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JOHN ELIAS BALDACCI
GOVERNOR

PATRICK K. MCGOWAN
COMMISSIONER

10 January 2006

The Honorable Scott W. Cowger, Chair
The Honorable Theodore S. Koffman, Chair
Committee on Natural Resources
100 State House Station
Augusta, ME 04333-0100

Dear Senator Cowger and Representative Koffman:

Public Law 2005 Chapter 452, section B-1 directs the Department of Environmental Protection, the Maine Land Use Regulation Commission, the Department of Health and Human Services, in consultation with the Department of Agriculture, Food and Rural Resources, and the Maine Geological Survey to develop a consistent, efficient and effective approach to hydrogeological review of proposals to withdraw ground water. I am submitting the attached report on behalf of the aforementioned agencies.

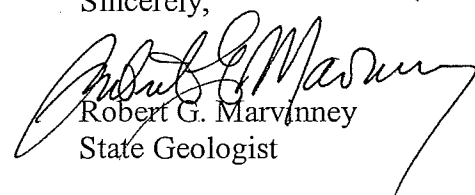
To summarize briefly, staff from the Maine Geological Survey (MGS), Maine Department of Environmental Protection (MDEP), Land Use Regulation Commission (LURC), Maine Public Utilities Commission (MPUC), and the Maine Drinking Water Program (MDWP) met in the spring and summer of 2005 and developed a protocol for hydrogeologic reviews, particularly relating to the Bulk Water Transport Law, wherein all of these agencies have responsibilities as reviewers. Under this law, the MDWP distributes application copies to agencies, and each reviews appropriate aspects of the application:

- MDWP reviews the source with regard to public health and safety;
- MDEP conducts an environmental impact review;
- MGS evaluates the hydrogeological characterization of the site;
- MPUC reviews impacts on existing public water supplies;
- LURC reviews proposals in their jurisdiction with regard to no undue impact and harmonious fit of the project.

The agencies have agreed to a consistent set of materials that the applicant must provide that satisfies the review requirements of the various agencies. This process standardizes and simplifies the process for the applicant.

If you have any questions on the full report, please contact me.

Sincerely,


Robert G. Marvinney
State Geologist



**Report to the Joint Standing Committee on Natural Resources
2005 Public Law Chapter 452, Section B-1
Development of Consistent Hydrogeological Review Procedures**

**Robert G. Marvinney, State Geologist
Department of Conservation
On behalf of the Departments of Conservation, Environmental Protection, and
Health and Human Services**

Introduction

Public Law 2005 Chapter 452, section B-1, directs the Department of Environmental Protection, the Maine Land Use Regulation Commission, and the Department of Health and Human Services, in consultation with others, to:

1. Review their existing administrative procedures and practices regarding review of development activities involving groundwater withdrawal;
2. Develop and implement any changes to such administrative procedures and practices that are appropriate and necessary to establish a consistent, efficient and effective approach under their existing legal authority to review pertinent hydrogeological and related natural resources issues; and
3. Submit a report to the Governor and Joint Standing Committee on Natural Resources summarizing actions taken pursuant to this section.

Activities

Staff from the Maine Geological Survey (MGS), Maine DEP, Land Use Regulation Commission LURC, Maine Public Utilities Commission (PUC), and the Maine Drinking Water Program (DWP) met in the spring and summer of 2005 to review hydrogeological standards under the Bulk Water Transport Law, Site Location Law, and under LURC rules. In particular for the Bulk Water Transport Law when all of these agencies are involved in review, we developed the following protocol. Under this protocol, there is an initial field meeting of agency staff at the site, and a discussion with the applicant of appropriate scope and content for the application. When the application is complete, the DWP sends review copies to these agencies, as appropriate, and each performs a review of an aspect of the application.

DWP review includes an assessment of the adequacy of the source with respect to public health and safety, particularly water quality and source protection. If the source is proposed to be marketed as “spring water”, the DWP review includes a hydrogeologic and geochemical evaluation of the connection between the natural spring and the point of collection for transport.

