Comments on the *NASSAU COUNTY MASTER PLAN 2010-2030*

Submitted to the Nassau County Planning Commission
Public Hearing
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Theodore Roosevelt Executive and Legislative Building
1550 Mineola, New York

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To the Members of the Planning Commission:

Thank you for the opportunity to comment on the *Draft Nassau County Master Plan: 2010-2030*. The following comments are respectfully submitted for your consideration. These comments address portions of the Draft Master Plan that concern water resources, water supply, and water-related infrastructure. They generally document why many of the proposed goals and actions presented in the plan may not be possible due to the impact that additional growth will have on the drinking water supply for Nassau County.

CHAPTER 3: LAND USE
1. Regarding the Year 2030 Goals, page 1 of Chapter 3, the following comments are provided.

COMMENTS:

A. Under the heading: **DOWNTOWNS AND TRANSIT ORIENTED DEVELOP**, two goals are stated that will not be able to be supported by the groundwater system relied on by Nassau County residents.

- **GOAL: ACCOMMODATE 26,000 NEW JOBS (10.4 MILLION SF OF NEW COMMERCIAL DEVELOPMENT):** the construction of 10 million square feet of additional commercial building space will necessitate additional water service and generate additional water demand. The present supply of water is not sufficient to support this new increase in water demand without producing **undesirable results**. The types of undesirable results, such as additional saltwater intrusion, the loss of stream base flow, the lowering of pond levels, and the spread of pollutants deeper into the aquifer system, are not mentioned in the Master Plan. While the Master Plan is not intended to be an environmental impact statement, it is intended to guide future decisions and plans. If the consequences of future actions are not informed by both the benefits and detriments of such actions, then the Master Plan will not promote prudent policy.
    - Not only have the impacts not been described or explained to Nassau residents via the Master Plan, the citizens of Nassau County have not been asked if they support or agree to these consequences in order to meet the goal set forth.
    - Since the protection of the drinking water supply is the highest environmental priority of the public on Long Island, it seems that proposals that place the drinking water supply at risk should be clearly discussed with the public, prior to the adoption of such proposals and projects.

- **GOAL: ACCOMMODATE UP TO 11,000 NEW RESIDENTIAL UNITS**: As per the comments above regarding commercial construction, new residential construction will add to the water demand of the County. The Master Plan offers no projection of how much water demand is contemplated by the proposed new growth. Even with strong water conservation practices, there will be environment consequences to a further build-out for commercial and residential construction.

B. Under the heading, **NASSAU HUB & THE GRUMMAN PROPERTY, BROWNFIELDS, AND UNDERUTILIZED COMMERCIAL CORRIDORS**, one goal will have an impact on the water supply that cannot be supported.

- **GOAL: ACCOMMODATE 16,275 NEW JOBS (6.5 MILLION SF OF NEW COMMERCIAL DEVELOPMENT**: This goal adds proposes more new commercial development for Nassau County. The total proposed growth (goals A. + B.) in Chapter 3 totals 32,275 new jobs and 17 million SF of new construction. Robust growth of the type proposed in Chapter 3 would be a welcomed boost to the Nassau County economy.

  The Master Plan uses the term "accommodate." To "accommodate" means to make fit, adjust to, and to have space for. In this regard, accommodate must also mean being able to support the proposed plans. To accommodate the vision of the Master Plan, the County must be prepared to address both the positive aspects and the negative aspects of future growth. The Master Plan is not only silent on the environmental impacts of some goals, in later sections, it misrepresents the current and future prospects for the water supply for the 1.3 million residents of Nassau County.

CHAPTER 4: INFRASTRUCTURE

1. Regarding the goals proposed for this chapter, two actions are proposed. They address transportation and energy. However, several goals are missing from this chapter.

COMMENTS:

A. The Master Plan should add Policy Goals for water supply and wastewater infrastructure. The essential services related to water infrastructure need more attention and additional spending. This is one way to "accommodate" the new future the Master Plan depicts.

