Cold River Local Advisory Committee

Drinking Water Protection Plan
Cold River Watershed

Pam O'Hara, Vice Chair Cold River Drinking Water Protection Committee E-mail: pgohara3@yahoo.com	Jennifer Palmiotto Source Water Specialist Granite State Rural Water Association E-mail: jpalmiotto@gsrwa.com
Bill Botting, Facilities Manager Fall Mountain Regional High School E-mail: bill.botting@sau60.k.12.nh.us	Debby Hinman, Chair Cold River Local Advisory Committee E-mail: dhinman@sover.net

Introduction

- Report researched and composed Dec. 2005
  - Funding provided by U.S. congressional appropriation
  - Agencies involved
    - National Rural Water Association
    - Granite State Rural Water Association
    - U.S. Department Environmental Services
  - Jennifer Palmietto, Author
    - Source Water Specialist, Granite State Rural Water Association

Project Description

- Increase understanding of drinking water resources in Cold River watershed
  - Only 0.24% Earth's water supply potable
    - Subject to natural and anthropogenic contamination
- Examine 6 sites for vulnerabilities
  - Develop inventory of potential contamination sources
  - Identify improvements as needed
- Prioritize watershed risks
  - Develop recommendations to address those risks
- Develop contingency plans for emergency loss of water supply

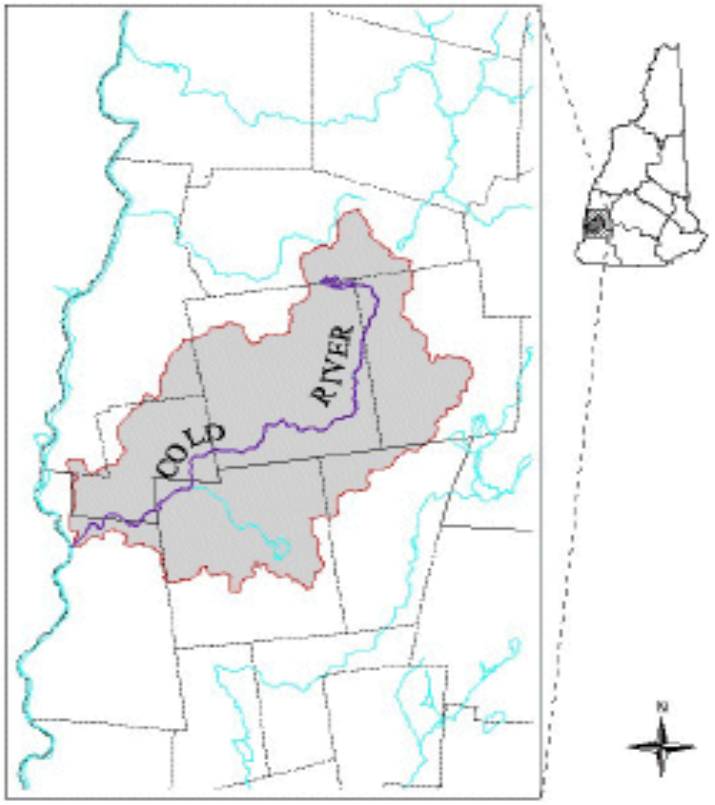
Drinking Water Protection Plan Uses

- Guidance document for planning efforts to protect water quality
- Guide NH DES in efforts to improve state surface groundwaters
- Identify technical or financial resources
- Identify technical or financial needs
- Support development of grant proposals
- Provide guidance to local and regional planning and zoning processes

