SECTION 15. GROUNDWATER

15.A Narrative

This section provides information regarding the occurrence of significant quantities of groundwater in the area of Bangor Hydro-Electric Company's (BHE) proposed Northeast Reliability Interconnect (NRI), including modifications to the Orrington Substation; potential threats to existing groundwater resources; and measures proposed to prevent adverse impacts.

15.B Location and Maps

The existing hydrogeologic conditions in the project area have been assessed by review of digital geographic data provided by the Maine Office of GIS (MEOGIS). Digital datasets were utilized to create site-specific maps to facilitate the review of hydrogeologic conditions within the proposed project area.

A digital dataset containing locations of significant sand and gravel aquifers in the proposed project area were derived from aquifer boundaries delineated and digitized by the Maine Geological Survey (MGS) from data compiled on United States Geological Survey (USGS) 7.5-minute quadrangle base maps. According to these data, the project crosses over significant sand and gravel aquifers in eight locations within the project area (Figure 15-1). These aquifers are characterized as having yields between 10 and 50 gallons per minute. There are no mapped significant sand and gravel aquifers within the Orrington Substation construction area. Another dataset provided by MEOGIS containing surficial geology map units was developed by MGS from their Regional Surficial Geology Maps published in 1987. According to this dataset, one significant source of sand and gravel was identified in the area of Sawtelle Heath in Baileyville (Figure 15-1). MGS has also developed a dataset containing information on bedrock source water protection and sand/gravel aquifer locations. Data provided indicate the presence of one bedrock source water protection and sand/gravel aquifer location in the area of Sawtelle Heath in Baileyville (Figure 15-1).

FIGURE 15-1 LOCATIONS OF SIGNIFICANT SAND AND GRAVEL AQUIFERS, BEDROCK SOURCE WATER PROTECTION AREAS, AND PUBLIC WATER SUPPLY WELLS

In addition, locations of public water supply wells and the surrounding source water protection buffers are identified on Figure 15-1. This data was provided by the Maine Drinking Water Program, based on records as current as June 2004. The radius of water protection buffers is proportional to the population served and/or the type of water supply system. These buffers can range from 300 to 2,500 feet in radius. The proposed project right-of-way (ROW) does not cross any public water supply wells or associated protection areas.

The existing hydrogeologic conditions in the project area have been assessed by review of the applicable MGS Bedrock Geology Maps. A copy of the MGS Bedrock Geologic Map with the proposed project shown is included as Figure 15-2.

A digital dataset containing surficial geology map units provided by MEOGIS was utilized to create a site-specific map depicting surficial geology within the proposed project area (Figure 15-3). This dataset was developed by MGS and contains information obtained by digitizing MGS Regional Surficial Geology Maps produced in 1987 (MEOGIS 2004).

There are no United States Environmental Protection Agency (USEPA) designated sole source aquifers located in the project area (USEPA 2004) and no private water wells are known to be located along the entire length of the proposed ROW.

Three areas have been identified as having private septic systems (leach fields) along the proposed ROW. Although these septic systems are encroachments on the existing Maine Electric Power Company (MEPCO) utility corridor and/or BHE land, they will not be disturbed during construction. Structures were sited to avoid these areas and mats will be used for equipment crossings. These areas are identified on the project Plan and Profile drawings, Sheets 2 and 6.

FIGURE 15-2 MAINE GEOLOGICAL SURVEY BEDROCK GEOLOGY MAP

FIGURE 15-3 SURFICIAL GEOLOGY MAP

15.B.1 Quantity

Construction and maintenance of the NRI, including modifications to the Orrington Substation will not require the use of groundwater. Temporary dewatering of shallow excavations for the substation foundations may occur in high groundwater table areas. However, this will have only negligible, short-term impacts on the groundwater table, and will be limited to within a few feet of the excavation itself.

Aside from the substation, the only structures associated with the project are the poles themselves and these will not impact groundwater or surface water in any way. A potential impact to groundwater quantity or surface waters could only occur if clearing activities were to materially increase the amount of runoff, thereby decreasing the amount of precipitation available for recharge of groundwater or surface water sources. However, the necessary removal of vegetation is specifically designed to avoid material changes to the runoff characteristics of the project area. By removing the overstory vegetation and leaving the shrub and brush layer intact, the runoff characteristics will not be diminished significantly. In fact, leaving the non-harvestable vegetation including some branches, undergrowth and small (2-inch diameter at breast height [dbh] and less) trees either standing or on the ground will provide some cover thereby deterring the formation of new drainage channels. In addition, by opening the forest floor to sunlight, new, denser grass and shrub growth will be encouraged and maintained over time. This will also aid in the retarding of runoff.

