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CLUB**
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LOWER HUDSON GROUP

c/o Gale Pisha, Secretary
13 New Haven Avenue
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June 22, 2015

Tim Miller
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Re: Sierra Club Lower Hudson Group's comments on the Draft Generic Environmental Impact Statement (DGEIS) regarding the annexation of certain lands to the Village of Kiryas Joel

The following comments are made on behalf of the more than 4,200 members of Sierra Club Lower Hudson Group (SCLHG), which includes members in Rockland County who will be affected by the environmental impacts of the proposed annexation.

The main--but not the only--objection of SCLHG to the DGEIS is the impact on the Ramapo River of the increased wastewater discharge from new development that will result from this annexation. This river supplies one-third of Rockland County's drinking water from well fields in the Ramapo Sole Source Aquifer.

I. The DGEIS's projections of population increase and resultant impacts on the environment out to the year 2025 are not adequate.

The DGEIS for the 507-acre annexation, section 3.2, projects the population of Kiryas Joel (KJ) will almost double in the next 10 years. Projecting out to the year 2025 is not enough to adequately assess the impacts from this high rate of population growth, since the rate of growth will presumably continue past that date. With more typical development projects, the population of the development usually increases until full build-out of the development and then stops. The KJ DGEIS makes no statement that once this doubling of population occurs in 10 years, it will stop. Therefore a plausible time frame for projection of impacts should be much longer, and at least the estimated lifetime of the water or sewer infrastructure, since this infrastructure will be needed to accommodate the continued rate of increase. At least a 50 year projection of population increase would be more adequate in properly identifying the environmental impacts of this population increase on the water and sewer capacity, as well as on other natural resources, in the region.

II. The addition of wastewater to the Ramapo River will have negative implications for the water supply of Rockland County.

The projected population increase will have major impacts for water supply and wastewater release.

To meet projected future water supply needs, the DGEIS states that KJ will connect to the Mountainville well field and eventually the New York City Aqueduct. A pipeline is being constructed which will bring water from Mountainville to the Village of KJ in 2015, and the DGEIS projects that the remainder of the pipeline to New Windsor to connect to the aqueduct will be completed by 2017. However, these plans are indefinite, since additional funds are needed to complete the pipeline, and

approval is needed by New York City. The DGEIS states, "The allowable water taking from the aqueduct will be determined by the NYCDEP at a future time when approvals and infrastructure are in place to connect to the aqueduct." (p. 3.5-4). With the possibility that funding will not materialize nor approvals be granted by NYC, there is the distinct possibility that the Mountainville well field will be the primary water source for this future increase in need. SCLHG believes that pumping from Mountainville will deplete the Woodbury Creek during low flow times, and that the diversion of this water from the Moodna basin to the Ramapo basin when it is discharged to the river as wastewater will have a negative impact on the Moodna basin.

The wastewater for KJ currently discharges to the Ramapo River basin via two waste water treatment plants (WWTPs), the Harriman and the Village of KJ WWTPs. The Village proposes to meet the increased need for wastewater discharge by increasing Harriman's capacity 50% from 6 mgd to 9 mgd to accommodate the 1.3 mgd average daily sewage flow increase. The DGEIS acknowledges that "thirty percent of Rockland County and two million residents in New Jersey receive their drinking water from the Ramapo River aquifer" (p. 3.5-24).

While the DGEIS may be technically correct that "the quality of the wastewater treatment plant effluent is not affected by the level of population growth or its location," (p. 3.5-27), it is clearly not correct to conclude from this statement that "therefore, there are no significant impacts to the receiving water body (Ramapo River) as a result of the proposed annexation action" (p. 3.5-27). **This conclusion completely ignores the fact that the increased amount of wastewater effluent very much impacts the receiving water body.**

Robert Kecskes, with 25 years of experience as Chief of the Water Supply Planning Section at the New Jersey Department of Environmental Protection, authored a report in 2014 assessing New York and New Jersey water resources, specifically related to proposed development projects along the Ramapo River which included two casinos and Orange County's Tuxedo Farms. While the casinos are no longer a threat to the Ramapo Sole Source Aquifer, Kecskes' analysis of the current and future wastewater composition of the Ramapo clearly contradicts the DGEIS assumption of no harm to the river from increases in wastewater effluent.

1.3 mgd of treated sewage released from KJ into the Ramapo daily will have a more severe effect on the proportion of wastewater to freshwater than the two casinos whose impacts are detailed in Table 2 on page 9 of the attached report. The fact is that the current drought flow of the Ramapo is comprised primarily of wastewater, and if 1.3 mgd is added upstream, it will be entirely wastewater as it enters northern New Jersey.

Although effluent is treated to some extent by WWTPs, the wastewater is clearly not treated to drinking water standards. Not only does the Harriman WWTP discharge into the Ramapo, but the Kiryas Joel WWTP discharges into a tributary of the Ramapo River. According to 2013 reports (attached), the Kiryas Joel WWTP was implicated as the primary source of a dramatic and steady increase of specific conductance levels in water samples from the tributary of the Ramapo downstream of the plant that significantly exceeded NYS Department of Environmental Conservation levels of concern. The SCLHG believes that KJ ought to remedy this defect in its WWTP before undertaking any expansion.

Kecskes discussed the potential impacts of the wastewater component of the river. One is that wastewater dominated waterways will affect indigenous aquatic life (Kecskes, p. 11). Another is the potential effect on downstream drinking water quality:

"As the Ramapo River is converted to more wastewater in the future, the potential to affect downstream drinking water quality grows. For example, the [United Water New York] well field and wells in the [U.S. Environmental Protection Agency]-designated Sole Source Aquifer that are operated by communities in New Jersey [and Rockland County] are recharged by the

Ramapo River during low flow conditions. The Ramapo River and the underlying aquifer are in close hydraulic connection. If the river is comprised of more and more wastewater with greater frequency and for longer durations, the probability of needing expensive water treatment plant upgrades increases. It is important to note that wastewater treatment plants do not discharge effluent that meets drinking water quality standards, but wells are required to meet these standards." Kecskes, NY/NJ Water Resources Assessment, 2014, p. 10)

Sierra Club Lower Hudson Group believes that the increase of wastewater in the Ramapo River will result in the drinking water for one-third of Rockland County from the Ramapo well fields needing higher levels of treatment to be potable. This will cost Rockland County ratepayers more money, yet the fiscal impacts of increased wastewater discharge from KJ were not included in section 3.5.5, which discusses the costs only to the residents of Orange County Sewer District #1.

There is also a danger that some of the contaminants in the wells might not be discovered by United Water, since it is only required to test for certain substances. Another possibility is that residents will be exposed to these contaminants before the water company discovers them via tests.

III. The letters of support from Rockland County legislators for the inter-basin transfer of water from the NY City Aqueduct to the Ramapo basin are not applicable to the current DGEIS.

The DGEIS lists in Appendix G9 and refers to several letters of support from Rockland County legislators for the plan to tap into the NYC Aqueduct water supply and discharge the resultant wastewater to the Ramapo River. The writers claimed this would bolster the flow of the Ramapo, which they believed was necessary due to a general shortage of water in Rockland County.

These letters were written in 2005, before the real state of Rockland's long-term water supply was known. Since then, there has been a study by the US Geological Survey of Rockland's aquifer (available at <http://ny.water.usgs.gov/projects/rockland/>), which found it was replenishing faster than previously thought. In addition, Rockland officials in 2005 thought Lake DeForest reservoir was low because of drought. We now know that an alleged broken valve at the dam was allowing much more water to be sent downstream to New Jersey than permitted, and when this was fixed, the reservoir filled up quickly. Also, water demand has since been shown to be decreasing in Rockland (Appleton letter to PSC, Nov. 8, 2013, attached), part of a nationwide trend. Therefore, Rockland's water supply was found to be more robust than was thought in 2005. On the other hand, the Ramapo Sole Source Aquifer has been threatened and actually impacted by numerous development projects since 2005 that both deplete the regular flow and replace it with wastewater releases, as described in Kecskes' report. Therefore, it is clear that in 2005, the legislators did not have the understanding of Rockland's water situation they do now, and these earlier letters of support are not appropriate to support the current annexation proposal.