- Specifically, more attention is needed to examine how the water supply can be stretched to "accommodate" proposed growth.
- The wastewater system operated by Nassau County is falling into a state of disrepair. This needs to be corrected. The system will need some upgrades if all the projected growth is realized because this new growth will generate additional wastewater.
- The stormwater collection system for Nassau County needs an on-going maintenance program with an adequate budget. The failure to maintain the recharge basin network of 800 basins or more causes less water to be recharged to the aquifers and increases the amount of water that evaporates and is lost.

2. Section 3 of Chapter 4 addresses **WATER RESOURCES**. There are numerous problems with information presented in this section. The following comments attempt to explain the problems and document why correcting them is important.

COMMENTS:

B. Groundwater (pg. 21): The opening discussion on groundwater, found on page 21, tells part of the groundwater story. The discussion notes **two important facts**:

- **Fact 1**: The Plan points out that water supply withdrawals have reached 190 million gallons per day (MGD).
- **Fact 2**: The Plan points out that during a hot/dry summer, high water use puts significant stress on the water infrastructure to meet demand.

- The Master Plan discussion fails to explain why these two facts are important for the future growth in Nassau County.
  - **First**, the fact that average water demand has reached 190 MGD, documents that Nassau County has exceeded the "safe yield" level for the aquifers. The County itself set safe yield at 185 MGD. By definition, when more water is withdrawn from the aquifer than the aquifer system can reasonably accommodate, undesirable consequences can result. The Master Plan fails to explain that Nassau County is already experiencing negative consequences. The Plan does not discuss the undesirable consequences or explain what they mean for the water supply and the environment. Some of the undesirable impacts include higher costs for water due to depletion, loss of water production areas due to saltwater intrusion, and loss of surface water features such as streams, ponds and wetlands.

  - **Second**, if water suppliers have to increase their production capacity and expand their water distribution infrastructure to meet higher demand, higher costs for their customers will occur.

  The Master Plan needs to make these consequences and trade-offs clear.

C. Regarding the groundwater discussion on page 22 related to **Perchlorates**, the discussion is not clear.

COMMENT: Presently, there is no drinking water standard for Perchlorates. If New York adopts a standard similar to California or Massachusetts, it is not certain that water quality would be within the standard.

D. Regarding the groundwater discussion related to **saltwater intrusion** on page 22, the following comments are offered.

COMMENT: The discussion on saltwater intrusion is factually correct but leaves the reader with an impression that is not correct. The way the discussion is presented, the reader is given the impression that when comparing aquifer changes due to water withdrawals for public water supply to the changes due to sea level rise, it is sea level rise that is of greatest concern. The aquifer has responded to sea level rise over the past 18,000. This is true. The aquifer response has been gradual because sea level rise, up until now, has been very gradual.

However, the greatest force for change in the aquifers now is the large amount of water taken out due to water pumpage (i.e., 190 MGD or more). The disrupting effect that water withdrawal has

on the saltwater interface is ignored, leaving the impression with the reader that of the two processes, sea level change (which we have little control over, in theory) is of greater importance.

This misunderstanding suggests the county has no responsibility regarding saltwater intrusion except to monitor it after the fact. But, once saltwater intrusion is detected, it is too late. Slow changes in the movement of the saltwater interface will continue moving inland as the Master Plan explains. But, large movements in the saltwater interface will be caused due to the excessive amount of water being removed from the aquifers due to pumping. The language in the discussion needs to be made more precise.

The Master Plan is correct in addressing the serious problem of saltwater intrusion. It is at fault for giving the impression that the intrusion we face is a reflection of sea level rise rather than to the large amount of water pumpage.

E. The Stormwater Program is discussed on pages 24 – 27. A brief discussion of **recharge basins** appears on pages 26 - 27. The recharge basin subsection and the information it presents will be commented on in detail because it has **substantial errors** and gives readers a false understanding of the water resource situation in Nassau County.

COMMENT: No comment is offered for the first paragraph discussing recharge basins (pg. 26).