15.B.2 Sources

During the construction phase, the potential sources of groundwater contamination will be fuel, and hydraulic and lubricating oils used in the operation of vehicles and construction equipment. Any spills of these materials from the vehicles or equipment are typically small and of very short duration. Spills that are properly cleaned-up would not pose any risk to groundwater quality. Procedures for handling these materials and preventing spills are discussed in BHE's oil and hazardous material spill contingency plans and BHE's environmental control requirements for contractors and subcontractors provided in Appendix 15-1. The basic elements of these

respective plans provide descriptive procedures for safe storage and handling of materials in order to prevent spills and, in the event of a spill, spill reporting procedures, emergency contact telephone numbers (including state and federal environmental agencies), and oil spill cleanup guidelines. In the event of a spill of oil or hazardous material, employees are trained to promptly contain, report, and clean up the spill in accordance with these procedures. In addition, as a standard operating procedure, all operational vehicles carry an oil spill kit that contains material for conducting initial containment and clean-up of spills. Based on normal operations and the characteristic of a routine spill clean-up, there is no need for any ongoing groundwater monitoring.

Routine operation and maintenance of a transmission line substation involves the use of common lubricants, petroleum products, or other chemical products. These products are typically integral to the equipment used on site, such as in oil-filled transformers, capacitors, batteries, or other apparatus. For substations that exceed the oil Spill Prevention Control and Countermeasure Plan (SPCC) planning threshold of 660 gallons in one container or 1,320 gallons in aggregate, an SPCC plan is developed in accordance with 40 CFR, Part 112. The Orrington Substation has an SPCC plan for current operations at the existing facility (see Appendix 13-1). However, this plan will be modified to reflect changes in oil storage activities as a result of proposed modifications to the substation. As required by 40 CFR, Part 112.3(b), modifications to the existing SPCC plan will be made within six months of completion of proposed changes to current oil storage activities at the site.

Storage of containerized chemical products used for maintenance on any substation site is limited, incidental, and confined to the control house building. Bulk quantities of petroleum products, pesticides, herbicides, fertilizer, or other products are not stored on site. The Orrington Substation will utilize essentially the same products, amounts, spill prevention and clean-up procedures as were used previously. Examples of these products include lubricating oils, aerosol lubricants, non-chlorinated dielectric solvents, and hornet or wasp spray.

BHE will maintain the proposed ROW and substation in the same manner as its other ROWs and substations. In addition to hand or mechanical cutting of vegetation that poses a safety or

reliability hazard to the lines, low volume, foliar application of herbicides using a backpack with a directional, hand-held sprayer will be conducted as necessary. In addition, herbicides may be applied to cut stumps and surfaces of larger trees. All herbicides used are low toxicity products registered with the USEPA and approved by the Maine Board of Pesticide Control for the control of woody plants on ROWs. Application of any herbicide will be carried out in accordance with approved guidelines, as described in BHE's NRI Post-Construction Vegetation Maintenance Plan (the Vegetation Maintenance Plan). The Vegetation Maintenance Plan is provided in Section 10, Buffers, Appendix 10-1. Application of approved herbicides in accordance with their label specifications and guidelines is designed to prevent adverse impact on groundwater quality.

15.B.3 Measures to Prevent Degradation

The multiple methods, plans, and procedures to prevent groundwater degradation during construction of the proposed transmission line and modifications to the Orrington Substation are incorporated in BHE's environmental control requirements for contractors and subcontractors, and BHE's oil and hazardous material contingency plan. These procedures establish a set of minimum requirements for spill prevention and response. The procedures incorporate measures developed and fine-tuned from experience during other transmission line construction projects, including input from the Maine Department of Environmental Protection and other review agencies. The procedures incorporated into the plan have proven successful for preventing spills and for addressing spills if they occur. Both the contractors' and BHE's environmental inspectors will ensure that all personnel working on the ROW or at the substation follow these procedures.