In conclusion, the DGEIS for the proposed annexation is not adequate because it 1) fails to project far enough into the future to be meaningful in addressing the water, sewer, and other impacts of the annexation, 2) completely fails to assess the impacts of the wastewater effluent on the Ramapo River and the residents downstream whose drinking water will be affected, and 3) uses outdated letters of support to imply that this annexation is currently supported by the Rockland County Legislature.

Respectfully submitted,

Gale Pisha
Secretary
Sierra Club Lower Hudson Group

NEW YORK/NEW JERSEY WATER RESOURCES ASSESSMENT

PROPOSED CASINOS IN RAMAPO RIVER WATERSHED:

CAESARS NEW YORK AND GENTING STERLING FOREST RESORT

ORANGE COUNTY, NEW YORK

SEPTEMBER 25, 2014

BY

ROBERT A. KECSKES

**NEW YORK/NEW JERSEY WATER RESOURCE ASSESSMENT
PROPOSED CASINOS IN RAMAPO RIVER WATERSHED:
CAESARS NEW YORK AND GENTING STERLING FOREST RESORT
ORANGE COUNTY, NEW YORK
September 25, 2014**

**INTRODUCTION: THE RAMAPO RIVER WATERSHED and DRINKING
WATER SUPPLIES**

Two casinos, both massive development projects, have been proposed for the Ramapo River Watershed in Orange County, New York. They are the Caesars New York Casino in Woodbury and the Genting Sterling Forest Resort Casino in Tuxedo. The New York State Gaming Facility Location Board will make a decision this autumn to approve up to four proposals statewide in New York State, from well over a dozen applications. This examination of the proposed Caesars and Genting casinos has concluded that serious water resource, water supply, and natural resource concerns exist with regard to the proposed casinos' impacts on the Ramapo River and its surface and groundwater drinking water supplies.

The Ramapo is an interstate waterway and water supply source shared by New York and New Jersey. Today, approximately 10,000 people in Orange County NY, 270,000 people in Rockland County NY, and at least 65,000 people in northern New Jersey communities count on a clean ground water supply from the Ramapo Basin aquifer system, while more than two million additional people in New Jersey rely on the Ramapo River as a source of their surface water supply. The Township of Mahwah and Boroughs of Allendale, Franklin Lakes, Oakland, Pompton Lakes, Ramsey and Wayne

Interstate waters, identified in the Clean Water Act as *"all rivers, lakes, and other waters that flow across, or form a part of, State boundaries ..."* are subject to the goals, regulations and standards of the Clean Water Act. The overriding goal of the Clean Water Act is *"to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."* This includes the protection of public water supplies, propagation of fish and aquatic life, recreation, agricultural, industrial, and other legitimate uses.

Both casinos are proposed to be located in a United States Environmental Protection Agency (**USEPA**) designated Sole Source Aquifer (**SSA**) that extends from New York south into northern

New Jersey. Designation as a Sole Source Aquifer *“is one tool to protect drinking water supplies in areas where there are few or no alternative sources to the ground water resource and where, if contamination occurred, using an alternative source would be extremely expensive ...”*

according to the USEPA. See <http://www.epa.gov/region2/water/aquifer/ramapo/ramapo.htm>

The proposed casino projects or related aspects may qualify for review under the Sole Source Aquifer Program.

Due to the severity of the problems identified in this assessment, it is recommended that:

1. The United States Environmental Protection Agency intervene in this matter as early as possible to prevent continued breaches of the Clean Water Act in the interstate Ramapo River Watershed; and
2. That the New York State Gaming Facility Location Board not make a determination regarding either of the casinos’ applications until adequate analyses of their impacts on the interstate Ramapo River watershed, including its critical ground and surface water supply resources on which nearly three million people rely, are conducted. Additional recommendations are noted later in this document.

PROPOSED DEVELOPMENTS in the RAMAPO RIVER WATERSHED

CASINO PROPOSALS:

Sterling Forest Resort Casino. The proposed Sterling Forest Resort by Genting Americas in Tuxedo would consist of 1.5 million square feet of commercial space, a 1,000-unit hotel, 150,000 square foot casino floor, parking for 8,900 vehicles, and a ski facility placed on a 238 acre private inholding located entirely within Sterling Forest State Park. The casino is projected to annually attract seven million people.

Genting proposes that the water supply for the casino resort be obtained from the Indian Kill Reservoir, a 65-acre impoundment on Indian Kill Creek, which is a tributary of the Ramapo River. The reservoir is managed by United Water New York (UWNY). According to the casino’s consultants, the safe yield (amount of water available) is 1.3 million gallons per day (mgd). UWNY has approval to use 0.6 mgd (i.e., the capacity of the reservoir’s water treatment plant), current UWNY customers in Tuxedo use 0.05 mgd, and the casino would use about 0.3 mgd. Casino officials state that all of the casino/hotel’s wastewater will be reclaimed for toilet-flushing, lawn irrigation, air conditioning, and snow-making during the majority of the year. During the small amount of time when there is less need for reclaimed water (e.g., early spring), the reclaimed water will be discharged to the Indian Kill Creek downstream of the Reservoir, to prevent any potential contamination. In effect, there would be zero discharge to

the Indian Kill Creek for the vast majority of time, and thus no contribution to the Ramapo River flow. As described later, the safe yield of the Indian Kill Creek Reservoir is questionable and was unable to be confirmed from scientifically verifiable data sources.

Caesars New York. The Caesars New York casino proposed by Caesars Entertainment would be built on 121 acres on the border of Harriman State Park in the Village of Woodbury. It would consist of an \$880 million casino complex with shops, restaurants, bars, an entertainment hall and a 300-unit hotel. The casino is projected to attract ten million people annually.

The water supply that Caesars is proposing to use is the Village of Woodbury's water system, which consists of a series of wells in the buried (sand and gravel) valley and bedrock aquifers located in the headwaters of the Ramapo River and Woodbury Creek. The buried valley wells are installed in the USEPA-designated Sole Source Aquifer described above. Although Woodbury has indicated that it has adequate water to serve the proposed casino, Caesars New York plans to fund the development of at least one new well to ensure that the casino will have sufficient water. Since the proposed casino is located within the Ramapo River watershed, it is assumed that the new well(s) will be located in the same watershed. The casino will require approximately 0.2 mgd of potable water during average conditions and 0.3 mgd during peak period conditions. Approximately 0.04 mgd of the potable water used will be reclaimed for cooling tower make-up and irrigation. In addition, rainwater will be harvested to supplement the cooling tower make-up water and irrigation needs. The project description states that an average of 0.2 mgd and a peak of nearly 0.6 mgd of wastewater are proposed to be conveyed to the Orange County Sewer District #1 plant that discharges to the headwaters of the Ramapo River. It is not understood why the peak wastewater discharge is twice as large as the peak water supply demand.

RESIDENTIAL DEVELOPMENT:

Tuxedo Farms. The Tuxedo Farms development is included in this assessment to endeavor to ensure that the cumulative effects on the Ramapo River from all recently proposed major land uses are considered. Tuxedo Farms by Related Companies is a proposed 1,195 home subdivision that includes 30,000 square feet of commercial development located on 400 of 1,200 acres in Tuxedo, within the Ramapo River watershed.

While much has yet to be confirmed, it is assumed that the water supply for this project will consist of wells in or near the subdivision, which would mean that the wells will be located in the Sole Source Aquifer. It is estimated that average demand from Tuxedo Farms will be 0.4 mgd and peak demand will be 0.8 mgd. The developer is proposing to have the existing Tuxedo wastewater treatment plant replaced with a new treatment plant. The current plant discharges

to the Ramapo River. It is estimated that Tuxedo Farms would generate approximately 0.4 mgd of additional (new) wastewater.

