WATER SUPPLY ISSUES AND UNCERTAINTIES IN NEW JERSEY'S ATLANTIC COASTAL REGION

April 20 and 21, 1999

WORKSHOP REPORT

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This workshop was sponsored by the Jacques Cousteau National Estuarine Research Reserve and the New Jersey Department of Environmental Protection Division of Watershed Management

Issue/Background

Conventional development practices in coastal communities have often adversely impacted water quality and quantity in many coastal areas, and the need to plan for a plentiful, pure supply of drinking water is often overlooked by communities as they strive to keep up with the rapid growth and development. It is estimated that nearly 269 million people live in the U.S., and 53% live in coastal counties, which represent some 17% of the contiguous United States. At 341 persons per square mile, the average population density is three times greater in coastal counties than in noncoastal counties[1]. The demands of providing the essential infrastructure to this influx of residents is a complex and politically sensitive task. Increasing populations in coastal areas naturally demand more housing, transportation, commercial services, freshwater, and energy. These populations inevitably generate larger quantities of solid waste and place growing demands on community services, such as solid waste disposal and sewage treatment. As coastal communities work to accommodate these demands, the need to develop a long-term strategy of water supply protection and planning is becoming critical.

As development changes the face of the land, the natural hydrological cycle is also altered, with more rainfall leaving the surface of the land as runoff and less water infiltrating the soil to recharge groundwater supplies. In many areas, this increased runoff contributes to more frequent and severe flooding. Pollution generated from our land use activities is directly delivered to our waterways via storm water runoff. Decreased soil infiltration results in lower water tables and often decreases in stream base flow. In Ocean County New Jersey it is estimated that 90% of the base flow of coastal rivers and streams are fed by groundwater sources[2].

More than one-half of New Jersey's drinking water comes from groundwater. In Ocean County alone, thirty-two of the thirty-three municipalities draw their water from underground sources. The water we use for household and commercial uses is then sent to a wastewater treatment facility where it is treated and discharged into the ocean. According to the Ocean County Municipal Utilities Authority, 54 million gallons of wastewater are discharged per day, leaving a sizable loophole in the natural water cycle. Without recharging this valuable resource, concerns about the long-term availability of the water supply and the effects of development are certainly justified.

Increased demand and excessive withdrawals from wells can be especially problematic in the coastal zone. In the area immediately around a well, the water level of the aquifer will slightly decline. Water drawn out of a well creates a void that must be filled. This is done by pulling in water from the area around the well creating what is called a cone or zone of depression. In the coastal areas, as the cone of depression increases, the aquifer level lowers below sea level, causing saltwater to be pulled into the aquifer. Across the country, many communities have lost public wells to saltwater intrusion. Nags Head, Newport News, Key West are part of a long list of towns that have all lost wells to saltwater intrusion.

As early as 1960 Cape May, New Jersey abandoned two public wells due to saltwater intrusion. Three more wells were dug inland, however in the late 1960's they too began to show signs of contamination and by 1980 two of those wells were abandoned. In 1996, Cape May began planning the construction of a reverse osmosis desalination plant along with drilling two new wells into the 800-foot Atlantic City Sands aquifer. The first desalination

plant in the northeastern United States went on-line in Cape May on July 1998 for a total cost of $5 million. The fully automated plant produces 2 million gallons per day in the busy summer season and is planned to meet the city's water requirements through the year 2020.

Desalination is a costly, yet unavoidable solution in areas where alternative sources are not available. However, much focus has been given to planning efforts designed to protect existing supplies. There are many programs at the federal, state and local level directed to protect drinking water supplies. The Water Supply Management Act (N.J.S.A. 58:1A-1) mandated NJ DEP to develop a Statewide Water Supply Plan. The first Statewide Water Supply Plan was developed in 1982 and was later revised in 1996. This Plan presents a range of alternatives designed to ensure that the State's water supplies will withstand foreseeable drought and that aquifers are not depleted.

The Safe Drinking Water Act Amendments of 1996 created many new initiatives including the Source Water Protection Program. The Source Water Protection Program is being implemented by several different program units within the New Jersey Department of Environmental Protection. By 2003, each state and participating Indian tribe will delineate the boundaries of areas in the state (or on tribal lands) that supply water for each public drinking water system, identify significant potential sources of contamination, and determine how susceptible each system is to sources of contamination. Once these state assessments are completed, public water systems will be strongly encouraged to develop appropriate source water protection plans based on the assessment results.

Many county and municipal governments are undertaking local programs to protect drinking water supplies. A range of programs are in place, but a common characteristic of successful efforts are those that combine land use controls with public education efforts.
Wellhead protection is one of the most common and successful approaches to source water protection. The purpose of wellhead protection is to minimize the risk of well pollution due to discharges to groundwater and to focus on the prevention of new discharges that may impair well water quality. Stafford Township is one of several New Jersey communities that have implemented wellhead protection programs. The Stafford ordinance, passed in 1996, establishes an overlay zone that prohibits or restricts certain uses and activities within 1,000 feet of an existing or potential public well. Prohibited activities include permanent storage or disposal of hazardous wastes, collection and transfer facilities for hazardous wastes, and underground storage of hazardous materials in excess of 300 gallons. Restricted activities include on-site storage, use or disposal of hazardous materials or wastes in excess of 50 gallons or 100 pounds; individual ground disposal systems; auto body and auto repair activities; new and used truck/auto sales; and contractor yards and commercial car washes. Stafford Township has also implemented a unique program to curb the off-site discharge of stormwater through their Stormwater Recharge Ordinance. This ordinance requires developers to treat and recharge stormwater on-site. It is hoped that limiting off-site discharge will reduce the threat of saltwater intrusion into the town's public supply wells.