The second paragraph, at the bottom of page 26 is a **substantial misrepresentation** of the groundwater system in Nassau County. Figure 4-7, on page 27, repeats the misrepresentation visually. **Both are flatly wrong and should be replaced** with information that correctly reflects the hydrologic processes that operate within the aquifer system beneath Long Island.

1. The discussion presented on page 26, states that the pumpage of 190 MGD is less than the average daily recharge of 341 MGD. It then states,

> "*Since recharge to the groundwater system significantly exceeds the amount of groundwater withdrawal from the system, available groundwater resources are more than sufficient to meet present and future demands.*"

This statement is technically inaccurate and misleading. Nassau County has maintained the position articulated by the statement quoted above for the past 20 years. It has been used to justify population growth, development and expanded water demand without any consequences. It is demonstrably incorrect and should be removed from the Master Plan.

2. The quotation from page 26 and Figure 4-7 both convey the same message. They both tell the reader that all we need to know is how much water is recharged (341 MGD) and how much water humans pump from the aquifer (190 MGD). As long as the water we take out is less than the water nature puts in is greater, all is OK.

This relationship can be written as: **Inflow > Water Pumpage = OK**
The statement above is not true and the outcome is not OK.

3. In hydrology, the **water budget** equation is:

Inflow = Outflow ± Water in Storage

To understand if there are problems with the aquifer, all of the components of the equation must be accounted for.

In the Master Plan, only a few of the components of the water budget are accounted; mainly inflow and pumpage (a part of total outflow).

Inflow = 660 million gallons/day or **341 MGD** of recharge

Pumpage = 190 MGD (Pumpage is only a part of total Outflow)

Outflow includes the following process:

- Discharge to streams/surface water (information **not given**)
- Outflow to the ocean and Long Island Sound (**not given**)
- **Pumpage** for water supply (**190 MGD**)

Water in Storage: how much water is stored in the aquifers (**not given**)

It is impossible to make the statement that *available groundwater resources are more than sufficient to meet present and future demands* without knowing the full details of the water budget.

Although the Master Plan did not provide all the information needed, Nassau County has quantified some of the Outflow components. From the *Nassau County 1998 Groundwater Study*, the water budget can be partially filled in.

Outflow: is the total of all water leaving the aquifers, including:
Pumpage today = 190 MGD
Discharge to streams = 35 MGD
Outflow to oceans/Long Island Sound = 169 MGD
Total Outflow = 394 MGD This is the amount for comparison to Inflow.

When Inflow and Outflow are now compared the inaccuracy of the Master Plan is clear.
Inflow (341MGD recharge) vs. **Outflow** (394MGD).

Inflow (341) < Outflow (394) Outflow significantly exceeds inflow.

However, Figure 4-17 shows: Inflow (341) > Pumpage (190) (improper comparison).

The correct comparison: Inflow (341) ≠ Outflow (394) (± Water in Storage)

Using the water budget, the **aquifer system is out of balance by 53 MGD**. More water is going out of the system than coming in. The system is being over-drafted, e.g., **depleted** today.

So where is the extra 53 MGD coming from?
It is coming from the **water held in storage**, the third part of the equation.

As the over-drafting continues, year by year, more and more water is permanently lost from the aquifer, and the undesirable consequences discussed earlier occur.

If the Master Plan presented the amount of **Water in Storage,** this value would be changing over time to provide the extra water being taken from the system. As the amount of water in storage decreases, the water table drops, saltwater potential increases, contamination spreads, and the aquifer system remains out of balance.

The water budget discussion shows how the water used in the county is beyond what can be safely produced. It also helps to explain where the County came up with its safe yield number. But, the safe yield number used by Nassau County has changed over the years. As water use reached one value and then exceeded it, a new safe yield value was chosen. The first safe yield value of 180 MGD was used in the 1980s; then 185 MGD in the 1990s; now, it seems to be 190 MGD. During the years 2000-2003, water pumpage reached the 200-203 MGD range.