WATER SUPPLY PLANNING PRINCIPLES RELATED TO THE PROPOSED PROJECTS

This abbreviated assessment of the proposed casinos, plus the Tuxedo Farms development, applies basic water supply planning and natural resource protection principles to estimate effects on the Ramapo River in southern New York State and northern New Jersey. These principles include:

- Well withdrawals result in an approximately one-to-one reduction in stream flows in close proximity to the wells during low flow conditions. In other words, for every 0.1 mgd withdrawn from a well, there will be approximately 0.1 mgd reduction in flow in near-by streams during periods of low rainfall.
- Water withdrawals are typically highest during summers, especially dry hot summers.
- Water withdrawn from wells and direct surface water diversions that are used for indoor water use (e.g., baths, clothes and dish-washing, toilets, etc.) is typically returned to the stream when the withdrawal is located in close proximity to the wastewater treatment plant. In this case, for every 0.1 mgd withdrawn for indoor water use, there will be an approximately 0.1 mgd reduction in near-by streams that will be “compensated” by a 0.1 mgd increase in wastewater discharge.
- When the well or direct surface water diversion is located far upstream from the wastewater discharge, there will be a 0.1 mgd reduction in stream flow near the withdrawals for every 0.1 mgd withdrawn for indoor use, but a 0.1 mgd increase in stream flow downstream of the discharge.
- Water withdrawn from wells and direct surface water diversions that are exported out of the watershed result in a one-to-one reduction in stream flow in that watershed.
- Water that is imported into the watershed and used for indoor use and discharged into that watershed result in a one-to-one increase in stream flow in that watershed. For every 0.1 mgd imported into the watershed for indoor use, there will be an increase in streamflow in that watershed (at the location of the wastewater discharge).
- Water withdrawn from wells and direct surface water diversions that are used for lawn irrigation, cooling water towers, and other non-indoor uses, is nearly totally consumptive (i.e., not returned to the stream). For every 0.1 mgd withdrawn, there will be approximately 0.1 mgd reduction in near-by stream flows during periods of low rainfall.

- The flow in a stream during periods of low rainfall reflects the above inflows plus (+) wastewater discharges and minus outflows (-) from withdrawals. Once these net inflows and outflows are considered, the remainder of the stream flow (if any) consists of freshwater base flow, which is the ground water discharge to the stream.
- Wastewater discharge regulatory limits are based on low stream flow conditions, in order to maintain and protect water quality. If stream flows are decreased by more upstream consumptive uses, surface water quality downstream will be impaired during periods of very low precipitation. In order to ameliorate these effects, expensive wastewater treatment upgrades can be required.
- In order to protect water quality for downstream users and uses, some well withdrawals and most direct surface withdrawals must cease when stream flow declines below certain low flow conditions. In this case, available supplies (safe yield) will be reduced if new upstream consumptive uses are allowed. In order to ameliorate such effects, expensive new water supplies may be required or “premature” drought emergencies may need to be declared during future periods of extremely low rainfall.
- If a stream becomes wastewater-dominant during low flow conditions, wells near the stream can induce these impacted waters into themselves. Further, some direct surface water withdrawals are required to cease pumping entirely when water quality is negatively affected. Wastewater treatment plant effluents typically are not regulated to meet drinking water standards.
- As a stream becomes more wastewater-dominant, its designated uses are likely to be impaired. Indigenous aquatic resources will probably be stressed, or even destroyed. Recreational uses such as fishing and swimming can be restricted.
- Good practice indicates that water supply surpluses or deficits need to be based on environmental limits such as ensuring ample stream flow adequate to maintain natural and aquatic resources, not simply on structural capacity such as water treatment plant and well pump capacity. The latter methodology was employed for many water systems in the Orange County Water Authority Water Master Plan.

ASSESSMENT OF CURRENT AND PROJECTED DROUGHT FLOWS AND CHARACTERISTICS OF THE RAMAPO RIVER

This assessment, employing the water supply planning principles described above, calculates current estimates of how much drought flow in the Ramapo River has increased or decreased, as well as the freshwater/wastewater composition of the Ramapo drought flow. Once current estimates have been calculated, they are followed by similar estimates incorporating the water

intake/wastewater outflow results of the proposed casinos and the Tuxedo Farms development.

Most Federal, State, and local agencies use low-flow statistical data or a drought flow to establish water-use policy and to assist in establishing effluent limits for wastewater treatment plants that discharge to surface water during periods of decreased stream flow. Low-flow statistical data are often utilized by water-supply purveyors and regulators/planners, as well as reservoir managers, to manage water availability for supply. The MA7CD10 (hereafter referred to as the 7Q10) is often used for these purposes. It is essentially an environmental “critical design” flow. It is defined as the minimum seven consecutive day low flow that would statistically occur once in every ten years, with therefore, a ten percent probability of occurring in any one year. Many water resource professionals refer to the 7Q10 as a “drought flow.”

The 7Q10 for the Ramapo River near Mahwah, New Jersey, was estimated to be 8 mgd in 1974. The USGS gage station that was used to make this estimate is less than a mile from the New York/New Jersey border, and has been in operation since 1903. Since the 7Q10 is calculated from all recordings of daily flow for the period of record (in this case from 1903 to 1974), and development in the Ramapo River watershed upstream of the gage was relatively sparse between 1903 and 1974, the 8 mgd 7Q10 flow represents a flow largely unaffected by human activities. It would be comprised of mainly ground water base flow from the 118 square mile upstream drainage, and could serve as a pre-development “baseline” to compare human impacts occurring subsequent to 1974.

The Ramapo River watershed upstream of Mahwah has, however, changed significantly since 1974. The watershed is now characterized by significant urban/suburban land uses. Consequently, the 7Q10 drought flow now includes more treated wastewater from new and expanded wastewater facilities, while much of the ground water base flow has been reduced by the many upstream consumptive withdrawals (i.e., used for lawn irrigation, air conditioning cooling, etc.) as well as withdrawals that export water out of the Ramapo watershed to eastern Rockland County. ***The 7Q10 that existed prior to 1974 that consisted primarily of freshwater has now been replaced by a 7Q10 comprised largely of wastewater.*** In addition, the overall volume of water in the Ramapo River has been reduced due to these increased consumptive uses and transfers of water from the upstream watershed.

To estimate the characteristics of the 7Q10 of the Ramapo River as it flows out of southern New York State, one needs to calculate the upstream consumptive water uses, water imported into the watershed, water exported out of the watershed, and wastewater discharged into the watershed. Recent demand projections were made for the year 2013 by the Orange County Water Authority (http://waterauthority.orangecountygov.com/county_plans.html), while United Water New York (UWNY) estimated demand for Rockland County

(<http://www.unitedwater.com/newyork/news-center.aspx>). These demands were increased by 50% to reflect summer demand increases associated with consumptive outdoor uses such as lawn irrigation, as well as when the 7Q10 is most likely to occur. Further, ground water withdrawals and direct surface water withdrawals were combined for calculation purposes since they both cause proportionate reductions in stream flow. Wastewater discharges were calculated at annual average discharge rates. Only high-volume withdrawals and discharges were used. Low-volume withdrawals and discharges such as those associated with domestic wells and septic systems were not estimated.

Table 1 below summarizes the current high-volume surface and ground water withdrawals and wastewater returns in the Ramapo River watershed. A “net gains/net losses” column is included in this assessment, which provides the following information: If surface or ground water was withdrawn, but not returned as a wastewater discharge (e.g., exported from the watershed), a net loss was estimated. The affect is that the withdrawal has resulted in a corresponding decrease to base flow in the watershed. On the other hand, if surface or ground water was withdrawn, but then returned as a wastewater discharge, a net loss was estimated only for the amount of the consumptive (outdoor) water use. If much of a specific water supply was imported into the watershed, as appears in the Woodbury section, its consequent wastewater discharge into the Ramapo watershed represents a net gain to the watershed.

