants in their drinking water. Dr. Smith is developing a model program that is an example for other states to follow in their protection efforts.

I strongly endorse Dr. Smith's application for funding. If you have any question about our collaborative work or my recommendation, please do not hesitate to contact me (207-581-3163 or kboyle@maine.edu).

Sincerely,

Kevin J. Boyle
Distinguished Maine Professor
and Chair

THE UNIVERSITY OF MAINE
Cooperative Extension

Putting Knowledge to Work with the People of Maine

May 26, 2004

Proposal Review Committee
Centers for Disease Control and Prevention
Atlanta, GA

Dear Sirs:

I am writing to express my support for the proposal submitted by the Maine Environmental Health Unit regarding private well research, education and outreach. The University of Maine Cooperative Extension is the major educational outreach program of the University of Maine. The Water Quality office at the University of Maine Cooperative Extension is part of a New England regional collaborative effort (in cooperation with US EPA Region 1) to promote the regular testing of private wells, and we have been working with the Maine Environmental Heath Unit for over a year. Protecting drinking water and human health is one of eight topical themes that the USDA CSREES (Cooperative State Research, Education and Extension Service) has identified as an Extension water quality program priority.

If the Environmental Health Unit is selected for funding, the University of Maine Cooperative Extension will maintain our collaboration, to ensure that the people of Maine receive concise, accurate information pertaining to private well drinking water. This collaboration has already resulted in a private well listserve, as well as meetings to discuss programming needs. I look forward to working with the Environmental Health Unit as we attempt to provide research based information to Maine citizens regarding their water and their health.

Thank you for your consideration.

Sincerely,

Laura R. Wilson
Water Quality Assistant Scientist
University of Maine Cooperative Extension

University of
NEW ENGLAND

May 25, 2004

Andrew E. Smith, S.M., Sc.D.
State Toxicologist and Director
Environmental Health Unit
Bureau of Health/Department of Human Services
286 Water Street
Augusta, ME 04333

Dear Dr. Smith:

It is my pleasure to let you know of my availability and willingness to partner with the Environmental Health Unit to develop a series of plain language materials about well water test results and correcting water problems.

Our history of collaborating on successful materials about mercury in fish and testing well water ensures that we will work effectively together. The mercury in fish brochure was nationally recognized as an example of outstanding public health communication, and as you know, was "borrowed" in whole or in part by other states. I look forward to the same warm acclaim for the soon-to-be printed brochure we've developed together on testing well water.

We know from the careful development and extensive field testing of our brochures that our rural Maine population with limited literacy skills can read, understand, and use the information in the brochures. This is essential to meeting national health literacy goals, stated repeatedly by Secretary of Health and Human Services, Tommy Thompson, and Surgeon General, Richard Carmona, M.D.

The AHEC Health Literacy Center at the University of New England has a national reputation for excellence in both training and materials development. We are the plain language trainers for the Centers for Disease Control and Prevention and have also trained extensively for the Environmental Protection Agency. We are thus well-versed in environmental risk communication and well equipped to communicate effectively about drinking water problems.

I welcome the opportunity to work with you and others, including our graphic designers, to create information about additional topics of vital health concern to Maine families.

Sincerely,

Sue Stableford

Sue Stableford, MPH, MSB, Director
AHEC Health Literacy Center

Maine
AHEC
Health
Literacy

11 Hills Beach Road, Biddeford, Maine 04005-9599
Phone 207 283-0171
Fax 207 282-6379

MAINE CENTER
for Public Health

May 26, 2004

Andrew E. Smith, SM, ScD
State Toxicologist & Director
Environmental Health Unit
Bureau of Health
11 State House Station
286 Key Plaza Bldg. 8th Floor
Augusta, ME 04333

Dear Andy,

The Maine Center for Public Health is very enthusiastic about your application to the Centers for Disease Control and Prevention regarding the delivery of environmental health services.

The Maine Center for Public Health is a private non-profit organization established in 1996 to improve the health of Maine citizens through an organized program of policy analysis, research, technical assistance and training. The Center has a strong relationship with the Maine Bureau of Health, particularly in the area of evaluation. Currently, MCPH is leading several evaluation efforts for the Bureau and helping to build internal evaluation capacity. Our evaluation work entails the development of logic models, indicators, and comprehensive evaluation plans and reports. The Center has also worked extensively with the Bureau utilizing the 10 Essential Public Health Services Framework.

The Maine Center for Public Health will provide the Bureau with technical assistance in the development and implementation of an evaluation plan that is both process and outcome driven. We feel this effort is important because it will give the Environmental Health Unit at the Bureau of Health important information that can be used to assess their efforts regarding delivering environmental health services.

Staff at MCPH is trained in program evaluation and we have a history of working collaboratively with the Environmental Health Unit. This project fits with both our personal and professional interests and experience. We are delighted to be a part of this effort.