DEP performs an environmental impact review utilizing the standards of the Site Location of Development wherein it must find “No unreasonable adverse effect on ground water quantity.”

MGS and DEP review includes an evaluation of the geologic and hydrogeologic characterization of the site along with calculations of the water budget. Particular emphasis is placed upon evaluation of pumping test reports and associated data and conclusions drawn from this data. In addition, these reviews consider the influence and potential for influence upon nearby wells, surface water bodies, and wetlands and provides comment on proposed monitoring plans.

PUC reviews potential impact on existing public water supplies.

LURC views groundwater withdrawal as an “alteration of the water table”, which is a use requiring a permit or allowed by special exception in most subdistricts. However, in some subdistricts, this activity is prohibited. To receive a permit, the activity must meet LURC’s Criteria for Approval, including “no undue adverse impact”, and “harmonious fit”; and meet the relevant provisions of Sections 10.25, 10.26, and 10.27, Land Use Standards, in Chapter 10. LURC’s review of groundwater withdrawal also includes outside agency review by MGS, MDIFW, and the Corps (when applicable). LURC coordinates its permitting review with DHHS/DWP’s review for appeal for Bulk Water Transport.

The DWP considers the technical review comments of these state agencies prior to making a recommendation regarding a permit under the Bulk Water Transport law. Under this law the Commissioner of DHHS must find that:

- A. The transport of water Transport of the water will not constitute a threat to public health, safety or welfare;
- B. Water is not available naturally in the location to which it will be transported;
- C. Failure to authorize transport of the water would create a substantial hardship to the potential recipient of the water; and
- D. For a source not otherwise permitted by the Department of Environmental Protection or the Maine Land Use Regulation Commission, the water withdrawal will not have an undue adverse effect on waters of the State, as defined by Title 38, section 361-A, subsection 7; water-related natural resources; and existing uses, including, but not limited to, public or private wells, within the anticipated zone of contribution to the withdrawal. In making findings under this paragraph, the commissioner shall consider both the direct effects of the proposed water withdrawal and its effects in combination with existing water withdrawals.

The Commissioner of the Department of Health and Human Services (DHHS) either approves or denies a permit based upon the staff recommendation. The DWP and DEP may impose groundwater, spring, and surface water monitoring requirements. Records of monitoring are kept on-site and available for inspection. Permits are valid for three years, and to be renewed, must meet the four statutory requirements at the time of renewal.

For all projects involving ground water withdrawal, state agency staff developed the following draft standard application requirements:

Application Requirements for Ground Water Withdrawals

- 1) **Project Description.** A description of the development history and proposed development at the site, including the acreage of the parcel, area to be developed, areas of buildings, parking lots, roads, paved areas and other existing or proposed facilities, proposed volumes of water to be extracted, locations and method of extraction, and other relevant information.
- 2) **Location Map.** A photocopy of the relevant area of the U.S.G.S. 7.5 minute quadrangle map or maps showing the boundaries of the property and the approximate location of the proposed extraction point or points.
- 3) **Site Plan.** A plan or plans of the site, at a scale of 1"= no more than 100', showing, at a minimum, the existing or proposed groundwater extraction point or points and the following features within 1000 feet of any existing or proposed extraction point. Depending on the size of the parcel on which the project is located, the area of the parcel to be impacted by the proposed development, volume of water to be withdrawn, other uses of water within the area and the results of the pumping tests and determination of the zone of contribution to any wells used for extraction of the water, the Department may require some or all of this information at a greater distance from any existing or proposed groundwater extraction point or points.
 - a. Existing or Proposed Facilities. All existing and proposed facilities related to groundwater extraction, transport, bottling, or other relevant activities, and all other structures on property owned or controlled by the applicant;
 - b. Roads. All public and private roads, existing or proposed;
 - c. Sources of Water. All wells, springs, or other locations where groundwater or surface water is drawn for private, public, or commercial use;
 - d. Surface-Water Resources. All surface water resources, including but not limited to streams, wetlands, ponds, lakes, and vernal pools;
 - e. Monitoring Locations. All monitoring wells, piezometers, flumes, staff gages, sampling locations, or other facilities and locations used in analysis of the site;
 - f. Possible Sources of Contamination. All known or potential sources of groundwater contamination, including but not limited to surface and subsurface wastewater disposal systems, landfills and dumps, sand – salt storage and mixing areas, junkyards, manure stacking sites, agricultural fields or other areas of pesticide, herbicide, or fertilizer application, and tanks or other storage areas for fuel or other hazardous materials.
- 3) **Geologic Characterization.** A report describing a conceptual hydrogeologic model of the aquifer being considered and its recharge areas, including but not limited to:
 - a. Geologic Description. Description of the geology and geologic history of the area.

