Northrop Grumman Response to HDR Report for Bethpage Plume
Executive Summary - December 5, 2016

Introduction

The New York State Department of Environmental Conservation (Department) directed Henningson, Durham & Richardson Architecture and Engineering, P.C. (HDR) to evaluate remedial options for addressing the groundwater plume associated with the Grumman Aerospace and associated U.S. Navy Bethpage Facilities ("Bethpage plume"). The July 2016 "HDR Report" provides the Department with three groundwater remedial options to consider:

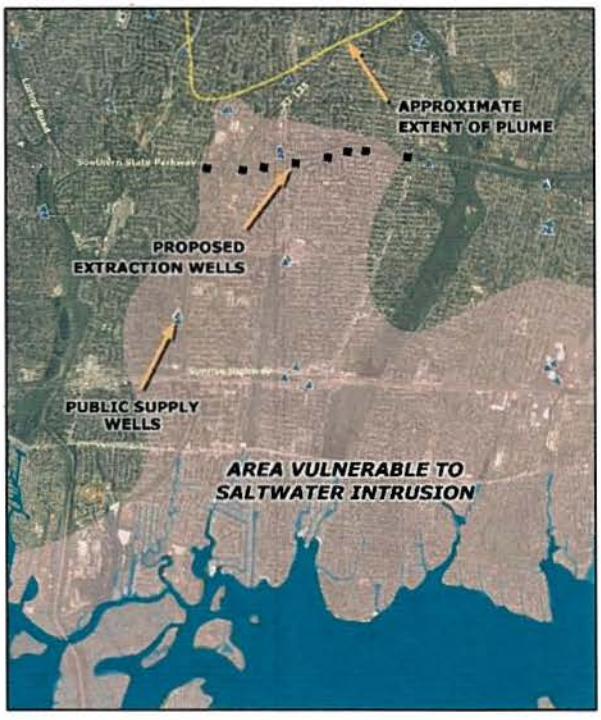
- Option 1 - Pump 19 million gallons per day (MGD) from extraction wells, treat extracted water in a newly constructed treatment plant, and discharge treated water to Massapequa Creek.
- Option 2 - Pump 19 MGD from extraction wells, treat extracted water in the Cedar Creek Water Pollution Control Plant, and discharge treated water to the Atlantic Ocean.
- Option 3 - Pump 19 MGD from extraction wells plus three South Farmingdale Water District public supply wells, treat extracted water at the Cedar Creek Water Pollution Control Plant, and discharge treated water to the Atlantic Ocean.

Northrop Grumman and the Navy both provided detailed comments on the HDR Report to the Department on September 9, 2016. Northrop Grumman's comments were prepared by experienced hydrogeologists, engineers, and scientists; this document represents an executive summary of those comments. The comments demonstrate that all three of the remedial options would increase salt water intrusion, deplete water supplies, and cause substantial environmental harm to natural resources including groundwater, surface water, wetlands, rare and endangered species, and estuarine organisms. The options would also create conditions that could increase volatile organic compound (VOC) impacts on drinking water supplies. Moreover, the HDR Report is based on the erroneous assumption that the remedial options could prevent the plume from impacting drinking water wells not currently affected; however, some VOCs would likely migrate past the planned remedial systems. As is the case at many locations on Long Island, wellhead protection would be required as part of any groundwater remedy to protect human health and the environment.

The HDR options would induce saltwater intrusion, damaging the groundwater resource.

Saltwater intrusion caused by years of heavy pumping by water suppliers poses a major threat to Nassau County water supplies. At the 2014 Long Island Groundwater Symposium, the U. S. Geological Survey reported that the extent of saltwater intrusion in Nassau County is substantially greater than previously estimated.

The extensive pumping the remedial options call for would lower the groundwater water levels and exacerbate saltwater intrusion. Supply wells lying within the 5-foot water level contour such as Massapequa Water District wells, would be particularly vulnerable to saltwater intrusion, as indicated in the figure on the right. In most cases, aquifers impacted by saltwater are lost to beneficial use and supply wells contaminated by saltwater are abandoned or used sparingly. The affected water districts would then be forced to meet the needs of their customers by providing water from other sources.