Sincerely,

Karen O'Rourke, MPH
Vice President, Operations

STATE OF MAINE
DEPARTMENT OF CONSERVATION
22 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0022

JOHN ELIAS BALDACCI
GOVERNOR

PATRICK K. McGOWAN
COMMISSIONER

Dr. Andrew Smith
State Toxicologist
Bureau of Health
11 State House Station
Augusta, ME 04333

Dear Andy:

I am pleased to express my full support for your proposal to the CDC funding opportunity number 04113 – Delivering Environmental Health Services. I support your proposal as an important step toward establishing a comprehensive health services program for private wells. As you know, Maine currently has no program to directly address quality issues related to private wells, in spite of the fact that these wells represent the domestic water supply for about 40% of the population. In the past several years the state has faced several significant water quality issues with private wells including radon, arsenic, and uranium. State agencies in response to these issues have done an admirable job in directing scant resources toward a program that educates the homeowner in the need for water testing and making them aware of remediation methods. Clearly, more must be done to address this significant issue.

Over the past several years, the Maine Geological Survey initiated a small program to assess ambient bedrock groundwater quality in different geologic settings in the state. This program is helping us understand the incidence of quality problems (metals in groundwater) as well as providing some insights into their underlying source, usually the varying bedrock geology of the state. With additional funds this program could cover more territory and analyze for other types of contaminants.

I look forward to the opportunity to work with you on this project and others related to the important issue of private well water quality.

Sincerely,

Robert G. Marvinney
Director and State Geologist

MAINE GEOLOGICAL SURVEY
ROBERT G. MARVINNEY, DIRECTOR AND STATE GEOLOGIST

PHONE: (207) 287-2801
FAX: (207) 287-2353
TTY: (207) 287-2213

United States Department of the Interior

GEOLOGICAL SURVEY

Water Resources Division
26 Ganneston Drive
Augusta, Maine 04330

May 27, 2004

Dr. Andrew E. Smith
State Toxicologist
Maine Bureau of Health
Augusta, ME 04330

Dear Dr. Smith,

This letter is in support of your proposal being submitted to the U.S. Centers for Disease Control and Prevention, Delivering Environmental Health Services Program.

The USGS, Maine District enthusiastically welcomes a lead role the Maine Bureau of Health (MBH) would play in integrating and coordinating all activities related to disseminating environmental health information to private well owners and consumers of private well water. Given the array of the major contaminants identified in your proposal, of potentially occurring in private wells throughout the state of Maine, changing environmental regulations, and the evolving educational and outreach burdens associated with the occurrence of these contaminants, clearly there is an urgent need for this service.

A great example of how the Maine Bureau of Health has already played a role in this function is illustrated by the recent successful collaboration between the USGS-Maine District and MBH, investigating the occurrence and distribution of MTBE in private wells throughout the state. The synergy between USGS science and the environmental health organizational machinery of the Maine Bureau of Health was essential in getting this information out to private well owners.

The USGS-Maine District and MBH continue to enjoy a satisfying and productive collaborative relationship. In partnership with the CDC, a pilot study investigating the occurrence and distribution of inorganic arsenic species, As(III) and As(V) in private well water was recently completed. The USGS-Maine District, MBH and CDC are currently collaborating on an evaluation of the impact variations in arsenic geochemistry and well water chemistry have on the effectiveness of domestic well-water filtration systems in removing arsenic. This study will provide critical information to State and local agencies, Maine Tribes, and to private citizens concerning treatment strategies and maintenance of domestic well-water filtration systems for the removal of arsenic and other heavy metals from drinking water supplies. The study will also provide valuable scientific information about the geochemical controls on the occurrence, distribution, and mobilization of arsenic in New England ground-water systems.

While the current MBH/CDC/USGS collaboration is focused solely on arsenic as a contaminant, regional occurrences of other heavy metals and contaminants have been identified by a number of federal, state and local agencies. Your proposal addresses the urgency to achieve greater testing of private well water not only for arsenic, but allows for the further expansion of target contaminants to include lead, uranium 238, radon, nitrate and bacteria. We fully support this endeavor, and will collaborate with the Maine Bureau of Health on aspects of this project where it is appropriate for the USGS to be involved.

In addition to the local collaboration between the MBH and USGS-Maine District, ongoing national USGS programs such as the National Geochemical Survey (NGS), National Toxics Hydrology Program (http://toxics.usgs.gov/), Uranium Resource Evaluation Program (NURE) (http://tin.er.usgs.gov/geochem/doc/home.htm) and the National Water-Quality Assessment (NAWQA) Program (http://water.usgs.gov/nawqa/) will be valuable resources in which to leverage many of the objectives of your study.

Furthermore, the addition of outreach and education components to this study will allow the Maine Bureau of Health, the U.S. Geological Survey, and the U.S. Centers for Disease Control to better inform and educate Maine's citizens about a range of critical health issues related to ground water contaminants impacting Maine's rural population.