Definitions

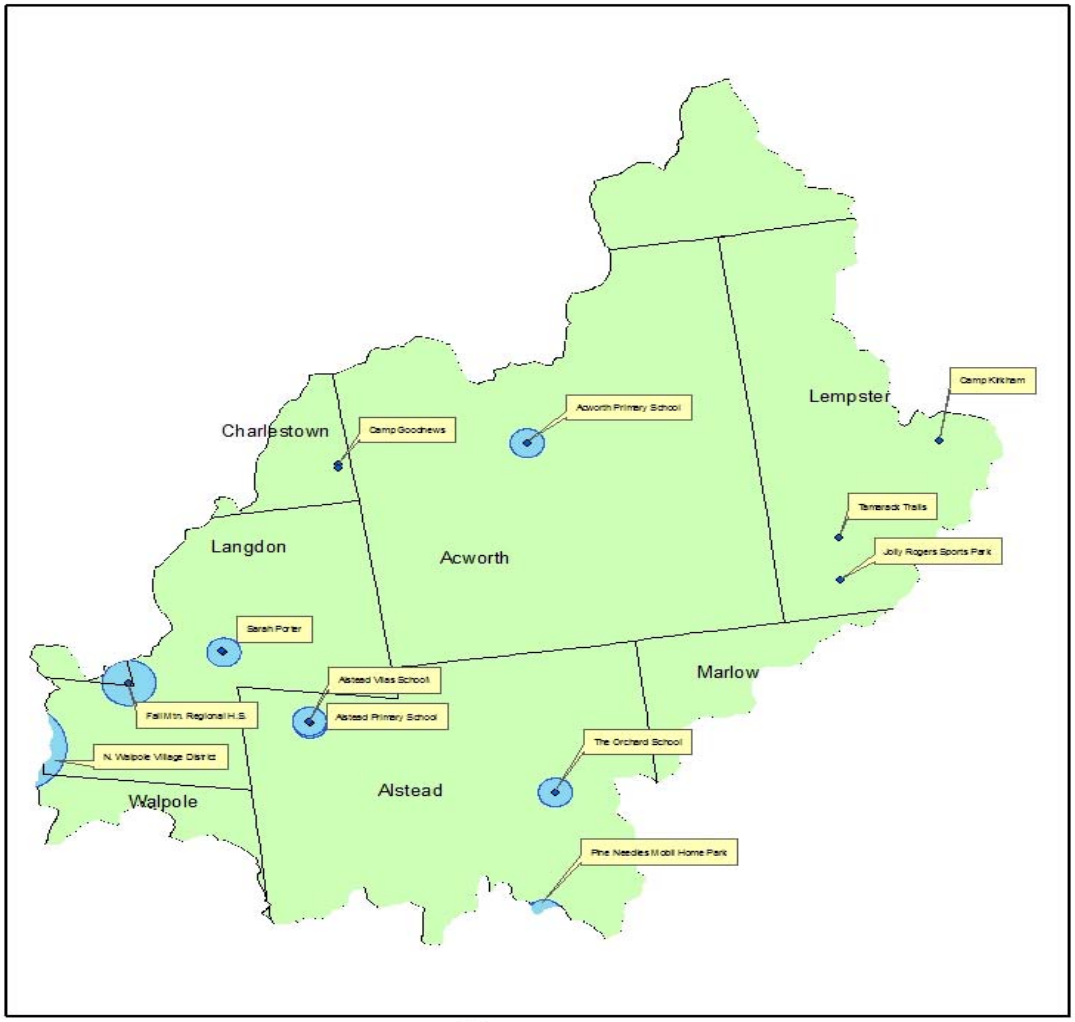
- Wellhead protection area
  - Area under which groundwater flows to a producing well
  - WHPA is a circle whose radius is calculated based on the maximum daily amount of water withdrawn from the well
- Sanitary Protective Radius
  - 75 - 400 foot radius around a well
  - Under current law *must* be controlled by the water supplier through ownership or easement
  - Size of the Sanitary Protective Radius depends on the permitted production volume for the well

Location of the Cold River Watershed



The Cold River and its Watershed

Figure 2.2 Public Water Supplies in the Cold RIver Watershed.