The HDR options would harm natural resources.

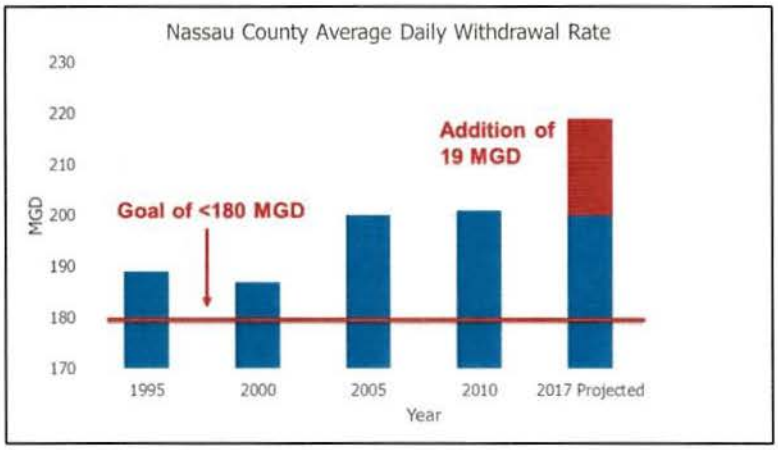
The remedial options would substantially alter sensitive habitats for threatened and endangered species including highly valued coastal estuaries and fisheries. Each of the remedial options would lower the water table and thereby reduce groundwater inflow to Nassau County streams by as much as 55 percent. Reduced streamflow would harm the ecological and recreational values of Newbridge Creek, Bellmore Canal, Cedar Creek, Seaford Creek, Carman Creek, and Narraskatuck Creek for all options, and Massapequa Creek for options 2 and 3.

Massapequa Creek and Massapequa Preserve are areas of important and limited natural habitat in Nassau County. One of the remedial options, Option 1, requires 19 MGD of treated groundwater to be discharged to the Massapequa Creek, increasing its average flow fivefold. This increased water flow would intensify erosion and sedimentation, which would change the stream's ecology and threaten the elimination of local populations of rare and endangered plants. Under Options 2 and 3, groundwater flow into Massapequa Creek would be severely reduced, which would alter important habitats such as the wet pine barrens in the Massapequa Preserve and further harm threatened and endangered species. Also, reduction in water flow would impair the use of the preserve for bird watching, hiking, and recreational fishing.

Massapequa Creek discharges into South Oyster Bay via Massapequa Cove, both locally important water bodies. Massapequa Cove and South Oyster Bay have been prized for shellfish and fishing for decades due to the natural balance between fresh water and saltwater. Changes in the Creek's flow would alter sedimentation and salinity in the Cove and the Bay, thereby affecting the survival of valuable natural resources such as seagrass, clams, and juvenile fish in this estuary.

The HDR options would deplete water supplies.

All the remedial options would deplete available water supplies to below sustainable levels. Indeed, the HDR Report readily acknowledges that "all of the remedial options will result in a loss of 730 billions of gallons of water resource from a sole source aquifer that supply the residents of Nassau County with drinking water for the next century ....", yet the report offers no solution to this resource loss. Removing 19 MGD of groundwater beyond what is currently withdrawn by public supply wells would reduce the availability of water to suppliers, particularly those nearest the proposed remedial wells such as South Farmingdale Water District Plants 4 and 6 and New York American Water Seaman's Neck Plant.



At the October 2016 Long Island Drinking Water Symposium, which took place after Northrop Grumman's submittal of its comments on the HDR Report, the Department indicated that historical public water supply withdrawals in Nassau County have exceeded the safe yield of 180 MGD, as shown in the figure on the right. All water districts on Long Island are required to submit water conservation plans to the Department by March 2017. Moving forward with implementing additional water conservation practices, the Department's stated goal for the County is to never exceed the 180 MGD safe yield. Each of the remedial options would produce an additional stress on the aquifer, working against the Department's water conservation principles for maintaining viable water supplies and protecting groundwater and ecological resources.