Public education and awareness programs have included efforts to reduce residential contributions of nonpoint source pollution through low impact landscaping, hazardous waste collection days, and education on the management and handling of hazardous materials around the home. Other campaigns focus on water conservation, promoting xeriscaping and distribution of water saving devices such as low-flow showerheads and low-flush toilets. The

New Jersey League of Women Voters has a long history of partnering with local communities to educate the public about water conservation. Their Showerhead project involves selling low flow showerheads for a nominal charge. It has been estimated that the devise cuts water usage in half for a savings of about 18,250 gallons a year for a family of four. Cape May is one community that has combined efforts with the League of Women Voters, and now require new businesses to install low flow devices.

Water is an important natural resource that is affected by population growth, precipitation, economic development, pollution and many other factors. For many coastal counties it is likely to become the principle environmental issue of the 21st century. Local communities need to begin to develop sound management strategies to protect our existing supplies and ensure its availability for the future.

[1]National Oceanic and Atmospheric Administration (NOAA). 1998 (on-line). "Population at Risk from Natural Hazards" by Sandy Ward and Catherine Main. NOAA's State of the Coast Report. Silver Spring, MD: NOAA.

[2]A Hydrologic Primer for New Jersey Watershed Management. United States Geological Survey Water-Resources Investigations Report 00-4140. 2000.

Workshop Summary

In April of 1998 the Jacques Cousteau National Estuarine Research Reserve and its partners produced a series of two one-day workshops entitled ***Water Supply Issues And Uncertainties In New Jersey's Atlantic Coastal Region*** This unique and practical one-day seminar provided an in-depth look at our coastal water supplies and provided a menu of alternatives for local government interested in water supply protection and planning.

This workshop was designed for mayors, environmental commissioners, planning and zoning board members, engineers, planners, and citizens concerned about water supply issues. Due to regional differences in water supply issues, workshops were held at two regional locations. Atlantic and Cape May Counties and barrier island communities from Long Beach Island and south attended the Richard Stockton College seminar. Monmouth and Ocean County representatives attended the April 20th Brookdale seminar.

WATER SUPPLY ISSUES AND UNCERTAINTIES IN NEW JERSEY'S ATLANTIC COASTAL REGION

Workshop Agenda

9:00 Welcome: Tina Bologna (IMCS), Dave Rosenblatt (NJDEP)

9:30 Jessica Sanchez, Office of State Planning
- How the State Plan establishes a framework for regional coordination among local governments
- Local water supply protection efforts – how they are affected by distribution types (MUA, private, etc.),
- Municipal needs and hurdles in water supply management and planning

10:00 Lloyd Mullikin, NJ Geological Survey
- Historical perspective on development of water supply in the coastal plain
- Delineation of coastal aquifers

10:30 Break

10:45 Bob Nicholson/Pierre Lacombe, US Geological Survey
- Coastal aquifer system
- Historic, current and predicted water supply demands
- Water quality and quantity characteristics (contaminants, surface water impacts, restrictions) within each aquifer

11:30 Steve Spayd, NJGS
Source Water Assessment Program (Wellhead Protection)
- Mapping sources of water for delineation areas
- Land Use Impacts
- Case Study on Wellhead Protection

12:00 Lunch

1:15 Bob Kecskes, NJDEP
- Water Quantity Protection Initiatives, Recommended Action Program, NJDEP
- Summarize implementation strategies reduce to threat of saltwater intrusion

1:45 Watershed Planning for Surface Water Protection
Kevin Donald, Brick MUA

2:15 Sherry Smith, Stafford Township Environmental Commission
Groundwater Guardian Community
- Stormwater management ordinance
- Wellhead protection overlay zoning

2:45 Marie Curtis/Peggy Haskin, League of Women Voters
- Water Conservation Measures, Cape May County
- Community Awareness

3:15 Break

3:30 David Blair, Metcalf and Eddy Cape May Desalination Plant

4:00 David Leister, NJ Rural Water Association
Atlantic County Wellhead Protection Advisory Committee
- Egg Harbor model ordinance

4:30 Wrap-up

Resources

Source Water Protection and Water Supply Planning

Environmental Protection Agency Office of Groundwater and Drinking Water
(www.epa.gov/ogwdw/)

NJ Statewide Water Supply Plan Executive Summary
(http://www.state.nj.us/dep.watershedmgt/publications.htm)

New Jersey Geological Survey
Draft Guidance for Well Head Protection Area Delineation and Public Community Supply Well Locations (http://www.state.nj.us/dep/njgs/index.html)

Public Education Resources

International City/County Management Association (ICMA) Source Water Awareness Media Toolkit (http://www.lgean.org/html)

National Association of Counties
(http://www.naco.org/programs/environ/)

Ordinances:

Atlantic County Model Ordinance
Stafford Recharge, Wellhead Protection
Cape May Water Conservation