Table 1. Current Surface and Ground Water Withdrawals and Wastewater Returns in Ramapo River Watershed			
Name of Purveyor/Town	2013 Surface & Ground Water Withdrawals (mgd)	Wastewater Returns (mgd)	Net Gain (+) or Net Loss (-) (mgd)
Woodbury	0.9 ¹	6.0 ²	+5.1
Monroe	2.4 ³	-	-2.4
Tuxedo	0.5	0.3 ⁴	-0.2
United Water	10.0	-	-10.0
Suffern	1.3	1.4 ⁵	+0.1
Hillburn/Sloatsburg/Ramapo	-	0.3 ⁶	+0.3
Total	15.1	8.0	-7.1

As shown by **Table 1**, current drought flow in the Ramapo River as the watercourse leaves southern New York State is primarily comprised of wastewater. Recent increases in consumptive water uses and out-of-basin water transfers are accelerating when these

¹ Assumes that half of Woodbury’s wells are in the Ramapo River watershed.

² Orange County Sewer District #1.

³ Assumes that half of Monroe’s wells are in the Ramapo River watershed.

⁴ Tuxedo Park and Hamlet Wastewater Treatment Plants.

⁵ Suffern Wastewater Treatment Plant

⁶ Hillburn (Western Ramapo) Wastewater Treatment Plant.

wastewater-dominant stream flow conditions occur because they reduce the total volume of water that would otherwise flow during periods of drought. The Ramapo River occasionally even dips below 8 mgd, suggesting that its flow is being induced into the aquifer beneath the River as a result of ground water pumpage by adjacent wells.

Table 2 illustrates the projected surface and ground water withdrawals and wastewater returns in the Ramapo River Watershed with the inclusion of the withdrawals and discharges from the two proposed casinos and the proposed Tuxedo Farms development. Table 2 assumes that these developments will all be built in the near future. Table 2 shows that the proposed casinos and housing/commercial development will further impair the River – to the degree that drought flow in the Ramapo River as it enters northern New Jersey would be entirely comprised of wastewater. The new consumptive water uses associated with these proposals, plus the continuation of water transfers, will further accelerate when these wastewater-dominant stream flow conditions will occur during future periods of drought. In addition, the river can be anticipated to decline further below 8 mgd, as more of its flow is recharged into the aquifer as ground water pumpage to wells increases to meet demand. These conditions will be further exacerbated if Orange and Rockland Counties continue their rapid growth trajectories into the future.

Table 2. Projected Surface and Ground Water Withdrawals and Wastewater Returns in Ramapo River Watershed			
Name of Purveyor/Town	2013 Surface & Ground Water Withdrawals (mgd)	Wastewater Returns (mgd)	Net Gain (+) or Net Loss (-) (mgd)
Woodbury	0.9 ⁷	6.0 ⁸	+5.1
Monroe	2.4 ⁹	-	- 2.4
Tuxedo	0.5	0.3 ¹⁰	-0.2
United Water	10.0	-	-10.0
Suffern	1.3	1.4 ¹¹	+0.1
Hillburn/Sloatsburg/Ramapo	-	0.3 ¹²	+0.3
Caesars	0.3	0.6	+0.3 ¹³
Sterling Forest Resort	0.3	-	-0.3
Tuxedo Farms	0.8	0.4	-0.4
Total	16.5	9.0	-7.5

⁷ Assumes that half of Woodbury’s wells are in the Ramapo River watershed.

⁸ Orange County Sewer District #1.

⁹ Assumes that half of Monroe’s wells are in the Ramapo River watershed.

¹⁰ Tuxedo Park and Hamlet Wastewater Treatment Plants.

¹¹ Suffern Wastewater Treatment Plant

¹² Hillburn (Western Ramapo) Wastewater Treatment Plant.

¹³ Caesars’ application does not explain why there would be more wastewater than water used.

IMPLICATIONS OF THE PROPOSED CASINOS AND TUXEDO FARMS

It is expected that the casinos and housing development will result in impacts to water supplies, water quality, and aquatic resources. These impacts include the potential to affect three critical elements: the safe yield of downstream water supplies, the water quality of downstream water supplies, and the natural resources of the Ramapo River. It is important to note that these quantified impacts are only those associated with the proposed casinos and the Tuxedo Farms development; impacts can be expected to be more severe when other new development in southern New York and northern New Jersey are considered.

1. The Potential to Affect the Safe Yield of Downstream Water Supplies

United Water New York operates the Ramapo Valley well field in the buried valley (sand and gravel) well field along the Ramapo River in the Suffern area. The well field, which provides about a third of Rockland County's total water supply, consists of ten wells along a two-mile stretch of the river just before it flows into New Jersey. The well field is required to cease pumpage when the Ramapo River declines to 8 mgd. The current consumptive water uses upstream of the well field are already contributing to stream flow depletion that causes the well field to cease operations during severe drought. The additional consumptive uses related to the Caesars Casino, Sterling Forest Resort, and Tuxedo Farms will cause the UWNY well field to shut down even more frequently and for longer durations. More precise estimates of these events would require streamflow modeling. Together, these three projects will have exactly the same effect as a new withdrawal of at least 0.7 mgd upstream of the well field, in which all the water is transferred out of the Ramapo River watershed.

It is noted that the New York State Public Service Commission has ordered UWNY to develop a new water supply in Rockland County. The purveyor has selected a \$164 million desalinization plant to address this mandate. While the Commission also recently allowed Rockland County a few years to develop a water conservation plan, it is imperative that UWNY's existing water supplies be protected and maintained. Rockland County is currently launching a County Task Force on Water Management, with the goal of managing all of the water resources for the county in the most economically and environmentally sustainable way. These three projects would seriously threaten the most productive well field for UWNY's Rockland County water supply.

In New Jersey, the North Jersey District Water Supply Commission (NJDWSC) and United Water New Jersey (UWNJ) operate a pump station on the Ramapo River that conveys water to NJDWSC's Wanaque Reservoir in Passaic County and UWNJ's Oradell Reservoir in Bergen County. The pump station is not allowed to operate when the river declines below 40 mgd. The current consumptive water uses upstream of the pump station are presently contributing to stream flow depletion that causes the pump station to cease operations during severe

drought. The additional 0.7 mgd of consumptive uses related to the proposed casinos and housing development will cause the pump station to shut down even more frequently and for longer durations during future drought, thereby affecting the safe yield of these two purveyors.

Moreover, the UWNJ Lake DeForest Reservoir in Rockland County is supposed to release additional water when UWNJ's reservoirs in Bergen County are at less than half their capacity. If the Ramapo River pump station cannot operate as frequently due to losses in stream flow in southern New York and northern New Jersey, the capacity of UWNJ's reservoirs can be expected to be at less than half capacity more frequently, causing UWNJ's DeForest Reservoir to release more water than anticipated, resulting in a loss of safe yield. Consequently, UWNJ would have two of its water supplies affected.

Finally, the Ramapo River watershed in New Jersey is likely to be concluded to be in severe deficit when the next NJ Statewide Water Supply Plan is released. The depletion of stream flow if the two casinos and housing development are approved in the portion of the watershed in New York State will simply magnify the deficit in New Jersey. The affected communities in New Jersey will probably need to seek new expensive water supplies if they wish to grow.