The HDR options may increase VOC impacts on water supply wells.

Implementation of any of the remedial options may increase VOC impacts on drinking water supplies. The proposed additional groundwater extraction would increase the hydraulic gradient and groundwater flow rate, thereby increasing the rate of VOC migration toward several supply wells including South Farmingdale Plants 1, 3, and 6 and New York American Water Seaman's Neck Road Plant. Further, because groundwater removal by the HDR options would reduce the water available to nearby water supply wells, such as Massapequa Water District wells, the capture zones for those supply wells may need to expand into areas impacted by VOC contamination to obtain sufficient water.

The current Department-approved remedy is more protective of public health than the HDR options.

The current remedy that Northrop Grumman and the Navy are implementing under the OU-2 and OU-3 Records of Decision (RODs) includes active groundwater remediation using several groundwater pump and treat systems and operation of a Public Water Supply Protection Program to provide wellhead treatment or comparable alternative measures at supply wells with actual or anticipated impacts. The Department determined, after a public review process, that the current remedy was appropriate and protective of public health. The HDR options would not improve on the current remedy and would actually be less effective in protecting public health and the environment due to the harm they would cause.

A key element of the current remedy is wellhead treatment, which has consistently produced safe potable water. Wellhead treatment systems are relatively simple, and routine monitoring by the water districts and the New York State Department of Health ensures the continued safety of the treated drinking water. Assemblyman Joseph Saladino, the sponsor of the bill that required preparation of the HDR Report, stressed to Long Island residents "by the DEC treating the water at the wellhead, it is made safe at the tap." Wellhead treatment is a common practice for protection of public health and there are currently 120 public supply wells with wellhead treatment for VOCs throughout Nassau County.

The HDR options are contrary to prior Department decisions.

The Department has rejected groundwater remedies like the proposed HDR options on two occasions. The HDR Report acknowledges the difficulty of implementing all three of the options but fails to consider the past and future benefits of the Department's remedial decisions. The HDR Report therefore has suggested options that are not only infeasible but would result in significant harm.

The Department evaluated, and rejected, a groundwater remedy resembling the remedial options in the 2001 OU-2 ROD due to "...technical infeasibility of implementing such a program in the extensive and diffuse offsite plume." Further, the Department responded in the ROD to a request from the Massapequa Water District to contain the Bethpage plume by stating "... full plume containment is not a feasible option... it is clear that full plume containment would be too extensive in nature, and is just not feasible." Twelve years later, the Department concluded in the 2013 OU-3 ROD, that a groundwater remedy like the proposed HDR options was even less realistic than in 2001. Northrop Grumman reviewed the same criteria that the Department applied in rejecting the prior proposals and found that the HDR options suffered from many of the same infirmities, but created new ones such as the need to build or expand large treatment plants to handle the massive amounts of extracted groundwater.

Conclusion

The HDR Report provides three options that all involve the same approach of removing massive amounts of fresh water from a valuable sole source aquifer in an attempt to capture contamination at the leading edge of the Bethpage plume. The concerns with this proposal expressed by the highly credentialed preparers of the September 9, 2016 comments have also been reflected in comments from a wide array of other knowledgeable individuals and organizations. Similar concerns were identified during the recent Long Island Drinking Water Symposium and in the comments submitted directly to the Department by, amongst others, the Nassau County Department of Health, the South Farmingdale Water District, the Friends of Massapequa Preserve, and the South Shore Audubon Society.

The Department has rejected, on at least two occasions, similar plume intercept schemes because they would not conform to the National Contingency Plan, were ineffective, and could not be feasibly implemented. The HDR Report tacitly recognizes these inherent difficulties, but the attempts to partially remedy those deficiencies has led to developing a scheme that would cause considerable environmental harm, a situation that can be avoided if the Department continues to implement its existing remedy.