The Nassau County Department of Public Works (2005) described the water pumped from the aquifers this way:

> "average annual water demand has crept upwards due to increased groundwater withdrawals during the peak pumping months. Demand increased from an average of approximately 185 mgd during the 1990s, to an average of approximately 193 over the last five years, primarily due to lawn watering during the warmer months. Additionally, annual demand over three of the last five years has **equaled or exceeded 200 mgd**" (*Groundwater Monitoring Program, 2000-2003,* Department of Public Works, 2005, pg. 120-121).

4. Not only has Nassau County kept moving the goal posts so to speak, it has continued to use a groundwater approach that is now widely discredited. The basic premise of "safe yield" is that as long as withdrawals do not exceed recharge, all is "safe."

As just demonstrated, the numbers do not support the "safe yield" view of groundwater processes. A list of professional articles from respected hydrologists is provided to demonstrate the many professional who have rejected safe yield as a management strategy. (Please see the list at the end of the comments.)

5. If the safe yield view of the groundwater resource is not accurate, then the assumption that there is sufficient water to meet present and future demand must also be questioned. Figure 4-17 should be removed or corrected.

6. A final point needs to be made regarding recharge basins. Recharge basins in Nassau County are not routinely maintained. To keep a recharge basin recharging, it needs to be periodically cleaned. Plants and debris on the bottom of the recharge basin should be removed and a sandy bottom should be maintained. After a storm, a basin should not continue to hold water. Water held in the basin long after a storm event is water that is not recharging the aquifers. To obtain the full value of recharge basins, they should operate efficiently. This is not presently occurring in Nassau County.

7. Climate Change is discussed on page 30 of Chapter 4. Climate change will produce a sea level rise around Long Island of up to 4.5 feet by 2080 (NYS Sea Level Task Force). While the

Master Plan discusses the impact of sea level rise over 18,000 years, it does not properly explore the impact over the coming 30 to 60 years. Sea level rise in this century will generate great pressure on the aquifers and substantial saltwater intrusion can be expected. It is probably not enough just to monitor changes. Figure 4-8, pg. 31, shows how far inland storm surges would reach. This graphic such be expanded to examine the percentage of land area that would be affected. Storm surges would destroy or damage the two county sewage treatment plants on the south shore.

The Master Plan needs to discuss how the county plans to avoid a sewage disaster over the twenty-year planning horizon of the plan. Not only would the loss or impairment of these two aging plants be an environmental disaster for the county; it would also be an economic disaster as well.

Appendix A.

The following references are articles and publications by respected hydrologists and scientists discussing the flaws of safe yield and rejecting it as valid or useful concept for groundwater management. This is an example of the professional critique of the concept.

Alley, W.M., and S.A. Leake. "The Journey from Safe Yield to Sustainability." *Ground Water* 42, no. 1 (Feb. 2004): 12-16.

Alley, William M., Thomas Reilly, and O. L. Franke. *Sustainability of Ground-Water Resources.* USGS Circular 1186, Denver: USGS, 1999, 79.

Bartolino, J.R., and W.I. Cunningham. *Ground-Water Depletion Across the Nation.* Fact Sheet 103-03, Reston: U.S. Geological Survey, 2003.

Bredehoeft, J.D. "The Water Budget Myth Revisited: Why Hydrogeologists Model." *GROUNDWATER* 40, no. 4 (July-August 2002): 340-345.

Bredehoeft, J.D., S.S. Papadopulos, and H.H. Cooper. "Groundwater: The Water Budget Myth." In *Scientific Basis of Water Resource Management,* 51-57. Washington, DC: National Academy Press, 1982.

Loaiciga, H.A. "Comments on "The persistence of the water budget muth and its relationship to sustainability" by J.F. Devlin and M. Sophocleous, Hydrology Jounal (2005) 13:549-554." *Hydrology Journal* 14 (2006): 1383-1385.

Sophocleous, M. "From safe yield to sustainable development of water resources - - the Kansas experience." *Journal of Hydrology* 235 (2000): 27-43.

Sophocleous, Marios. *Bulletin 239: Perspective on Sustainable Development of Water Resources in Kansas.* Bulletin 239, Kansas Geological Survey, Lawrence: University of Kansas, 1998, 61-85.