The multiple methods, plans, and procedures to prevent groundwater degradation during the operation of the modified substation will be incorporated in the operations SPCC Plan as appropriate. As discussed above and required by 40 CFR, Part 112.3(b), modifications to the existing SPCC plan will be made within six months of completion of the proposed changes to current oil storage activities at the site. The existing SPCC Plan with containment plans and calculations, standard operating procedures, and spill prevention inspection plans is located in

Appendix 13-1. These procedures have proven successful for preventing spills and for addressing spills if they occur.

15.C Groundwater Protection Plan

The project, including modifications to the Orrington Substation, will not significantly alter existing surface water drainage characteristics, as provided by the stormwater management plan developed for the facilities (see Section 12). Groundwater recharge characteristics will not be permanently affected by operation of the substation. Temporary impacts to surface water drainage may occur during construction. The use of herbicides, petroleum and other hydrocarbon products during construction and operation represent a potential threat to groundwater quality. Measures to be utilized to address potential impacts are included in the procedures found in Appendix 15-1, the SPCC Plan for existing operations (see Appendix 13-1), and the Vegetation Maintenance Plan (Appendix 10-1). These documents and adherence to the design and procedural requirements they contain represent the groundwater protection and monitoring plans for the project. Accordingly, the construction or operation of the project is not expected to adversely affect groundwater resources.

15.D References

USEPA, Office of Water. 2004. Designated Sole Source Aquifers in EPA Region 1. [Online] URL: http://www.epa.gov/safewater/swp/ssa/reg1.html. (Accessed December 28, 2004.)

MEOGIS. 2004. Maine GIS Data Catalog. [Online] URL: http://apollo.ogis.state.me.us/catalog/catalog.asp. (Accessed December 28, 2004.)

APPENDIX 15-1
CONTRACTOR REQUIREMENTS AND CONTINGENCY PLAN

ENVIRONMENTAL CONTROL REQUIREMENTS
FOR CONTRACTORS AND SUBCONTRACTORS
OF BANGOR HYDRO-ELECTRIC COMPANY

OIL, HAZARDOUS MATERIAL, AND EROSION AND SEDIMENTATION CONTROL

The criteria listed in Section I below are the requirements for oil and hazardous material use compliance by contractors and subcontractors of Bangor Hydro-Electric Company. All contractors and subcontractors are required to comply with these requirements while working for or on behalf of Bangor Hydro-Electric Company.

The criteria listed below in Section II are the requirements for erosion and sediment control by contractors and subcontractors of Bangor Hydro-Electric Company. All contractors and subcontractors are required to comply with these requirements while working for or on behalf of Bangor Hydro-Electric Company.

Penalties:

Failure to abide by these requirements will constitute grounds for termination of contractor/subcontractor services.

Section I

General Requirements:

- Contractors/subcontractors will store, transport, and use oil, hazardous materials, and wastes in accordance with all applicable local, state, and federal regulations and these requirements.

- At a minimum, contractors/subcontractors will follow best management practices when storing, transporting or using oil, hazardous materials, and wastes.

- All vehicles and equipment containing petroleum that are in use on the right-of-way will be inspected daily for leaks or signs of deterioration that could cause a leak or spill. Repair all leaking or deteriorated conditions prior to use.

- Contractors/subcontractors, at all times, will take care not to cause an uncontrolled spill or release of oil or hazardous materials to the environment.

- Contractors/subcontractors will provide and maintain on-site sufficient spill cleanup and containment supplies (absorbent pads, containment booms, protective clothing, debris containers, etc.) to control releases of oil, hazardous materials, or wastes. In addition, all operational vehicles carry an oil spill kit that contains material for conducting initial containment and clean-up of spills.

- Contractors/subcontractors will remove all oils, hazardous materials, wastes and unused materials from the work site at the completion of the job. This includes full and partially full containers of waste material such as, but not limited to, rags, gloves, trash, scrap material, and empty containers.

  NOTE: If large quantities of oil or hazardous materials are involved, written agreements with emergency response contractors may be required.

Storage and Handling Requirements:

- Contractors/subcontractors will store only the minimal amount of material (at each work site) necessary to complete the work.