Sincerely,

Robert M. Lent
District Chief
U.S. Geological Survey
Augusta, Maine

Maine Medical Center

NORTHERN NEW ENGLAND POISON CENTER

May 26, 2004

U.S. Centers for Disease Control
National Center for Environmental Health
4770 Buford Highway, F-28
Atlanta, GA 30341

To Whom It May Concern:

The Northern New England Poison Center (NNEPC) is the poison center serving the states of Maine, New Hampshire and Vermont. The Center has a strong history of working collaboratively with the Maine State Toxicologist, Dr. Andrew E. Smith, to provide comprehensive services to both health care professionals and lay persons living in Maine. The Poison Center received nearly 30,000 calls from Maine in 2003. Of these, 1,000 involved cases of or questions about environmental poisoning. Well water questions and exposures are not uncommon. The public and their health care providers are concerned.

The NNEPC consults with Dr. Smith regarding arsenic, uranium or nitrate levels in well water. The Poison Center manages the patients clinically and provides basic information. Dr. Smith provides risk assessment and relevant literature regarding long-term exposures to both the Center and the public. Procedures for assessing potential toxicity after chronic ingestion of uranium-containing well water were developed collaboratively. Additionally, considerations for assessing patients with chronic arsenic or nitrate exposure have been discussed. As a result of the collaboration between the State Toxicologist and the Poison Center, both patients and health care professionals in Maine receive comprehensive care and information.

The NNEPC strongly supports the State of Maine Bureau of Health's effort to enhance well water testing, communication and assessment of environmental toxicity in Maine. The Poison Center plans to participate in current and new efforts to address well water issues. Once new well water educational materials are developed, the NNEPC will distribute them throughout the state along with other poison prevention and education literature.

Sincerely,

Karen E. Simone, PharmD, DABAT
Managing Director, Northern New England Poison Center

22 Bramhall Street, Portland, Maine 04102-3175

The MaineHealth® Family

Supported by Maine Medical Center, the State Department of Human Services Division of Community and Family Health, the United Way, and federal grants from Department of Health and Human Services Health Resources and Services Administration through the Maternal and Child Health Bureau

Appendix C

CDC Review Comments on Proposal

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta, GA 30341-3724

August 20, 2004

Mr. Andrew Smith
State of Maine, Department of Public Health
Environmental Health Unit, Bureau of Health
11 SHS Key Plaza, 3rd Floor
Augusta, ME 04333

Reference: Program Announcement 04113

Dear Mr. Smith:

Your application submitted under Program Announcement 04113, Delivering Environmental Health Services was recommended for approval, but did not rank highly enough to be funded. A copy of the Summary Statement from the review of your application is enclosed.

This action in no way precludes consideration of any applications you may submit in the future. We appreciate the time and effort you spent on preparing this application.

Your application will be held for 12 months from the date of this letter, during which time all unfunded applications may be reconsidered for funding if additional money becomes available. After that period, it will be destroyed. If you wish to have your original application returned to you, please notify us in writing within 30 days and include a copy of this letter or provide the Program Announcement Number under which you applied along with your request.

If you have any questions concerning this, please contact Daneen Farrow-Collier at 770-488-4945.

Sincerely yours,

Sharunda Buchanan
Chief, Environmental Health Services Branch
Centers for Disease Control and Prevention
National Center for Environmental Health
4770 Buford Highway, NE (F28)
Atlanta, GA 30341-3724

Enclosure
cc: Sharron Orum, PGO (with enclosure)
Business Official (without enclosure)

Maine Department of Health & Family Services

Application Number: 04113-05

Name of Principal Investigator/Program Director: Andrew Smith

Name of Applicant Organization: Maine Department of Health & Family Services

Location of Applicant Organization (City, State): Augusta ME

Amount of CDC funding Requested: $169,887

Duration of Support Requested: 1 Year, with continuation funding in 2005 and 2006

Recommendation: Approve

Date Reviewed: June 30, 2004

PROJECT DESCRIPTION:

State of Maine demonstrated a clear need for a funded project that could bring together efforts to improve the drinking water quality which is a state-wide concern. As the lead public health agency, the Department of Health and Family Services, Environmental Health Unit, will lead this project.

There is a clear need to provide environmental health services to private wells, an unregulated source of drinking water for many residents. The environmental health program (established in 1981), in collaboration with other state and university programs, has been taking actions on drinking water quality since 1994. Nevertheless, until present, the state doesn't have an environmental health services programs focused on meeting the needs of the private well owners. The naturally occurring contaminants in well water are largely unknown. If funded, the state will use CDC funds to a) increase testing of private well water for arsenic, radon, uranium 238, etc.; b) develop new test result reporting forms; c) develop educational materials to help people read the results; and d) achieve improved integration/coordination of service delivery to private well owners through the organizations.

HUMAN SUBJECTS/ANIMAL SUBJECTS

N/A

PROJECT STAFFING:

The Principal Investigator is very experienced, and has been the leader of another CDC project.

Not hiring any new people, there is an experienced crew in place.

SUMMARY OF STRENGTHS:

- Good understanding of the problem (i.e., more than half of the population relies on unregulated well water for drinking water)
- Previous efforts have been going on since 1994, establishing the foundation for this project
- Strong possibility of sustainability post-project
- Implementation of CDC *Strategy* - outstanding
- Coordination and collaboration - outstanding
- Project management - outstanding

SUMMARY OF WEAKNESSES:

- Need a better description of how the lab work conducts water testing (e.g., the budget for the supplies is only $910 – will that be adequate to cover the necessary equipment and supplies for water testing? Is the state lab already fully equipped? Is the test very cheap or will that part be funded through other channels already?)
- Need more detail about project evaluation; the long-term goal in this proposal (reduce arsenic exposure etc.) will take much more effort than is described; is it good enough to contract out to someone?
- The goal is clear, but ensuring outcomes remains unclear.