- b. Cross-Sections. Generalized geologic cross-sections through the aquifer based on available information such as well logs, geologic reports, maps, and subsurface data.
- c. Logs. Logs of all wells, borings, seismic lines, and other subsurface data used in development of the report;
- d. Hydrogeologic Description. A description of aquifer flow, hydraulic boundaries, recharge conditions, interaction of the source of the withdrawal with surrounding water resources, and springs, and the estimated zone of contribution;
- e. Conceptual Flow Net. A conceptual groundwater flow-net map for the aquifer and its recharge areas based on available data, showing hydraulic head contours; and horizontal and vertical groundwater flow under average, ambient, non-pumping conditions.

4) **Demonstration of No Adverse Impact**. Submit information demonstrating that the proposed withdrawal of water will not adversely affect existing uses of groundwater or surface water resources. Note that all instrumentation used during this assessment must meet standards of accuracy and precision determined by the Department.

- a. Natural Flow from Springs, Other Surface Sources, or Artesian Wells. If the proposed extraction does not involve pumping water out of the ground or a surface water body, but relies instead in whole or part on collection of water from a spring or surface source, demonstrate that the flow remaining after removal of the water for transport will be sufficient to maintain existing and designated uses of downstream surface waters, particularly during periods of low-flow, and that the classification of downstream surface waters will not be affected.
- b. Pumping from Surface Waters. If the proposed extraction includes pumping water out of a surface water body, demonstrate that the flow remaining after removal of the water for transport will be sufficient to maintain existing and designated uses of upstream and downstream surface waters, particularly during periods of low-flow, and that the classification of upstream and downstream surface waters will not be affected. Demonstrate that any changes in baseflow resulting from reduction in pre-pumping upstream or downstream flows will not adversely impact existing uses of groundwater or groundwater classification.
- c. Pumping of Groundwater. If the proposed extraction includes pumping of groundwater, submit a determination of the long-term safe yield of each well, including a prediction of operating levels and determination of the zone of influence and zone of capture for each well. Provide a specific assessment, developed from monitoring of water levels and flows during the pump tests, of the impacts on any existing wells and existing groundwater flow paths within the zone of influence and zone of capture for each well, and on the impacts on baseflow volumes, potential for induced recharge, maintenance of flow and surface water quality, duration of saturation in wetlands and vernal pools, and other potential impacts on surface-water or groundwater quantity,

quality, and classification within the zone of influence and zone of capture for each well. Pump tests should include, at a minimum, the following:

- i. Establishment of near-field and far-field monitoring wells, including nested wells near springs, wetlands, and other surface waters in order to evaluate changes in vertical flow due to the pumping, and background wells to document background water levels in an area of the aquifer (or adjacent aquifer) that will not be influenced by the test.
- ii. Location and elevation of the monitoring wells relative to the existing well(s), to the nearest 1 ft horizontal and 0.01 ft vertical.
- iii. Measurement of elevation and distance from the pumping well(s) of springs, streams, lakes, rivers, and wetlands shown on the site plan.
- iv. Establishment of staff gages or pressure transducers in streams, ponds, open-water wetlands, and other surface waters reasonably likely to be affected by pumping.
- v. Establishment of one or more precipitation monitoring stations.
- vi. Two or more weeks of daily background monitoring at all stations.
- vii. A stepped-rate pumping test to assess the hydraulic characteristics of the well or wells to be pumped during the long-duration test.
- viii. A long-duration pumping test at a reasonably fixed rate, to continue until stabilization has been reached or for 5 days, whichever is less. Stabilization is considered to be reached when the drawdown reading at either an observation well no more than ten feet from the pumping well or the pumping well itself has not varied by more than 1/2 inch (0.04 feet) during the preceding 24-hour period. An alternative definition of stabilization may be proposed by the applicant and must be reviewed and approved by the Department prior to the pumping test. The Department may require longer-duration tests if determined to be necessary to assess impacts to surface waters or other wells.
- ix. Monitoring of water levels at monitoring wells, surface waters, springs, and other areas, at a frequency determined by the Department, during the pump tests and a recovery period no shorter than the duration of the test.
- x. Records of precipitation during the pump test and recovery period, at a frequency determined by the Department.
- xi. Flows from the pumping well in gallons per minute.
- xii. Uses and flows of nearby wells or other operations, such as construction dewatering, in the vicinity of the pumping well or monitoring wells that could affect groundwater levels during the test and recovery period.

5) Monitoring Plan. Submit a plan for long-term monitoring of groundwater and surface water within areas likely to be impacted by the proposed use, and of background conditions outside that zone if determined to be necessary by the Department. This may include, but is not limited to, regular measurement and assessment of water level, water quality, streamflow, biomonitoring, wetland

vegetation, amount and type of precipitation, and other sources of information as determined to be applicable to particular sites, depending on the presence and sensitivity of the resources, the proposed volume and method of extraction, and other relevant factors. This plan must include a provision for regular submission of data to the Department, comparison of measured data to predicted values, and a plan to be implemented in the event that monitoring indicates the potential for adverse impact on surface-water or groundwater quantity, quality, and classification.

- 6) **Classification as Spring Water.** Sources tapping underground water but seeking to be classified as spring water must submit additional information demonstrating compliance with spring-water criteria in CMR 10-144, Chapter 235, including, but not limited to, the following:
- a. Hydraulic Connection. Information demonstrating a measurable hydraulic connection between the well(s) or other points from which water is to be drawn and the natural spring.
 - b. Water Chemistry. A water-chemistry comparison between the spring and the proposed source(s) of water showing that water from any proposed source shares all the physical properties, before treatment, and is of the same composition and quality, as the water that flows naturally to the surface of the earth at the spring. At a minimum, water chemistry comparisons should present all analysis results and should measure cation and anion concentrations for both the spring and any proposed source on a Piper Diagram or other graphical method acceptable to the Department.
 - c. Maintenance of Spring Flow. Information demonstrating that water will continue to flow naturally to the surface of the earth through the spring's natural orifice during operation at the proposed extraction rates.
 - d. Contributing Area. Delineation of contributing areas to the spring and proposed source, using appropriate geologic information and methods to assess groundwater flow and the influence of boundary conditions.

For further information, please refer to the DHHS guidance on Spring Water Classification.

NOTE: The following three provisions apply to Bulk Water Transport Applications only.

- 7) **Demonstration of No Threat to Public Health.** Information describing the source's development and protection, transport and sanitation procedures for the water and the transport vehicles sufficient to demonstrate that transport of the water will not constitute a threat to public health, safety, or welfare. The source and loading facilities must be compliant with Maine Bottled Water Regulations, CMR 10-144, Ch 235 and Maine Drinking Water Regulations, CMR 10-144, Ch 231. Operation of the source must not interfere with the provision of safe and adequate water by either private or public water supplies.

- 8) **Demonstration of Need.** Information determined by the Department to be sufficient to demonstrate that the water is not available naturally in the location to which it will be transported. This may include documentation that there is not sufficient water meeting required quality or classification standards at the destination point.

- 9) **Demonstration of Substantial Hardship.** Information determined by the Department to be sufficient to demonstrate that failure to authorize transport of the water would create a substantial hardship to the potential recipient of the water. Documentation may include economic hardship, substantiation of unused plant capacity, and unmet market share for a particular classification of water.

PL 2005 c. 452 study group

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