Public Water Systems Surveyed

- Acworth Primary School, Acworth
- Alstead Vilas School, Alstead
- Alstead Primary School, Alstead
- Fall Mountain Regional High School, Langdon
- The Orchard School, East Alstead
- Sarah Porter School, Langdon

Protective Radii Definitions for Surveyed Public Water Systems

- Acworth Primary School
  - Sanitary Protective Radius: 75 feet
  - WHPA: 1,300 feet
- Alstead Vilas and Alstead Primary School
  - Sanitary Protective Radius: 125 feet (Vilas)
  - Sanitary Protective Radius: 100 feet (Primary)
  - WHPA: 1,300 feet each well

Protective Radii Definitions for Surveyed Public Water Systems

- Fall Mountain Regional High School
  - Sanitary Protective Radius: 175 feet
  - WHPA: 2,000 feet
- Orchard School
  - Sanitary Protective Radius: 100 feet
  - WHPA: 1,300 feet
- Sarah Porter School
  - Sanitary Protective Radius: 175 feet
  - WHPA: 1,300 feet

Risk Definitions

- Red: Potentially significant risk
- Yellow: Potentially moderate risk
- Green: Low or no risk

Potential Contamination Sources
Acworth Primary School

Potential Contamination Sources	Potential Pollutants	Approximate Location	Potential Risk
Residential Development	• Residential Heating Fuel: Volatile Organic Chemicals • Household Hazardous Waste: Various Contaminants • Lawn care: Nutrients and Synthetic Organic Chemicals • Septic Systems: bacteria, viruses	Within wellhead protection area	
Transportation Corridors	• Automotive chemicals: Volatile Organic Chemicals • Road salt	Within sanitary protective radius And wellhead protection area.	
Church	• Septic Systems: Bacteria, Viruses • Heating Fuel Storage: Volatile Organic Chemicals	In wellhead protection area >75 feet from source.	
School Building	• School Building Parking Lot: Volatile Organic Chemicals • Septic System: Bacteria, Viruses • Heating Fuel Storage: Volatile Organic Chemicals	In sanitary protective radius In wellhead protection area.	

Recommendations for Improvement Acworth Primary School

- School district should work with the church to ensure septic systems are properly maintained
- School district should ascertain age and condition of churches heating fuel storage tank
- Research options for radon treatment of the water system

Potential Contamination Sources
Alstead Vilas and Primary Schools

Potential Contamination Source	Potential Pollutants	Approximate Location	Potential Risk
Athletic Field	Nutrients, Synthetic Organic Chemicals	Within Sanitary Protective Radius (<125 feet) of the Vilas School Well Within wellhead protection areas of both schools.	
Informal parking by Athletic Field	Volatile Organic Chemicals	Within Sanitary Radius (<50 feet) of Vilas School well.	
Lack of bathroom facilities available for athletes.	Bacteria, Viruses	Potentially within sanitary radius of Vilas School well and both wellhead protection areas.	
Vilas School Septic System Alstead Primary Septic System	Nitrates, Bacteria, viruses	Within wellhead protection areas for both school water systems.	
Gas Station (1)10,000 gal. double walled tank for gasoline (2)4,000 gal double walled tank for gasoline.	RCRA Site Underground Storage Tanks: Volatile Organic Chemicals	Within wellhead protection areas for both school water systems.	
Transportation Corridors	Automotive chemicals, road salt	Within wellhead protection areas for both school water systems.	
Residential Development	Residential Heating Fuel: Volatile Organic Chemicals Lawn care: Nutrients and Synthetic Organic Chemicals Septic Systems: Nitrates, bacteria, viruses	Within wellhead protection areas for both school water systems.	