OTHER COMMENTS:

- Is it enough to state that one will accomplish one's evaluation plan via contracting with someone?
- The stated goal and disease burden cannot be reduced within the allotted 3-year project period.
- What will the applicant do when contaminated wells are found? Will remediation be provided?

BUDGET:

The budget is clearly explained, adequately justified, and is reasonable and consistent with the stated objectives and planned activities. It would have been helpful to understand how the water testing will be paid for.

RECOMMENDATIONS TO NEGOTIATORS:

Appendix D

Comments from External Stakeholders / Interested Parties

- Cover letter to interested parties
- Mailing List
- Written comments received from interested parties

John Elias Baldacci
Governor

John R. Nicholas
Commissioner

Maine Department of Health and Human Services
11 State House Station
Augusta, Maine 04333-0011
Bureau of Health
Environmental Health Unit

<NAME>
<ADDRESS 1>
<ADDRESS 2>

Dear <NAME>

Last year, the 121st Maine State Legislature passed a law requiring that the Department of Health and Human Services, Bureau of Health (DHHS) submit a report to the Legislature (PL 2003 c.457 s. 4). The report is to contain an assessment of the need for a comprehensive safe drinking water program for private wells to address arsenic and other contaminants of human health concern. The report is also to include recommendations to address any identified needs. Prior to submitting the report, DHHS was directed to consult with a diverse group of interested parties. The report is to be submitted by October 1, 2004. No funding was provided to support preparation of such a report.

Coincidentally, DHHS became aware of an opportunity to apply for funds to implement a comprehensive environmental health services program. DHHS submitted a proposal to the Centers for Disease Control (CDC) in late June that discussed the need for a comprehensive safe drinking water program for private wells in Maine and proposed a program to address the identified needs. We just recently learned that although our proposal was recommended for funding, it did not score high enough to obtain the limited funds available (only 9 proposals out of 48 submitted were funded).

It is our belief that our proposal contains most, if not all, the elements of the legislatively mandated report. It is therefore our intention to submit this grant proposal to the Legislature on October 1st. What is missing is the need to consult with a diverse group of interested parties. We are therefore providing you a copy of our proposal and requesting that you submit to us any written comments you have regarding our discussion of the need for a comprehensive safe drinking water program for private wells, and our specific proposals on how to address these needs. We are particularly interested in whether you believe there are needs that we have not adequately characterized, or whether there are additional recommendations that should be made. Our intent is to include any comments submitted to us by September 30th as an addendum to our report. Please be sure to reference your organization in your comments, so it will be clear to the Legislature who they are from.

Physical Location:
Bureau of Health
Key Plaza 3rd Floor
286 Water Street
Augusta, Maine 04333-0011

(207) 287-4311
Fax: (207) 287-3981
Toll-Free: 1-866-292-3474
TTY: (207) 287-8066

We are mailing this request to individuals involved in the testing of private well water, the treatment of private well water, the drilling of private wells, the delivery of public education materials, the response to contamination of private wells, the study of well water quality issues in Maine, as well as public interest organizations.

Should you have any questions or concerns with our request, please do not hesitate to contact me.

Sincerely,

Andrew E. Smith, S.M., Sc.D.
State Toxicologist & Director,
Environmental Health Unit
Bureau of Health

Mailing List

Public Interest Groups

Arthur Astarita
Water Resource Specialist
RCAP Solutions, Inc.
51 Woods Road P.O.Box 84
Peaks Island, Maine 04108

Michael Belliveau
Environmental Health Strategy Center
27 State Street, Suite 44
P.O. Box 2217
Bangor, ME 04402

Maine Public Health Association
Attn: Saskia Janes
11 Parkwood Drive
Augusta, ME 04330

Well Water Treatment Companies

Norlen's Water Treatment, LLC
Attn: Tom Dimaso
Route 15
Orrington, ME
Tel: (800-339-7873)

Air & Water Quality Inc.
Attn: Mike Corbin & Jeff Twitchell
160 Route 1
Freeport, ME
Tel (800-698-9655)

Water Treatment Equipment Company
915 US Rt. 1
Yarmouth, ME
Tel (800-328-7328)

Well Drillers

Maine Ground Water Association
c/o Patricia Pratt
280 Litchfield Rd
Bowdoin, ME 04287

Testing Laboratories

Association of Maine Environmental Laboratories
c/o Michael Sodano
205 Gardiner Road
Whitefield, Maine 04353

Jack Krueger, CEO
Public Health and Environmental Testing Laboratory
11 State House State of Maine
Augusta, ME 04333

State & Federal Agencies

Robert Marvinney, Ph.D.
State Geologist & Director
Maine Geological Survey
22 State House Station
Augusta, ME 04333