- Handling and application of pesticides and herbicides shall only be in accordance with regulations under the Maine Pesticide Control Act of 1975, as amended, Title 7 M.R.S.A., Section 601.

- Petroleum products and other hazardous materials will not be stored or transferred, including fueling of vehicles and equipment, within 100 feet of waterbodies, wetlands, rare plant or unique natural community locations, and within at least 200 feet from water supply wells.

- Overnight parking of equipment will not occur within 100 feet of waterbodies, wetlands, rare plant or unique natural community locations, and within at least 200 feet from water supply wells.

- Materials will be stored in D.O.T. approved containers or approved tanks in areas not considered to be environmentally sensitive.

- Containers will be kept closed unless material is being transferred.

- Contractors/subcontractors will ensure that all transferring operations are monitored and not left unattended.

- Containers will not be stored on the ground, but will be stored in cabinets or on a firm working surface such as a portable trailer bed or other secure decking.

- If at any time a contractor/subcontractor needs to store oil including, but not limited to, fuel oil, petroleum products, sludge, and oil refuse in excess of an aggregate amount of 1,320 gallons (excluding 55-gallon or less containers) that is located near a pathway to navigable waters, the Federal requirements for oil pollution prevention (40 CFR Part 112) must be met. Contractor/Subcontractor Spill Prevention Control and Countermeasure (SPCC) plans must be approved by a licensed, professional engineer and a copy must be sent to the BHE Environmental Services and Compliance group no later than one week prior to the commencement of the oil storage activities.

- Storage and handling of flammable and combustible liquids including gasoline and diesel fuel will be in accordance with rules developed under Title 25 M.R.S.A., Section 2441 (Fire Prevention and Fire Protection), as amended (See also Code of Maine Rules 16-219 Chapter 317). These regulations include, but are not limited to, bonding and grounding during transfer operations, fire protection requirements, storage quantity limitations, and spacing and location requirements.

- All gasoline and fuel storage tanks with greater than a 25 gallon capacity must have secondary containment constructed of an impervious material and be capable of holding 110% of tank capacity.

- Handling and disposal of hazardous wastes will be in accordance with Maine Department of Environmental Protection (DEP) Hazardous Waste Management rules (06-096 Chapters 850 through 857) developed pursuant to Title 38 M.R.S.A., Section 1301 et. seq., and U.S. Environmental Protection Agency regulations (40 CFR 260 through 272). Handling and disposal of waste oil will be in accordance with Maine Department of Environmental Protection Waste Oil Management Rules (06-096 Chapter 860) and U.S. Environmental Protection Agency regulations (40 CFR 279).

Spill Reporting Requirements:

All spill reporting requirements are the responsibility of the contractor/subcontractor. As required by Title 38 M.R.S.A., Section 543 and Department of Environmental Protection regulations (06-096 Chapters 600 4.B and 800 4.1), spills of oil or hazardous materials in any amount and under any circumstances must be reported to the Department within two hours from the time the spill was discovered at **1-800-482-0777**.

As required by the Federal Clean Water Act (40 CFR Part 110.4), a discharge of oil "which causes a sheen upon the surface of the water or adjoining shore line or oily sludge deposits beneath the surface of the water" must be reported within 24 hours to the National Response Center at **1-800-424-8802**.

The need to report spills to the National Response Center of hazardous materials other than oil will be determined by the contractor/subcontractor by consulting the CERCLA list of hazardous substances and reportable quantities (40 CFR Table 302.4). Any spills that involve a reportable quantity of any hazardous substance must be reported to the National Response Center by the contractor/subcontractor.

The contractor/subcontractor must also report all spills immediately to the Bangor Hydro-Electric Company Project and/or Construction Manager and the Bangor Hydro-Electric Environmental Services and Compliance group. Contact information is provided at the end of this document.

Spill Cleanup Requirements:

It is the contractor's/subcontractor's responsibility to ensure and oversee immediate and complete cleanup of all spills involving oil or hazardous materials. The contractor/subcontractor is also responsible for all health and safety issues related to the cleanup of oil or hazardous materials. The contractor/subcontractor is also responsible for expediting the disposal of spill debris waste and restoring the site to its original condition.

If the spill cannot be safely handled by personnel on site, the Contractor will arrange for a licensed spill response contractor to contain, clean up, and perform required sampling and disposal of spilled materials and debris and comply with applicable reporting requirements.