Recommendations for Improvement Alstead Primary and Vilas Schools

- Prohibit parking within 125 foot sanitary protective radius of the well
- Determine pattern of drainage for the Vilas School parking lots
- Bathroom facilities for athletes and spectators always available
- Continue monitoring of both school's underground heating fuel storage tanks
- Add additional water storage tank for better fire safety
- Explore purchase of fee simple rights or conservation easements of the land east and up-gradient of the well
- Explore options for radon treatment of both water systems

Potential Contamination Sources
Alstead Vilas and Primary Schools

Potential Contamination Source	Potential Pollutants	Approximate Location	Potential Risk
Storm Drain	Toxic chemicals (e.g. cyanide, phenolics, and trichloroethylene), metals, oxygen depleting chemicals, fecal coliform, oil, grease, pesticides, fertilizers, and trash	Within wellhead protection areas for both school water systems.	
Vilas School Underground Storage Tank Former site of Leaking Underground Storage Tank. This tank is "Closed". 4,000 gallon Underground Storage Tank for #2 heating oil	Volatile Organic Chemicals	Within wellhead protection areas for both school water systems.	
Alstead Primary School Underground Storage Tank 4000 gallon double walled tank for #2 heating oil.	Volatile Organic Chemicals	Within wellhead protection areas for both school water systems.	
Horse Ring	Bacteria, Viruses	Within wellhead protection areas for both school water systems.	
Cemetery	Arsenic	Within wellhead protection areas for both school water systems.	

Potential Contamination Sources
Fall Mountain Regional High School

Potential Contamination Source	Potential Pollutants	Approximate Location	Potential Risk
Agricultural Activities Barnyard, manure storage, animals	Nitrates, Bacteria, Viruses	Within sanitary protective radius. Located <45 feet from well.	
Aboveground Storage Tank 275 gallon oil tank for sugar house operations. No secondary containment.	Volatile Organic Chemicals	Within sanitary protective radius. Located <75 feet from well.	
Parking Areas	Volatile Organic Chemicals, Road Salt	Within sanitary protective radius and wellhead protection area.	
Transportation Corridors	Volatile Organic Chemicals, Road Salt	In wellhead protection area	
Underground Storage Tank 10,000 gal. tank of #2 heating oil	Volatile Organic Chemicals	In wellhead protection area	

Potential Contamination Sources
Fall Mountain Regional High School

Potential Contamination Source	Potential Pollutants	Approximate Location	Potential Risk
Aboveground Storage Tank (500 gallons)	Volatile Organic Chemicals	In wellhead protection area	
Underground Storage Tank 10,000 gallon tank of diesel fuel.	Volatile Organic Chemicals	In wellhead protection area	
Bus Repair Shop	Volatile Organic Chemicals	In wellhead protection area	
School Science Lab	Various	In wellhead protection area	
School's Septic System	Nitrates, Viruses, Bacteria	In wellhead protection area	
Sand and Gravel Operation		In wellhead protection area	
Agricultural Land Use	Nitrates, Bacteria, Viruses	In wellhead protection area	
Athletic Field	Nutrients, Synthetic Organic Chemicals	In wellhead protection area	

Recommendations for Improvement Fall Mountain Regional High School

- Use this plan as an educational tool for students
- Conduct a feasibility study for an emergency back-up water supply (currently none exists)
- Contact administrators of Charlestown and Langdon and the NH Division of Forests and Lands
  - Ensure awareness of school's wellhead protection area
  - Encourage participation in any relevant land use discussions which may affect well
- Notify service and repair shops within wellhead protection area as to importance of source protection
- Create secondary containment for aboveground fuel storage tank
  - Currently significant risk that leak will contaminate ground water
- Address the location of the school's farm complex to the proximity of the well
- Investigate radon treatment options for the well

Potential Contamination Sources
The Orchard School

Potential Contamination Sources	Potential Pollutants	Approximate Location	Potential Risk
Storm water from driveway and parking area	Automotive chemicals	Within Sanitary Radius (<10 feet)	
Agricultural land	No pesticides used	Within Sanitary Radius and within Wellhead	
Transportation Corridors	Automotive chemicals, road salt not used	With in sanitary protective radius and wellhead protection area.	
Rural Residential Development	Residential Heating Fuel: Volatile Organic Chemicals Lawn care: Nutrients and Synthetic Organic Chemicals Septic Systems: bacteria, viruses	Within wellhead protection area	