Nancy Beardsley
Director, Drinking Water Program
Bureau of Health
11 State House Station
Augusta, ME 04333

George Seel
Department of Environmental Protection
17 State House Station
Augusta, ME 04333

Robert Lent
District Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04330

Laura R. Wilson
University of Maine Cooperative Extension
Water Quality Office
495 College Avenue, Orono, ME 04473-1294

Other Interested Parties

Ruth Warren
8 Mountain View Road
Standish, ME 04084

Galen Plummer
670 Shore Road
Northport, ME 04849

Maine Association of Realtors
19 Community Drive
Augusta, ME 04330

Maine Municipal Association
60 Community Drive
Augusta, ME 04330

RCAP Solutions
Resources for Communities And People

Arthur Astarita Field Representative and Water Resource Specialist
51 Woods Road P.O. Box 84, Peaks Island, Maine 04108
Phone: 207.766.3065 *Fax:* 207.766.0940 *Voice Mail:* 800.488.1969 x288
Email: rcap@maine.rr.com *Web Site:* www.rcap.org

Wednesday, September 22, 2004

Dr. Andrew E. Smith
State Toxicologist & Director
Environmental Health Unit
Bureau of Health
Key Plaza 3rd Floor
286 Water Street
Augusta, ME 04333-0011

RE: Comments on the DHHS Report to Legislature (PL 2003 c.457 s.4)

Dr. Smith,
Thank you for the opportunity to give comment on the subject report. Over six years of RCAP technical assistance experience helping Maine rural communities with water and wastewater issues have exposed me to a number of private well concerns.

Your report reveals good knowledge of these issues. Your proposal is justified; it is comprehensive and deserves funding approval.

Your data and RCAP's experience supports the lack of private well owner understanding of the water quality complexity and its' treatment solutions. Although there is information available in brochures and at various state and private agencies, the lack of general knowledge is staggering. Understanding chemistry, geology, plumbing engineering does not come easy to most home owners.

A private drinking water system is scaled-down version of a public water system. Just like public systems it is vital that owners realize they require the technical, managerial, and financial knowledge of source protection, treatment and distribution maintenance and operation. It is a public health issue similar to a non-transient non community (NTNC) public system. It is essential for private well owners to increase their awareness and education of their well type, location, treatment, storage and distribution.

The state plumbing code says that the private well should not be closer than 100-feet from a septic system. However, one cannot assume that people understand that a "system" comprises the pipe from the house to the septic tank, the tank itself, the leach field, and connecting pipe. The construction of the well is dependent upon the driller's suggestion and the owner's willingness to pay the cost.

Upon drilling a well, the driller distributes a questionnaire to the homeowner that documents owner, address, date of drilling, depth, yield estimate etc. This document should be sent, by the homeowner, to the Maine Department of Conservation's Maine Geological Survey. However, I suggest that the drillers should be responsibility to file such a document and that such filing should be required by his license. Only then can you be insured that all the data is being reported.

Most home owners wrongly confuse well treatment with plumbing. However, other than the BOH/DWP for questions on treatment technologies, specific solutions are not available except from treatment vendors (conflict of interest?). There needs to be a better way to disseminate solution-specific answers to home owners' lab-result issues.

There are financial resources available for low income and elderly. Although these resources should public knowledge, many home owners do not know they exist. Funding should be maintained and awareness should be increased. Specifically, I refer to:

- Rural Housing Repair and Rehabilitation Loans (502/504 programs) are available to very low-income rural residents who own and occupy a dwelling in need of repairs. Funds are available for repairs to improve or modernize a home, or to remove health and safety hazards. This loan is a 1% loan that may be repaid over a 20 year period. www.rurdev.usda.gov/me/SFH/sfh.htm

It's nice to see some states have other alternatives to Rural Development:

- For Ohio and Iowa, the Foundation for Affordable Drinking Water manages a program for low to moderate incomes who can apply for low-interest loans to construct, improve or repair a household water well. www.wellowner.org/afinancing/householdwells.shtml.

RECOMMENDATIONS / OBSERVATIONS

A. Establish a primary point of contact. There are too many different agencies sometimes giving conflicting information.

B. Develop a simple, standard "battery' of tests that all homes should follow especially, at point of sale.

C. Provide assistance to interpret the lab results and solutions.

D. Create a better way to disseminate solution-specific answers to home owners' lab-result issues.

E. Well drillers should be responsibility to file a well completion report document on all wells drilled. Such filing should be required by the drilling license. Only then can you be assured all information is being reported and submitted.

F. There is a vital need for homeowner awareness and education of well type, location, treatment, storage and distribution. Although manuals may exist, they are not readily available within the mainstream. Self-help books entitled "*How to live on a water well*" and "*How to live on a septic system*" should be required distribution by real estate agents and city permitting officials.

G. In order to protect the health of rural citizens on private well water and mortgage holder portfolio credibility, states should tighten up current statutes (http://janus.state.me.us/legis/statutes/33/title33sec173.html) to require a water test at point of a home sale or sale of property that will be used to construct (a) home(s). Additionally, the statute should stipulate that the test should be performed by a state certified lab. Also, the test should include all parameters listed in the Maine State Lab Test BFA (http://www.state.me.us/dhs/etl/guide.htm). This test costs about $72 and includes all the current basic significant parameters that would pertain to any property but does not address the organic chemicals that could be site specific.