2. The Potential to Affect the Water Quality of Downstream Water Supplies

As the Ramapo River is converted to more wastewater in the future, the potential to affect downstream drinking water quality grows. For example, the UWNJ well field and wells in the USEPA-designated Sole Source Aquifer that are operated by communities in New Jersey are recharged by the Ramapo River during low flow conditions. The Ramapo River and the underlying aquifer are in close hydraulic connection. If the river is comprised of more and more wastewater with greater frequency and for longer durations, the probability of needing expensive water treatment plant upgrades increases. It is important to note that wastewater treatment plants do not discharge effluent that meets drinking water quality standards, but wells are required to meet these standards.

One of the primary reasons the Ramapo River was selected decades ago as a water supply source by the NJDWSC and UWNJ was because of its good water quality, at that time. As the river deteriorates to a more wastewater-dominated water body, the probability of requiring expensive water treatment improvements grows more likely. The NJDWSC and UWNJ are currently restricted from pumping at the Ramapo River pump station during the summer months due to water quality concerns at this location. It would not be unrealistic to assume that additional restrictions may be placed on the pump station as Ramapo River water quality further declines.

3. The Potential to Affect the Natural Resources of the Ramapo River

Most water resource professionals recognize that a wastewater-dominated water body will result in a loss of indigenous aquatic resources. USEPA, NYSDEC and NJDEP surface water quality standards all mandate the protection and maintenance of these resources. As illustrated in the above tables, most of the Ramapo River consists of wastewater during low stream flow periods, and all of the river will be comprised of wastewater if the proposed casinos and housing development are approved and constructed.

Furthermore, most water resource professionals acknowledge that significant reductions in natural stream base flow will impair natural resources. As shown in the above tables, current natural Ramapo River fresh water base flow is being reduced by about 88%; this will be further reduced by about 94% with the construction of Caesars, Sterling Forest Resort, and Tuxedo Farms.

These phenomena are recognized when the waters of the River are assessed. Only 6% of the Ramapo River watershed in New York has been found to be in good condition, 38% satisfactory, 22% in poor condition, and 34% un-assessed (<http://www.dec.ny.gov/lands/48022.html>). In New Jersey, nearly every stream reach on the Ramapo River is not attaining its designated use of supporting aquatic life due primarily to point and nonpoint sources of water pollution. (http://www.state.nj.us/dep/wms/bwqsa/2012_draft_integrated_list.pdf) It is hard to imagine that the watershed will be improved if the proposed casinos and housing development are permitted to be built, in conjunction with other growth that will occur in the future, to some extent growth stimulated by the casino.

4. Uncertainty Regarding the Safe Yield of the Indian Kill Reservoir

As noted above, the Sterling Forest Resort Casino is proposing to use UWNYS Indian Kill Reservoir on the Indian Kill Creek, which it claims to have a safe yield of 1.3 mgd. The 65-acre reservoir has a drainage area of between 2 and 4 square miles (see Thonet Associates Re: Proposed Sterling Forest Resort/Casino – Environmental Consequences, Sept. 2014). Because of the very limited drainage area, and the requirement for a minimum passing flow, the safe yield may be in question. Based on the history of the NJDEP's reactions to proposed withdrawals in New York State that can affect the safe yield of downstream water supplies in New Jersey, the NJDEP is quite likely to insist that this reservoir have an ample passing flow to protect downstream diversions, especially since nearly all of the casino's withdrawal will be consumptive.

CONCLUSIONS AND RECOMMENDATIONS

This examination of the casino proposals demonstrates that Clean Water Act objectives, as well as other public health, welfare, and environmental goals and objectives for the interstate waters of the Ramapo River Watershed, are currently being violated. Conditions that are already serious will deteriorate even further if either of the two casinos is approved. Water quality, water supply, and aquatic natural resources in this watershed are already being negatively impacted by existing development, and these negative impacts will be exacerbated to the detriment of the public's health and welfare if either of the two proposed projects is constructed.

The large-scale Caesars and Sterling Forest Resort casino development projects proposed for the Ramapo River watershed in Orange County, New York, have the potential to significantly exacerbate water quality, water supply, and aquatic resource problems that currently exist. These two projects will reduce the safe yield of the United Water New York (UWNY) well field in Rockland County and, potentially, the safe yield of the North Jersey District Water Supply Commission (**NJDWC**) Wanaque Reservoir system in Passaic County, New Jersey. The two casinos will also cause the Ramapo River to be more of a wastewater-dominated stream during periods of low flow than it already is. This will cause further negative effects on the river's water quality, including drinking water from the UWNY well field and wells along the river that supply downstream communities in New Jersey, the drinking water supply of the NJDWSC, and the aquatic resources of the watershed. The 1200 housing unit/commercial development (Tuxedo Farms) that has recently been approved is expected to cumulatively exacerbate all of these effects. Finally, it is questionable whether the water supply proposed for the Sterling Forest Resort Casino, the Indian Kill Reservoir, has adequate safe yield.

Nevertheless, in spite of the serious impacts of the proposed projects on both states, it is likely that New York and New Jersey will approve them, since both states assess projects on an individual, rather than a holistic basis. Although the Ramapo River is an interstate water body, shared by the States of New York and New Jersey, for decades, proposed development projects have been reviewed individually, in isolation from other projects, both existing and proposed. This practice has led to the severe and growing problems described above. Now, three major projects are proposed that, if approved, are certain to worsen existing water supply and water quality problems. Yet, the applicants for these projects are requesting that they be reviewed separately from each other, and without an evaluation of the cumulative effects of both current and future development.

It does not appear that the States of New York and New Jersey have adequately met their public health, welfare and regulatory environmental objectives for the Ramapo River. In recognition of the serious issues that clearly face the Ramapo River and its water supply, the New York State Gaming Facility Location Board should take no action on the proposed casinos at this time. Without the Board's leadership in this matter, the State of New York is likely to assess the proposed projects separately and without addressing their cumulative effects, while the State of New Jersey is likely to pay little attention to the proposed projects because of perceived out-of-state and minimal effects. Both states are likely unaware of the magnitude of the problems that this interstate river is presently experiencing, and are consequently unable to appreciate the severe additional stresses that the casinos and housing development will place on this water resource and on the millions who rely on it for their drinking water.

Recommendations:

Recommendation 1. That the New York State Gaming Facility Location Board take no actions on the proposed casinos at this time, in recognition of the severe and growing but unaddressed water supply problems of the Ramapo Watershed already faced by both New York and New Jersey.

Recommendation 2. That the USEPA intervene promptly in this matter to preclude continued breaches of the Clean Water Act in the Ramapo River watershed.

Recommendation 3. That the USEPA notify the States of New York and New Jersey, the parties presenting the major proposals (Caesars and Genting), and the New York State Gaming Facility Location Board that it is involving itself in this matter because it is concerned with the environmental and water supply status of the Ramapo River as an interstate water under the Clean Water Act, as well as the status of region's groundwater supply as a USEPA-designated Sole Source Aquifer. Further, it is recommended that the USEPA request that no further determinations on the two proposals be made by the State of New York at this time.

Recommendation 4. That the USEPA make a prompt determination to ascertain whether the objectives of the Sole Source Aquifer will be compromised if the proposed casinos are approved and built. According to the EPA, "*(SSA) designation protects an area's ground water resource by requiring EPA to review certain proposed projects within the designated area. All proposed projects receiving federal funds are subject to review to ensure that they do not endanger the water source. The SSA protection program is authorized by section 1424(e) of the Safe Drinking Water Act of 1974 (Public Law 93-523, 42 U.S.C. 300 et seq.)*." It should be determined whether any aspect of the two casinos or related water supply, water treatment, wastewater treatment, transportation, park land diversion, land acquisition or energy utility developments qualifies directly or indirectly for review under the Sole Source Aquifer Program.

Recommendation 5. That the USEPA require that a Bi-State Regional Watershed Assessment and Plan for the Ramapo River Watershed be developed, to be overseen by the USEPA and the New York Department of Environmental Conservation (**NYDEC**), the New York State Office of Parks, Recreation and Historic Preservation (**OPRHP**), specifically the Palisades Interstate Park Commission (**PIPC**), and the New Jersey Department of Environmental Protection (**NJDEP**), in coordination with New York and New Jersey-based environmental organizations.