Recommendations for Improvement
The Orchard School

- Ensure stormwater flow from the driveway remains diverted from the school's drinking water source
- Investigate options for radon treatment of the well

Potential Contamination Sources
Sarah Porter School

Potential Contamination Source	Potential Pollutants	Approximate Location	Potential Risk
Fire Department Facility	Automotive chemicals, Vehicle washing and repair	In sanitary protective radius, within 10 feet of well.	
Transportation Corridors	Automotive chemicals, road salt	Within sanitary radius and wellhead protection area	
Residential Development	Residential heating fuel: Volatile organic chemicals Lawn care: nutrients and synthetic organic chemicals Septic systems: bacteria, viruses	Within wellhead protection area	

Recommendations for Improvement Sarah Porter School

- Develop alternative water source
  - Currently school uses bottled water
- Investigate options for radon treatment of water supply

Potential Contamination Sources Watershed-Wide

- Residential heating fuel storage
- Household hazardous waste
- Lawn care
- Septic systems
- Transportation corridors
- Stormwater runoff
- Lack of water resources protection
- Commercial, Industrial and Municipal land uses

Figure 5.1 Map of Potential Sources of Contamination in the Cold River Watershed

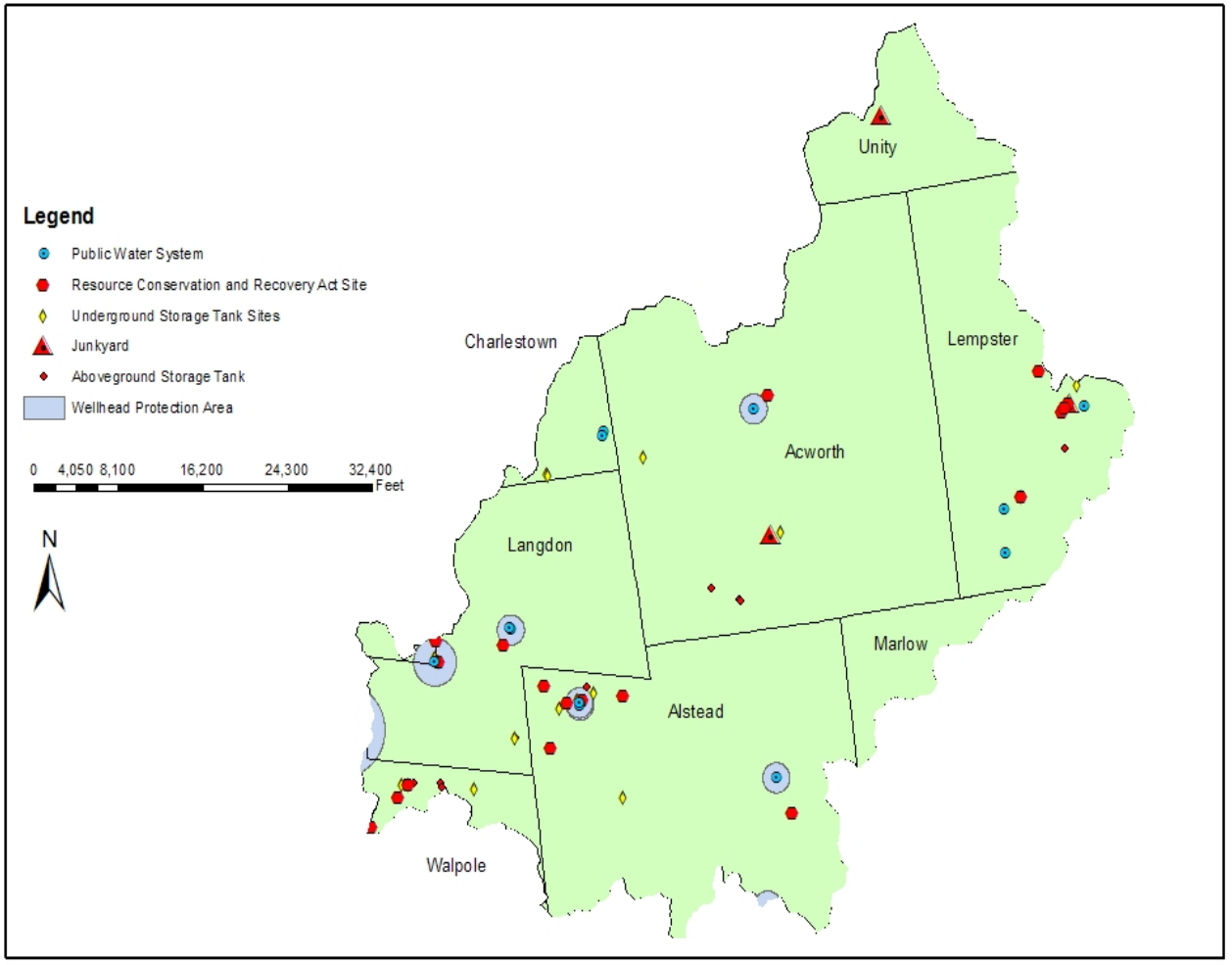
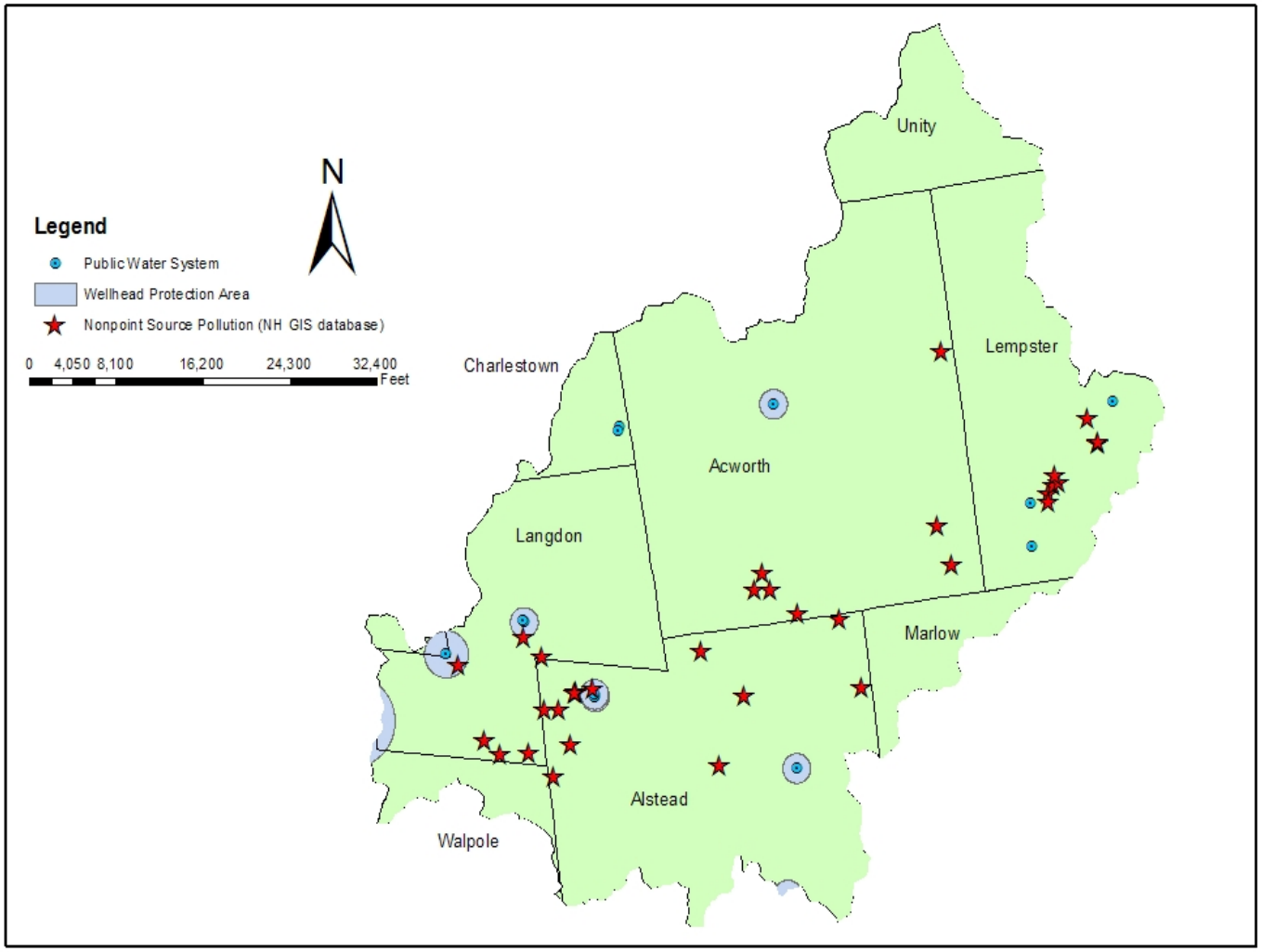