H. Where municipal infrastructure is not available, this RCAPer's experience is that developers are avoiding EPA/DWP drinking water rules by drilling individual wells for each home (some building tracts are 20 to 60 homes!). In some towns, the contractors are not required to test the water that is found. The "buyer beware" argument is without substance when community health is at stake especially with first-time home buyers. Drinking water contamination is very complex to know and understand for the public water systems much less for the general citizen.

The fact is that contaminates such as arsenic can be removed, for what some may think is little money ($1100-$3000). However it is the rural families trying to make ends meet that suffer, when such costs are subsequent to their loan closure. Disclosure of such contaminants prior to sale, enable the (treatment) solution to be covered within the loan or for a negotiated price prior to sale. When considering such costs, the mortgage payment changes very little and has little financial impact to the buyer. This should not be a deal breaker.

Thank you,

Arthur Astarita

218 Central Street • P.O. Box 429 • Winchendon, MA 01475-0429 • Voice: 978-297-5300 • Fax 978-297-2606 • TDD: 978-297-3176 • www.rcapsolutions.org

maine public health association
11 Parkwood Drive, Augusta, ME 04330

September 27, 2004

Andrew Smith
Maine Bureau of Health
11 State House Station
Augusta, ME 04333

Hey Andy:

I have a few comments on the proposal/report you sent recently for input. I wondered as I read it if you might need more rationale for why the programs you chose (and hope to expand on) will work (or have worked). In public health, as you know, the slogan is "best practices" demonstrated by the research. The info from BRFSS certainly demonstrates the need. The reference list wasn't included so I don't know the sources you relied on, etc. I also think visuals such as tables that illustrate the magnitude of the problem may be helpful. That saves you from having to repeat the data several times in the text. Data from the programs already in place would be helpful too.

Contextual issues are really important in Maine. The rural nature of the state in terms of geography and social organization (like where people get their information most commonly) is a significant factor in all kinds of public health areas. Another issue is cost of testing and cost of fixing the problem. It appears that one of your target groups will be low literacy/income adults who may not have the resources, and so don't really want to know what's in their water. Raising awareness and education can only go so far if cost is a barrier.

It might be useful in planning to consider being creative in where and how you reach people for the greatest return. For example, setting up a display at the home show or developing some PSAs using local people, may reach a broader population. Another thought re: lower income/literacy is the computer issue - both access and feeling skilled enough to use it may be a barrier as well.

These seem to be issues reviewers may want to know how you are going to address them since they could be significant barriers. Anyway, I hope this is helpful.

Sincerely,

Saskia Janes

Saskia Janes
Maine Public Health Association

AIR & WATER QUALITY INC.
160 US Route One • PO Box 536 • Freeport, Maine 04032 • www.awqinc.com

October 28, 2004

Dr. Andrew E. Smith
State Toxicologist
Maine DHHS/Bureau of Health
11 State House Station
Augusta, ME 04333-0011

Dear Andy:

I have reviewed the Application of Funding which you mailed to me in late September. Our organization, Air & Water Quality Inc., designs and installs water treatment and radon mitigation systems throughout Maine and New Hampshire. In addition, we provide bottling facilities for hotels and restaurants on an international basis.

Most of our water treatment in the State of Maine involves private water supplies. Our clients contact us generally as a result of **(1) a perceived aesthetic problem (staining, smell, sediment, etc.) or (2) a water test that fails a health related or aesthetic standard.**

With respect to your proposal, the emphasis, as it should be, is on health related issues such as arsenic, uranium, radon, bacteria and nitrates. As you point out, the State of Maine has some rather unique problems with groundwater quality in that the levels of groundwater arsenic, uranium and radon are some of the highest in the country. Unfortunately, many homeowners with private wells have never tested their water. In addition, most of those that have tested have not tested for the three contaminants - arsenic, uranium and radon!

I believe that the initial thrust of this proposal should be on **TESTING.** Most people do not test unless they perceive a problem or are involved in a real estate transaction. In a real estate transaction, the buyer is oftentimes guided by the real estate agent with respect to water testing. Many lenders require that the buyer present a water test with satisfactory results with respect to the health parameters – coliform bacteria, nitrite nitrogen and nitrate nitrogen. Most often, these are the only health parameters which are tested. Since there are thousands of real estate transactions involving private water supplies, I would recommend the real estate industry as one avenue to promote testing, especially for the three rather unique health parameters above (arsenic, uranium and radon). To get the most bang for the buck, I recommend that the real estate industry be targeted as a means to include arsenic, uranium and radon as part of the "standard" mortgage test. One issue

that I see as a problem is – the State Public Health & Environmental Testing Lab (HETL) is the only lab in Maine that provides uranium testing. While on that subject, I also see a general conflict in that HETL competes with private labs for all other water testing(but that is a topic for another day).