The Bi-state Regional Watershed Assessment and Plan Initiative for the Ramapo River Basin should undertake the following tasks:

1. Assess the current quality, quantity and aquatic health of the Ramapo River basin with a particular emphasis on drought conditions;
2. Assess the projected quality, quantity and aquatic health of the Ramapo River basin if the current projects are approved in conjunction with the other development projects likely to be implemented in the next 20 – 25 years; and
3. Develop a protection and management plan that:
 - a) ensures that surface, ground and drinking water standards are maintained,
 - b) preserves the safe yield of the basin’s surface and ground water supplies, and
 - c) strengthens protections to make sure that aquatic life is adequately protected during the planning period.

Recommendation 6. That the New York State Gaming Facility Location Board (the “Board”) notify the New York State Department of Environmental Conservation that:

- a) The Board is concerned about the long-term viability of the proposed developments in relation to water supply, including questions regarding the safe yield of the Indian Kill Reservoir, as well as potential serious impacts on nearly three million New York and New Jersey citizens who rely on the Ramapo watershed for their drinking water supply; and
- b) The Board is unable to make further determinations at this time on the casinos proposed for the Ramapo River watershed, due to uncertainties regarding compliance with the Clean Water Act, and that it cannot make such determinations until a current regional watershed assessment and plan for the Ramapo River Basin is developed, as described above.

ROBERT A. KECSKES

BIOGRAPHY

Robert A. Kecskes, the author of this report, has over 40 years of experience managing environmental projects and programs, including 25 years as Chief of the Water Supply Planning Section at the New Jersey Department of Environmental Protection. The Water Supply Planning Section is devoted to statewide and regional water supply planning, and is mandated to develop water supply plans, strategies and policies for areas experiencing or projected to experience water supply shortages. Mr. Kecskes was one of the primary authors of the 1996 and 2014 (draft) New Jersey Statewide Water Supply Plans.

Mr. Kecskes has directly managed or has been directly involved in an array of projects that included new reservoirs, regional water pipelines and desalination facilities, as well as strategies dealing with water conservation, wastewater reuse, ground-surface water optimization, and other water planning initiatives that are capable of maximizing available water. He holds a Bachelor's Degree in Earth Science from The College of New Jersey and completed graduate credits in Water Resources at Rutgers University.

ELEVATED SPECIFIC CONDUCTANCE LEVELS
of an unnamed tributary of the Ramapo River
Town of Monroe, NY



Field work and analysis performed by:
WATERSHED ASSESSMENT ASSOCIATES, LLC
SCHENECTADY, NEW YORK



ORANGE COUNTY WATER AUTHORITY
February 2013

Introduction and Overview

The Orange County Water Authority has been monitoring stream water quality countywide since 2004 through its Stream Water Quality Biomonitoring Project.¹ The Project was designed as a comprehensive, county-wide assessment of ambient water quality in streams, using the stream biomonitoring methods developed by the NY State Department of Environmental Conservation's Stream Biomonitoring Unit. All monitoring work that is referenced in this report was performed by Watershed Assessment Associates, LLC (WAA) as part of the OCWA's Stream Water Quality Biomonitoring Project.

Biomonitoring involves the collection and analysis of benthic macroinvertebrate communities to assess overall water quality, which is then expressed as a numerical value ranging from 0 to 10, called a Biological Assessment Profile (BAP) score. Biomonitoring also includes measurement of certain chemical and physical attributes found in and along streams, such as specific conductance, pH, temperature, dissolved oxygen, stream width and depth, etc.

Specific conductance is an indicator of anthropogenic-source effects (land use) within a watershed and is routinely measured during stream biomonitoring. Specific conductance (SC) is a measure of electrical conductance ($\mu\text{mhos/cm}$) that estimates the concentration of dissolved ions in the water, including salinity, total dissolved solids, and chlorides (Allan 1995). Stream biological communities (macroinvertebrates and fish) may be negatively impacted by increases in developed land area and SC may be used as a proxy. However, there is no evidence that specific conductance directly exerts a negative effect on macroinvertebrate communities. NYS DEC has designated specific conductance concentrations exceeding 800 $\mu\text{mhos/cm}$ as a level of concern and that biological impairment is expected to occur at this level (Bode et al, 2005).

This Report summarizes the data collected at and upstream of station 4089_005, which is located on an unnamed tributary of the upper Ramapo River in Monroe NY, where elevated specific conductance levels have been documented since the mid-2000's. This Report is based upon and is an update of a 2008 investigative report by WAA, entitled "Investigation of Elevated Specific Conductance Levels: Station 4089_005," that pinpointed the Kiryas Joel wastewater treatment discharge as a primary source of elevated specific conductance levels at station 4089_005. This updated Report includes data collected at that station in years subsequent to 2008.

Results

Station 4089_005 was surveyed through OCWA's Stream Water Quality Biomonitoring Project from 2005 – 2009 and then again in 2012. Survey results, based on the benthic macroinvertebrate community structure for all years have indicated Moderately Impacted water quality. However, specific conductance readings obtained during these years show a dramatic and steady increase in specific conductance levels (Figure 1).

▼
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¹ All reports are available at <http://waterauthority.orangecountygov.com/streams.html>

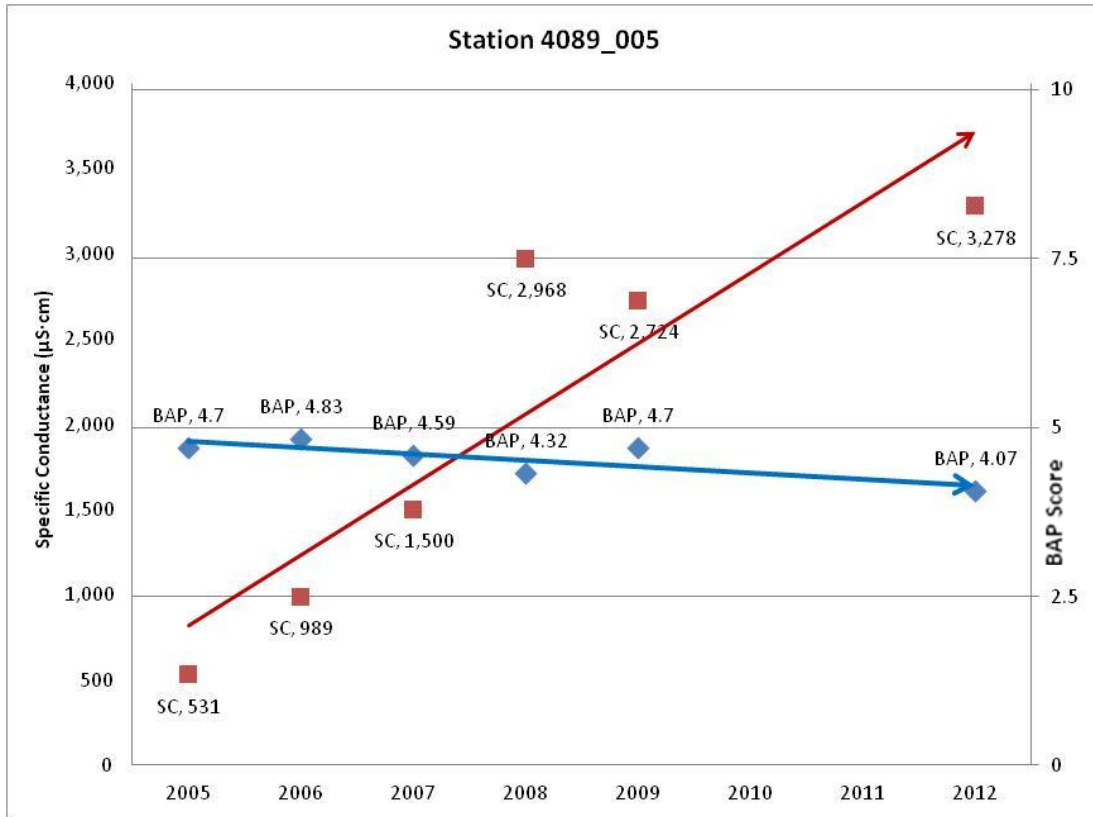


Figure 1. Biological Assessment Profile (BAP) scores and specific conductance levels illustrating values and associated trend lines from 2004 – 2009, and 2012 for station 4089_005, an unnamed tributary of the Ramapo River.

The spike in specific conductance readings in 2008 prompted the OCWA to request that additional field chemical analysis be conducted at strategic locations above station 4089_005 in an attempt to isolate the potential sources responsible for the elevated specific conductance readings. A similar investigation, using field chemical assessments to detect potential sources, was successfully employed in Woodbury Creek by the NYS DEC in 2005, which resulted in the identification and remediation of the Woodbury Commons salt storage shed.

On September 12, 2008, just days after WAA had alerted OCWA that the readings at site 4089_005 were at 2,968 µS/cm, WAA visited eight (8) stations at and above Station 4089_005 where non-nutrient water quality information (temperature, dissolved oxygen, percent oxygen saturation, specific conductance, salinity, and pH) was collected using an YSI multi-probe following the OCWA Water Quality Biomonitoring Project Quality Assurance Project Plan for water chemistry analysis (Gruber, 2004). The stations were strategically located in an attempt to isolate potential tributaries or point sources that may be causing the increased specific conductance levels. Table 1 and Figure 2 provide the water quality data results for each station.

Station	Date	Time	SC ($\mu\text{mhos/cm}$)	Salinity (PSS)
4089_005	17-Sep-08	8:47 AM	4260	2.28
1	17-Sep-08	9:30 AM	4169	2.23
2	17-Sep-08	9:15 AM	426	0.21
3	17-Sep-08	9:18 AM	4890	2.63
4005_001	17-Sep-08	9:42 AM	743	0.37
4	17-Sep-08	10:00 AM	307	0.15
5	17-Sep-08	10:13 AM	681	0.33
6	17-Sep-08	10:37 AM	235	2.14

Table 1. Station information and specific conductance (SC) for the eight stations sampled above Station 4089_005 in 2008.

Station location descriptions (shown in Figure 2):

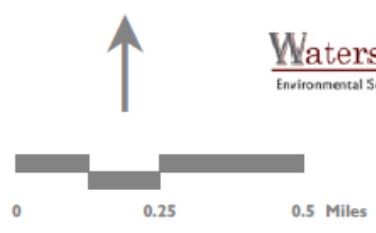
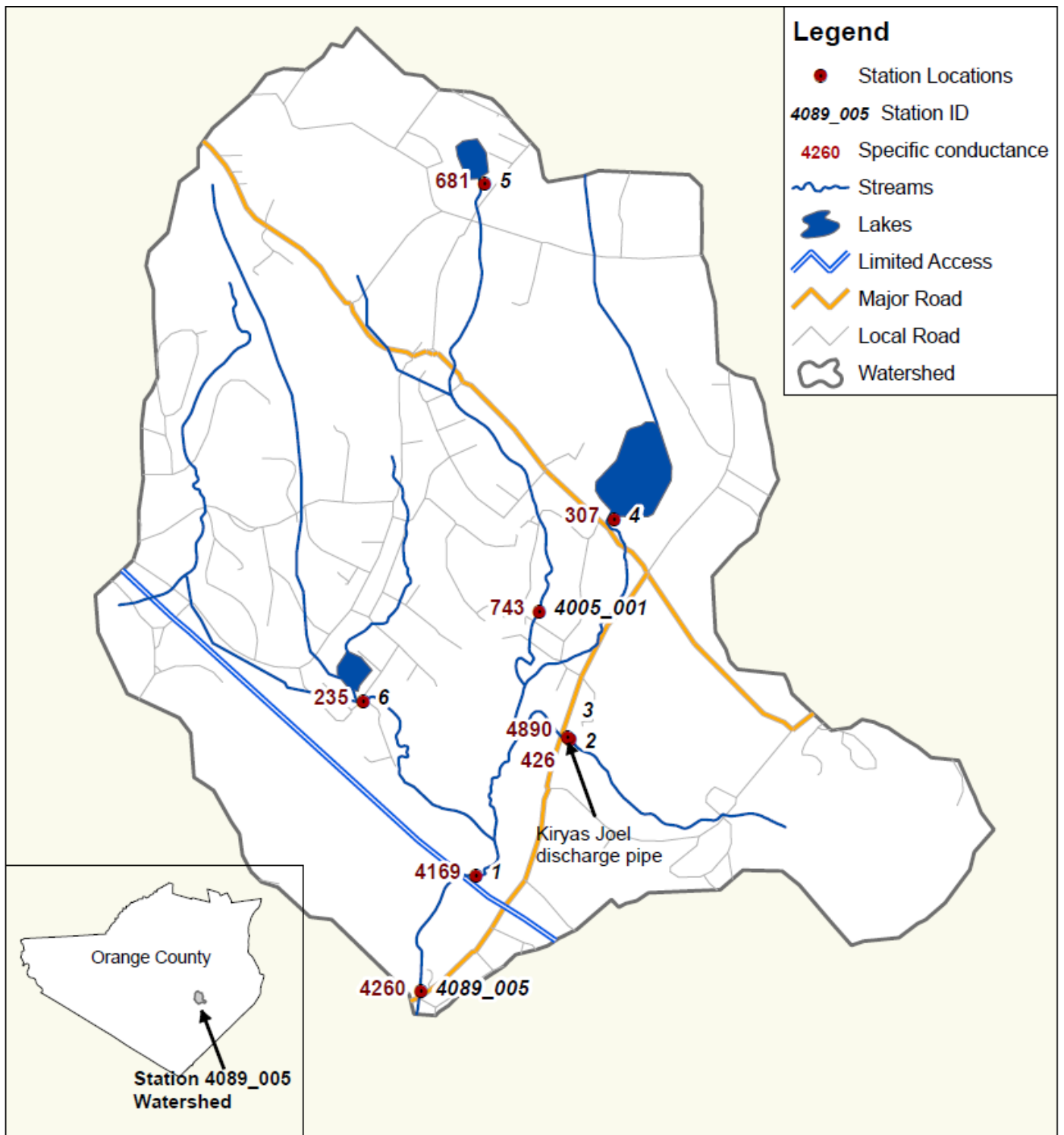
- Station 4089_005 is located just above County Route 105 bridge
- Station 1 is located just above the highway 6 culvert
- Station 2 is located just above the Kiryas Joel sewage treatment plant discharge pipe
- Station 3 is located just below the Kiryas Joel sewage treatment plant discharge pipe
- Station 4005_001 is located just above Kahan Drive bridge
- Station 4 is located at the mouth of Coronet Lake
- Station 5 is located at the mouth of Amdur Park Lake
- Station 6 is located at the mouth of Forest Road Lake

The results of this investigation implicated the Kiryas Joel wastewater treatment plant's discharge as the primary source of the elevated specific conductance levels in this unnamed tributary of the upper Ramapo River. As shown in Table 1 and Figure 2, the specific conductance readings taken at site 4089_005 during the investigation *exceeded* the level recorded just a week prior, reaching 4,260 $\mu\text{S/cm}$ at station 4089_005. Note that Figure 1 displays the earlier, and lower, reading of 2,968 $\mu\text{S/cm}$, which was the reading when the biomonitoring sample was taken; it is included in the graph so as to be consistent in methodology with other years.

Specific conductance levels were slightly lower when station 4089_005 was sampled in 2009, but levels again increased to 3,278 when sampled on September 9, 2012.

Conclusion

As of September 2012, specific conductance levels at station 4089_005 continue to substantially exceed the NYS DEC's level of concern (800 $\mu\text{S/cm}$). The Kiryas Joel wastewater treatment plant was implicated as the primary source of specific conductance in 2008 and it is likely that the plant's discharge is continuing to negatively impact downstream waterbodies, including the unnamed tributary of the Ramapo River where site 4089_005 is located.



Watershed Assessment Associates **WAA**
 Environmental Services / Biomonitoring / Invertebrate Taxonomy / Professional Training

Figure 2

Station 4089_005 Watershed
Orange Co., New York

Orange County Water Authority
 Water Quality Biomonitoring Project
 Source:
 NYS DEC Mid Atlantic/New England
 ArcInfo Coverage 3/4/2002

Citations

Allan, J.D. 1995. *Stream Ecology*. Chapman and Hall, London, 388pp.

Bode, R. W., M.A. Novak, L.E. Abele, D.L. Heitzman, and A.J. Smith. 2005. Woodbury Creek Biological Assessment. NYS DEC technical report.

Gruber, Simon. 2004. Water Quality Biomonitoring Project Quality Assurance Project Plan. OCWA technical report.

Nolan, J. Kelly. 2008. Investigation of Elevated Specific Conductance Levels: Station 1089_005. Watershed Assessment Associates technical report for OCWA.

Water quality of an Unnamed Tributary of the Ramapo River

Sampling performed near to and downstream of the Village of Kiryas Joel's sewage treatment plant discharge pipe.

Sampling performed 4/24/13 by Kelly Dobbins, AICP for the Orange County Water Authority using a LaMotte Tracer PockeTester (Code 1766)

	Upstream of outfall	Downstream of outfall	Downstream of outfall and of Village on Co Rte 105 (OCWA Station 4089_005)
Salinity (ppm)	140	3,030	2,430
pH	6.71	6.87	9.27
Total Dissolved Solids (ppm)	270	5,590	2,460
Specific Conductance (μ mhos/cm)	292	6,400	2,730

ALBERT F. APPLETON

**ENVIRONMENTAL, INFRASTRUCTURE AND SUSTAINABLE DEVELOPMENT
POLICY AND PROGRAMS ADVISOR**

**c/o 1623 Third Avenue -Apt. 36F
New York, New York 10128**

November 8, 2013

To: Kathleen Burgess
Secretary, Public Service Commission:
secretary@dps.ny.gov

Re: Comments on Case 13-W-0303-Proceeding on Motion of the Commission to Examine
United Water New York, Inc.'s Development of a New Long-Term Water Supply Source.

Submitted by Email

Dear Ms. Burgess:

This memorandum, along with several attachments, referenced herein, are my comments to the Commission on the above referenced proceeding. To provide more information on my credentials, I have submitted my CV for your reference. The most important experience from your perspective will be my tenure as New York City Commissioner of Environmental Protection and Director of the New York City Water and Sewer System, during which time I designed and carried out the world's most successful urban water conservation program, reducing New York City water use by 30% or roughly 400 million gallons a day, and saving New York City over \$5 billion in infrastructure cost, for an expenditure of \$550 million on water conservation measures including massive repairs of water main leaks, toilet rebate programs, conservation incentive rate systems and sector by sector water audits and water conservation strategies. I am also an expert on environmental sustainability and serve as Senior Fellow for sustainability entrepreneurship at the Cooper Union Institute for Sustainable Design. I am also a recognized global expert and a member of the Katoomba Group on market solutions to environmental problems.

My submission consists of my report to the Rockland Water Coalition on the use of demand side measures to address the problems of water need in Rockland County, comments on the August 19th submission of United Water to the PSC, and some additional comments in this memorandum. Above all, I want to emphasize two points. As the information submitted by UW in Exhibit D of its August 19th submission demonstrates, the claim of United Water that the capacity analysis of 2006 which they claim was reaffirmed in 2010 and in the DEIS draft is untenable. The actual water use figures through 2011 fall 5 mgd a day short of the projections made in those studies and show a 10% reduction in water use in Rockland County since 2007. United Water attempts to dismiss this shortfall as the result of temporary factors, as a plateau of demand that will go shortly disappear. Outside the fact that a 10% reduction in water use is more of a gully than a plateau, they offer no analysis to support the conclusion of an immediate rebound in demand by 2015. In fact, if one takes their figure of 28.34 mgd use in 2011 and compares it to the 33.96 mgd a day in capacity and then trends forward water use in Rockland by an increase of 2% annually, a very

generous figure, given they predict in Exhibit D a 2013 increase of only 200mgd a day or 0.7%, it will take ten years to reach the 33.96 mgd current capacity. And that assumes no ameliorative measures. And, as my report points out, there are readily available cost effective demand side measures that would add a net of 8.5 mgd a day in capacity.

p. 2, APPLETON, COMMENTS

Second, I have to stress that their demand analysis is hopelessly compromised by the failure to consider the impact of escalating water rates on demand. Given the increases in water rates in Rockland over the last ten years, over 30%, and just applying an elasticity of .2, then at least half of the drop in water consumption in Rockland County since 2007 can be attributed to consumer response to escalating prices. United Water (UW) is currently seeking rate increases that would increase rates by up to 70% and, if the proposed desalinization plant (desal plant) is built would at least double. But, just taking the currently sought rate increases, and leveling them at 60% to be conservative, with again a conservative .2 elasticity on demand, that would reduce water demand in Rockland by 12% or 3.6 mgd. This leaves a water demand picture that looks as follows in terms of a supply cushion.

Current shortfall to 2006 projected demand and capacity		5.5mgd
Reductions in Water Demand Due to Price Impacts	up to	3.6 mgd

Then there are the proposals in my report and made elsewhere

Change in Deforest Reservoir rule	4.0 mgd
Minimal Water Conservation, 10% Target	3.0 mgd
Reduction of Pipeline Leaks From 17% to 12%	1.5 mgd

In short, by readily available measures with the control of UW and the natural outcome of the future rate environment Rockland has an additional available water capacity of at least 17.6 mgd

Which leads to one conclusion. There is no basis for concluding Rockland needs a 130 to 180 million dollars supply side project that will double or more local water rates.

In closing, I must stress again the complete economic unreality of assessing future capacity need without assessing price. As the Commission members at the October 1st and October 2nd hearings will recall UW attempt to dismiss these concerns by in effect suggesting that the factors that drive demand are independent of price. The outpouring of public sentiment at those hearings, the virtually unanimous cries of anguish from the Rockland public is the best refutation of such indifference. Rockland is facing a full scale water rate revolt, of a kind I am very familiar with, having had to deal with one in New York City in the 1990s. What New York City did then, is what UW should do now; adopt a cost conscious management strategy based around demand side management. In New York City we succeeded in changing a water rate pattern where increases had averaged 14% a year for seven years into a two year rate freeze and then increases that, for nearly a decade, were affordable and in line with the inflation rate. I remind the PSC that its obligation is not only to ensure an adequate water supply but to protect the water consumer from unnecessary

and imprudent expenditures. That should be UW's obligation also, but one sees little if any evidence of a cost conscious management in its indifference to the rate increases their management of the capacity issue will produce or their impact on the affordability of life and business in Rockland County. One also sees, as a particularly distressing manifestation of that, and as outlined in my report, a lack of the kinds of due diligence, in terms of planning and financial analysis, that is supposedly one of the strengths of a private sector company.

Should you staff desire any further information on these or other related issues, I will be happy to provide them.

Attachments:

AFA Report to Rockland Water Coalition
Executive Summary AFA Report to Rockland Water Coalition
p.3, Appleton Comments

Rockland Water Coalition Letter to County Executive on Use of Deforest Reservoir,
Attachment to AFA Report
AFA CV
AFA Comments on UW August 19th Letter