Figure 5.2 Map of Nonpoint Pollution Sources in the Cold River Watershed



Management Activities for Source Protection Cold River Watershed

- Education & Outreach Campaign
  - Distribute copies of drinking water protection plan to all watershed town offices
  - Post drinking water protection plan on the Cold River Local Advisory Committee's website
  - Work with local papers to publish an article about the work of the Drinking Water Protection Committee and its plan of recommendations
  - Share the results of this plan with the other public drinking water systems in the watershed that have not yet participated in this project

Management Activities for Source Protection Cold River Watershed

- Protection of Drinking Water Resources
  - Work with watershed communities to adopt zoning provisions which will protect water resources for watershed residents.
- Emergency Response Planning
  - Work with local emergency response teams within the watershed to ensure that the locations of public drinking water systems are well known
  - Ensure drinking water resources such as aquifers are best protected during a crisis.

Management Activities for Source Protection Cold River Watershed

- Assessment and Planning for Current and Future Drinking Water Needs
  - Encourage watershed towns to assess and plan for future drinking water needs

Conclusion

- Share plan with town boards, citizens and businesses within watershed
- Develop new goals and objectives as current ones are implemented
- Review and update plan every 3 years

References

- Ballestero, T., Roseen, R., Wildey, R., Avellaneda,P., Briggs, J., and Houle, J. 2004 Powerpoint presentation on the University of New Hampshire Stormwater Center. http://www.unh.edu/erg/cstev/Presentations/UMASS-Lowell-_04_06_05_files/v3_document.htm
- Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials. 2004. Eds. A. Donlon and B. McMillan. New Hampshire Department of Environmental Services. Concord, New Hampshire.
- CRCJ, 1994. A Home-Owner's Guide to Nonpoint Source Pollution in the Connecticut River Valley. Published jointly by Connecticut River Joint Commissions and NH DES.
- Freill, M. 2004. "Industry Should Address Tank Issues Before Solutions Area forced upon It". December 2004. Oil & Energy. New England Fuel Institute.
- Jeer, S., Lewis, M., Meck, S., and Witten, J. 1997. Nonpoint Source Pollution: A Handbook for Local Governments. Planning Advisory Service, Report Number 476. American Planning Association. Washington, D.C.
- NH DES. Chapter Env-Ws 300 NH Drinking Water Rules.
- NH DES One-Stop Data Retrieval web site (http://www.des.state.nh.us/OneStop.htm).
- Zielinski, J. 2002. Watershed Vulnerability Analysis. Center for Watershed Protection. Elliot City MD.