How do we get the average private well homeowner to test? Generally, when we ask about testing, we get the response – "I don't have any problems with my well. The water tastes good and nobody has gotten sick yet!" Sometimes, I feel that the **sledgehammer approach** is the only effective one. We often pussyfoot around the severity of the health issues in order not to offend anyone. This allows the private well owner to rationalize away the issue. Often when asked if the homeowner thinks that his arsenic at 100 ppb is a problem he would consider treating, we get the response – "I don't think so; I was told you need to live in the house for decades for that to be a problem." According to your report, the incremental lifetime cancer risk for regular consumption of water at 10 ppb of arsenic is 1 per 1000. Personally, that statistic blows my mind! I think we need to find a way to get the point across that the exposures to high levels of carcinogens are a serious life threatening problem!

Certainly, documentation in the form of informative brochures is part of the approach to getting people to test. However, as I say to my salespeople, direct person to person contact is the best approach to sales, second is the telephone and third is mailing. I feel that the major emphasis should be direct contact through community programs and school programs. In addition, in neighborhoods with statistically high concentrations of one or more health contaminants, mailing and phone calls directly to the effected homeowners is necessary. Again, you need to apply the sledgehammer to get the homeowner to test and then, you will need to apply the bulldozer to get them to take action!

As an additional thrust of the proposal, I would selfishly recommend emphasis on working with the professional water treatment companies regarding treatment for the three contaminants we have discussed. Treatment methods and, as importantly, proper discharge of waste from treatment systems must be addressed. . **Guidelines in writing** would be extremely useful.

I would like to write more now, but, unfortunately, I have run out of time. I hope this will be useful to you.

Very truly yours,

Michael A. Gelberg
President

DEP Comments on BOH Private Drinking Water Wells Report as required by PL 2003 Ch 457 Sec 4

For More information contact: George Seel 287-7166

- The BRWM has observed through groundwater monitoring situations where As concentrations are elevated due to changes to the chemistry of the ground water, resulting in natural As being desorbed and placed into solution in the groundwater. The changes are due to increases in the BOD load or an increase in the pH of ground water. The first situation has been documented in monitoring wells around oil spill sites, a small community waste water treatment system relying on discharge to ground water, sludge disposal facilities, and a gravel pit reclaimed using manufactured topsoil made from sludge. Any significant BOD source to ground water could in a geological setting with naturally high As produce such results. Landfills with high pH waste, primarily from the paper industry, have been documented to also change the geochemistry of the area and desorb As, resulting in elevated downgradient As concentrations. To date, no private wells have been documented to be contaminated above the MCL. It is simply a question of time and the right circumstances and location. BRWM is currently looking for oil contaminated ground water sites involving contaminated private drinking water supply wells to investigate further and determine how best to distinguish where the As MCL is exceeded because of desorbed As vs. naturally occurring As.

- Although not included in the scope of the BOH's proposal, it should be noted that in addition to these naturally occurring health risks, that many wells are contaminated annually and many more at risk from human pollution. Based on our experience from the remediation of oil and hazardous waste contaminated wells, it has been our experience that private well owners have little knowledge of how their own activities and those of their neighbors threaten their drinking water supplies and how they almost never test their wells except at the time of purchase. They generally are ambivalent and just assume their water to be safe and will remain so, just because it is ground water. It is not uncommon to find wells already contaminated by bacteria, especially in coastal Maine. Both more effective education and outreach efforts to raise the awareness of well owners and to increase routine testing would be a good start.

- Significant resources and the focus of most of the BRWM's licensing programs are related to preventing the contamination of ground water and private drinking water wells, including oil storage and handling (except the loophole in the "safety net" of above oil storage facilities regulated by the State Fire Marshal's Office), solid waste disposal facilities, and hazardous waste handling and storage facilities. Unfortunately, far more resources are devoted to the investigation and remediation of discharges to the environment, including the contamination of private wells, by oil and hazardous wastes. The largest program in the Bureau in terms of staff and expenditures is the oil remediation program of contaminated soil, ground water, and primarily private drinking water supply wells. Clearly our overall regulatory scheme focusing solely on major potential contamination sources is not enough. Future efforts should include the other side of the equation, the proper location of private wells away from known or suspected sources of contamination. Currently a private well can be located in Maine on the presumption that well will produce potable water. That simply is no longer true, especially as sprawl residential development encroaches onto abandoned and active solid waste landfills (e.g. Gray, Jefferson, Wells, etc.) and hazardous waste and oil storage facilities and areas of past contamination (e.g. Gorham, Machias, Gray, Long I., etc.). Education of local planning boards, town planners, and well drillers on threats to potential private drinking water wells, while making the necessary information more available at the local level, such as with the integrated use of the statewide GIS library, are much needed steps. Most planning boards have the authority to require documentation that safe drinking water supplies are available when reviewing subdivisions or zoning or site review ordinances, but all too often the only

Smith, Andy E.

Subject: FW: report to legislature on need for a safe drinking water program for private wells

-----Original Message-----
From: R Warren [mailto:rewarren@pivot.net]
Sent: Monday, November 22, 2004 2:05 PM
To: Smith, Andy E.
Subject: Re: report to legislature on need for a safe drinking water program for private wells

Andy,

Hi, so very sorry. My email has been down with a defective dsl from my isp until today and I'm just getting back online. Too late???

If not, I believe as I stated earlier in our discussions that I strongly believe there is a need for a private well program like you have outlined. I believe the request for grant is well written and thought out. I believe that the request covers all the elements necessary in instituting a private well protection program. I think utilizing resources from local universities like the University of Maine or St. Joseph's College and the like establishes a collaborative partnership that enables local educators and students as well as interested community partners to share in the process and "buy" into the need and importance of such a program. It also helps personalize and reach out to communities and people that might not otherwise latch on to a "State sponsored" or run program. It sort of takes the governmentism out of the plan which I think is helpful.

Aside from any minor typos or word usage issues which unfortunately, I cannot recollect at this moment and as luck would have it, I cannot locate the report at this moment either, I believe the request for grant to be complete and not lacking.

Thank you for including me in this process as I am always interested in the progress of the Arsenic issue since our Committee has since disbanned. I appreciate the opportunity. Good luck with the request! Let me know how it turns out.

Happy Thanksgiving!
Ruth E. Warren
Former Chair, Arsenic Committee
Town of Standish

ruth

Smith, Andy E.

From: Mike Belliveau [mbelliveau@preventharm.org]

Sent: Friday, November 19, 2004 12:03 PM

To: Andy Smith

Cc: Rep. Gary Moore - home; Rep. Gary Moore; Ted Koffman; Ted Koffman; Ted Koffman; Sen. John Martin; Scott Cowger; Rep. Scott Cowger

Subject: COMMENTS: Safe Drinking Water in Private Wells

Dear Andy,

Please accept these brief comments on the Bureau of Health's unfunded grant proposal to the Centers for Disease Control and Prevention which describes an assessment of the need for a comprehensive safe drinking water program for private wells in the state of Maine. You intend to represent this document as the report to the Legislation required by Section 4 of Chapter 457, Public Laws of 2003, which addressed arsenic in drinking water wells and pressure-treated wood.

The report is strong on documenting the problem and the need for a comprehensive safe drinking water program for private wells. The report does an excellent job at proposing a series of educational materials and outreach strategies that would be culturally appropriate and aimed at increasing awareness and testing of private wells by individual consumers. The report also identifies useful ways to improve coordination and communications among institutional stakeholders. These are necessary steps to reduce exposure to toxic contaminants in private wells by motivating individuals to test their drinking water and treat drinking water with high levels of contaminants, as well as improving government responsiveness.

The report fails, however, to address the need for systems change and policy reform necessary to further achieve reductions in exposure to toxic contaminants in private wells. Educational outreach is not enough. While awareness and testing rates should increase, educational outreach alone will not completely motivate testing, treatment and other behaviors to minimize exposure. Consider for example that in Maine, which has the highest voter turnout rate in the country, more than 25% of the eligible electorate did not vote in the recent Presidential election, despite the high level of public interest and awareness of the stakes. This fact illustrates that some Mainers will not be motivated by educational outreach, no matter how high-profile, prolonged or literacy-level appropriate. Whether it's due to information overload, hectic lifestyles, poverty, educational status, personal life crises, physical or mental health challenges, substance abuse, apathy or alienation from society, there are limits to changing individual behavior. This is especially true in Maine which has a relatively higher level of rural poverty and aging population than most states.

That's why we need a strong program of institutional change to complement any social marketing strategy. Private well testing and treatment should also result from mandatory requirements and incentive programs at key points of intervention, including but not limited to whenever the ownership of residential properties changes hands.

We support immediate steps to address arsenic in private wells, including:

- Requiring all private laboratories to include arsenic testing in their routine screening of contaminants in private wells
- Requiring all private laboratories to report arsenic levels at or above 10 parts per billion as exceeding the Maximum Contaminant Level

Maine should also develop and adopt a regulatory program for private wells, modeled in part on legislation adopted in New Jersey, which includes:

- Mandatory testing of private wells for priority chemicals of concern
- Mandatory disclosure of well testing results whenever real property transactions occur
- Extension of drinking water standards to include private well water
- Provision of technical assistance, educational outreach and funding to ensure that all private wells are tested
- Source reduction and source protection strategies should be identified and implemented to reduce and prevent human-caused ground water contamination

An example of the need for further source protection actions is the fact that all construction and demolition debris landfills in Maine are currently unlined, allowing arsenic to contaminate ground water by leaching out of pressure-treated wood and creating the reducing conditions from landfill leachate that liberate naturally occurring arsenic from soils in to ground water supplies.

We need to make achieving safe drinking water in private wells as automatic and convenient as possible in order to reach those people not readily motivated to act individually. I encourage you to also seek funding and apply existing resources where feasible to convening stakeholders and developing policy solutions to bring about systems change and policy reform.

Thank you for this opportunity to contribute to the state's efforts to protect public health from toxic contaminants in private water supply wells.

Sincerely,

Mike Belliveau

Michael Belliveau, Executive Director
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