Personnel Training Requirements:

Prior to construction, the contractor will instruct construction personnel on the operation and maintenance of construction equipment to prevent the accidental discharge or spill of fuel, oil and lubricants. Personnel will also be made aware of the pollution control laws, rules and regulations applicable to their work. During construction, spill prevention refresher briefings with the construction crew will be conducted monthly. These briefings will highlight the following:

- Precautionary measures to prevent spills.
- Potential sources of spills, such as equipment failure or malfunction.
- Standard operating procedures in case of a spill, including applicable notification requirements.
- Equipment, materials and supplies available for clean-up of a spill.
- And, a list of known spill events

Section II

General Requirements for Erosion and Sediment Control:

For any project that involves soil disturbance, the contractor/subcontractor will, in accordance with Maine's Erosion and Sedimentation Control requirements (38 M.R.S.A. Section 420-C), take all necessary precautions, prior to commencing construction activity, to prevent unreasonable erosion of soil or sediment beyond the project site or into a protected natural resource as defined by 38 M.R.S.A. Section 480-B, i.e., lakes, ponds, rivers, streams, intermittent streams, brooks, and wetlands. Erosion and sediment control measures may include, but are not limited to, the use of timber mats for access or working in wet areas, the installation of silt fence and hay bale check dams, use of seeding and hay mulching or application of erosion control mix, as necessary. All erosion control mechanisms will be installed and maintained in accordance with the Maine Erosion and Sedimentation Control Handbook for Construction: Best Management Practices, 1991, i.e., grass seed, hay mulch, silt fence, and rutting control and repair.

The contractor will also assure that no vehicles are driven through wetlands or streams. Temporary stream and wetland crossings will be installed in accordance with the Maine Erosion and Sedimentation Control Handbook for Construction: Best Management Practices, 1991, and may include installation of temporary timber mat bridges or temporary culverts. Temporary crossing installations shall be used for the shortest practical period of time and be removed as soon as their function is completed.

Compliance with Laws and Permits:

Certain projects may require local, state, and federal permits. Bangor Hydro will determine whether any environmental or other permits are required by local, state, or federal agencies and will obtain all necessary permits. The contractor/subcontractor will be provided with a copy of all approved permits, as necessary, and will abide by all permit conditions. The contractor/subcontractor shall also comply with all applicable local, state, and federal laws and ordinances together with all applicable local, state, and federal environmental protection statutes, regulations, and standards including, but not limited to:

- State of Maine Natural Resources Protection Act (38 M.R.S.A. Section 480-A to 480-Z)
- State of Maine Erosion and Sediment Control Law (38 M.R.S.A. Section 420-C)
- State of Maine Site Location of Development Law (38 M.R.S.A. Section 483-A)
- Maine Protection and Improvement of Waters Act (38 M.R.S.A. Section 413)
- United States Rivers and Harbors Act of 1899 (Section 10)
- United States Clean Water Act (Section 404)
- "Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices" dated March 1991.

Any questions concerning these requirements should be directed to Bangor Hydro-Electric Company's Environmental Services and Compliance group at 207-973-2543 or 207-973-2542.

Effective date: 06/19/90
Revised: 06/18/03
FWL/mes
ENVIRONMENTAL/ENVCTRLREQFORCONTRACTORS

Certification for Agreement with Bangor Hydro Electric Company's
"Environmental Control Requirements
For Contractors and Subcontractors"

I certify that I have read and understand Bangor Hydro Electric Company's "Environmental Control Requirements for Contractors and Subcontractors" dated 6/18/03. All work performed will be in compliance with all applicable local, state and federal environmental regulations and Bangor Hydro Electric Company requirements. I agree to and will advise any on-site supervisor to enforce strict adherence to the above stated regulations and requirements.

_____

Company

_____

Executive/Owner/Manager – Signature

_____

Date

PROJECT CONTACT LIST

To be determined *BHE Construction Project Manager*	Office: Pager: Mobile:
To be determined *BHE Lead Environmental Inspector*	Office: Pager: Mobile:
To be determined *BHE Environmental Compliance Manager*	Office: Pager: Mobile:
To be determined *BHE Land Agent*	Office: Pager: Mobile:
To be determined *BHE Public Relations*	Office: Pager: Mobile: